



A University of Sussex DPhil thesis

Available online via Sussex Research Online:

<http://sro.sussex.ac.uk/>

This thesis is protected by copyright which belongs to the author.

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

Please visit Sussex Research Online for more information and further details

**Effects of Remittances on Household
Expenditure Inequality and Education Expenditures:
Evidence from the Philippines**

Akira Murata

**Doctor of Philosophy
(Migration Studies)**

University of Sussex

[September 2011]

UNIVERSITY OF SUSSEX

AKIRA MURATA

DEGREE OF DOCTOR OF PHILOSOPHY

EFFECTS OF REMITTANCES ON HOUSEHOLD
EXPENDITURE INEQUALITY AND EDUCATION EXPENDITURE:
EVIDENCE FROM THE PHILIPPINES

SUMMARY

This thesis examines the economic effects of both international and domestic remittances on Filipino households. The thesis investigates three main research questions: (1) “Which household characteristics affect the probability and the size of domestic and international remittances migrant households received?”; (2) “How do these two sources of remittances Filipino households received affect welfare inequality at the household level?”; (3) “How do the remittances affect the recipient household’s expenditure patterns, especially educational expenditures?” The data mainly used for the thesis come from the nationally representative Family Income and Expenditure Survey (FIES) in the Philippines during the period of 1985-2006.

With regard to the first question, the thesis finds that the levels of receiving international and domestic remittances are mutually related and reveals that there is a displacement effect of remittances from abroad on those from within the country. Furthermore, the thesis also revealed that several explanatory factors such as the welfare level, the heads’ characteristics, the job-related factors, and the regional disparities are significant to determine both the probability and the size of receiving the remittances.

Regarding the second question, the thesis shows that the receipt of international remittances could significantly contribute to an improvement in Filipino households’ livelihoods at any welfare level and that it would cause expenditure inequality between Filipino households to widen over time. In contrast, the receipt of remittances from within the Philippines did not exert a significant impact on improving the welfare.

As for the last question, the thesis finds that the receipt of remittances from abroad would increase the budget share for education as well as its absolute value. This result supports the idea that international remittances could contribute to the future Philippine economic growth via increase in human capital investment if the country sort out the issues on brain drain of educated migrants’ children.

Acknowledgement

Writing this thesis has been a great journey. Before starting the doctoral research, I had no idea on which direction to go. I had no enough skills to use for the research. I knew no researchers and policymakers who are working in the research field. Thus, every day I experienced something new and learnt from the research. Every day I woke up with great motivations to carry on the research. While doing the research, I spent great time with great people. Without kind support and great encouragement from them, I could not complete this thesis.

I owe my deepest gratitude to my doctoral thesis supervisor, Dr. Barry Reilly, who has patiently, enthusiastically and intelligently enlightened me. His productive, surprisingly very swift, comments and advice always helped me carry on the research. Also, there has been a lot of fun to pursue new research methodologies under his careful and thorough supervision. Without his wonderful supervision, the journey got tougher and this thesis could not have been completed.

I would like to express my gratitude to the Sussex Centre for Migration Research (SCMR) for allowing me to give an opportunity to do migration research based on economics. I believe that it is one of the best institutions to study migration issues. I was very happy to belong to the centre as a research student. I am deeply indebted to Dr. Richard Black for giving me great research opportunities to work for external institutions: UK Department for International Development (DFID) and British Council. Richard helped me a lot to build the network not only within the United Kingdom but in the Philippines. The network has been very helpful for me to not only complete the thesis but pursue my further career as a researcher. Moreover, the university supported my travel cost when I gave a presentation about my research at IMISCOE Conference in Maastricht in May 2009. I would like to thank Dr. Jessica Hagen-Zanker from Overseas Development Institute for her productive comments on the earlier draft of my thesis.

During the research, I had an opportunity to stay in the Philippines for more than one year from July 2009 to August 2010 as well as between April-May 2011. In the Philippines, I met so many people helped me understand migration and development issues. I would like to record my gratitude to, among others, Mr. Ricardo Casco and Ms. Aiko Kikkawa from International Organisation for Migration (IOM), Ms. Keiko Niimi from International Labour Organisation (ILO), and Dr. Guntur Sugiyarto from Asian Development Bank (ADB), Dr. Eric Le Borgne and Ms. Soonhwa Yi from the World Bank for providing me the opportunities to work for their projects. In addition, so many academic scholars, researchers, policymakers, and practitioners gave their very kind hospitality extended to me during my stay in Manila and enlightened me about migration, remittance and employment issues. I would like to express my gratitude to,

among others, Dr. Aniceto C. Orbeta Jr. from Philippine Institute for Development Studies (PIDS), Dr. Ernesto M. Pernia, Dr. Agustin L. Arcenas and Dr. Rene E. Ofreneo from University of the Philippines, Dr. Fernando T. Aldaba from the Ateneo de Manila University, Dr. Marla Asis from Scarabrini Migration Center, Mr. Ildefonso F. Bagasao and Mr. Jeremiaiah M. Opiniano from Economic Resource Center for Overseas Filipinos (ERCOF), and Mr. Loreto B. Soriano from LBS e-Recruitment Solutions Corporation. All of the precious research experiences I enjoyed in the Philippines made my research progress.

I would express my special gratitude to the Japanese government and the World Bank which offered the scholarship for my doctoral research. My special thanks further go to the Institute of Economic Research at Hitotsubashi University in Tokyo which officially allowed me to use the Family Income and Expenditure Survey (FIES). Dr. Masako Ii at Hitotsubashi University and Dr. Rouselle F. Lavado at Philippine Institute for Development Studies (PIDS) helped me access the datasets. With regard to the datasets, I am also indebted to Mr. Vincent D. Olaivar, Ms. Estelita Marquez, and Ms. Emma A. Fabian at National Statistics Office (NSO) in the Philippines. Furthermore, Wednesday lunch meetings with Dr. Tony Fielding, Dr. Kevin McCormick, John, Saki, & Sanya Tapsell, and Min-Hua Tsai at Institute of Development Studies (IDS) Cafeteria were the precious moment of my research life at the University of Sussex. Christos Karagiannidis, Genner Llanes Ortiz, Miguel Rivera, Verena Erlenbusch, Yohannes Birru and Yoshihiro Nakano were great office mates at the University of Sussex.

Finally, I am grateful to give my thanks to my friends and families. I would like to express my gratitude to all of past and current migration researchers at University of Sussex for their kindness, among others, Ceri Oeppen, Christina Oelgemoller, Cristina Pantiru, Janine Teerling, Julie Vullnetari, Giuseppe Scotto, Lena Nare, Prosper Asima, Vanessa Iaria, and Zana Vathi. I owe great thanks to Saeid Rohani and Yohannes Birru for discussing a wide variety of political, economic, and social issues which are relevant to my research interests. While explaining these issues to them, I could often find the way to move on. Claudia Harflett, Desmond Hewitt, Eric Lucas, Gemechu Ayna Aga, Kieron Swift, Manuel Muriel, and Saeid Rohani were great housemates. With great time at home, I had no worry about my research and got motivated every morning. The time spent with James Andrew Hannam, Woongse Kim, and Xinyi Li is also delightful and makes me feel at home even abroad. I owe special thanks to Machiko Goto who has always cheered me. With her, as an old proverb says, “*shared joy is a double joy; shared sorrow is half a sorrow*”. Finally, my parents, Tamotsu Murata and Reiko Murata have provided me with warm and continuous support during the periods I have been working on the thesis. Words will never express how much I appreciate both of you always giving me your love.

Contents

| | |
|--|-----|
| Chapter 1: Introduction | 1 |
| 1.1 Research on International migration and development..... | 1 |
| 1.2 Research questions | 5 |
| 1.3 The structure of the thesis | 11 |
| Chapter 2: International Remittances into the Philippines..... | 16 |
| 2.1 Migration and Remittances | 16 |
| 2.2 International remittance flows into developing countries..... | 17 |
| 2.3 Trends in international remittances into the Philippines..... | 25 |
| 2.4 Some features of international remittances into the Philippines..... | 31 |
| 2.4.1 Types of Remittances..... | 31 |
| 2.4.2 Modes of Remittances..... | 32 |
| 2.4.3 Places of Origins of Remittances | 33 |
| 2.4.4 Remittances by Types of Migrants' Work..... | 33 |
| 2.4.5 Remittances by Migrants' Gender | 34 |
| 2.5 Factors affecting international remittances into the Philippines..... | 34 |
| 2.5.1 Remittance channels..... | 35 |
| 2.5.2 Transaction costs of remittances | 37 |
| 2.5.3 Remittance networks and services | 38 |
| 2.5.4 Exchange rates | 39 |
| 2.5.5 Stock of migrant workers | 40 |
| 2.5.5.1 <i>Economic background</i> | 49 |
| 2.5.5.2 <i>Culture of international migration</i> | 51 |
| 2.5.5.3 <i>Risk-aversion and close family ties</i> | 52 |
| 2.5.5.4 <i>Expansion of the global labour market</i> | 53 |
| 2.5.5.5 <i>Governmental policies and institutions for migration</i> | 54 |
| 2.6 Summary | 64 |
| Chapter 3: Data on International Migration and Remittances for the Philippines..... | 65 |
| 3.1 Survey on Overseas Filipinos (SOF) | 65 |
| 3.1.1 Scope and coverage..... | 65 |
| 3.1.2 Survey design | 66 |
| 3.2 Family Income and Expenditure Survey (FIES)..... | 68 |
| 3.2.1 Scope and coverage..... | 68 |
| 3.2.2 Survey design | 69 |
| 3.2.3 The Main variables..... | 72 |
| Chapter 4: The incidences and amounts of remittances received by Filipino households | 80 |
| 4.1 Introduction | 80 |
| 4.2 Motivations for Remittances | 82 |
| 4.3 Profile of remittance-receiving households | 85 |
| 4.4 Econometric Methodology..... | 95 |
| 4.4.1 Methodology for the probability of receiving remittances | 98 |
| 4.4.1.1. <i>Probit Model</i> | 98 |
| 4.4.1.2. <i>Bivariate Probit Models</i> | 100 |
| 4.4.2 Methodology for the amount of receiving remittances | 103 |
| 4.4.2.1. <i>Tobit model</i> | 106 |

| | |
|--|-----|
| 4.4.2.2. <i>Bivariate Tobit Model</i> | 109 |
| 4.4.3 The effect of International Remittances on Domestic Remittances | 110 |
| 4.5 Estimation Results | 114 |
| 4.5.1 Determinants of remittances | 115 |
| 4.5.2 The effect of International Remittances on Domestic Remittances | 127 |
| 4.6 Concluding Remarks | 133 |
| Chapter 5: Remittances and their effects on Household Expenditure Inequality in the Philippines before and after a set of crises during the late 1990s | 136 |
| 5.1 Introduction | 136 |
| 5.2 Philippine economy during the 1990s | 143 |
| 5.3 Methodology of Analysis | 145 |
| 5.3.1 Conditional quantile regression | 145 |
| 5.3.2 Decomposition of unconditional quantile regression | 147 |
| 5.4 Empirical Results | 152 |
| 5.4.1 Conditional quantile regression results | 152 |
| 5.4.2 Quantile Decomposition results of Expenditure Inequality | 159 |
| 5.5 Concluding Remarks | 164 |
| Chapter 6: The effects of remittances on education expenditures among Filipino households | 167 |
| 6.1 Introduction | 167 |
| 6.2 Education in the Philippines | 168 |
| 6.3 Effects of Remittances on Household Education Expenditures | 173 |
| 6.4 Data | 177 |
| 6.5 Methodology of Analysis | 187 |
| 6.5.1 Engel Curve Framework | 187 |
| 6.5.2 Censored Regression Model | 190 |
| 6.5.2.1 <i>Tobit estimator</i> | 190 |
| 6.5.2.2 <i>Instrumental-variable Tobit (IV Tobit) estimator</i> | 191 |
| 6.5.2.3 <i>Censored Least Absolute Deviations (CLAD) estimator</i> | 193 |
| 6.6 Estimation Results | 195 |
| 6.6.1 Mean comparison | 195 |
| 6.6.2 Engel Curve Framework | 204 |
| 6.6.2.1 <i>Tobit estimator</i> | 204 |
| 6.6.2.2 <i>Instrumental-variable Tobit (IV Tobit) estimator</i> | 211 |
| 6.6.2.3 <i>Censored Least Absolute Deviations (CLAD) estimator</i> | 216 |
| 6.6.3 Effects of household characteristics on education | 217 |
| 6.6.4 Geographical disparities | 217 |
| 6.7 Concluding Remarks | 220 |
| Chapter 7 Conclusion | 223 |
| Bibliography | 238 |
| Appendix | 251 |
| Appendix I Estimation Results | 252 |
| Appendix II Estimating marginal effects and impact effects of a bivariate probit model | 277 |
| Appendix III Measuring Regional differences | 279 |
| Appendix IV Selection of instruments in the instrumental-variables (IV) probit and Tobit models | 280 |

List of Tables

Chapter 2

| | |
|---|----|
| Table 2. 1: Formal and informal remittance channels in the Philippines | 36 |
| Table 2. 2: Stock Estimate of Overseas Filipinos | 36 |
| Table 2. 3: Total costs for sending US\$200 to the Philippines in 2008 (in US\$)..... | 37 |
| Table 2. 4: Newly hired land-based OFWs by major occupation and gender in 2009 ... | 47 |

Chapter 3

| | |
|--|----|
| Table 3. 1 Number and Percentage Distribution of OFWs by Region of Origin, 1996-2008..... | 68 |
| Table 3. 2: Sample size of the FIES | 72 |
| Table 3. 3: Number and Percentage Distribution of sample households by region and urbanity | 75 |
| Table 3. 4: Lists of relevant past studies using the FIES | 79 |

Chapter 4

| | |
|---|-----|
| Table 4. 1: The probability of migrants' remitting as a case in point (expected signs of relationship)..... | 84 |
| Table 4. 2: Distribution of remittance-receiving households by type of receiving remittances | 87 |
| Table 4. 3: Profile of Filipino households by type of the receipt of remittances (mean)..... | 90 |
| Table 4. 4: Variable Description | 97 |
| Table 4. 5: The correlation of the residuals (ρ) from two remittance equations in the bivariate probit models..... | 102 |
| Table 4. 6: The correlation of the residuals (ρ) from two remittance equations in the bivariate Tobit models..... | 110 |
| Table 4. 7: Marginal effects of household expenditure levels on international remittances | 116 |
| Table 4. 8: Marginal effects of household expenditure levels on domestic remittances | 117 |
| Table 4. 9: The t-tests for temporal changes in the effects of welfare levels on remittances | 120 |
| Table 4. 10: Share of OFWs by Marital Status (%) | 123 |
| Table 4. 11: Percentage Distribution of OFWs in 2008, by gender and region of origin (%)..... | 126 |
| Table 4. 12: Marginal effects of international remittances on the receipt of domestic remittances | 127 |
| Table 4. 13: ivprobit and ivtobit estimation results using 2003 FIES..... | 131 |

Chapter 5

| | |
|---|-----|
| Table 5. 1: The expenditure Gini coefficient, 1985-2006 (by receipt of remittances)..... | 137 |
| Table 5. 2: Descriptive Statistics..... | 150 |
| Table 5. 3: Summary Statistics..... | 151 |
| Table 5. 4: Per capita household expenditures (in pesos) and their gaps by types of remittances | 152 |
| Table 5. 5: Pooled regression on expenditure levels (<i>lpctotex</i>) | 153 |
| Table 5. 6: Interquantile regression (pooled) on expenditure gaps (<i>lpctoex</i>)..... | 154 |
| Table 5. 7: Quantile regression results..... | 157 |

| | |
|--|-----|
| Table 5. 8: Decomposition results of the expenditure differences in distribution (including mean results)..... | 160 |
| Table 5. 9: Shares of Household Expenditure among International Remittance Recipient (RR) and Non-Recipient (NR) Households, 1994-2000 | 163 |

Chapter 6

| | |
|--|-----|
| Table 6. 1: School Enrolment Ratios by the level of education and by gender | 170 |
| Table 6. 2: Distribution of Tertiary Education Institutions by region and by type (as of July 18, 2002)..... | 171 |
| Table 6. 3: Tertiary Education expenditure (in Philippine pesos) by type in 1995 | 172 |
| Table 6. 4: School attendance of tertiary education by income deciles by location, 1988-2000..... | 173 |
| Table 6. 5: The average share (<i>edush</i>) and the average absolute value (<i>educ</i>) of education expenditures among households who spent on education (Philippine pesos, in real terms), 1988-2006 | 179 |
| Table 6. 6: Type of remittances received and their average amounts (in Philippine pesos), 1988-2006 | 181 |
| Table 6. 7: Definition of the variables used in the analysis | 182 |
| Table 6. 8: Summary Statistics..... | 183 |
| Table 6. 9: Sample Mean Household Expenditure on Education by welfare level (Philippine pesos, in real terms)..... | 195 |
| Table 6. 10: Sample Mean Household Expenditure on Education by region (Philippine pesos, in real terms)..... | 196 |
| Table 6. 11: Mean Educational Expenditure/ budget share for education in 2006..... | 197 |
| Table 6. 12: The average number of family members aged 7-14 among households who spent on education, in 2006..... | 200 |
| Table 6. 13: Shares of Household Expenditure among International Remittance Recipient (RR) and Non-Recipient (NR) Households 1985-2006..... | 203 |
| Table 6. 14: The Tobit estimation results of the effects of remittances on education .. | 206 |
| Table 6. 15: The t-test of the effects of remittances on education | 207 |
| Table 6. 16: The Tobit estimation results of the effects of household welfare levels on education | 209 |
| Table 6. 17: The t-test of the effects of household welfare levels on education..... | 210 |
| Table 6. 18: The IV Tobit estimation results on education using the 2006 FIES | 214 |
| Table 6. 19: The CLAD estimation results of the effects of remittances on education expenditures (or <i>educ</i>)..... | 216 |
| Table 6. 20: Normalized regional effects on the absolute value of education expenditures (or <i>educ</i>)..... | 219 |

Appendix

| | |
|--|-----|
| Table A4. 1: Probit marginal effect estimation results | 252 |
| Table A4. 2: Bivariate probit marginal effect estimation results | 254 |
| Table A4. 3: Two-Part model Coefficient estimates on Domestic Remittances..... | 256 |
| Table A4. 4: Two-Part model coefficient estimates on International Remittances | 258 |
| Table A4. 5: Tobit marginal effect estimation results..... | 260 |
| Table A4. 6: Bivariate Tobit coefficient and marginal effect estimation results | 262 |
| Table A4. 7: Probit marginal effects of international remittances on the probability of domestic remittances | 264 |
| Table A4. 8: Tobit marginal effects of international remittances on the level of domestic remittances | 265 |

| | |
|---|-----|
| Table A4. 9: Selection of instruments in the <i>ivprobit</i> model in Chapter 4 ($y=dinrem$) | 283 |
| Table A4. 10: Selection of instruments in the <i>ivtobit</i> model in Chapter 4 ($y=inrem$) .. | 285 |
| Table A5. 1: Pooled regression results on expenditure levels (including remittance dummy variables)..... | 266 |
| Table A5. 2: Interquantile regression results on expenditure gaps | 267 |
| Table A5. 3: Mean regression results on expenditure levels by types of remittances .. | 268 |
| Table A6. 1: Coefficient estimates of the Two-Part model on education expenditure share (%) with the absolute amount of remittances | 269 |
| Table A6. 2: Coefficient estimates of the Two-Part model on education expenditure (Philippine pesos, in real terms) with the absolute amount of remittances..... | 270 |
| Table A6. 3: The Tobit estimation results of marginal effects on education expenditure share (%) with remittance dummy variables..... | 271 |
| Table A6. 4: The Tobit estimation results of marginal effects on education expenditure (Philippine pesos, in real terms) with remittance dummy variables | 272 |
| Table A6. 5: The Tobit estimation results of marginal effects on education expenditure share (%) with the absolute amount of remittances | 273 |
| Table A6. 6: The Tobit estimation results of marginal effects on education expenditure (Philippine pesos, in real terms) with the absolute amount of remittances..... | 274 |
| Table A6. 7: The CLAD estimation results on education expenditure (Philippine pesos, in real terms) with remittance dummy variables..... | 275 |
| Table A6. 8: The CLAD estimation results on education expenditure (Philippine pesos, in real terms) with the absolute amount of remittances | 276 |
| Table A6. 9: Selection of instruments in the <i>ivtobit</i> model in Chapter 6 ($y=educsh$)... | 287 |
| Table A6. 10: Selection of instruments in the <i>ivtobit</i> model in Chapter 6 ($y=educ$) | 288 |

List of Figures

Chapter 2

| | |
|--|----|
| Figure 2. 1: International Remittance Flows into Developing Countries, 1980-2008 (current US\$)..... | 18 |
| Figure 2. 2: Percentage Growth rate of International Remittance Flows into Developing Countries, 1981-2008..... | 19 |
| Figure 2. 3: The receipt of International Remittance Flows by world region, 1980-2008 (current US\$)..... | 19 |
| Figure 2. 4: The receipt of International Remittances by Income Level, 1980-2008 (current US\$)..... | 21 |
| Figure 2. 5: International Remittances of the Top recipients in developing countries ... | 23 |
| Figure 2. 6: Remittances, ODA, and FDI into Low & Middle income countries..... | 24 |
| Figure 2. 7: Real GDP per capita (based on 2005 PPP exchange rate)..... | 26 |
| Figure 2. 8: Overseas Filipino Workers' remittances | 29 |
| Figure 2. 9: Philippine peso-U.S. Dollar Exchange rate and remittances sent by land-based workers in the United States | 40 |
| Figure 2. 10: Trends in the Deployment of land-based OFWs by major world group ... | 44 |
| Figure 2. 11: Deployed land-based OFWs by main destinations, New hires and Rehires (% of total land-based OFWs), 1998-2009 | 45 |
| Figure 2. 12: Trend in deployed land-based OFWs by Major Occupational Category, New hires, 2003-2009 | 46 |
| Figure 2. 13: Gender share of Newly Hired OFWs (%), 1992-2009 | 47 |
| Figure 2. 14: Determining factors of the number of OFWs..... | 48 |
| Figure 2. 15: Unemployment rates in the Philippines..... | 50 |
| Figure 2. 16: Philippine government institutions managing migration..... | 56 |

Chapter 4

| | |
|--|----|
| Figure 4. 1: Average amounts of remittance by type, 1985-2006..... | 86 |
|--|----|

Chapter 6

| | |
|--|-----|
| Figure 6. 1: Median-Spline plots of Educational Expenditure..... | 199 |
| Figure 6. 2: The number of family members aged 7-14 among households who spent on education, in 2006 | 201 |

List of Abbreviations

| | |
|---------|---|
| ADB | Asian Development Bank |
| APIS | Annual Poverty Indicators Survey |
| ASEAN | Association of Southeast Asian Nations |
| ATM | Automated Teller Machine |
| BSP | Bangko Sentral ng Pilipinas |
| CAR | Cordillera Administrative Region |
| CFO | Commission on Filipinos Overseas |
| CGMA | Classroom Galing sa Mamamayang Pilipino Abroad |
| CLAD | Censored Least Absolute Deviation |
| COMELEC | Commission on Elections |
| DFA | Department of Foreign Affairs |
| DOLE | Department of Labor and Employment |
| DWH | Durbin-Wu-Hausman |
| FDI | Foreign Direct Investment |
| FIES | Family Income and Expenditure Survey |
| GDP | Gross Domestic Product |
| GNI | Gross National Income |
| ILO | International Labour Organization |
| ILPA | Iterative Linear Programming Algorithm |
| IOM | International Organization for Migration |
| ISH | Integrated Survey of Households |
| IV | Instrumental Variable |
| LDV | Limited Dependent Variable |
| LFS | Labour Force Survey |
| LSMS | Living Standards Measurement Study |
| MTO | Money Transfer Organisations |
| NCR | National Capital Region |
| NDS | National Demographic Survey |
| NEDA | National Economic and Development Authority |
| NRCO | National Reintegration Center for Overseas Filipino Workers |
| NRH | Non-remittance Recipient Household |
| NSO | National Statistics Office |
| OCW | Overseas Contract Worker |
| OAVS | Overseas Absentee Voting Secretariat |
| ODA | Official Development Assistance |
| OFW | Overseas Filipino Worker |
| OLS | Ordinary Least Squares |
| OLAMWA | Office of the Legal Assistant for Migrant Workers' Affairs |
| OUMWA | Office of the Undersecretary for Migrant Workers Affairs |
| OWWA | Overseas Workers Welfare Administration |
| PDOS | Pre-Departure Orientation Seminars |
| PIDS | Philippine Institute for Development Studies |
| POEA | Philippine Overseas Employment Authority |
| POLO | Philippine Overseas Labor Office |
| PPP | Purchasing Power Parity |
| QEE | Quantile Endowment Effect |
| QTE | Quantile Treatment Effect |
| RRH | Remittance Recipient Household |
| RSP | Remittance Service Provider |
| SOF | Survey on Overseas Filipino |
| SOW | Survey on Overseas Workers |
| SURE | Seemingly Unrelated Regression Equations |
| UAE | United Arab Emirates |
| UNICEF | United Nations Children's Fund |
| UNFPA | United Nations Population Fund |
| Welfund | Welfare Fund for Overseas Workers |
| WTFOW | Welfare and Training Fund for Overseas Workers |

Map of the Philippines



Source: World Atlas.com

http://www.lib.utexas.edu/maps/middle_east_and_asia/philippines_admin_93.jpg

Chapter 1: Introduction

1.1 Research on International migration and development

In the global economy, international migration has become a central issue for both developing and developed countries or for both migrant source and host countries. Until recently, international migration used to be from one country to another, and normally caused permanent settlement or return migration after a period of time. However, during the era of globalisation, there is an expansion of ‘patterns of recurring, circulatory and onward migration which lead to greater diversity of migratory experiences as well as more complicated cultural interactions’ (Castles, 2007: 353). Due to the diversity and development of multicultural society resulting from international migration, research on international migration is multifarious. To address the varied issues of international migration, migration research should be conducted using an interdisciplinary approach although in reality much of the research on migration has been done within the framework of a single discipline. Actually, international migration is not a recent phenomenon and was also recognised as an issue related to many disciplines by Jansen (1969) who stated more than four decades ago:

‘Migration is a demographic problem: it influences sizes of populations at origin and destination; it is an economic problem: a majority of shifts in population are due to economic imbalances between areas; it may be a political problem: this is particularly so in international migrations where restrictions and conditions apply to those wishing to cross a political boundary; it involves social psychology in so far as the migrant is involved in a process of decision-making before moving and that his personality may play an important role in the success with which he integrates into the host society; it is

also a sociological problem since the social structure and cultural system both of places of origin and of destination are affected by migration and in turn affect the migrant.’

Jansen (1969: 60)

In addition to the lists of disciplines illustrated by Jansen, King (2002: 90) explained the importance and possibility of migration studies with other disciplines such as anthropology, history, law, study on human rights, social politics, philosophy, literature, and media studies. In academia, an interdisciplinary approach for migration studies has been met with general acceptance (Castles, 2007: 353). Migration scholars with different backgrounds have been pursuing their studies on international migration. It is very important to note, however, that ‘interdisciplinary does not mean putting many disciplines all together’ and that ‘each [discipline] needs to fulfil a specific role as well as contributing to migration studies as an interdisciplinary enterprise’ (Castles, 2007: 353-354). Most sociological studies on international migration are concerned about the impact of international migration on individuals, communities and societies. Castles (2005: 354) argued that the main categories that the sociology of migration traditionally analysed were ‘institutions, class (or stratification), integration, anomie, solidarity, power, social order, social conflict’ and more recently ‘gender, ethnicity, identity, agency, networks, social exclusion/inclusion and social capital’. Furthermore, Castles (2005: 355) summarised that the comprehensive research project on the sociology of migration would analyse ‘...the ways in which social structures, institutions and relationships (and changes in these) help cause migration and influence the conditions under which it takes place...’ and ‘...the ways in which international migration (including incorporation in receiving countries or return to places of origin) affects

social structures, institutions and relationships in all the localities involved (including sending, transit and receiving areas)’.

Then, how does economics contribute to international migration research? The major topics on international migration that economists have been investigating are, for example, the determinants of international migration and remittances, the labour market impact of international migration; and the effect of international migration and remittances on economic development. From the above topics, the role of economics for international migration research could be said to understand the determinants of and the effects of international migration in both source and host societies. There is a clear reason why the volume of migration research recently conducted by economists has been increasing. It used to be popular for economists to use macroeconomic determinants (such as income, the unemployment rate, and immigrant stock) to explain net international migration flows (see for example, Vogler and Rotte, 2000; Hatton and Williamson, 2002; Jennissen, 2004). However, there has emerged an increasing number of data sources containing the information on migration and remittances at the micro-level. For example, the Living Standards Measurement Study (LSMS), initiated by the World Bank in 1980 and available for 34 countries¹ as of December 2010, contains a migration module with detailed migrant characteristics. Thus, many studies on international migration and remittance have been undertaken with LSMS (for example, Agarwal and Horowitz, 2002 for Guyana; Carletto et al, 2004, Castaldo, Litchfield, and Reilly, 2005, Zezza et al, 2005, Carletto et al, 2006, Piracha and Vadean, 2010; Vadean and Piracha, 2009 for Albania; Lokshin et al, 2007 for Nepal). Other research has been

¹ Albania, Armenia, Azerbaijan, Bosnia & Herzegovina, Brazil, Bulgaria, China, Cote d’Ivoire, Ecuador, Ghana, Guatemala, Guyana, India, Iraq, Jamaica, Kazakhstan, Kosovo, Kyrgyz, Malawi, Morocco, Nepal, Nicaragua, Pakistan, Panama, Papua New Guinea, Peru, Romania, Russia, Serbia, South Africa, Tajikistan, Tanzania, Timor Leste, and Vietnam.

conducted with the migration data designed and collected by the researchers themselves or with the household survey datasets (for example, Labour Force Survey (LFS) or Family Income and Expenditure Survey (FIES)).

Remittances

One of the most important migration phenomena that economists have shown an increased interest in is remittances. The effect of remittances has been one of the most important topics on migration and development. Especially, in developing countries, remittances from abroad appear to be a significant component, and play a key role in contributing to their source economies. At the national level, remittances help to stabilize the domestic economy, while at the household level it improves the welfare of the recipient households. Remittances are mostly allocated for food, child education, health care and housing and can contribute to poverty reduction not only for remittance-receiving households but also households without migrants through multiplier effects associated with increases in consumption and investment by migrants and their families. Remittances are also used as a hedging fund for migrant households against various risks ranging from natural disasters to sickness. It can also prevent households from falling into poverty. On the other hand, migration and remittances could have negative impacts on the countries, for example, through (i) brain drain, (ii) over-dependency on remittances, (iii) inflation, (iv) high voluntary unemployment, (v) exchange rate appreciation and (vi) a lower marginal propensity to save and invest due to moral hazard among recipient households (Ahortor and Adenutsi, 2009). Therefore, policy-makers should be keen to know the effects these remittances exert on economic development and poverty in their countries. In addition to the increasing amounts of remittances, another reason why remittances have attracted attention is that they are regarded as more stable than other foreign currency flows to developing countries. For example,

Gupta et al. (2008) mentioned that remittances to sub-Saharan Africa are less volatile not only than official aid but also than foreign direct investment (FDI). It is also noted that remittances are normally the most stable private financial flow in sub-Saharan Africa.

Some families of migrants living in developing countries rely on remittances and can improve their living standards. However, it is not clear whether migration actually contributes to future development for the countries. Remittances often exacerbate social inequality, and lead to increased concentration of land ownership because, in general, the migrants come from the middle strata rather than the poorest groups in the areas of origin (Castles and Miller, 1998: 148-149). To make the migration research more solid, King (2002: 101) highlighted the importance of comparative analysis between migratory groups within the country, or between countries, or over time. Following King's suggestion, this research will rely on comparative analyses by dividing the major sample of households into various types of household groups depending on whether they receive remittances or not, by comparing the results across countries, and by analysing data over time.

1.2 Research questions

The main purpose of this thesis is to investigate the effects of remittances on Filipino households. Before examining these effects, we need to identify which characteristics affect the receipt of remittances. Past literature on migration and remittances has referred to altruistic and exchange motives for remittances (for example, Cox, D., 1987; Cox, D., Eser, Z. and Jiminez, E., 1998). With an altruistic motive, migrants care about the well-being of their children or other family members. On the other hand, with an

exchange motive, migrants remit for services received from their parents such as childcare, education, bequests and inheritance. To investigate the motivations of remittances from migrants' perspectives, the previous literature mainly exploited migrant surveys and therefore mainly dealt with the characteristics of migrants and those of households living with migrants in the remittance-sending countries (for example, Brown, 1997; Brown and Connell, 2006; Markova and Reilly, 2007). However, the main beneficiaries of the remittance incomes are migrant households. Thus, migrant household characteristics should be considered when we look at the determinants of remittances. The new economics of migration theory argues that international migration is a strategic behaviour undertaken by migrant families, rather than by individual migrants (Massey, D.S. et. al., 1998; 125).

Using a single year data on both migrant and household characteristics Alba and Sugui (2009) found, in regard to remittance motives for overseas Filipino workers (OFWs) and their household members remaining in the Philippines, that altruism motives seem to dominate exchange motives for households with migrants who are likely to be the primary bread-winners of their recipient households. This is because almost all heads and heads' spouses send money to support the livelihood of their family members remaining in the Philippines. In addition, the needs of the young family members were found to be significantly important in terms of motivations for remittances among these households.

As Skeldon (2006) argues, a globalising world does not allow us to analyse internal and international migration separately. In the case of the Family Income and Expenditure Survey (FIES), which was mainly exploited for this thesis, the data on the amounts of

remittances received from within the Philippines and those from overseas are available. With regard to research on international remittances, it is important to consider the mutual dependence between internal and international remittances, which is one of the primary research aims of this thesis. However, the FIES has the detailed characteristics on migrant households but not migrants. It is not possible to investigate a migrant's motivation for remittances using only the FIES, while it enables us to examine effects of household characteristics on the receipt of remittances and to explore their changes over time. In this thesis, we will cast light more on the role of the features of recipient households and examine the extent to which their characteristics affect the receipt of remittances and their amounts. In summary, our first research question is “*What are the determinants of both the probability and the size of both domestic and international remittances received at the level of the household?*” Furthermore, we also investigate the effects of international remittances on domestic remittances. When households send their family members abroad and they start sending remittances back to the home country, those who used to rely on domestic transfers might not need any support from family or relatives now living within the country. This assumes that domestic remittances could be displaced by international remittances due to continuous and greater amounts of financial support from migrant workers.

After understanding the determining features of migrant households, we start analysing the effects of remittances on the households, especially their expenditure. International remittances have been interpreted as potentially important for poverty reduction in migrant sending countries. The receipt of remittances from abroad can directly affect poverty through an increase in incomes or welfare levels. In the case of the Philippines,

the poverty indices ² significantly declined in the 1980s and 1990s whereas the expenditure Gini increased after 1997 mainly due to the increase in the share of the richest ten per cent of the population in total expenditure (Balisacan and Hill 2003:319). With regard to the linkage between remittances and poverty in the Philippines, it was argued that the direct and indirect impact of the increases in remittance flows into the Philippines, caused by a sharp appreciation of a migrant's host country currency against the Philippine peso during the period of 1997-1998, could reduce poverty in the Philippines (Yang and Martinez 2005).

In contrast to the impact of remittances on poverty, however, the link between remittances and inequality seems less straightforward. If remittances are sent disproportionately to better-off households, it may cause disparities between households to widen. On the other hand, if remittances are sent to the households who are worse off, it might lead to a contraction in inequality between rich and poor households (World Bank, 2006:121).

There have been a number of empirical studies that have attempted to analyse which factors influence expenditure inequality in developing countries by decomposing inequality (see for example, Mishra and Parikh, 1992 ³ for India; Tsakloglou, 1993 ⁴ for

² The headcount index, the poverty gap index, and the Foster-Greer-Thorbecke measure were used as the poverty indices, (for more details, see Balisacan and Hill 2003: 340).

³ Theil's entropy measure, Theil's second measure, and Atkinson's measure were used for the decomposition analysis. Expenditure inequality in India was decomposed by regions (states) and by sectors (urban or rural).

⁴ Expenditure per equivalent adult was decomposed into the following factors: regional (region and locality of residence), demographic (age of household head) and educational (educational level of household head). Among the factors included in the decomposition analysis, only an educational factor accounts for a relatively large part of aggregate inequality.

Greece; Akita et al., 1999⁵ for Indonesia; Nguyen, 2008⁶ for Vietnam; Balisacan and Fuwa, 2004⁷ for the Philippines). Past studies have found that the differentials in educational attainment and in geographical location accounted for a large part of expenditure inequality (Akita and Miyata, 2008:148). In the case of the Philippines, using Fields (2003) decomposition, which is a regression-based inequality decomposition approach and allows for the contribution of each explanatory variable to inequality to be investigated, Balisacan and Fuwa (2004) found that spatial inequality, which includes both rural-urban disparity and regional disparities, accounted for approximately 19 per cent and 11 per cent of the total expenditure inequality in 1985 and 2000, respectively. However, there is no Philippine research exploring the effects of the receipt of remittances on inequality using the appropriate decomposition method.

Thus, our second research question attempts to provide an insight into the effect of the receipt of remittances on inequality. In this research, we will focus on the effect of the receipt of remittances on expenditure differences between households with and without remittances. In short, our second research question is *“How do domestic and international remittances affect household expenditure inequality between households with and without the receipt of remittance incomes?”*

Finally, the thesis will also look at more specific effects of remittances on household expenditure behaviour. Households seem to have different expenditure patterns depending on their receipt of different types of remittance. However, it is not

⁵ Two Theil indices (T and L) were used to measure inequality in the distribution of household expenditures. Total inequality was decomposed into rural-urban disparity, region, age, education, household size, and gender.

⁶ Gini coefficient and Two Theil indices (T and L) were used to measure inequality. Inequality was decomposed by the receipt of international remittances. It was found that international remittances slightly increased inequality.

⁷ Two Theil T indices (T and L) were used to measure inequality. Expenditure inequality was decomposed into locality (urban or rural), region, and sector of employment.

straightforward to measure the effect of remittances on consumption or investment. This is because of the difficulties of separating remittances from other sources of income (World Bank 2006, 126). Using household budget surveys would be appropriate to investigate these effects of remittances.

Among past studies on expenditure behaviours using the Philippine household survey, Tabuga (2007), Pernia (2008) and Ang, Sugiyarto, and Jha (2009) examined the remittance effects on household expenditures. Except for Ang, Sugiyarto, and Jha (2009), the above studies found that international remittance positively influenced education expenditures. In addition, Pernia (2008) and Ang, Sugiyarto, and Jha (2009) used ordinary least squares (OLS) and did not take into account the censored nature of educational expenditures. On the other hand, Tabuga (2007) reported the results derived from a censored Tobit model though she also reported the remittance effects on education derived from the normal mean and median regression. In addition to the careful consideration of zero educational expenditure, we cannot neglect a potential endogeneity of reverse causality between education and remittances. This issue of endogeneity was considered only in Ang, Sugiyarto and Jha (2009) but they did not take into consideration the zero expenditure issue as mentioned above. For this thesis, we simultaneously take into account both the censored nature of education expenditure as well as a potential endogeneity of reverse causality between education and remittances using an instrumental-variable Tobit (IV Tobit) estimator. Dealing with the above mentioned issues discussed in the cited studies and providing the empirical estimation results derived from the appropriate econometric analysis contributes to the field of research concerned with remittance effects on education.

The above mentioned past studies on Filipino households focused only on the effect of international remittances on education and did not consider the role of domestic remittances. In addition, the studies were conducted using a single year survey and then we do not know the extent to which the effects of remittances on education changes over time. In order to fill in the gap, the last empirical chapter of the thesis considers both the effects of domestic and international remittances on education expenditure and it also explores the change in these effects over time.

Among many expenditure items, this thesis focuses on the effects of the receipt of remittances on education as the possession of education (or human capital) is a key factor that helps reduce poverty especially in developing countries. In addition to the budget share, in this thesis we also consider the absolute value of education expenditures to examine the effects of remittances on education spending. In sum, our last research question is *“How much do domestic and international remittances influence their education expenditure at the household level?”*

1.3 The structure of the thesis

This thesis consists of eight chapters. Chapter Two provides a global overview of international remittance flows into developing countries. Then, it describes the trends in international remittances into the Philippines since the 1980s and also explains the following features of remittances sent by overseas Filipino workers (OFWs): types of remittances; modes of remittances; places of origins of remittances; remittances by type of migrants' work and migrants' gender. Chapter Two also investigates the reasons why the total amount of remittances sent by OFWs has dramatically increased over time. To address this question, this chapter will describe several factors: remittance channels;

transaction costs of remittances; remittance networks and services; exchange rates; and the international migrant stock. Furthermore, it will also explain key international migration drivers: the economic, social and political situations in the Philippines; increasing demand for labour in the global economy; and Philippine governmental policies on international migration. These factors contribute to an increase in the numbers of OFWs. Finally, the chapter will describe key roles of Philippine governmental institutions that manage the international migration for OFWs.

Chapter Three describes the Survey on Overseas Filipinos (SOF) and the Family Income and Expenditure Survey (FIES), the sources of the data mainly used throughout this thesis. The SOF provides data on the number of overseas Filipino workers (OFWs), their socio-economic characteristics of remittances received by their families left in the Philippines. The FIES contains information about expenditure patterns, income sources and inequality. They provide information on sources of income (both cash and in-kind), household characteristics (such as family size, marital status and number of children by age group), and job-related information (such as earnings and employment status). Furthermore, the survey asks respondents to report on a variety of private transfers, including remittances, both in-kind and cash, from domestic sources and from overseas. This chapter describes the scope and coverage of the datasets as well as their survey design including sampling methodology and sampling weight. In addition, the definition of main variables used in the thesis (e.g., remittance, family income and expenditure, urban/rural areas) is explained and outlined here. Finally, past studies relevant to the topics of this thesis are summarised and introduced to demonstrate both the similarity and differences in the methodology.

Chapter Four examines the determinants of remittances received by Filipino households by modelling both the probability and the size of the transfer. It is important to deepen our understanding of the determining factors of remittances as they could reduce poverty, enable recipient families to smooth consumption patterns, and also allow families to invest (see World Bank, 2006 Ch4; Freund and Spatafora, 2008). This chapter investigates the features of Filipino households categorised by the status of remittances. We will distinguish households with and without international remittances as well as domestic remittances. In other words, the households will be divided into four types; households who received both domestic and international remittances (*dbothrem*), those who received only external remittances (*dexrem*), those who received only internal remittances (*dinrem*), and those who received no remittances at all (*dnorem*). These categories enable us to provide some insights on the differences across households based on the nature of remittances received.

Chapter Five investigates the effects of remittances on household expenditure inequality between households with and without the receipt of remittance incomes. Recently, economic inequality between rich and poor in the Philippines has widened and has been at a high level for the past three decades. For example, the estimates from the 2006 Family Income and Expenditure Survey (FIES) revealed that the richest ten per cent earn nineteen times more than the poorest ten per cent of Filipinos (Aldaba and Opiniano, 2008:2). Similarly, among most developing countries, it was found that the richest 20 per cent experienced the fastest increase in per capita expenditure. In the case of the Philippines, per capita expenditures increased by 2.27 per cent for the richest 20 per cent, while they increased by only 1.28 per cent for the poorest 20 per cent in the period of 1994-2003 (ADB, 2007).

Based on past findings on widening inequality in the Philippines, it is assumed that remittances from abroad would contribute to widening the Filipino household expenditure disparities. In Chapter Five, the methodology is mainly developed in two parts. First, to find evidence for the effects of the receipt of remittances on the entire expenditure distribution, this chapter investigates the extent to which the differences in the household expenditure distribution between households with and without receiving remittances can be attributed to differences in characteristics of the households. The effects of these characteristics on the conditional household expenditure distribution for each household remittance receiving category (i.e., *dbothrem*, *dexrem*, *dinrem*, and *dnorem*) can be estimated within a quantile regression framework. Then, I will also decompose the welfare differences of the unconditional quantile functions between the households with and without the receipt of remittances to examine the effect of the receipt of remittances on expenditure gaps between the households.

Chapter Six examines the effects of remittances received by Filipino households on household educational expenditures. The receipt of remittances could alter a household's expenditure pattern of consumption and investment. An Engel curve framework can be used to analyse changes in household expenditure patterns. Theoretically and empirically, past literature on remittances using the Engel curve analysis will be reviewed. This chapter will then analyse the extent to which the remittances affect the level of education expenditure among Filipino households with due consideration to the difference in remittances from within the Philippines and from abroad.

In Chapter Seven, the thesis concludes and reviews the evidence on how the receipt of international remittances would contribute to future Philippine economic growth via an increase in education expenditure or human capital investment if the country could resolve the issues relating to the brain drain of educated migrant workers. In addition, the findings of the thesis reveal that the receipt of international remittances could significantly contribute to an improvement in the livelihoods of Filipino households at any welfare level but that it would cause expenditure inequality between Filipino households to widen over time. In contrast, the receipt of remittances from within the Philippines did not exert a significant impact in improving the welfare of Filipino households.

Chapter 2: International Remittances into the Philippines

2.1 Migration and Remittances

One of the most significant current discussions in developing countries is international migration and development. In the global economy, international migration has become hard to ignore in both migrant source and host countries. In migrant source countries, generally with lower income levels than the host countries, their citizens desire better welfare through migration. Of course, there are various reasons to migrate and it might be misleading to generalise the motivations for migration. However, the motivations for working abroad or receiving remittances, to some extent, can be identified using empirical research. On the other hand, in migrant host countries, governmental policies on employment determine the inflows of migrant workers. For example, to respond to declining birth rates and aging societies, there is a growing demand for health-care workers such as doctors, nurses and caregivers in developed countries such as the United States, Japan, the United Kingdom, Australia and Canada. Likewise, professional work, for instance, IT engineers, is in demand in many developed countries. Moreover, the dirty, dangerous and demanding jobs (that is, the 3D jobs) are often taken by foreign migrants in these countries as their nationals are reluctant to engage in these sorts of jobs.

International migration leads to remittances from abroad. Total remittances into developing countries from abroad have been growing over time. The World Bank estimated that recorded remittances and capital flows to developing countries in 2008 exceeded US\$300 billion, which is over three times greater than remittances received in 2001 (Ratha, Mohaparta and Silwal, 2009). However, the true size of remittances is

believed to be much larger because of unrecorded flows through both formal and informal remittance channels (Ratha, 2007). Among developing countries that received remittances from abroad, India, China, Mexico, and the Philippines have been the top recipients (Ratha, Mohaparta and Silwal, 2009). Some overseas migrant workers send money back to support the livelihoods of their family members or relatives living in their countries of origin. Others send money back home for investment or saving purposes.

The purpose of this chapter is to describe the trends in international remittances into developing countries, especially the Philippines. This chapter shows the increasing flows of international remittances received by Filipino households. Considering the nexus between international migration and remittances, it is clear that the amounts of remittances received by the recipient families increase as the numbers of migrant workers increase. In addition to an increased stock of migrant workers, however, there are several reasons for increasing remittances from abroad. After explaining some features of international remittances into the Philippines, the latter part of the chapter will mainly focus on explaining the various factors for an increase in international remittances into the Philippines. The last section will provide a summary of this chapter.

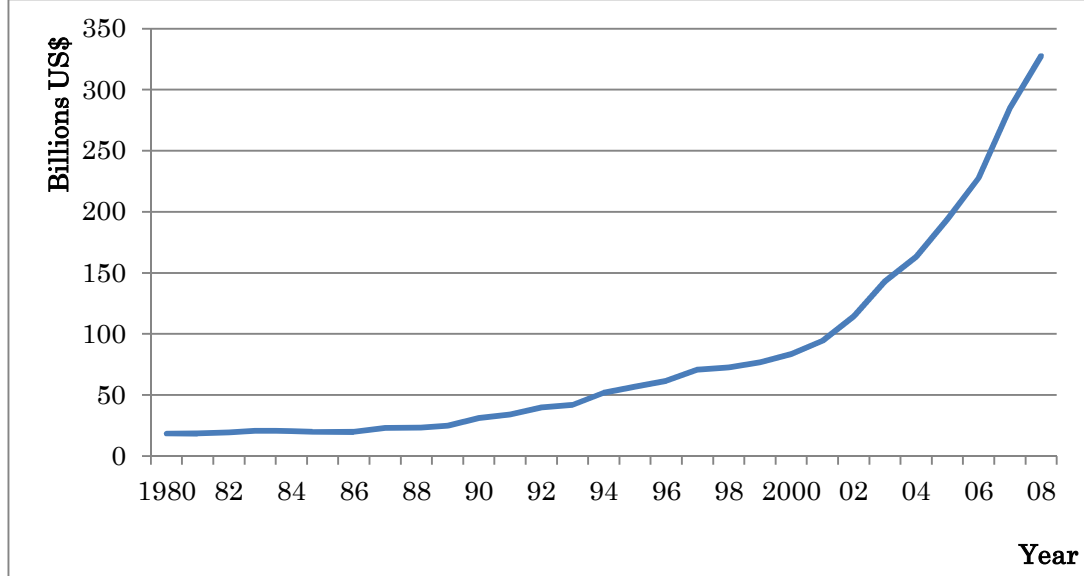
2.2 International remittance flows into developing countries

In recent times, international remittance flows into developing countries have dramatically increased. Figure 2.1 shows the sum of workers' remittances and compensation of employees received by all developing countries ⁸ over time. These data

⁸ Developing countries are defined as low- and middle-income economies in which Gross National Income (GNI) per capita was US\$11,905 or less in 2008.

include current transfers by migrant workers, and wages and salaries earned by non-resident workers abroad. In the World Development indicators and Global Development Finance provided by the World Bank, migrants' transfers, which are part of capital transfers, are treated as workers' remittances.

Figure 2. 1: International Remittance Flows into Developing Countries, 1980-2008 (current US\$)

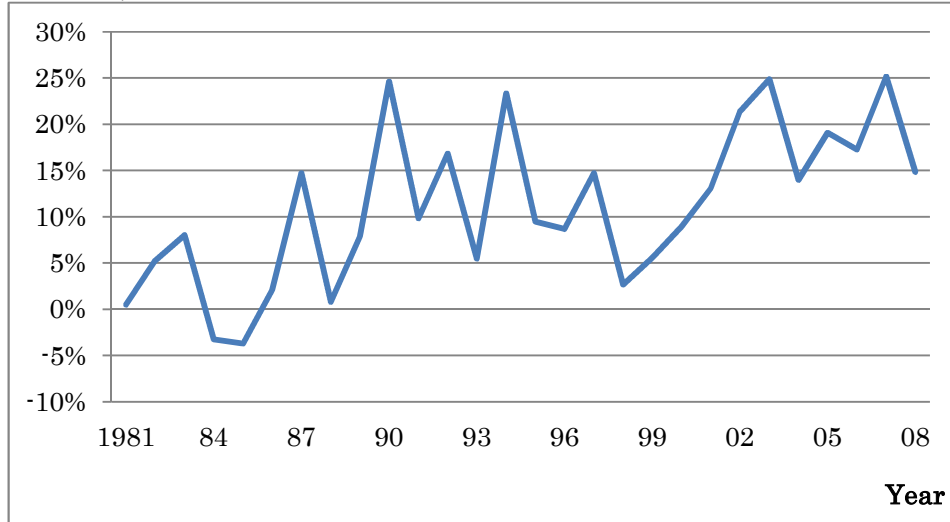


Source: World Development Indicators 2009

During the 1980s, the total amount of remittances into developing countries was steady at US\$ 20 billion. In the 1990s, there was a slight increase until 1998, and subsequently the annual growth rate of total workers' remittances and compensation of employees for all developing countries was more erratic. Although the annual growth rate dropped from 24.8 per cent in 2003 to 14.1 per cent in 2004, the growth rate continued to rise between 1998 and 2003. During this period, the amount of workers' remittances nearly doubled from US\$ 73 billion in 1998 to US\$ 140 billion in 2003. Since 2004, the growth rates of remittance flows have been remaining high within the range of 15-25 per cent and have been significantly greater than the average annual growth rate (see Figure 2.2). This recent increase in remittance flows into developing countries made the

total amount US\$ 328 billion by 2008. The figures are nominal. But the sharpest rises have been in periods of low inflation. Hence, the real effects have been fairly impressive.

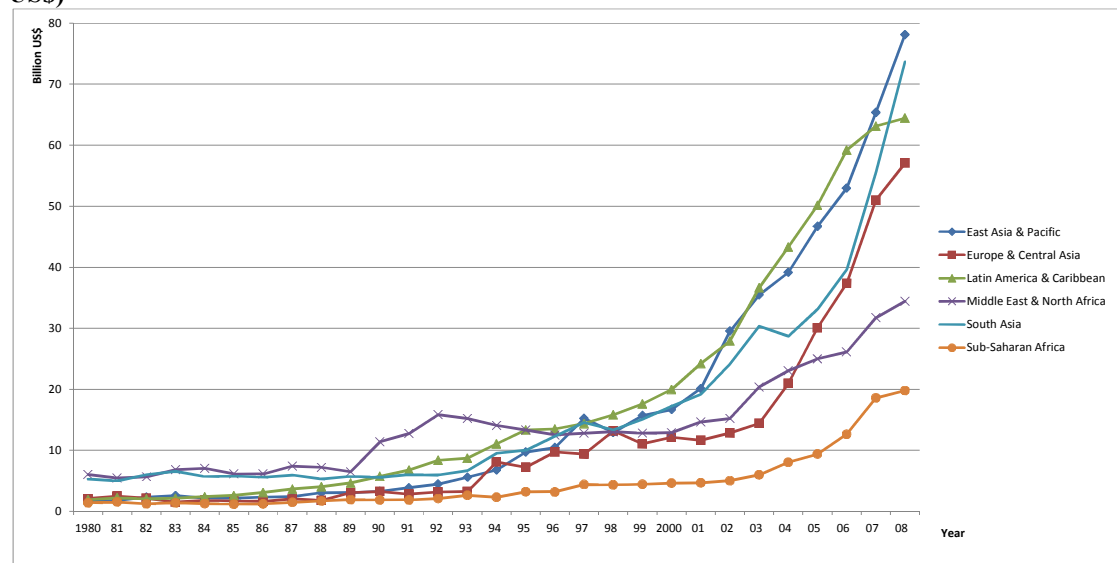
Figure 2. 2: Percentage Growth rate of International Remittance Flows into Developing Countries, 1981-2008



Source: World Development Indicators 2009

When it comes to the remittance receiving regions in the world, in the first half of the 1990s, Middle East & North Africa received the most remittances, while in the second half, the amount of remittances dramatically increased in East Asia & the Pacific, South Asia, Latin America & the Caribbean, and Europe & Central Asia (see Figure 2.3).

Figure 2. 3: The receipt of International Remittance Flows by world region, 1980-2008 (current US\$)



Source: World Development Indicators 2009

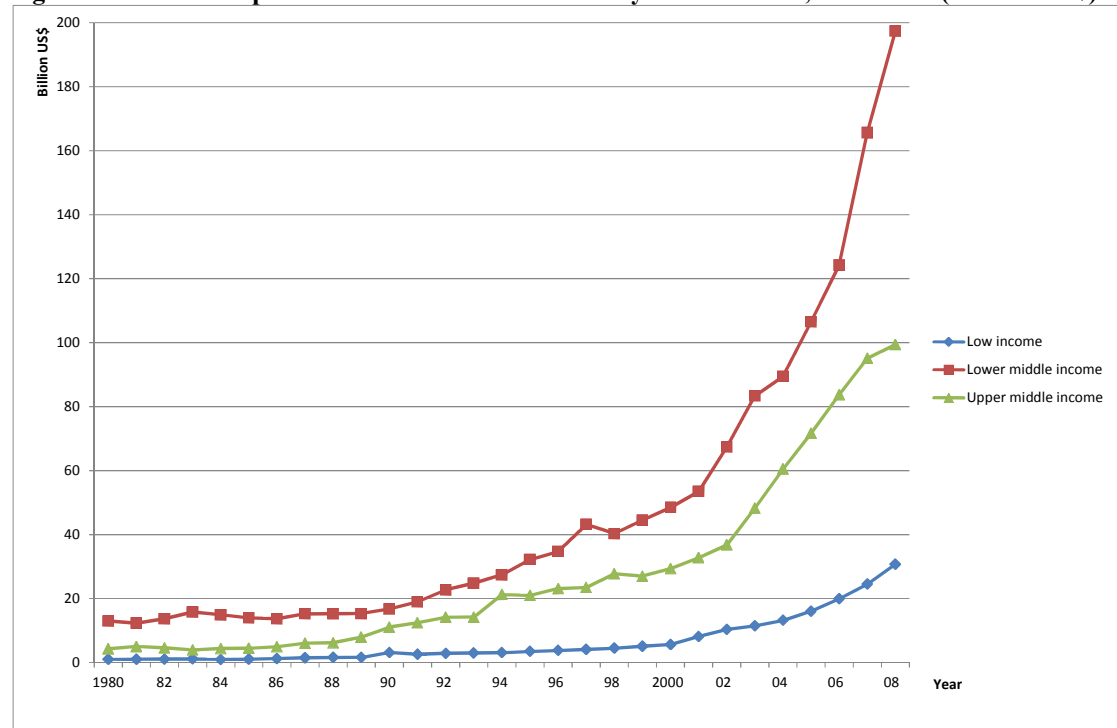
Among all developing countries, almost all amounts of remittances have been received by middle income countries⁹, while the share of remittance into low income countries¹⁰ has been slight. The total amount of remittances that middle income countries received dramatically increased from US\$ 100 billion in 2002 to US\$ 300 billion in 2008. The amount of remittances in lower¹¹ and upper¹² middle income countries dramatically increased after 2000. The aggregated amount of remittances in lower and upper middle income economies reached US\$ 200 billion and US\$ 100 billion in 2008, respectively (see Figure 2.4).

⁹ Middle income countries are those in which 2008 Gross National Income (GNI) per capita was between US\$976 and US\$11,905.

¹⁰ Low income countries are those in which 2008 GNI per capita was \$975 or less. The following countries are included: Bangladesh; Benin; Bhutan; Burkina Faso; Burundi; Cambodia; Cameroon; Central African Republic; Chad; Comoros; Congo, Dem. Rep.; Congo, Rep.; Cote d'Ivoire; Eritrea; Ethiopia; Gambia, The; Ghana; Guinea; Guinea-Bissau; Haiti; India; Kenya; Kyrgyz Republic; Lao PDR; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Moldova; Mongolia; Mozambique; Myanmar; Nepal; Nicaragua; Niger; Nigeria; Pakistan; Papua New Guinea; Rwanda; Sao Tome and Principe; Senegal; Sierra Leone; Solomon Islands; Somalia; Sudan; Tajikistan; Tanzania; Togo; Uganda; Uzbekistan; Vietnam; Yemen, Rep.; Zambia; Zimbabwe

¹¹ Lower middle income economies are those in which 2008 GNI per capita was between US\$976 and US\$3,855. They include the following countries: Includes: Albania; Algeria; Angola; Armenia; Azerbaijan; Belarus; Bolivia; Bosnia and Herzegovina; Brazil; Bulgaria; Cape Verde; China; Colombia; Djibouti; Dominican Republic; Ecuador; Egypt, Arab Rep.; El Salvador; Fiji; Georgia; Guatemala; Guyana; Honduras; Indonesia; Iran, Islamic Rep.; Jamaica; Jordan; Kazakhstan; Macedonia, FYR; Maldives; Morocco; Paraguay; Peru; Philippines; Romania; Samoa; Serbia and Montenegro; Sri Lanka; Swaziland; Syrian Arab Republic; Thailand; Tonga; Tunisia; Ukraine; Vanuatu.

¹² Upper middle income economies are those in which 2008 GNI per capita was between US\$3,856 and US\$11,905. The following countries are included: Argentina; Barbados; Belize; Botswana; Chile; Costa Rica; Croatia; Czech Republic; Dominica; Equatorial Guinea; Estonia; Gabon; Grenada; Hungary; Latvia; Lebanon; Lithuania; Malaysia; Mauritius; Mexico; Oman; Panama; Poland; Russian Federation; Seychelles; Slovak Republic; South Africa; St. Kitts and Nevis; St. Lucia; St. Vincent and the Grenadines; Trinidad and Tobago; Turkey; Uruguay; Venezuela, RB.

Figure 2. 4: The receipt of International Remittances by Income Level, 1980-2008 (current US\$)

Source: World Development Indicators 2009

India, China, Mexico, and the Philippines are the top recipients among developing countries which received remittances (Ratha, Mohaparta and Silwal, 2009). Figure 2.5 indicates that the remittances received by these countries dramatically increased since the 1990s. A remarkable fact is a sudden rise in remittances into India and China over these two or three years. The amount of remittances received by China was US\$ 6.2 billion in 2000, which is similar to that received by the Philippines or half of that received by India in 2000, and the remittances China received were comparable in size to those received by India in 2004. The former is US\$ 21.3 billion, whereas the latter is US\$ 21.7 billion. According to the China economic yearbook 2001, the rapid increase in Chinese remittances from 2000 is due to China's open policy established by the Chinese government's general assembly meeting in 2000. The Chinese government viewed international labour exports as important. In this meeting, the government stated that it is important not only to receive investment from abroad but also to invest in foreign countries and to make inroads into foreign markets. The international labour

exports were taken to form a part of the investment overseas. With regard to remittances into India, it is suggested that improvements in remittance networks and services contribute to the significant increase in the inflows of remittances by Indian workers. Singh (2009) argued that a reduction in the transaction costs of remittances through the formal channels and widely available remittance-receiving infrastructure has significantly encouraged more Indian migrants to send money through the more formal remittance channels. Mexico has experienced a decreasing trend in remittances since 2003. The growth rates of remittance clearly show that the rates in 2007 and in 2008 became lower than those between 1981 and 2008. On the other hand, the growth rates in the Philippines have been positive and stable since 2003. When we look at the recent growth rate of remittances, India's is much greater than the other three countries.

Figure 2. 5: International Remittances of the Top recipients in developing countries

Figure 2.5a: Amount (current US\$), 1980-2008

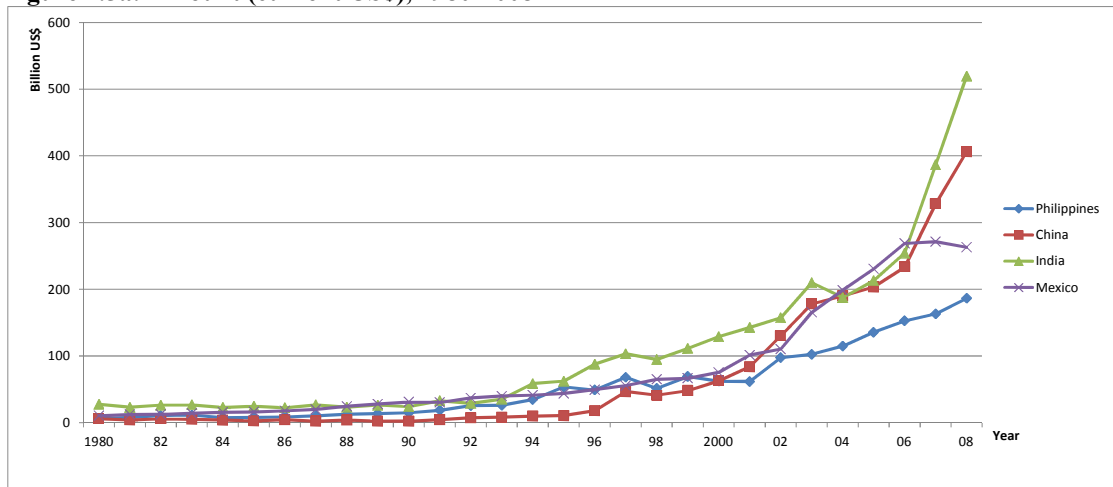
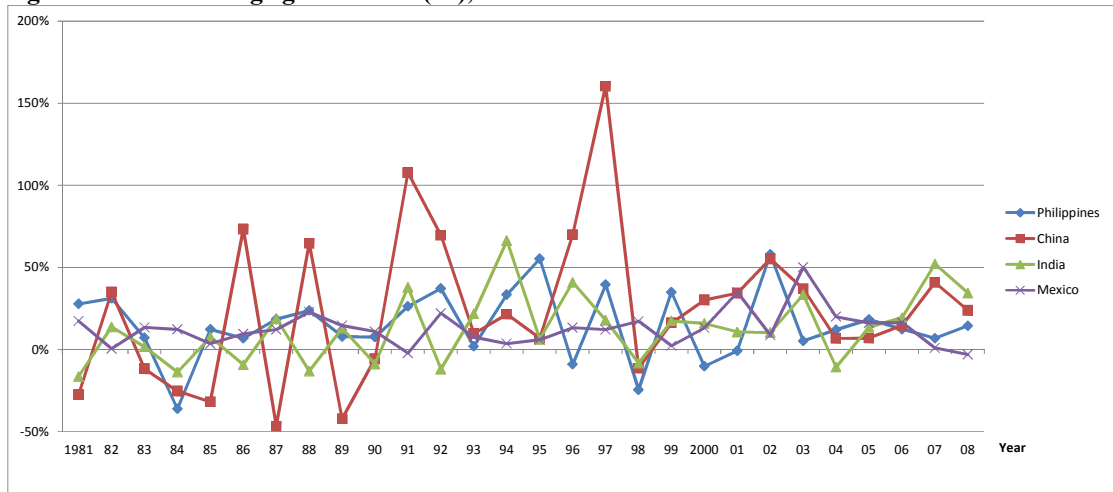


Figure 2.5b: Percentage growth rate (%), 1981-2008



Source: World Development Indicators 2009

Increases in the amount of remittances are potentially very important for developing countries as remittances into low & middle income countries have been the second largest source of external finance after foreign direct investment (FDI) and they have also been greater than official development assistance (ODA). The percentage growth rate shows that remittances have become stable income sources for developing countries (see Figure 2.6). Remittances can be regarded as more stable than other foreign currency flows to developing countries.

Figure 2. 6: Remittances, ODA, and FDI into Low & Middle income countries

Figure 2.6a: Amount (current US\$), 1980-2007

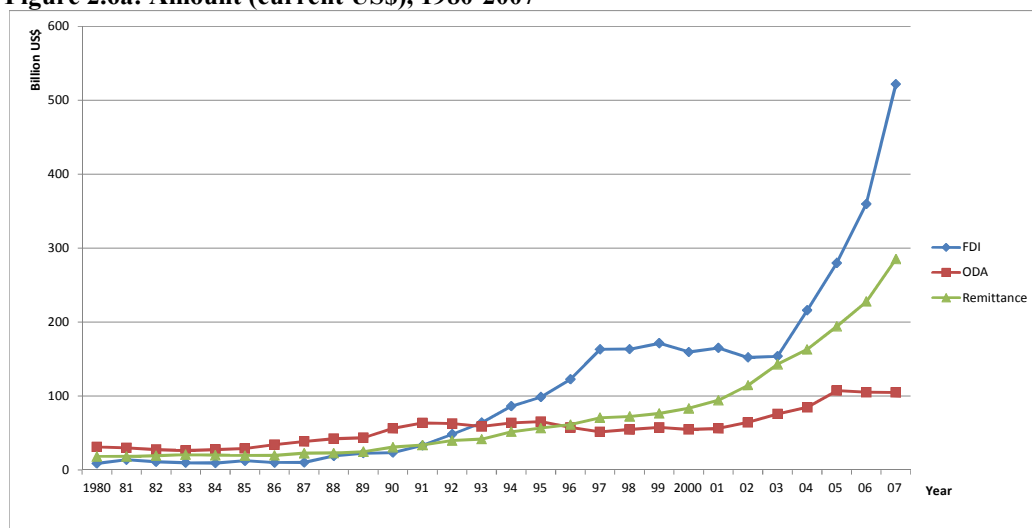
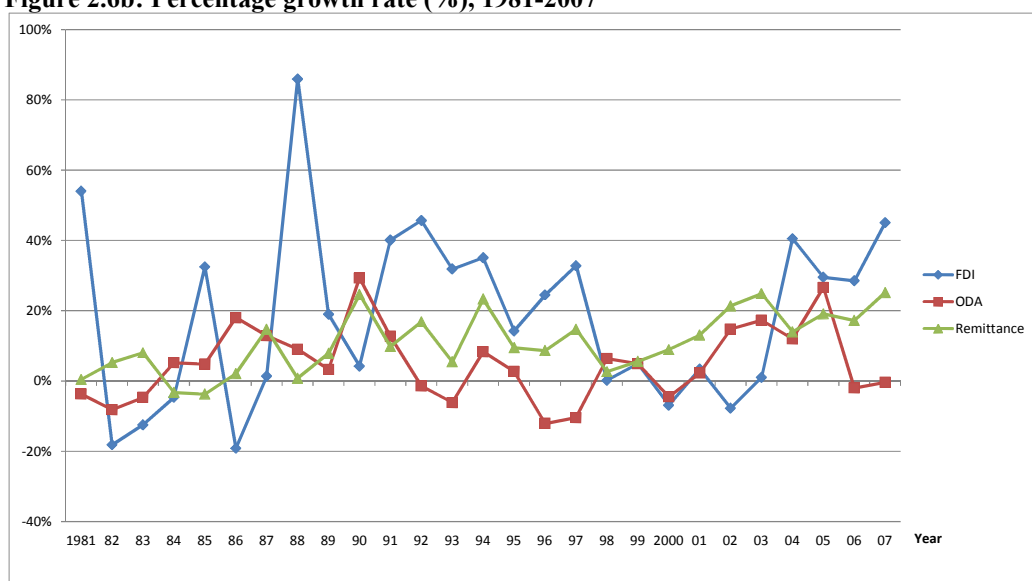


Figure 2.6b: Percentage growth rate (%), 1981-2007

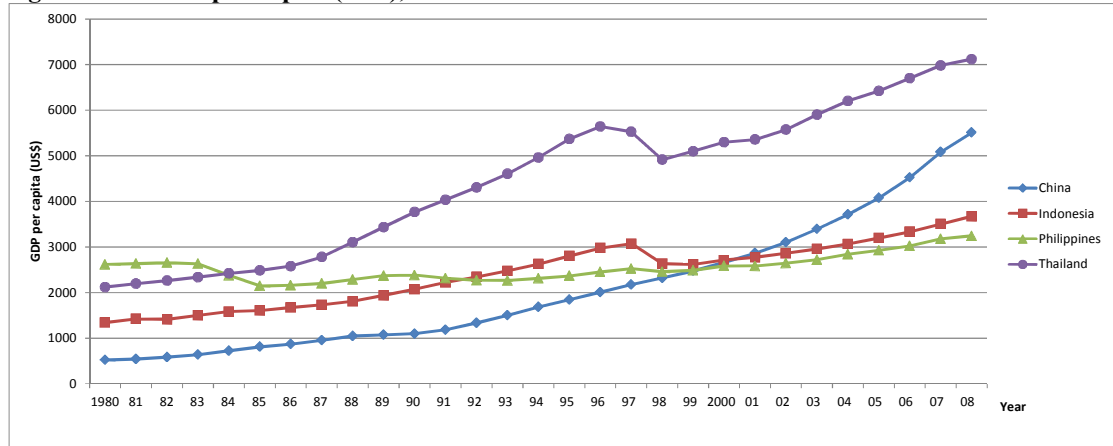
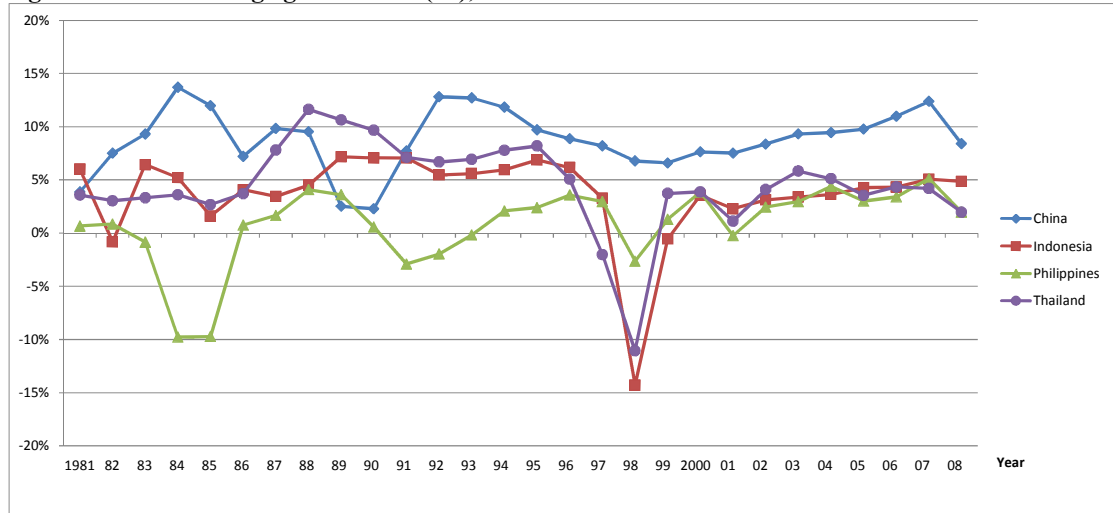


Source: World Development Indicators 2009

2.3 Trends in international remittances into the Philippines

The Filipino economy is generally viewed as relatively weak among the set of Asian countries. The real gross domestic product (GDP) per capita¹³ in the Philippines was overtaken by Thailand in 1984, by Indonesia in 1992, and by China in 2000 (see Figure 2.7). Compared with other Asian countries, the growth rates of its real GDP per capita in the Philippines were lower. Official statistics reveal that the real per capita GDP in the Philippines in 2000 was close to the same level as in 1980 (Balisacan and Hill, 2003: 4). It means that the Philippines effectively lost two decades of growth between the 1980s and the 1990s. However, recently the growth rates of real per capita GDP have been positive and relatively stable growth has occurred.

¹³ Based on the 2005 purchasing power parity (PPP) exchange rate.

Figure 2. 7: Real GDP per capita (based on 2005 PPP exchange rate)**Figure 2.7a: GDP per capita (US\$), 1980-2008****Figure 2.7b: Percentage growth rate (%), 1981-2008**

Source: World Development Indicators 2009

The 1970s were a decade of continuous expansion of per capita GDP in the Philippines. However, a political and an economic crisis occurred in the 1980s. The former was triggered by the assassination of former opposition leader Benigno Aquino in August 1983. The latter crisis was partly a response to this incident, but its roots lay deeper in the economic policy settings of the 1970s. Negative external shocks further complicated the situation. These events resulted in a sharp economic contraction in 1984-1985 (see Figure 2.7). It made the per capita GDP growth rate even weaker than before (Balisacan and Hill, 2003: 7). To make matters worse, per capita GDP decreased again between

1991 and 1993 due to serious power shortages, natural disasters (especially the eruption of Mt. Pinatubo in 1991), and the removal of U.S. military bases in 1992.¹⁴ In 1998, there was the Asian economic crisis with a severe El Niño-induced drought. On this occasion, the downturn was very brief (see Balisacan and Hill, 2003: 7). As noted above, the Philippines missed out almost completely on the Asian economic boom from the late 1970s until the mid-1990s. In particular, labour-intensive industries were more attracted to China and other lower-wage economies within the Association of Southeast Asian Nations (ASEAN). These industries bypassed the Philippines because of its political and economic crises.

More recently, the Philippine economy has been developing for several years. In 2007, the gross domestic product (GDP) increased by 7.3 per cent, which was the best performance for over three decades. This economic growth was mainly driven by the service sector which expanded by 8.7 per cent in 2007 (NEDA 2008).¹⁵ The growth in service industry has been mainly caused by the development of the following service sectors: business process outsourcing, tourism, telecommunications, retail trade, real estate and housing, which were encouraged by increases in remittances from overseas Filipino workers (OFWs) (Aldaba and Opiniano, 2008: 129).

Figure 2.8 shows the amounts of remittances sent by land-based and sea-based OFWs and exchange rate fluctuations. The lion's share of the remittances has been sent by land-based workers and their remittances have dramatically increased since the 1990s. On the other hand, the remittances by sea-based workers tripled from US\$ 274.5 million in 1998 to US\$ 846.2 million in 1999 and since then have been continuously increasing.

¹⁴ It is said that the U.S. military bases contributed, directly and indirectly, as much as 5 per cent of measured GDP (Balisacan and Hill, 2003: 10).

¹⁵ The services sector contributed 4.2 percentage points to GDP growth (NEDA 2008).

During the Asian crisis, there was a steep increase in overseas remittances due to a depreciation of the Philippine peso against a migrant's currency, for example the U.S. dollar. From 1997 to 1998, the nominal Philippine exchange rate depreciated against currencies in OFW's destination countries such as the United States, Japan, Taiwan, and Singapore. However, the real effective exchange rate index, measured as a value of a peso against a weighted average of a several foreign currencies divided by a price deflator, appreciated (see Figure 2.8). The effect of the change in the real effective exchange rate can be divided into three factors: nominal effective exchange rate; domestic inflation; and foreign inflation. During the period of 1997-1998, Philippine nominal exchange rate was depreciated against major currencies. The inflation effect in the Philippines was stronger than other countries. This denotes that migrants send more remittances not only because of a sharp depreciation of Philippine peso but also price increase within the home country. Since 2004, the real effective exchange rate index has depreciated. This might partly contribute to an increase in remittance flows. However, exchange rate is not only a factor affecting remittance flows into the Philippines. This will be explained in the latter of this chapter. As a consequence, the remittance flows into the country (in, say, dollar terms) have increased continuously since then.¹⁶ In 2010 the total amount of remittances by OFWs reached US\$ 18.76 billion.

¹⁶ According to the World Bank study by Sanket Mohapatra and Dilip Ratha, the rapid growth in OFW remittances is overestimated. With taking into consideration the Philippine peso appreciation against the US dollar and the increases in crude oil and food grains prices, they estimated that remittances only increased by 3 per cent in real terms from 2004 to 2007 (see Jaleco 2008).

Figure 2. 8: Overseas Filipino Workers' remittances

Figure 2.8a: Remittance Amount (Billion US\$, nominal) and real effective exchange rate index (=100 in 2005), 1981-2008

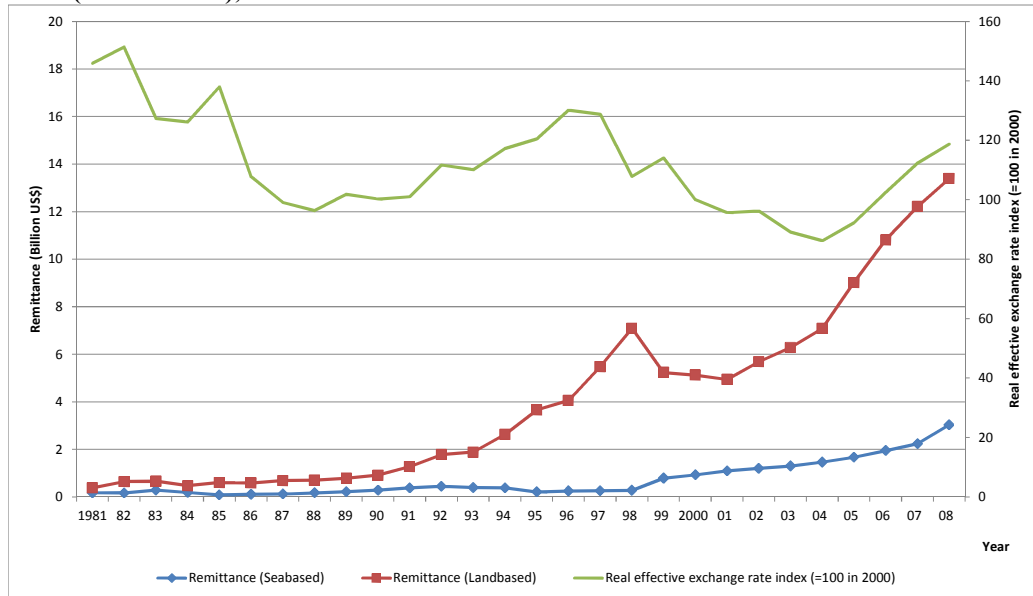
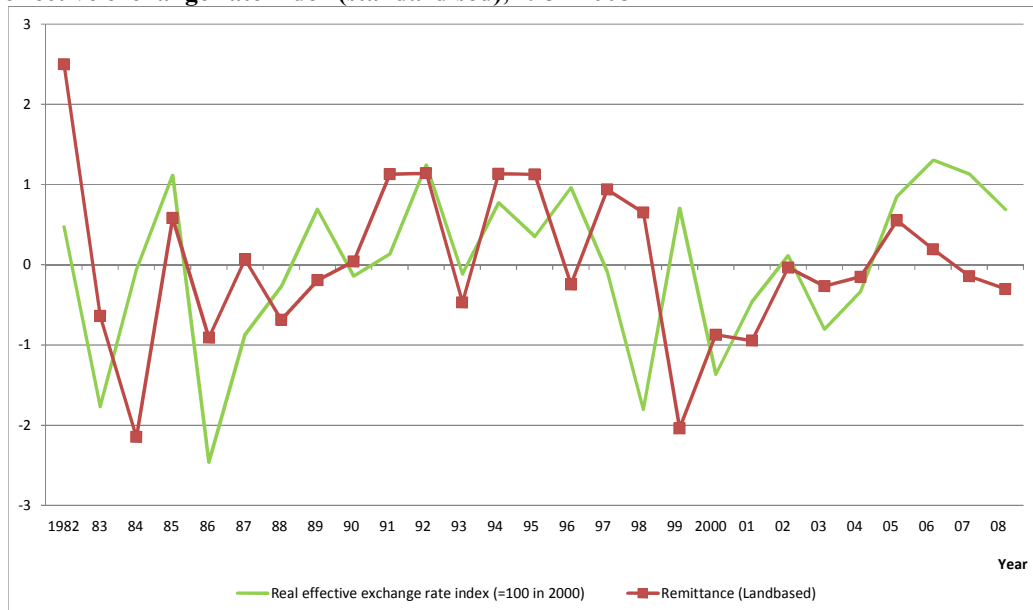


Figure 2.8b: Growth rate of land-based workers' remittances (standardised) and of real effective exchange rate index (standardised), 1982-2008



Source: Philippine Overseas Employment Administration (POEA) Statistics Bangko Sentral ng Pilipinas (BSP) Statistics

Note: Official exchange rate is calculated as an annual average based on monthly averages. Real effective exchange rate is the nominal effective exchange rate (a value of a peso against a weighted average of a several foreign currencies) divided by a price deflator.

In regard to the Asian crisis, Burgess and Haksar (2005: 3) argue that remittance flows into the Philippines during this period made the economic conditions stable. At the macro level, we can examine the relationship between remittances and economic growth or the impact of remittances on economic growth in developing countries. However, to determine these relationships and the effect of remittances is not easy to untangle. For example, the amount of remittances could affect the growth of remittance-receiving countries, and vice-versa. This endogeneity issue makes it difficult to explain the effect of remittances without adequate instruments (Burgess and Haksar, 2005: 11). Burgess and Haksar (2005: 11) concluded that the studies based on the household survey, or at the micro level, are more useful to investigate the determinants and the effect of remittances on developing economies. Moreover, sending or receiving remittances potentially reflect household decision-making. The new economics of migration casts a new light on the role of households on migration research and contributed to the integration of migration decision-making with migrant remittance behaviour and migrant household remittance use (Stark and Bloom, 1985). In this field of research, it proves useful to use household survey data to inform important research questions. Another concern is the linkage between internal and international migration. As Skeldon (2006) argues, a globalising world does not allow us to analyse internal and international migration separately. In the case of the Family Income and Expenditure Survey (FIES), mainly exploited for this thesis, the data on the amounts of remittances received from within the Philippines and those from overseas are available. With regard to research on international remittances, it is important to consider the mutual dependence between internal and international remittances, which is one of the primary research aims of this thesis.

2.4 Some features of international remittances into the Philippines

2.4.1 Types of Remittances

With regard to types of remittances, the Survey on Overseas Filipinos (SOF) revealed that around 70 per cent of total remittances were cash sent, one-fourth of total remittances were brought home by OFWs, and five per cent of total remittances consisted of goods, whose values were calculated in cash. When we look at the average remittance, however, the SOF also revealed that cash brought from abroad is, on average, greater than cash sent for the family members left at home. This may be because some OFWs send regularly only a small amount of money to sustain the livelihoods of their families in the Philippines. Others might prefer carrying and keeping a part of their earnings with them and not sending all of the earnings to their family members after the end of their overseas contract work. Most OFWs tend to regularly send money back home. The survey on Filipino migrant workers in Italy showed that 72 per cent of respondents remitted money on a monthly basis, whereas 11 per cent remit every other month (ERCOF and IOM, 2010a: 33). On the other hand, not all OFWs bring their remittances in cash. Some OFWs buy electrical appliances or gadgets and bring them back to the home country. Overseas Filipinos are renowned for sending balikbayan (or returning migrant) boxes of goods to their families in the Philippines. According to the survey on OFWs in Italy, over three-quarters of them responded that they send non-monetary items such as food, clothes, accessories, appliances, decorative items, mobile phones and electronic gadgets (ERCOF and IOM, 2010a: 42).

2.4.2 Modes of Remittances

When it comes to the modes of cash remittances sent by OFWs, over three-quarters of total remittance money was sent through the formal banking networks. Similar findings were detected among OFWs in Italy. The survey on Filipinos working in Italy found that 78 per cent of survey respondents are aware of banking services and 95 per cent of them actually use formal banking channels to send remittances, while 21 per cent send money through money transfer organisations (MTOs) with only ten per cent using informal remittance channels (ERCOF and IOM, 2010a: 40). With regard to the amounts of remittances sent, on average, greater amounts of remittances have been sent through money transfer organisations such as Western Union and MoneyGram.

Recently, there has been a shift from informal to formal remittance channels due to increased scrutiny after the September 11 attacks and reduction in remittance costs mainly due to technological improvements (see Ratha 2007), especially new developments in mobile payment applications, for example, G-CASH and SMART Padala, for Filipino migrants (see Jo Domingo 2008). Furthermore, the Bangko Sentral ng Pilipinas (BSP) or the Philippine central bank recently signed a Memorandum of Agreement with member banks of the Association of Bank Remittance Officers, Inc. to allow for faster and cheaper delivery of remittances to beneficiaries, and thereby to promote a steady stream of international remittances from OFWs (BSP, 2009).

In addition, with regard to remittance channels, it is also said that the proportion of total remittances sent by overseas Filipinos through informal channels declined to only less than four per cent compared to 30 per cent more five years earlier. This is because OFWs can send money easily through formal channels due to the efforts made by banks

and remittance centres. Moreover, the Philippine central bank discourages OFWs to use informal channels (e.g., illegitimate remittance centre and friends going back home) because the bank cannot identify accurate figure of money flows into the Philippines (Remo, 2009).

2.4.3 Places of Origins of Remittances

With regard to the places of origins of remittances sent by OFWs, the share of remittance flows into the Philippines from the Middle East has increased. The OFW's deployment outlook has been favourable in the Middle East, especially in Saudi Arabia's construction and health industries (BSP, 2009). The second major origin of remittances is East Asia. However, its share has been decreasing over time. Interestingly, the average amounts of remittance sent from Africa were significant. This is because there is a small percentage of OFWs working in Africa and also because most of them are skilled and higher-paid workers. Among the Middle Eastern countries, Saudi Arabia remains the country from which the largest amount of total cash remittances have been sent by OFWs over time. However, the greatest amount of cash remittances sent by female OFWs was from Hong Kong due to a large number of female domestic workers.

2.4.4 Remittances by Types of Migrants' Work

In terms of types of work of OFWs, 'Labourers and unskilled workers' and 'Plant and machine operators and assemblers' sent a large amount of remittances back to the Philippines. This could simply be because the numbers of OFWs working as factory and construction workers are sizeable especially in the Middle East. As for the average amounts of remittances, highly-skilled OFWs (such as corporate executives, managers,

proprietors, supervisors, and other professionals) sent more remittances back home, on average. The wages of professional OFWs are higher and they could afford to send more money back home, and thereby their average remittances could get greater than those from any other OFWs.

2.4.5 Remittances by Migrants' Gender

When it comes to the gender differences in remittances sent by migrant workers, there is evidence that male OFWs sent, on average, more money back to the country from all major OFWs' destination countries, except for Taiwan. The OFWs only in Taiwan exhibited little gender difference in the average remittances they sent. It is found that this gender difference in international remittances could be mainly due to their earning gaps in the foreign labour markets (Semyonov and Gorodzeisky, 2005:63). In addition, using the 2004 Vietnam Migration Survey, Niimi and Reilly (2008) found the evidence that gender differences in internal remittances are largely attributable to gender labour market earning differentials in Vietnam.

2.5 Factors affecting international remittances into the Philippines

There are a number of reasons for a global increase in the amount of remittances. Ratha (2007) provided a number of explanations. First, the measurement of remittance flows has been improving and becoming more accurate. Second, after the terrorist attacks of September 11 in 2001, the scrutiny of remittance flows were increased. Then, there was a big shift from informal to formal remittance channels to send remittances back to migrants' home countries. Third, the reduction in transaction costs of sending money abroad has also affected the amounts of remittances received by the migrant source

countries. Fourth, both migrants and migrant families have had more access to remittance services due to expanding remittance networks by banks, and remittance service providers (RSPs) such as Western Union and MoneyGram. Fifth, exchange rate fluctuations influence migrants' remitting patterns such as the timing and the amount of remittances. If there is a sharp appreciation of the currency migrants earned against the currency in their home countries, migrants have incentives to send more money back home. Finally, there is a growth in migrant stock and their incomes. More migrants could afford to send more money than before. Migrant remittances contribute to migrant countries of origin, especially with the availability of more foreign exchange to finance the dollar requirements of the economy at the macro level as well as with increasing purchasing power of the remittance beneficiaries. This can act as a driver for economic activities in some industries, especially the service sectors.

2.5.1 Remittance channels

Formal remittance channels are serviced by institutions authorized to engage in money transfers, such as banks, and licensed money transfer organizations (MTOs), while all other unauthorized channels are considered informal. In the case of the Philippines, there have been an array of formal and informal remittance channels (see Table 2.1). According to data from the Philippine central bank, the share of informal remittance or money which was not sent through a formal banking channel is diminishing. Undocumented migrants usually send money via an informal remittance channel because of their irregular status. Informal remittances are sent door-to-door through informal networks such as companies without partner banks and courier services. With improvements in the reporting of remittances, the Philippines' central bank has made efforts to record remittances passed through informal channels since 2001. In the

Philippines, the share of informal remittances to total cash remittances were estimated to have decreased from 22 per cent in 2001 to three per cent in 2007 (Opiniano, 2008). This is a function of improved reporting by the central bank and an increasing involvement by formal financial institutions in the remittance industry (ERCOF and IOM, 2010b: 59). Philippine banks such as Banco de Oro, Bank of the Philippine Islands, Philippine National Bank, Allied Bank, and Metrobank have offered remittance services for Filipinos abroad. Thus, it is getting easier for overseas Filipinos to access remittance services abroad than before. In addition, the recent decline in the share of informal remittances into the Philippines is also partly because the decreasing number of overseas Filipinos with irregular status. The stock estimate of overseas Filipinos with irregular status declined from 1.6 million in 2001 to 0.9 million in 2007 (see Table 2.2).

Table 2. 1: Formal and informal remittance channels in the Philippines

| Formal channels | Informal channels |
|---|--|
| <ul style="list-style-type: none"> • Banking Institutions • Domestic Money Transfer Agencies or Remittance Centres • International Money Transfer Agencies or Remittance Centres • Telecommunications companies working with banks • Internet-based remittances • Rural banks, cooperatives, and microfinance institutions • Mobile phone companies • Post office | <ul style="list-style-type: none"> • “<i>Padala</i>” practice (bringing money home through friends or relatives) • Cash brought home by overseas Filipinos |

Source: ERCOF and IOM (2010b), p.58 Table17

Table 2. 2: Stock Estimate of Overseas Filipinos

| Migrant Status | As of December 2001 | As of December 2007 |
|----------------|----------------------|----------------------|
| Permanent | 2,736,528 (36.9%) | 3,692,527 (42.3%) |
| Temporary | 3,049,622 (41.1%) | 4,133,970 (47.4%) |
| Irregular | 1,625,936 (21.9%) | 900,023 (10.3%) |
| Total | 7,412,086 (100%) | 8,726,520 (100%) |

Source: Commission on Filipinos Overseas

2.5.2 Transaction costs of remittances

Transaction costs of remittances affect the receipt of remittances passed through formal remittance channels. Freund and Spatafora (2008) found that high transaction costs significantly reduce the level of recorded remittances. Higher transaction costs encourage migrant workers to use informal channels where transaction costs can be lower.

In Italy, there are six Philippine banks¹⁷ that have been set up and are licensed by the Italian authorities not as banks but as money transfer agencies, to service overseas Filipinos sending money back to the Philippines. They noticeably offer an identical remittance fee of €8 (or US\$ 11.85), differing marginally with regards delivery time and foreign exchange spreads (ERCOF and IOM, 2010a: 26). Average costs for sending US\$200 from Italy to the Philippines via banking networks was around US\$15 in 2008. It costs US\$21 on average to send the same amount of money through money transfer organizations (MTOs). There are the geographical differences in transaction costs of remittances depending on countries from which overseas Filipinos send their money (see Table 2.3).

Table 2. 3: Total costs for sending US\$200 to the Philippines in 2008 (in US\$)

| | Bank Average | MTO Average | Total Average |
|-------------------------|--------------|-------------|---------------|
| From Italy | 14.88 | 20.96 | 20.08 |
| From Japan | 29.54 | 22.44 | 24.82 |
| From Saudi Arabia | 9.3 | 9.74 | 9.56 |
| From Spain | N.A. | 15.94 | 15.94 |
| From the United Kingdom | 9.38 | 18.46 | 17.56 |
| From the United States | 11.8 | 18.38 | 17.8 |

Source: World Bank (<http://remittanceprices.worldbank.org>)

¹⁷ These are Banco de Oro, Bank of the Philippine Islands, Rizal Commercial Banking Corporation, Metropolitan Bank and Trust Company (or Metrobank), Philippine National Bank and Land Bank of the Philippines.

2.5.3 Remittance networks and services

Western Union continues to be the leading money transfer organization (MTOs) serving Filipinos abroad. Western Union has over 6,400 agent locations across the Philippines. On the other hand, MoneyGram, the world's second-biggest money transfer organization, has 1,200 money-transfer locations and plans to have 900 bank locations nationwide. Aside from their wide networks, it is also obvious that the high migrant patronage for MTO services could be attributed to their easier accessibility to migrants and recipients, longer working hours including during weekends and holidays, and possibly less tedious and flexible paperwork compared to banks (ERCOF and IOM, 2010a: 26). In addition to its own outlets, Western Union has partnerships with local banks. In Malaysia, one of them is Bumiputra Commerce Bank, which processes remittance transactions from Filipinos using the Western Union channel (ERCOF and IOM, 2010b: 55).

With regard to banking networks, the interconnection of the Philippines' three major automated teller machine (ATM) networks (i.e., Megalink, Bancnet and Expressnet) has led to ease and increased access of withdrawals by remittance beneficiaries (ERCOF and IOM, 2010b: 61). Moreover, three Philippine banks¹⁸ cooperate with Malaysian commercial banks to offer remittance services to overseas Filipinos in Malaysia. Among Malaysian banks, Maybank has branches in the Philippines and also serves Filipino remitters (ERCOF and IOM, 2010b: 63).

For enhancing competition in the remittance industry, the Philippines' central bank has been screening and monitoring as well as approving applications from various financial

¹⁸ These banks are Metropolitan Bank and Trust Company or Metrobank, Bank of the Philippine Islands, and Rizal Commercial Banking Corporation.

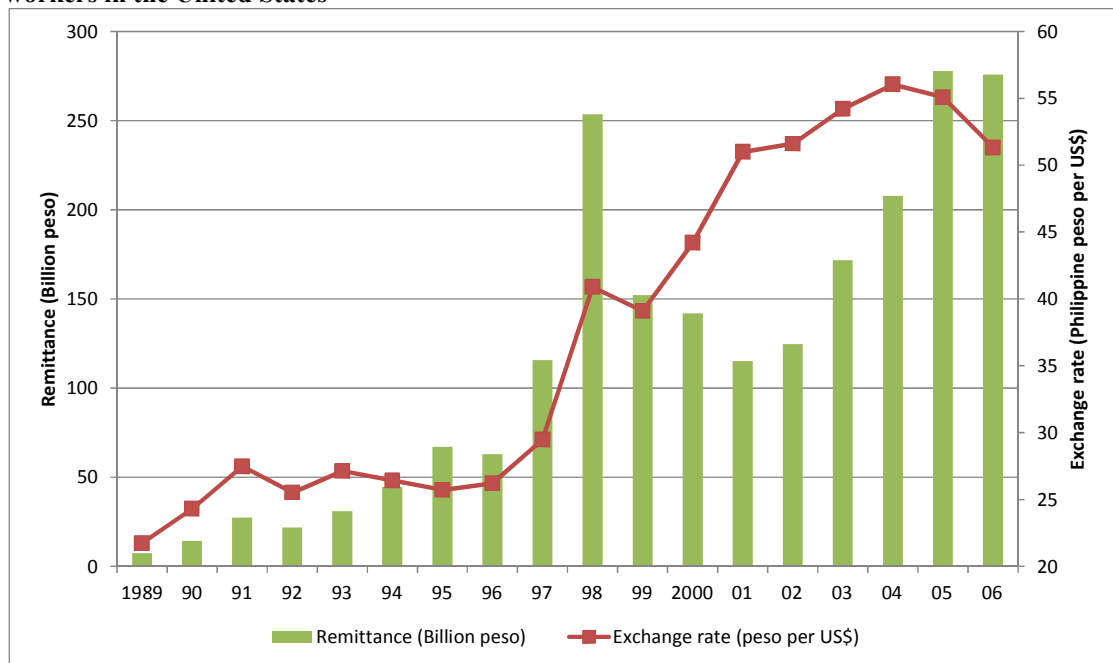
institutions to open up more remittance channels. One notable example is the approval in 2003 of mobile phone remittance payments by two large communications Philippine companies, Smart Communications and Globe Telecoms. The mobile remittance system has become an alternative remittance channel. The prospects of more frequent use of mobile phone remittances would depend on how remittance charges compete with the charges of other remittance channels. The charge for mobile phone remittances includes the cost of text messages that recipient households receive. Including this cost makes the remittance charge for mobile phone remittances nearly at the same level as that for the regular remittance channels (ERCOF and IOM, 2010b: 61).

2.5.4 Exchange rates

Overseas Filipinos work in more than 200 countries abroad. They endure unpredictable exchange rate movements when they send money back home. Due to the 1997 Asian financial crisis, many OFWs experienced sudden changes in exchange rates. However, the changes were different depending on OFWs' locations. For example, the U.S. dollar and currencies of the main Middle Eastern destinations of OFWs appreciated by 50 per cent against the Philippine peso during the period of July 1997-October 1998. Due to the sharp depreciation of the Philippine peso against the dollar, the amount of remittances sent by land-based workers in the United States leaped in 1998 (see Figure 2.9). The currencies of Taiwan, Singapore and Japan also appreciated against the Philippine currency by 26 per cent, 29 per cent, and 32 per cent, respectively, during the same period. On the other hand, the Malaysian and Korean currencies dropped by one per cent and four per cent, respectively (Yang, 2008: 592). The appreciation of a currency against the Philippine peso in a migrant's host country leads to increases in a household's receipt in pesos of remittances from overseas (Yang, 2008).

In order to reduce the layers of remittance processing, the Bangko Sentral ng Pilipinas (BSP) or the Philippine central bank granted licenses for rural banks and cooperative banks to operate foreign currency deposit units. This gives overseas remitters the convenience to receive their wages in foreign currencies instead of immediately converting them into the Philippine pesos (ERCOF and IOM, 2010b: 61). Foreign currency deposit accounts operated by rural and cooperative banks can also encourage the flow of foreign exchange into the local banking system and provide overseas Filipinos with an option to maintain foreign currency deposits.

Figure 2. 9: Philippine peso-U.S. Dollar Exchange rate and remittances sent by land-based workers in the United States



Source: Author's calculation based on BSP statistics (<http://www.bsp.gov.ph/statistics>)

2.5.5 Stock of migrant workers

Overseas Filipino Workers (OFWs) are Filipinos who are employed abroad. OFWs mainly consist of three types of workers: (1) overseas contract workers (OCW); (2) workers with a valid working visa or work permits; and (3) Filipinos with non-

immigrant visa but working full-time abroad. According to technical notes¹⁹ on the Survey on Overseas Filipinos (SOF), Filipino overseas contract workers (OCW) are defined as ‘workers who are presently and temporarily out of the country to fulfil an overseas work contract for a specific length of time or who are presently at home on vacation but still have an existing contract to work abroad’.²⁰ The OCW can be categorised as land-based²¹ or sea-based²² workers. In addition, there is another type of OFWs. They are not contract workers, but have valid working visas or work permits. For example, crew members of foreign airplanes (such as pilots and flight attendants) are included in this category. OFWs also include overseas Filipinos working full-time with non-migrant visas (such as tourist/visitor, student, medical etc.). However, even if Filipinos are working abroad, the following workers are not considered as OFWs: (1) Filipinos who worked or are working abroad for the Philippines government (such as Philippine embassies, missions and consulates); (2) Filipinos who are sent abroad by the Philippine government or by private institutes for training, scholarship etc.; (3) Filipinos who are hired abroad as consultants/advisers of international organizations (such as the United Nation groups, International Monetary Fund, etc.) ; (4) Long-term/permanent migrants to foreign countries.

The inclusion of some Filipino workers such as pilots and flight attendants working for foreign air carriers and tourists and students working full-time abroad can overestimate

¹⁹ Available at <http://www.census.gov.ph/data/technotes/notesof.html>

²⁰ There are some limitations of the accuracy of the SOF. First, the OFW included in the data are those whose families still live in the Philippines as of time of survey visit. Second, the OFWs included were those working abroad between April 1 and September 30 of the reference year. Third, the OFWs who were at home during their vacation and left before April 1 of the reference year were also included in the data as long as they work abroad as full time employees.

²¹ Land-based workers are defined on the SOF as ‘overseas contract workers who are hired either by direct hiring of an employer abroad or through the assistance of Philippine Overseas Employment Administration (POEA) or through a private and licensed recruitment agency’.

²² Sea-based workers are defined by the SOF as ‘overseas contract workers who worked or are working in any kind of international fishing/passenger/cargo vessels....who worked or are working for a shipping company abroad’.

the true size of migrant workers as they are not migrant workers per se. However, they act as a player to send remittances to the Philippines. Thus, in this thesis we decided to use the number of OFWs not OCWs.

The OFWs have been scattered far and wide in the world. The total number of OFWs deployed reached 1.42 million (i.e. daily average 3900 people) in 2009 (POEA, 2009). Among them, 1.09 million OFWs are land-based, while 0.33 million workers are sea-based. An increase in the number of deployed workers makes over 8.2 million Filipinos (or almost ten per cent of the population) living outside the country already as of December 2008. Nearly half of them are temporary contract workers, mostly based in the Middle East (CFO, 2008). The top three destinations of the land-based overseas Filipino workers (OFWs) in 2009 are Saudi Arabia (26.7 per cent of total land-based workers), followed by United Arab Emirates (18.0 per cent) and Hong Kong (9.2 per cent). Figure 2.10 shows the trends in the deployment of land-based OFWs over the period 1985-2009. This figure emphasizes the sharp increase in deployment of land-based OFWs to the Middle East since 2004. In 2009, 60 per cent of them were deployed in the Middle East. The growth rate of the number of deployed Filipino workers in the Middle East has been positive between 2004 and 2008, while the rate in Asian destinations has been negative during the same period. Despite the global economic and financial crisis, the number of sea-based OFWs leaped in 2009 as some ship owners preferred hiring Filipinos and replaced other foreign workers with comparatively cheap, English-speaking and well qualified Filipino seafarers.

The main destination countries of deployed land-based OFWs during the period of 1998-2009 are shown in Figure 2.11. The top destination is Saudi Arabia where more

than a quarter of the OFWs have been deployed every year. United Arab Emirates (UAE) and Qatar also have been dramatically exerting a strong presence as a destination. The share of deployed land-based OFWs increased from 7.5 per cent to 18.0 per cent in UAE and from 2.2 per cent to 8.2 per cent in Qatar between 2003 and 2009. On the other hand, among Asian countries, Hong Kong and Taiwan have been losing their share due to the strong presence of the Middle East though the number of the OFWs to Hong Kong has been increasing mainly due to strong demand for female domestic helpers.

Figure 2. 10: Trends in the Deployment of land-based OFWs by major world group

Figure 2.10a: Number of deployed land-based OFWs, 1985-2009

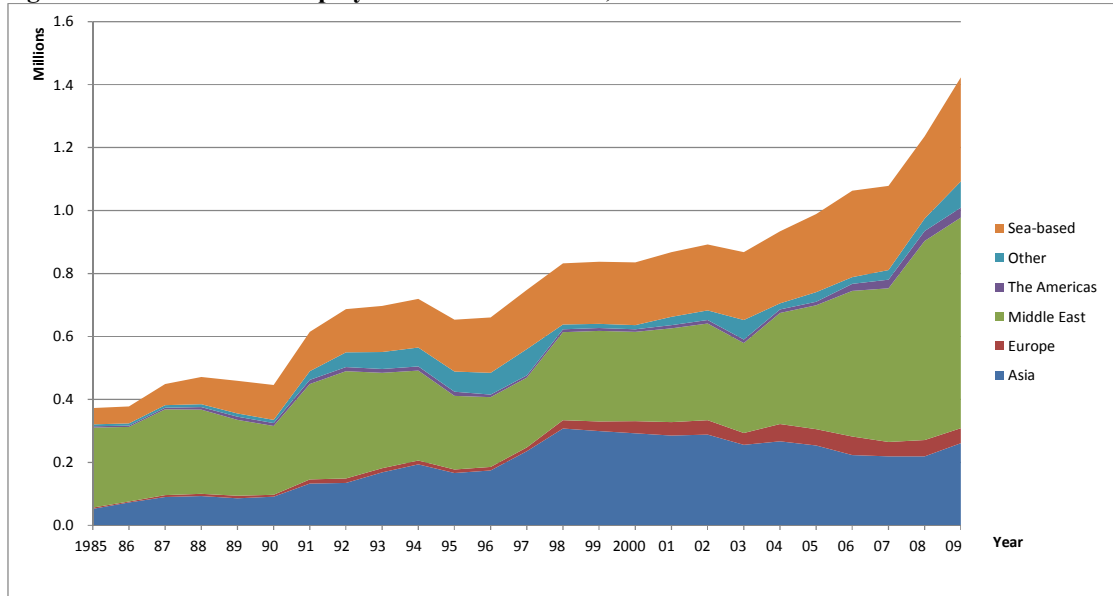
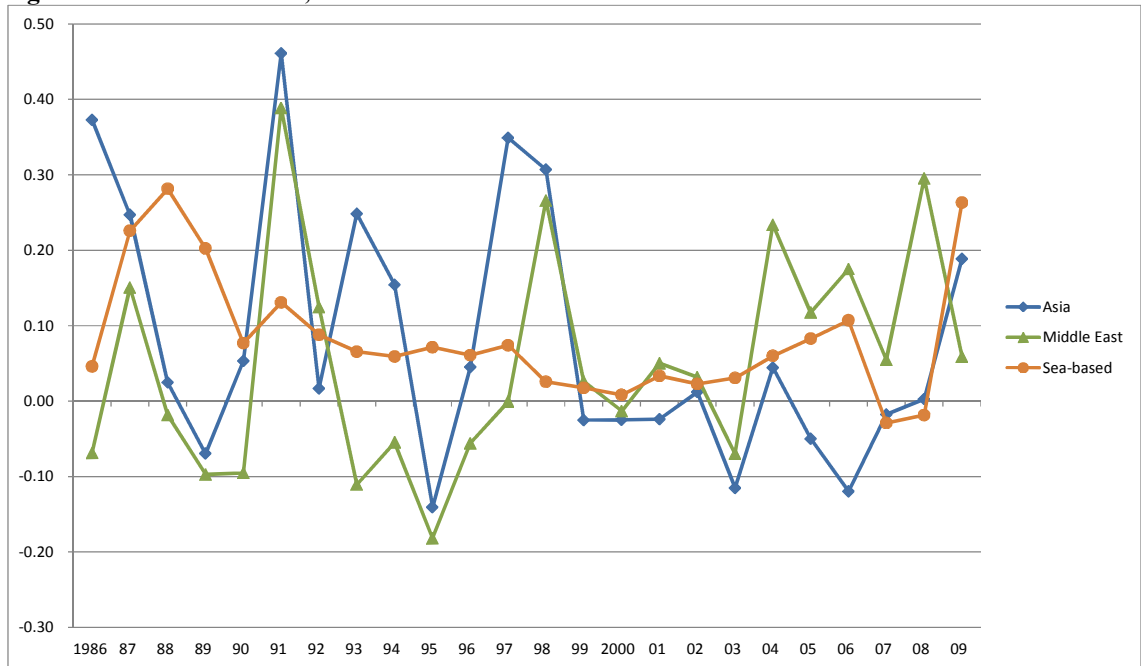


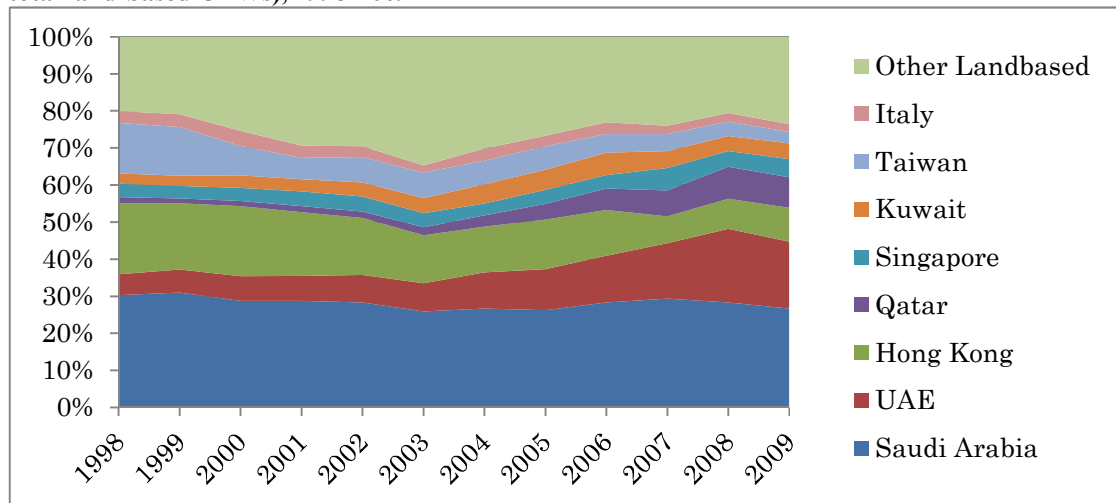
Figure 2.10b: Growth rate, 1986-2009



Note: The numbers of deployed OFWs are New hires and Rehires.

Source: POEA Statistics <http://www.poea.gov.ph/html/statistics.html>

Figure 2. 11: Deployed land-based OFWs by main destinations, New hires and Rehires (% of total land-based OFWs), 1998-2009

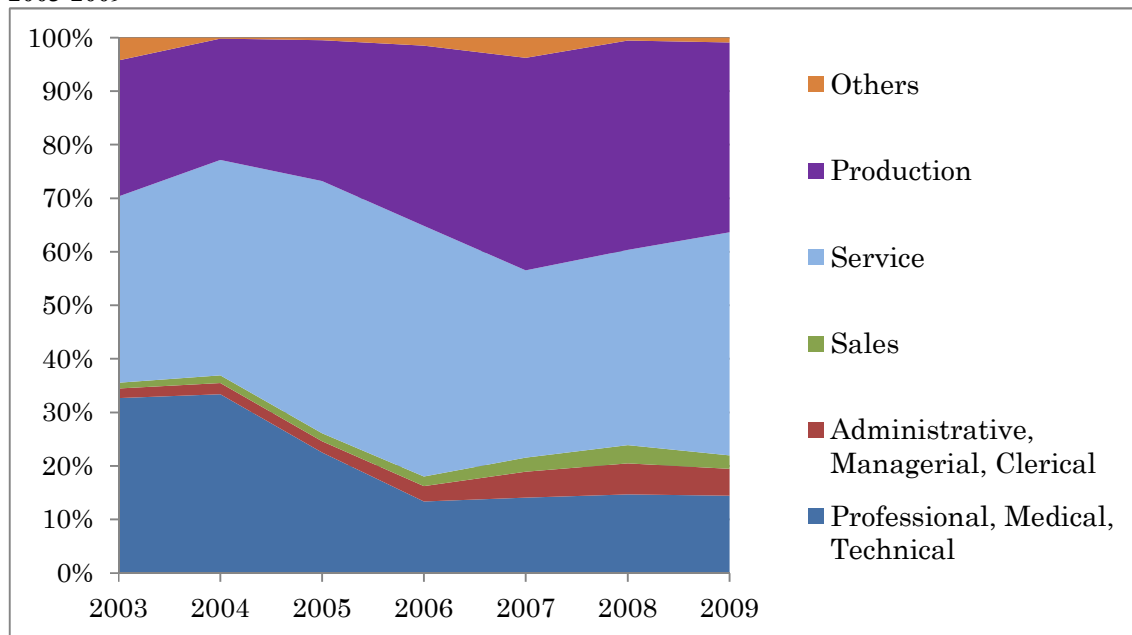


Note: The percentage shows the share of deployed OFWs out of the total new hires and rehires land-based OFWs.

Source: Authors' calculation based on Philippine Overseas Employment Administration (POEA) Statistics

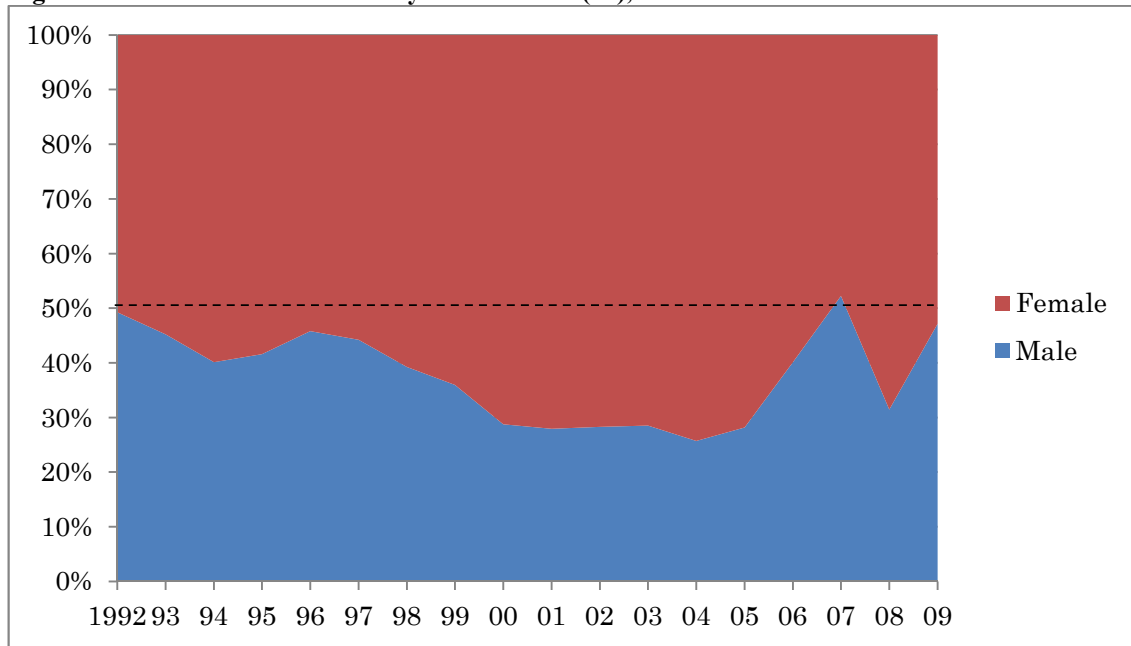
Over half of the deployed OFWs are rehired. A high proportion of rehires shows the preference of employers for migrant workers with previous work experiences abroad (Orbeta and Abrigo, 2009: 2). Furthermore, a low share of newly hired OFWs results from the lack of qualified skilled manpower. This is partly because of the lagging economy and insufficient construction activity that has failed to produce the experienced workers who could be deployed abroad (Mamanglu, 2010). Figure 2.12 clearly shows the declining share of professional OFWs since 2004. The number of the newly hired professionals became half in 2009 from its peak in 2004.

Figure 2. 12: Trend in deployed land-based OFWs by Major Occupational Category, New hires, 2003-2009



Source: Authors' calculation based on Philippine Overseas Employment Administration (POEA) Statistics

Among the newly hired OFWs, the female share has been increasing over time (see Figure 2.13). The numbers of new female migrants have been overwhelming male counterparts except in 2007, when more than 100,000 male migrant were newly deployed into South Korea and Taiwan as production workers, and into Saudi Arabia as labourers, construction workers and plumbers.

Figure 2. 13: Gender share of Newly Hired OFWs (%), 1992-2009

Source: Authors' calculation based on Philippine Overseas Employment Administration (POEA) Statistics

In 2009, 77 per cent of the newly hired land-based OFWs were production or service workers, which are mainly dominated by male and female workers respectively (Table 2.4). In the production industry, male OFWs work as wiremen, plumbers, and welders mostly in Saudi Arabia and Qatar. On the other hand, female service workers mainly work as domestic helpers in Hong Kong, Kuwait, and UAE, waiters and bartenders in Saudi Arabia and UAE, cleaners in Saudi Arabia, and caregivers and caretakers in Taiwan (POEA, 2009).

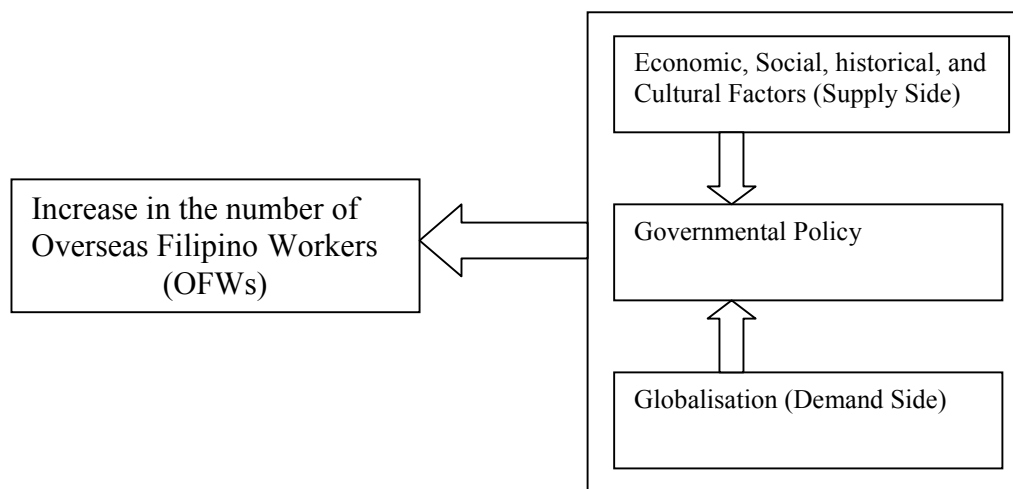
Table 2. 4: Newly hired land-based OFWs by major occupation and gender in 2009

| Major Occupational Group | Male | (%) | Female | (%) | Total |
|----------------------------------|--------|------|--------|------|--------|
| Professional, Medical, Technical | 25859 | 54.0 | 22026 | 46.0 | 47886 |
| Administrative, Managerial | 797 | 61.8 | 493 | 38.2 | 1290 |
| Clerical | 5408 | 35.1 | 9995 | 64.9 | 15403 |
| Sales | 3166 | 37.9 | 5182 | 62.1 | 8348 |
| Service | 21643 | 15.7 | 116578 | 84.3 | 138222 |
| Agricultural | 1077 | 79.8 | 272 | 20.2 | 1349 |
| Production | 97240 | 82.7 | 20369 | 17.3 | 117609 |
| Others | 1264 | 76.8 | 383 | 23.3 | 1645 |
| Grand Total | 156454 | 47.2 | 175298 | 52.8 | 331752 |

Source: POEA (2009)

Several factors affect the trend in the number of migrant workers. At the macro level, there are three key international migration drivers: economic, social, and cultural backgrounds; increasing demand for labour in the global economy; and Philippine governmental policy on international migration. Figure 2.14 shows how these three factors cause an increase in the numbers of OFWs.

Figure 2. 14: Determining factors of the number of OFWs



The Philippine economic situations explain the supply side of international labour migration. The economic situations within the Philippines are more vulnerable compared to other Asian countries. These situations would implicitly make Filipino workers decide to go abroad. In addition, social, historical, or cultural factors also could drive Filipino workers to find a job abroad. On the other hand, globalisation denotes the demand side of international labour migration. The globalisation allowed more Filipino workers to work in more destination countries all over the world. There is a great demand for cheap, reliable, and English-speaking labour in the world. Finally, Philippine governmental policies on international labour migration play an important role as an intervening factor between the first and second factors, which are highly correlated.

2.5.5.1 Economic background

The high level of unemployment in the Philippines has naturally made overseas employment more attractive (Balisacan and Hill, 2003: 296). In addition, compared to other Asian countries, a lower per capita gross domestic product (GDP), higher income inequality, and a weaker industry structure have served to push Filipino workers overseas. There are two main reasons for the country's poor employment performance; weak economic growth and rapid population growth. The rapid increase in the size of the labour force can be attributed not only to a high population growth but also to the steady increase in the participation of women in the workforce. Unemployment among young and educated workers is a common phenomenon in the Philippines. In the 1970s and early 1980s, most unemployed were in the 15-24 year age group and had been educated to primary or secondary level (Reyes, Milan, and Sanchez 1989). Even today, youth unemployment rates remain very high at more than 15 per cent while the total

unemployment rates fluctuate between the five and ten per cent (see Figure 2.15). An increasing proportion of the unemployed now possess a tertiary education. The percentage of total unemployed with at least some college education increased from 31 per cent in 1998 to 40 per cent in 2006 (see Figure 2.15). Even more telling is the proportion with a college degree, which increased from 8.5 per cent in 1980 to 14.8 per cent in 2000. This could be taken to imply a serious waste of human resources.

Figure 2. 15: Unemployment rates in the Philippines

Figure 2.15a: Youth unemployment and total unemployment rates, 1980-2008

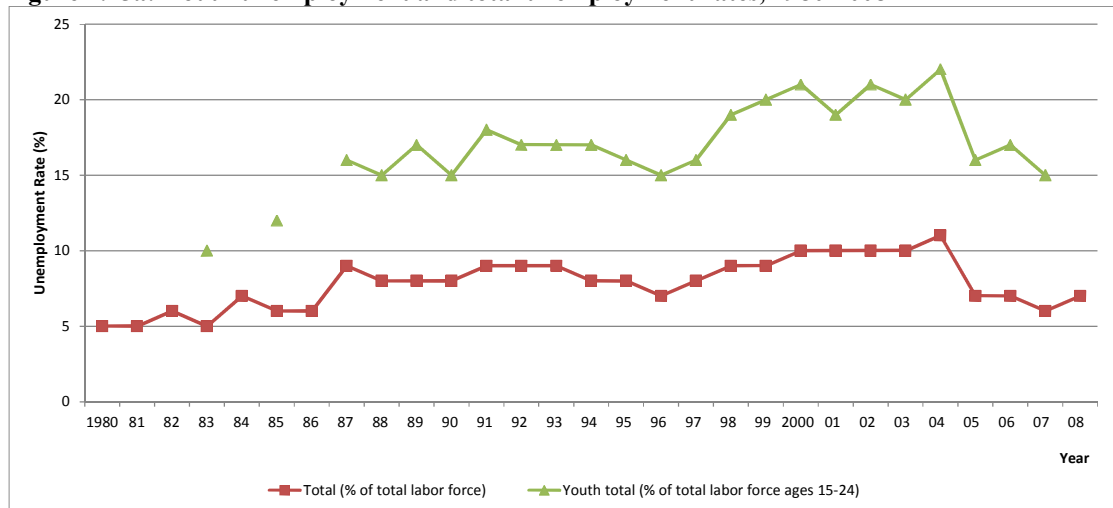
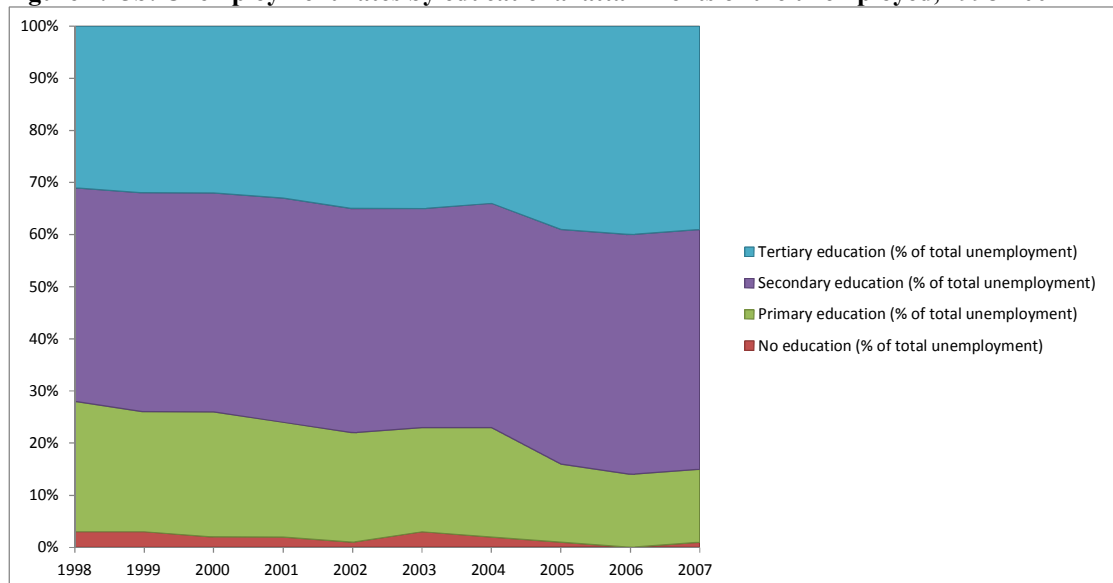


Figure 2.15b: Unemployment rates by educational attainments of the unemployed, 1998-2007



Source: World Development Indicator Online

Moreover, recently there has been an indication that the Philippine economy has experienced the Dutch disease phenomenon. The huge inflow of remittances into the country appreciates the Philippine peso against the currencies OFWs earned in their destinations. This appreciation of the Philippine peso makes the domestic industries, especially manufacturing sectors, lose their competitiveness as imported products get relatively cheaper and domestic goods become less attractive to purchase. Amador et al. (2007) found that remittances have led to symptoms of the Dutch disease phenomenon in the Philippines. They found that a huge remittance flow into the country have contributed to the appreciation of the peso in real terms as well as to the shift in output and employment away from the tradable goods sector toward the non-tradable goods sector.

2.5.5.2 Culture of international migration

In the early 1900s, Filipino migrants were recruited for plantation work in Hawaii due to labour shortages caused by the Chinese exclusion acts of 1875, 1882, and 1903, and the Gentleman's Agreement of 1906-1907, which banned Japanese labourers. Labour recruiters found Filipinos in Ilocos, which is an agrarian region in the Philippines, to be an effective labour force. In this way, historically, people from the Ilocos region possess a culture of international migration. The Ilocos region remains a major source of international migration (Tyner, 2001: 179-180). The culture of international migration in a certain area provides one of the key international migration drivers.

2.5.5.3 Risk-aversion and close family ties

Most of the male OFWs are doing construction work or providing labour on the docks, which are typically seasonal. On the other hand, female OFWs' work may yield a more stable annual income even though the average wage per day for female OFWs may be less than that for male OFWs. This stability of female migrant income may be strongly preferred by risk-averse rural families because it minimises the variance in their household income (Lauby and Stark, 1988: 485). In addition, there seems to be another reason why Filipino households with several children prefer to send females to work abroad. It is found that Filipino households might interpret remittances from daughters as more reliable rather than from sons because daughters tend to keep closer family ties with their family members even after they get married. In Asia, there is evidence that female migrants are more likely to send remittances than male (see for example, Niimi and Reilly, 2008 for Viet Nam). This could be explained by the feature of some Asian countries like the Philippines which is that 'daughters are taught to be responsible family members, taking care of young siblings, for example, while sons are given more freedom and are expected to be more independent' (Lauby and Stark, 1988: 485). Furthermore, other research shows the evidence of the altruistic motives of migration by Filipino females. For example, Ballescás (1992: 23) mentioned that female overseas artists '...do not leave for their own selves but for the sake of their families-their parents, their spouses and children, their brothers and sisters'. Another example of the altruism of Filipino females is shown by Nuqui (1993: 17), who argued that 'Filipino women often take it upon themselves to sacrifice everything for the sake and well-being of their family. That is why even if the jobs available to the Filipino women entail high risk or sometimes debasement of their dignity, they just ignore the obvious danger, notably sexual abuse and other related crimes, that awaits them and the possible stigma by

society in the hope that their stint abroad would pay off in terms of a better quality of life for her family' (quoted from Tyner, 2004: 88).

2.5.5.4 Expansion of the global labour market

The second key factor is an expanding global labour market. Migrant workers are necessary to meet current needs in most developed countries. Due to the increasing pace and the penetration of globalisation, Filipino workers have had more opportunities to work overseas. For example, there is a demand for Filipino nurses, care-givers, and housemaids in aging societies. On the other hand, the contemporary penetration of globalisation, especially trade liberalisation, also impacts on the Philippine labour market. In the Philippine economy, changes in demand for labour lead to changes in employment or in wages (or both). Moreover, some Filipino skilled workers work at multinational organizations, while others go to the Gulf countries, especially Saudi Arabia, as construction workers.

The English speaking nature of schooling in the Philippines also provides potential for employment opportunities abroad, especially in high-income English-speaking countries. For example, there is a demand for the following jobs: nurses in Canada, United States, and United Kingdom; caregivers in Canada; mathematics and science teachers as well as IT engineers in United States. Furthermore, a booming Chinese economy has created a demand for Filipino teachers and housemaids because of their fluency in English.

In the Philippines, the number of nursing schools has been mushrooming and generating a huge number of graduates every year. In 2009, over 70,000 graduates passed the

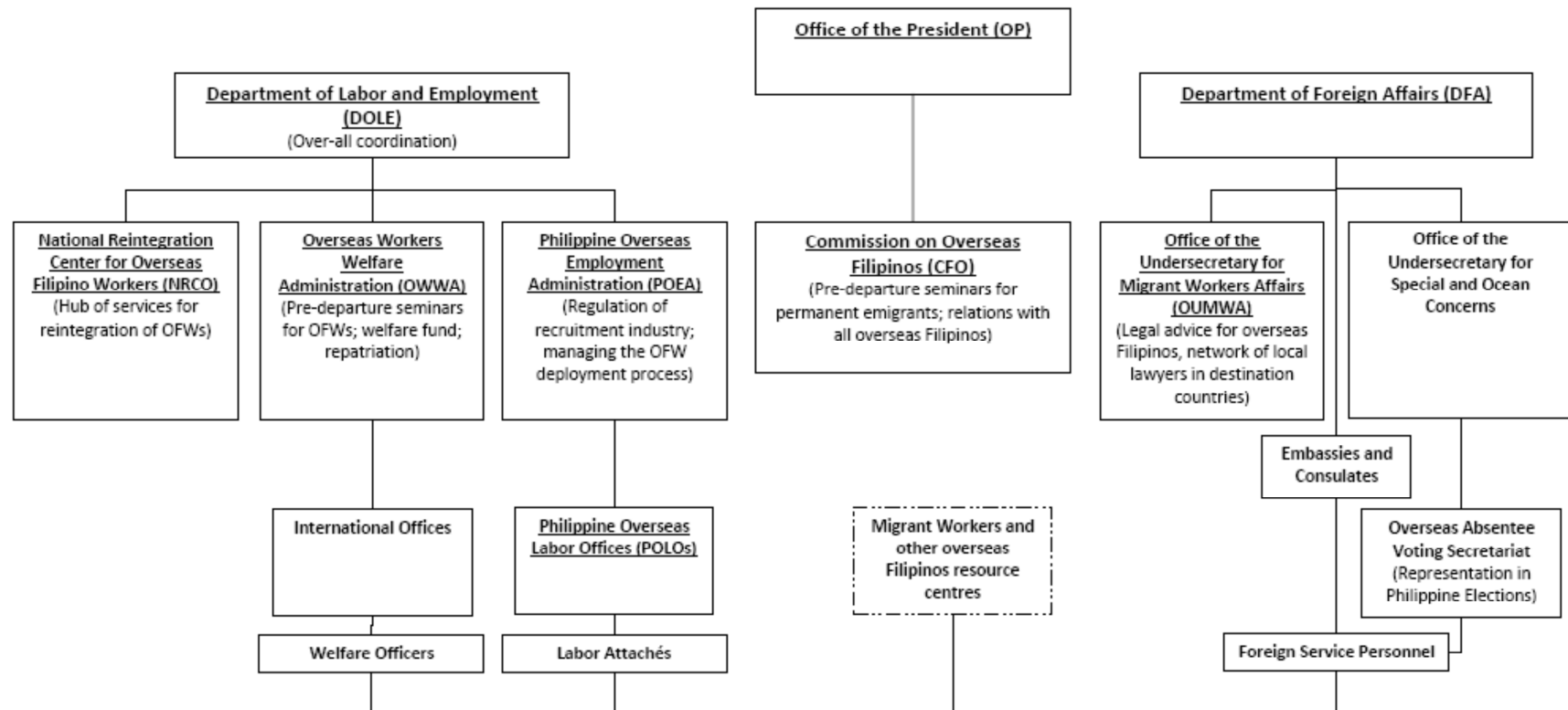
Nursing Licensure Examination (Lorenzo et al., 2009). Most exam passers are planning to work abroad. In contrast, mathematics, science, and engineering are not popular programs at the tertiary level. However, these subjects are very important for technological innovation which is the engine of economic growth. Lack of scientists and engineers may render the Philippine potential economic growth low in the future. For the Philippine long term growth, the education sector needs to produce large numbers of maths and science students rather than just those fluent in English (Alba, 2009).

2.5.5.5 Governmental policies and institutions for migration

The third factor influencing an increase in the number of deployed OFWs is Filipino governmental policies for migration and remittances. The governmental policy on overseas employment was first introduced in 1974. The 1974 Labor Code aims to protect Filipinos who wish to work overseas, strengthen functions of government institutions for overseas employment, and rationalise the participation of private recruitment agencies (Orbeta, Abrigo, and Cabalfin, 2009). The government created agencies specifically to cater for the needs of overseas workers—the Overseas Employment Development Board, the National Seamen's Board, and the Bureau of Employment Services—when overseas employment was introduced as a measure to ease domestic unemployment in the 1970s. These three agencies were merged in 1982. The Philippine government has crafted a programme that examines the employment process from beginning to end—from application for an overseas job to a worker's reintegration upon return (IOM, 2005). Within three decades, several institutions have been spawned to manage almost every aspect of migration and worker deployment (Orbeta, Abrigo, and Cabalfin, 2009). Figure 2.16 shows the current Philippine government institutions which manage overseas migration. Here, we explain their main

roles on international migration focusing on the following institutions: Philippine Overseas Employment Administration (POEA); Overseas Workers Welfare Administration (OWWA); National Reintegration Center for OFWs (NRCO); Commission on Filipinos Overseas (CFO); and Department of Foreign Affairs (DFA).

Figure 2. 16: Philippine government institutions managing migration



Adopted from: Ruiz, N. G., "Managing Migration: Lessons from the Philippines", Migration and Development Brief 6 (Migration and Remittances Team - Development Prospects Group, The World Bank, August 2008). www.worldbank.org/prospects/migrationandremittances.

Source: Orbeta, Abrigo, and Cabalfin (2009)

(a) Philippine Overseas Employment Administration (POEA)

The Philippine Overseas Employment Administration (POEA) was established in 1982 with the re-organization of the Department of Labor and Employment (DOLE). The POEA is mandated to promote and monitor temporary overseas employment of Filipino workers and to protect their rights. After promulgation of the Migrant Workers and Overseas Filipinos Act of 1995 (or RA 8042)²³, the legal mandate of the POEA was reinforced by affirming its role of regulating private participation in the recruitment and overseas placement of Filipino workers, and of promoting and monitoring their overseas employment. On the other hand, pursuant to section 29 (*Comprehensive Deregulation Plan on Recruitment Activities*) and section 30 (*Gradual Phase-out of Regulatory Functions*) of RA 8042, the governmental policy on overseas employment was supposed to deregulate the recruitment and overseas placement process. In 2007, however, with RA 9422²⁴, the regulatory functions of the POEA were strengthened (Orbeta, Abrigo, and Cabalfin, 2009). RA 9422 repealed Sections 29 and 30 of RA 8042, which allowed private sectors to recruit and deploy migrant workers in an "unregulated atmosphere" (Senate of the Philippines, 2007).

The on-site extension of the POEA is the Philippine Overseas Labor Offices (POLOs), manned by Philippine Labour Attachés. The POLOs provide the following services: ensuring adequate protection for OFWs through verification of labour documents; providing on-site assistance to OFWs; seeking new employment opportunities for

²³ See POEA website: <http://www.poea.gov.ph/rules/ra8042.html>

²⁴ Republic Act No.9422, signed on April 10 2007, is an act to strengthen the regulatory functions of the Philippine Overseas Employment Administration (POEA), amending for this purpose Republic Act no. 8042, otherwise known as the "Migrant Workers and Overseas Filipinos Act of 1995".

Filipino job seekers; organizing socio-cultural activities and programs to help OFWs re-integrate to Philippine communities.

(b) Overseas Workers Welfare Administration (OWWA)

In 1977, under the DOLE, a Welfare and Training Fund for Overseas Workers (WTFOW) was established. Then, in 1980, the WTFOW was renamed the Welfare Fund for Overseas Workers (Welfund). The Welfund was mandated to provide social and welfare services to Filipino migrant workers, such as insurance coverage, legal assistance, placement assistance and remittance services. In 1987, with the re-organization of the DOLE, the Welfund was renamed Overseas Workers Welfare Administration (OWWA). The OWWA is mandated to deliver welfare services and benefits to temporary migrant workers, and to ensure sustainability and fund viability for the continuous protection of migrant workers. The OWWA's welfare services of OFWs and their families include the following programs and services: insurance and health care program; education and training programs; family welfare and assistance programs; and workers' assistance and on-site services (Orbeta, Abrigo, and Cabalfin, 2009). These OWWA's operations, programs and services are funded by the contributions which have to be paid by foreign employers for each departing OFWs, which is currently US\$25 per person. The OWWA pools and invests the money on high-yielding financial instruments.

With regard to insurance for OFWs, on November 18 2009, the bicameral committee approved the mandatory insurance for land-based OFWs who are hired by their recruitment agencies though migrant workers and civil society groups have objected to the passage of this mandatory insurance for migrants. The reason the groups have been

campaigning against the mandatory insurance is that the insurance will benefit the recruiters, rather the migrant workers. The mandatory insurance will also shield the government and the recruiters from their responsibility to protect the OFWs (Balleascas, 2009 November 19 & 26). Filipino migrants and trade union groups asserted that the insurance should be voluntary as there are already various mandatory insurance programs for OFWs.

(c) National Reintegration Center for Overseas Filipino Workers (NRCO)

The National Reintegration Center for OFWs (NRCO), which is a part of DOLE, was established in 2007. The NRCO aims to optimize the benefits of overseas employment for OFWs, their families, communities and the Philippines. The role of NRCO is to act as a one-stop centre and a networking hub of reintegration services for OFWs. The NRCO offers the following services: counselling services; capability enhancement services; wage employment services; assistance desk; the “Classroom Galing sa Mamamayang Pilipino Abroad” (CGMA) project.

First, OFW counselling services guide OFWs and their families on values formation and preparing for eventual reintegration by providing re-entry options such as employment and investment opportunities, participating in brain-gain initiatives and retirement programs, sharing their expertise as part of their social and economic commitments in their respective communities. Second, OFW capability enhancement services equip OFWs and their families with knowledge and skills to enhance the employability of return migrants. Third, wage employment services are job search assistance for Filipino expatriates who would like to work within the Philippines. Fourth, an assistance desk provides face-to-face as well as on-line answers to questions of OFWs. Finally, the

CGMA project is one of the priorities of the DOLE in support of the basic education agenda of the government. The project aims to solicit donations from OFWs to build classrooms in elementary and secondary public schools with critical shortages countrywide (Orbeta, Abrigo, and Cabalfin, 2009).²⁵

(d) Commission on Filipino Overseas (CFO)

In 1980, the Commission on Filipinos Overseas (CFO) replaced the Office of Emigrant Affairs, which was established in 1978. The CFO primarily registers and provides pre-departure orientation seminars (PDOS) to permanent residents and emigrants. The PDOS is a half-day to one-day orientation seminar required for Filipino workers to get informational materials as well as contacts of diplomatic and labour staffs, NGOs, or other persons that workers might need to call in case of emergencies. The PDOS curriculum is observed not to be uniform as some PDOS contain information on remittances, savings and investments whereas others include information on services available as a result of OWWA membership (ERCOF and IOM, 2010a: 115). In addition, the CFO promotes the transfer of technology, and material and financial contributions from overseas to development activities for the communities all over the Philippines. It also provides younger generations of overseas Filipino with opportunities to learn Philippine history, culture, institutions and the Filipino language.²⁶ The CFO is also designated as the anti-trafficking focal point in the government (ERCOF and IOM, 2010b: 94).

²⁵ See NRCO website: <http://www.nrco.dole.gov.ph/>

²⁶ See CFO website: <http://www.cfo.gov.ph/>

(e) Department of Foreign Affairs (DFA)

The Department of Foreign Affairs (DFA) was created in 1989. The DFA enters into bilateral, regional and multilateral agreements or arrangements with foreign countries to promote the interests of the Philippines and overseas Filipinos. The Migrant Workers and Overseas Filipinos Act of 1995 (or RA8042) provided the framework for stronger protection of OFWs with the designation of the Office of the Legal Assistant for Migrant Workers' Affairs (OLAMWA) under the DFA with the rank of undersecretary.²⁷ In 2003, the OLAMWA was renamed Office of the Undersecretary for Migrant Workers Affairs (OUMWA). The OUMWA provides the legal and consular assistance and services for Filipino migrant workers and overseas Filipinos in distress. The DFA established the Overseas Absentee Voting Secretariat (OAVS), which assists the Commission on Elections (COMELEC) and coordinates all election activities in all voting posts around the world (Orbeta, Abrigo, and Cabalfin, 2009).

The above government institutions support Filipino working overseas. Initially, the Philippine government sought to regulate the market by acting as the sending agency for all departing workers. However, the government decided to reduce its placement function in 1982 because it realized that market demand was so significant that acting as an intermediary would be more efficient. Currently, the government operates a licensing system for recruitment agencies deploying land-based workers and for manning agencies that place Filipino seafarers, or sea-based OFWs, on ocean-going vessels or for other related maritime activities. As of 12 June 2007, the POEA has granted licenses to 3,168 recruitment agencies. Only 1,431 (or 45 per cent) were operating in good standing. The other agencies were no longer operating for several reasons such as cancelled

²⁷ See DFA website: http://dfa.gov.ph/?page_id=16

licenses or having been delisted (COA, 2008:74-75). An increase in licensed recruitment agencies enables more Filipino workers to work overseas. In order to recruit and deploy land-based OFWs, there are two types of recruitment agencies: private employment agencies and service/construction contractors. Private agencies help Philippine labour to find a job by foreign clients as principal employers, whereas service/construction contractors provide labour through the deployment of Philippine companies with the Philippine company receiving the foreign labour contract.

In the case of Filipino overseas temporary contract workers, the bilateral agreements between the Philippines and the receiving countries would also be significant because a standard employment contract is prescribed by the POEA based on minimum standards of terms and conditions of overseas work that are negotiated with host countries as part of the bilateral agreements concluded with them (IOM, 2005). Bilateral agreements are concluded between migrant countries of origin and migrant host countries to manage migration flows. As of September 2009, the Philippines has made 44 bilateral labour agreement with 22 countries on employment, welfare and general labour cooperation, twelve social security agreements with ten countries and 44 agreements on the recognition of seafarers' certificates since 1974 when the overseas employment program began (Go, 2010). The existence of these bilateral agreements and arrangements with migrant host countries would have a positive effect on the number of overseas Filipino workers. According to Senate President Jinggoy Ejercito Estrada, OFWs are vulnerable to abuse and maltreatment especially in countries with which the Philippine government does not have bilateral labour agreements. Thus, to protect OFWs, he suggested that the government should promote bilateral labour agreements with countries hosting OFWs and also that the POEA should strictly enforce RA 9422, which strengthened the

POEA's regulatory functions against private agencies recruiting and deploying OFWs without ensuring the workers' protection as well as illegal recruiters (Senate of the Philippines, 2007).

(f) Compulsory Retention of Remittances

During the 1980s, the government mandated through Executive Order (EO) 857 certain types of overseas Filipinos to send a required percentage of remittance amounts to the country. That executive order, approved on 13 December 1982, called on seafarers, workers for construction companies, and professionals such as doctors, engineers, teachers, nurses, and other professionals whose contracts provide for free-board and lodging, to remit 70 per cent of their salaries. Other professional workers whose contracts do not provide for free-board and lodging, domestic workers, and all other types of overseas workers were compelled to remit 50 per cent of their earnings.²⁸ EO 857 imposed penalties for those who did not comply with this forced remittance. If contract workers fail to comply with the requirements of EO 857, they are suspended or excluded from the list of eligible workers for overseas employment. In cases of subsequent violations, they are repatriated from the job site at the expense of the employer or at their own expense. However, this forced remittance law created a wide protest among many OFWs and they did not follow this law. Due to the resounding resistance of migrant workers and their families, EO 1021, promulgated on the 1st May 1985, abolished the compulsory remittance retention system under EO 857. In any case, seafarers are required by a clause in their contracts, to retain 80 per cent of their salaries

²⁸ See the website of The Lawphil Project, Arellano Law Foundation, in http://www.lawphil.net/executive/execord/eo1982/eo_857_1982.html

which are remitted by their respective manning agencies to their allottees or designated beneficiaries (ERCOF and IOM, 2010a: 19).

2.6 Summary

This chapter has mainly described international remittances into the Philippines. First, the chapter has shown increasing flows of international remittances into developing countries in the last three decades. Recently, the flows have dramatically increased in East Asia & the Pacific and in South Asia mainly because of a sudden rise in remittances into India and China. The chapter then focused on the flows into the Philippines. The Philippines ranks as the fourth biggest recipient of remittances worldwide with a positive and stable inflow growth rate reaching US\$ 18.76 billion by 2010. Then, the chapter explained about some features of remittances into the Philippines in terms of their types, modes, places of origins, and the size of remittances by types of migrants' work and by migrants' gender. These features will prove helpful in understanding and interpreting the empirical findings of this thesis. Moreover, the chapter has also explained the factors contributing to the continuous and sharp increase in remittance flows into the Philippines. It has also focused on describing the following factors: remittance channels; transaction costs of remittances; remittance networks and services; exchange rate fluctuations; and the stock of OFWs. In addition, the chapter has also explained the idiosyncratic features of key drivers of international migration for Filipino workers. We mainly explained the following three factors: (1) economic circumstances as well as social, historical, and cultural backgrounds; (2) increasing demand for labour in the global economy; and (3) Philippine governmental policies on international migration, and the chapter described the important roles of Philippine governmental institutions in managing international migration from the Philippines.

Chapter 3: Data on International Migration and Remittances for the Philippines

Unlike most developing countries, the Philippines has fairly well developed statistical data on international migration and remittances. This chapter describes the sources of the main data used in this thesis and the definitions of the variables used for the analyses. First, with taking advantage of the detailed information on the OFWs, this chapter begins by describing the features of the Survey on Overseas Filipinos (SOF) and then illustrates the important characteristics of Family Income and Expenditure Survey (FIES), which are the household surveys that this thesis mainly exploits.

3.1 Survey on Overseas Filipinos (SOF)

3.1.1 Scope and coverage

According to the technical notes on the Survey on Overseas Filipinos (SOF), the SOFs are nationwide surveys that seek to gather information on Filipino citizens including overseas workers²⁹ who went abroad during the last five years. Data on their remittances are gathered using the most recent six month reference period. The SOFs are conducted as a rider to the October round of the Philippine Labor Force Survey (LFS) every year. As of December 2010, the SOF are available from 1993 to 2008. The SOFs provide more accurate data on the number of OFWs, their socio-economic characteristics and

²⁹ Data collection of the characteristics of overseas workers started in 1982 using a one-page questionnaire in the Integrated Survey of Households (ISH) and continued until 1986. In 1987, during the revision of the ISH Form 2 or the Labor Force Survey (LFS) questionnaire, a column indicator for overseas contract workers (OCWs) was added to get the estimate of the number of OCWs. With the increasing demand for information on overseas workers, the Survey on Overseas Workers (SOW) was resumed in 1991 revising the previous questionnaire to generate more comprehensive data. Data on international migration were gathered in the 1988 National Demographic Survey (NDS). With the expanded coverage of the 1993 NDS on health and immunization, the section of international migration was deleted from the NDS but recommended for inclusion in SOW starting 1992. Hence, the SOW is renamed to SOF.

the amount and mode of remittances, in cash and in kind, received by their families. The SOF data, however, have the following limitations. First, the OFWs include people who had no working visa or work permits (i.e., tourist, visitor, student, medical, and other types of non-immigrant visas) but were employed and working full time in other countries. Second, the OFWs covered in the survey were Filipinos working abroad during the period of 1 April to 30 September, not for a whole year. Finally, the SOFs have no information on the OFWs' salaries. Thus, the remittances presented in the SOFs would be a part of the total salary earned by the OFWs. Even acknowledging these limitations, the SOFs represent one of the most useful data sources to capture several features of international remittance (e.g., amounts, types and modes), and migrant workers (e.g., age, gender, jobs, host countries, and length of stay abroad).

3.1.2 Survey design

The survey design of the SOF can be found on the National Statistics Office (NSO) website.³⁰ Here, we summarise some important aspects of the survey design from the technical notes on the SOF.

Sampling methodology

The sampling design of the SOF adopts that of the Integrated Survey of Household which uses the new master sample design starting in July 1996. The multi-stage sampling design of the master sample consists of 3,416 sample barangays (2,045 urban and 1,371 rural) in the expanded sample for provincial level estimates with a sub-sample of 2,247 sample barangays designated as the core master sample for regional

³⁰ See technical notes on the Survey on Overseas Filipinos (SOF)
<http://www.census.gov.ph/data/technotes/notesof.html>

level estimates. In the first stage of sample selection, the list of barangays with the household and population counts is used based on the results of the 1995 Census of Population, and then at the second stage sampling units are selected in the enumeration areas. The sample barangays and sample enumeration areas were selected systematically with probability proportional to size. For the third stage, sample households are selected from the list of households of the 1995 Census of Population. As mentioned above, the SOF is undertaken every year as a rider survey to the October round of the Labor Force Survey (LFS). Thus, the SOF sample households are the same as those for the LFS. For example, the completed interview response rate for October 2000 LFS was 93.2 per cent, whereas non-response rate was 6.8 per cent.

Sampling weight

Sampling weights are the inverse of the probability of sample selection. However, the basic sampling weights are adjusted to account for non-response bias by applying a non-response adjustment factor at the domain level. Using the adjusted sampling weight, the estimated numbers of OFWs during the period of 1 April to 30 September are reported in Table 3.1. Approximately half of OFWs are from National Capital Region (NCR) or from its neighbouring regions such as Central Luzon and Southern Luzon. However, the current weight adjustment procedure does not take into account any sudden increase in the number of OFWs. Thus, in a year with any significant change in the number of OFWs, the survey estimates might generate a larger margin of error.

Table 3. 1 Number and Percentage Distribution of OFWs by Region of Origin, 1996-2008

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------------------------------|------|-------|------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|
| Number of OFWs (in thousands) | 900 | 1,013 | 904 | 1,016 | 978 | 1,029 | 1,056 | 982 | 1,063 | 1,326 | 1,515 | 1,747 | 2,002 |
| Region of origin (%) | | | | | | | | | | | | | |
| NCR | 16.2 | 19.1 | 17.8 | 19.5 | 17.6 | 19.4 | 20.5 | 18.5 | 18.3 | 17.4 | 16.4 | 16 | 14 |
| CAR | 2.4 | 1.9 | 2.4 | 2.6 | 2.6 | 2.2 | 1.7 | 2.0 | 2.3 | 2 | 2.2 | 2.1 | 1.9 |
| Ilocos | 11.8 | 12.5 | 10.2 | 9.4 | 10.1 | 10.1 | 8.5 | 8.4 | 8.1 | 8.7 | 7.6 | 7.7 | 7.8 |
| Cagayan | 5.3 | 5.0 | 5.5 | 3.7 | 5.5 | 5.6 | 5.9 | 6.4 | 5.4 | 4.6 | 5.3 | 5.9 | 5.5 |
| Central Luzon | 16.0 | 12.0 | 14.6 | 14.3 | 12.9 | 13.1 | 13.4 | 12.1 | 14.0 | 13.4 | 14.5 | 14.3 | 14.5 |
| Southern Luzon | 16.9 | 18.9 | 17.4 | 19.0 | 20.2 | 17.8 | 19.2 | 18.7 | 19.0 | 19.1 | 18.1 | 19.4 | 20.6 |
| Bicol | 3.4 | 2.7 | 3.3 | 3.3 | 2.9 | 3.1 | 3.1 | 3.3 | 3.0 | 2.6 | 2.5 | 3 | 3.1 |
| Western Visayas | 9.4 | 9.4 | 9.8 | 8.6 | 9.2 | 8.7 | 9.1 | 10.0 | 8.7 | 8.5 | 9.5 | 8.5 | 7.8 |
| Central Visayas | 4.9 | 4.2 | 4.3 | 5.3 | 5.3 | 4.5 | 3.6 | 5.3 | 4.6 | 5.3 | 5.5 | 5.1 | 5.6 |
| Eastern Visayas | 1.9 | 1.8 | 2.1 | 1.8 | 1.9 | 1.3 | 2.3 | 1.9 | 2.3 | 2.1 | 2.2 | 2.1 | 2.9 |
| Western Mindanao | 1.9 | 3.0 | 2.7 | 3.4 | 3.1 | 2.7 | 2.7 | 1.8 | 2.1 | 1.8 | 2.2 | 2 | 1.8 |
| Northern Mindanao | 1.0 | 1.3 | 1.5 | 1.2 | 1.5 | 2.9 | 2.5 | 2.7 | 2.6 | 2.7 | 2.8 | 3.1 | 2.8 |
| Southern Mindanao | 4.1 | 2.6 | 2.9 | 3.1 | 3.2 | 3.4 | 2.6 | 3.3 | 3.2 | 3.3 | 3.1 | 2.6 | 2.8 |
| Central Mindanao | 1.0 | 2.4 | 2.0 | 2.0 | 2.1 | 2.3 | 2.7 | 3.2 | 2.8 | 3.5 | 4 | 4.2 | 4.5 |
| Caraga | 0.9 | 1.3 | 1.5 | 1.4 | 0.8 | 1.0 | 1.0 | 1.0 | 0.9 | 1.4 | 1.1 | 1 | 1.2 |
| ARMM | 2.9 | 1.9 | 1.8 | 1.5 | 1.0 | 1.7 | 1.4 | 1.3 | 2.9 | 3.4 | 3.1 | 3.1 | 3.3 |

Source: Index of Overseas Filipino Workers Statistics from National Statistics Office (NSO) website (<http://www.census.gov.ph/data/sectordata/datasof.html>)

3.2 Family Income and Expenditure Survey (FIES)

3.2.1 Scope and coverage

As of December 2010, the FIES in the Philippines is available every three years from 1985 to 2006.³¹ This survey collects income and consumption information for a nationally and regionally representative cross-section of Filipino households. Undertaken by the National Statistical Office (NSO) in the Philippines, the FIES is the only official household survey of income and expenditure patterns. The main objective of the survey is to obtain information about expenditure patterns, income sources and inequality. The survey provides information on sources of income (both cash and in-kind), household characteristics (such as family size, marital status and the number of children by age group), and job-related information (such as earnings and employment status). Furthermore, the survey asks respondents to report on a variety of transfers, including remittances, both in-kind and cash, from domestic sources and from overseas.

³¹ The FIES are also available for 1961, 1965, 1971, 1975, and 1979. The data on total cash receipt and assistance from abroad, however, is available after the 1985 FIES. The survey conducted in 1975 and 1979 were not published because of serious under-reporting of income.

The survey's definition of private transfers includes only inter-household transfers, so that redistribution within the household is not measured (Cox, Hansen and Jimenez 2004: 2202; Balisacan and Hill 2003: 316).

3.2.2 Survey design

The survey design of the FIES is well explained by Erieta and Fabian (2009). Here, to fully understand how the FIES is collected, we summarise some important aspects of the survey design from Erieta and Fabian (2009).

Sampling methodology

With regard to sampling methodology, the FIES from 1985 and 1994 used a stratified two-stage cluster sampling with the urban and rural classification of each province as principal domains for the survey. Approximately 20,000 households were selected as a national sample, which seems to be enough to provide reliable estimates of income and expenditure levels for each province of the Philippines. The 1991 and 1994 FIES added Autonomous Region of Muslim Mindanao (ARMM), which was newly created on August 1 1989 through RA 6734³², into the principal domain of the survey. Based on the 1995 Census of Population, the master sample design was newly constructed. It used a multi-stage sampling design with the selection of sample barangay for the first stage, enumeration area for the second stage and households for the third stage. As a national sample, about 41,000 sample households were interviewed for the 1997 and 2000 FIES. Similarly, for the 2003 and 2006 FIES, the sampling frame was renewed using the 2000

³² RA 6734 is called as "*An Act providing for an organic act for the Autonomous Region in Muslim Mindanao*". See the website of The Lawphil Project, Arellano Law Foundation, in http://www.lawphil.net/statutes/repacts/ra1989/ra_6734_1989.html

Census of Population and Housing. The 17 administrative regions³³ were selected as a sampling domain and around 51,000 sample households were interviewed (see ERICTA and Fabian, 2009: 12-15). In the case of the FIES, non-response rate is small. For example, the technical notes on the 1997 FIES reports that total interview non-response rate was only 3.6 per cent of the sample households.

Survey weight

The final survey weight is computed as the product of the base weight, the non-response adjustment and the population weighting adjustments. However, weighted sample distributions do not conform to population distributions. In general, sample estimates of household counts fall short of true household counts as there is non-coverage resulting from omission of units and from non-responses such as refusal, non-reachable areas and others (see ERICTA and Fabian, 2009: 21-23).

Comparability over time

We can compare some estimates derived from one FIES with results from another FIES in real terms. The inflation effects can be removed by deflating the results with the consumer price index (CPI) (see ERICTA and Fabian, 2009: 26). For empirical analyses, the CPI was used, if necessary, to remove the effects of inflation. With regard to geographic classification, Cordillera Administrative Region (CAR) is categorised as a regional classification except for the 1985 FIES. In 1985, the provinces in this region are divided into two classifications: Ilocos Region for Abra, Benguet, and Mountain

³³ The 17 administrative regions are as follows: National Capital Region, Cordillera Administrative Region, Ilocos, Cagayan Valley, Central Luzon, CALABARZON, MIMAROPA, Bicol, Western Visayas, Central Visayas, Eastern Visayas, Zamboanga Peninsula, Northern Mindanao, Davao, SOCCSKSARGEN, Caraga, and Autonomous Region in Muslim Mindanao.

Province; and Cagayan Valley for Apayao, Ifugao, and Kainga.³⁴ Compared to other regions, sample size of CAR is quite small (around 2.2 per cent) in 1988. In 1985, the percentage shares of sample households in Ilocos and Cagayan Valley are approximately one percentage point higher each than those in 1988. These increases in the shares would be simply because of inclusion of sample households in CAR. If we compare regional differences between 1985 and other survey years, we should be cautious about estimation results obtained for Ilocos Region and the Cagayan Valley. Moreover, according to the technical notes on the 1997 FIES³⁵, there is a major difference in geographic classification between the 1994 and 1997 FIES. The 1997 FIES added the new classification of CARAGA region, located in the North-eastern Mindanao, which was created on February 23, 1995. The CARAGA comprise the provinces of Agusan del Norte, Agusan del Sur, Surigao del Norte and Surigao del Sur. The first three provinces were formerly part of Northern Mindanao whereas Surigao del Sur was formerly part of Southern Mindanao. To avoid the usage of different regional classification and to apply the clear and straightforward classification for the analyses in this thesis, the regional categories for Mindanao were aggregated into one as a Mindanao region. This enables us to compare results at the regional level even before and after the 1997 FIES.

Data processing

The original data need to be processed for the following empirical chapters. For the 1985 FIES, five sample households were omitted because a household head's educational attainment was not reported, whereas due to incorrect data entry for the same variable (i.e., the head's education level) three households were deleted from the

³⁴ See Annex I of Bautista and Lamberte (1990) for the regional classification of the 1985 FIES.

³⁵ See technical notes on the 1997 Family Income and Expenditures (FIES)
<http://www.census.gov.ph/data/technotes/notefies.html>

original sample households for the 2006 FIES. Table 3.2 reports the final sample household for all the FIES as well as the numbers of original sample households and those omitted for the empirical analysis.

Table 3. 2: Sample size of the FIES

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Original Sample Size | 16,546 | 18,429 | 24,124 | 24,165 | 38,442 | 39,615 | 42,094 | 38,483 |
| Sample Omitted | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Final Sample Size | 16,541 | 18,429 | 24,124 | 24,165 | 38,442 | 39,615 | 42,094 | 38,480 |

Source: FIES

3.2.3 The Main variables

Remittance

With respect to the detailed information on remittances, the data on cash receipts from abroad and those from within the Philippines are separately collected. The former covers all cash receipts from all sources outside Philippine territory. These transfers might originate from family members, non-relatives, foreign government and charitable institutions. According to the NSO, the transfers from abroad comprise five items: (1) cash received from a family member³⁶ who is a contract worker³⁷ abroad; (2) cash received from a family member living abroad (immigrant, tourist, and those with student visa); (3) pensions, retirements and other benefits received from the U.S. government and other foreign government and enterprises. An example is the pension received by World War II veterans from the U.S. government; (4) cash gifts and support from relatives (except those under (1) and (2) categories above) or from charitable groups and foreign government; (5) income from abroad accruing from dividends from investment, net income from business, rental from properties and other property income.

³⁶ The term ‘family member’ refers to an individual who would have been included as member of the sample household had been in the Philippines at the time of the survey.

³⁷ A contract worker is a person hired abroad for a definite period, like those in Saudi Arabia and other Middle East countries, while non-contract workers are those who are abroad with no definite date of return such as long-term/permanent migrants.

On the other hand, cash receipts, support, assistance and relief from domestic sources are received by family members from other families³⁸ living in the country and from the Philippine government. In addition, the transfers from domestic sources include cash receipts from charitable institutions (for example, Red Cross, Department of Social Welfare and Development etc).

Cash receipts from both abroad and within the Philippines, and gifts and other assistance in kind³⁹ from any of the above two sources were separately included. The basic public use files (PUFs) of the FIES contain only the aggregated figures in terms of both transfer from abroad and that from within the Philippines, not their figures relating to the above fine classification. Tabuga (2007) mentions the possibility of an overestimation of remittance amounts with inclusion of income from foreign investment and pensions especially among high income households. However, according to Tabuga, there seems to be no significant difference in the results even if we use a narrower definition of remittances composed of three categories mentioned above (i.e., (1), (2), and (4)) because there are only a few sample households with income from foreign investment and pensions. For this thesis, due to a lack of access to the finer classification of remittance the total amounts of transfers from abroad and domestic sources received by each Filipino household are used as figures of international and internal remittances received by each household.

Family Income and Expenditures

³⁸ 'Other families' include those who are not enumerated as a member of the household if they are not expected to return within 30 days from the date of their departure.

³⁹ Gifts and other assistance in kind are measured in cash to calculate the total amount of transfers from abroad and those from within the Philippines.

A family is defined as a group of persons usually living together and composed of the head and other persons related to the head by blood, marriage or adoption. For purposes of the FIES, a single person living alone is considered as a separate family. Total family income includes primary income and receipts from other sources received by all family members. Primary income includes salaries and wages, compensation and net receipts derived from family enterprises. Income from other sources includes imputed rental values of owner-occupied dwelling units⁴⁰, interests, rentals including landowner's share of agricultural products, pensions, support and the value of food and non-food items received as gifts by the family. On the other hand, family expenditures refer to the expenses or disbursements made by the family purely for personal consumption during the survey year. They exclude all expenses in relation to farm or business operations, investment ventures, purchase of real property and other disbursements which do not involve personal consumption.

Urban/Rural Areas

Following the guidelines used in the 1980 Census of Population and Housing, areas with the following aspects⁴¹ were categorised as urban areas: (1) in their entirety, all cities and municipalities having a population density of at least 1,000 persons per square kilometre; (2) slums or central districts of municipalities and cities which have a population density of at least 500 persons per square kilometre; (3) slums or central districts (not included in (1) and (2)), regardless of the population size, with some of urban features such as road network, commercial and manufacturing establishments, a town hall, church, park, cemetery, market, school, hospital, and library; (4) barangays⁴² having at least 1,000 inhabitants which meet the conditions set forth in (3) above, and where the occupation of inhabitants is predominantly non-farming or non-fishing. All areas not falling under any of the above classifications (i.e., (1) to (4)) are considered rural. Table 3.3 reports the size and the percentage distribution of sample households in each region with the urban/rural classifications. Overall, there seems to be no significant change in the urbanisation category except for the 2003 FIES in which the urban aspect was not considered.

⁴⁰ Imputed rent is the estimated amount that the owner of a dwelling unit would charge if he/she were to rent his/her entire dwelling unit monthly, unfurnished and excluding the costs for utilities.

⁴¹ See the technical notes on the 1997 FIES for more details.

http://www.census.gov.ph/data/technotes/notefies.html#data_processing

⁴² A barangay is the smallest administrative division in the Philippines and is the native Filipino term for a village, district or ward.

Table 3. 3: Number and Percentage Distribution of sample households by region and urbanity

| | | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|--------------------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Philippines | Grand Total | 16,541 | 18,429 | 24,124 | 24,165 | 38,442 | 39,615 | 42,094 | 38,480 |
| | | (100) | (100) | (100) | (100) | (100) | (100) | (100) | (100) |
| Ilocos | Total | 1,225 | 1,105 | 1,332 | 1,331 | 1,864 | 1,887 | 2,449 | 2,258 |
| | | (7) | (6) | (6) | (6) | (5) | (5) | (6) | (6) |
| | Urban | 407 | 337 | 654 | 655 | 928 | 942 | N.A. | 837 |
| | | (2) | (2) | (3) | (3) | (2) | (2) | | (2) |
| | Rural | 818 | 768 | 678 | 676 | 936 | 945 | N.A. | 1,421 |
| | | (5) | (4) | (3) | (3) | (2) | (2) | | (4) |
| Cagayan | Total | 834 | 781 | 947 | 955 | 1,540 | 1,561 | 2,101 | 1,900 |
| | | (5) | (4) | (4) | (4) | (4) | (4) | (5) | (5) |
| | Urban | 227 | 190 | 341 | 347 | 554 | 569 | N.A. | 483 |
| | | (1) | (1) | (1) | (1) | (1) | (1) | | (1) |
| | Rural | 607 | 591 | 606 | 608 | 986 | 992 | N.A. | 1,417 |
| | | (4) | (3) | (3) | (3) | (3) | (3) | | (4) |
| Cluzon | Total | 1,684 | 1,925 | 2,630 | 2,616 | 3,728 | 3,770 | 3,389 | 3,114 |
| | | (10) | (10) | (11) | (11) | (10) | (10) | (8) | (8) |
| | Urban | 849 | 956 | 1,741 | 1,740 | 2,784 | 2,826 | N.A. | 1,910 |
| | | (5) | (5) | (7) | (7) | (7) | (7) | | (5) |
| | Rural | 835 | 969 | 889 | 876 | 944 | 944 | N.A. | 1,204 |
| | | (5) | (5) | (4) | (4) | (2) | (2) | | (3) |
| Sluzon | Total | 2,331 | 2,388 | 3,475 | 3,486 | 6,028 | 6,168 | 5,963 | 5,265 |
| | | (14) | (13) | (14) | (14) | (16) | (16) | (14) | (14) |
| | Urban | 1,134 | 1,110 | 2,149 | 2,161 | 3,911 | 3,999 | N.A. | 2,830 |
| | | (7) | (6) | (9) | (9) | (10) | (10) | | (7) |
| | Rural | 1,197 | 1,278 | 1,326 | 1,325 | 2,117 | 2,169 | N.A. | 2,435 |
| | | (7) | (7) | (5) | (5) | (6) | (5) | | (6) |
| Bicol | Total | 1,053 | 1,184 | 1,378 | 1,372 | 2,059 | 2,099 | 2,532 | 2,250 |
| | | (6) | (6) | (6) | (6) | (5) | (5) | (6) | (6) |
| | Urban | 313 | 351 | 569 | 584 | 951 | 979 | N.A. | 558 |
| | | (2) | (2) | (2) | (2) | (2) | (2) | | (1) |
| | Rural | 740 | 833 | 809 | 788 | 1,108 | 1,120 | N.A. | 1,692 |
| | | (4) | (5) | (3) | (3) | (3) | (3) | | (4) |
| Wvsayas | Total | 1,472 | 1,648 | 1,998 | 1,986 | 2,934 | 3,014 | 2,970 | 2,716 |
| | | (9) | (9) | (8) | (8) | (8) | (8) | (7) | (7) |
| | Urban | 535 | 617 | 978 | 967 | 1,452 | 1,501 | N.A. | 824 |
| | | (3) | (3) | (4) | (4) | (4) | (4) | | (2) |
| | Rural | 937 | 1,031 | 1,020 | 1,019 | 1,482 | 1,513 | N.A. | 1,892 |
| | | (6) | (6) | (4) | (4) | (4) | (4) | | (5) |
| Cvisayas | Total | 1,240 | 1,391 | 1,738 | 1,766 | 2,217 | 2,333 | 2,892 | 2,503 |
| | | (7) | (8) | (7) | (7) | (6) | (6) | (7) | (7) |
| | Urban | 513 | 593 | 949 | 967 | 1,344 | 1,386 | N.A. | 1,222 |
| | | (3) | (3) | (4) | (4) | (3) | (3) | | (3) |
| | Rural | 727 | 798 | 789 | 799 | 873 | 947 | N.A. | 1,281 |
| | | (4) | (4) | (3) | (3) | (2) | (2) | | (3) |
| Evisayas | Total | 857 | 933 | 1,103 | 1,109 | 2,120 | 2,252 | 2,296 | 1,944 |
| | | (5) | (5) | (5) | (5) | (6) | (6) | (5) | (5) |
| | Urban | 248 | 282 | 428 | 432 | 1,120 | 1,168 | N.A. | 408 |
| | | (1) | (2) | (2) | (2) | (3) | (3) | | (1) |
| | Rural | 609 | 651 | 675 | 677 | 1,000 | 1,084 | N.A. | 1,536 |
| | | (4) | (4) | (3) | (3) | (3) | (3) | | (4) |
| Mindanao | Total | 3,562 | 4,122 | 5,346 | 5,398 | 10,484 | 10,728 | 11,909 | 10,540 |
| | | (22) | (22) | (22) | (22) | (27) | (27) | (28) | (27) |
| | Urban | 1,208 | 1,407 | 2,657 | 2,686 | 5,144 | 5,274 | N.A. | 3,276 |
| | | (7) | (8) | (11) | (11) | (13) | (13) | | (9) |
| | Rural | 2,354 | 2,715 | 2,689 | 2,712 | 5,340 | 5,454 | N.A. | 7,264 |
| | | (14) | (15) | (11) | (11) | (14) | (14) | | (19) |
| NCR | Total | 2,283 | 2,546 | 3,693 | 3,656 | 3,879 | 4,141 | 3,972 | 4,454 |
| | | (14) | (14) | (15) | (15) | (10) | (10) | (9) | (12) |
| | Urban | 2,283 | 2,546 | 3,693 | 3,656 | 3,879 | 4,141 | N.A. | 4,454 |
| | | (14) | (14) | (15) | (15) | (10) | (10) | | (12) |
| | Rural | 0 | 0 | 0 | 0 | 0 | 0 | N.A. | 0 |
| | | (0) | (0) | (0) | (0) | (0) | (0) | | (0) |
| CAR | Total | N.A. | 406 | 484 | 490 | 1,589 | 1,662 | 1,621 | 1,536 |
| | | | (2) | (2) | (2) | (4) | (4) | (4) | (4) |
| | Urban | N.A. | 198 | 244 | 248 | 692 | 739 | N.A. | 464 |
| | | | (1) | (1) | (1) | (2) | (2) | | (1) |
| | Rural | N.A. | 208 | 240 | 242 | 897 | 923 | N.A. | 1,072 |
| | | | (1) | (1) | (1) | (2) | (2) | | (3) |

Source: FIES

Note: Parentheses denote the share of sample households out of the grand total.

The variable identifying urban and rural areas is not available for the 2003 FIES.

Relevant previous studies

Because of the richness of the datasets, large sample sizes, the availability of many years, and a variety of important household variables, the FIES has been used by many researchers investigating, *inter alia*, household income sources, expenditure behaviour, income inequality and poverty. Fortunately, the FIES contains the information on the amount and nature of remittances received. Therefore, the survey enables us to undertake research on the effects of remittances, for example their effects on household expenditure behaviour, inequality and poverty levels among households.

In order to examine the key research questions of this thesis, which are (1) determinants of remittances, (2) the effects of remittances on expenditure inequality between households, and (3) the effects of remittances on household educational expenditures, we can derive a great deal of insights from using the FIES. Past studies have exploited the advantages of the use of the FIES in this context (see for example, Alba and Sugui (2009) for research on determinants of remittances; Balisacan (1991), Estudilo (1997), Rodriguez (1998), Balisacan and Fuwa (2004), Cox, Hansen, and Jimenez (2004), Burgess and Haksar (2005), and Dakila and Dakila (2006) for studies on inequality; Orbeta and Alba (1998), Ballesteros (2001), and Tabuga (2007) for research on household expenditure behaviour). Lists of past studies which are relevant to the topics of this thesis are summarised in Table 3.4.

Alba and Sugui (2009) investigated remittance motives using the combined data of the 2003 FIES and 2003 SOF. This combined data could make it possible to examine both remittance motives of migrants and their recipient households. However, despite the great benefit of using the combined FIES-SOF datasets, there are still several disadvantages. For example, they are available only after 2000 FIES. Thus, the period

of the survey years is limited only to 2000, 2003, and 2006. Moreover, combining the FIES with the SOF reduces the number of sample households, mostly those who did not have migrants working abroad and did not receive remittance incomes from abroad. As a consequence, we lose huge numbers of sample households who received only remittances from within the Philippines as well as those without any remittance incomes at all.

Many studies focus on research on inequality using the FIES. However, among the listed studies in Table 3.4, most of them use a single year survey. Inequality needs to be investigated over time. There is a limited literature on inequality using the multiple FIES. For example, Estudilo used the 1965, 1971, 1985, and 1991 FIES as the survey conducted in 1975 and 1979 were not published due to serious under-reporting of income. The 1961 and 1988 FIES were disregarded because there had not been any significant change in the structure of household income from 1961 to 1965 and from 1985 to 1988. As mentioned above, the remittance information is available after the 1985 FIES. Thus, for purposes of our thesis, the survey period has to be undertaken after 1985. Using the several FIES after 1985, Balisacan and Fuwa (2004) used Fields (2003) decomposition technique, which is a regression-based inequality decomposition approach and allows for the contribution of each explanatory variable to inequality to be investigated. The Fields decomposition is quite popular and widely used for research on inequality and provides an indication of the contribution of a set of factors to inequality such as location and household-specific attributes in Balisacan and Fuwa (2004). However, if we apply this decomposition technique into our analysis which compares the welfare level between households with and without remittance incomes, household characteristics have to be assumed to have the same effects on inequality between two

household groups. In order to relax this strong assumption, in the empirical chapter, we will use the Melly (2006) decomposition, which enables us to capture the receipt of remittance incomes on inequality after controlling for each effect of household attributes on inequality for each household group.

Among past studies on expenditure behaviour using the FIES, Tabuga (2007), Pernia (2008) and Ang, Sugiyarto, and Jha (2009) examined the remittance effects on household expenditures. Except for Ang, Sugiyarto, and Jha (2009), the above studies found that international remittance positively influenced education expenditures. However, all of them used a single year FIES. Thus, the results are not readily interpretable over time. In addition, Pernia (2008) and Ang, Sugiyarto, and Jha (2009) used ordinary least squares (OLS) and did not take into account the censored nature of educational expenditures in their analysis. On the other hand, Tabuga (2007) reported the results derived from a censored Tobit model, though she also reported the remittance effects on education derived from the normal mean and median regression. In addition to the careful consideration of zero educational expenditure, we cannot neglect a potential for endogeneity through reverse causality between education and remittances. This issue of endogeneity was considered only in Ang, Sugiyarto and Jha (2009) but they did not take into consideration the zero expenditure issue as mentioned above. For this thesis, we simultaneously take into account both the censored nature of education expenditure as well as a potential endogeneity of reverse causality between education and remittances using instrumental-variable Tobit (IV Tobit) estimator. Dealing with the above mentioned issues discussed among the said past studies and providing the empirical estimation results derived from the appropriate econometric analysis would contribute to the field of research concerned with remittance effects on education.

Table 3. 4: Lists of relevant past studies using the FIES

| Authors and research topics | Data |
|------------------------------------|-----------------------------|
| Determinants of remittances | |
| Alba and Sugui (2009) | 2003 FIES and 2003 SOF |
| Inequality | |
| Balisacan (1991) | 1985 FIES |
| Estudilo (1997) | 1965, 1971, 1985, 1991 FIES |
| Rodriguez (1998) | 1991 FIES |
| Balisacan and Fuwa (2004) | 1985-2000 FIES |
| Cox, Hansen, and Jimenez (2004) | 1988 FIES |
| Burgess and Haksar (2005) | 2000 FIES |
| Dakla and Dakla (2006) | 1994 FIES |
| Expenditure behaviours | |
| Orbeta and Alba (1998) | 1991 FIES |
| Ballesteros (2001) | 1985-1997 FIES |
| Tabuga (2007) | 2003 FIES |
| Pernia (2008) | 2003 FIES |
| Ang, Sugiyarto, and Jha (2009) | 2006 FIES |

Chapter 4: The incidences and amounts of remittances received by Filipino households

4.1 Introduction

Recently, more researchers have shown an increased interest in migration topics, especially remittances. This is mainly because more data on migration activities have become accessible than before. The Living Standard Measurement Survey (LSMS) undertaken by the World Bank, which is a nationally representative household survey, is a good example. Policymakers are interested in what factors could cause increases in the amounts of international remittances into developing countries. This is because remittances are the second largest source of external finance for developing countries after foreign direct investment, and thereby remittances could have a huge potential to contribute to economic development in developing countries. In recent years, there has been an increasing amount of literature on migration and development, especially the impact of remittances on developing countries. Some researchers have carried out fieldwork and mainly collected information on migrants. By using these migrant datasets, most studies on remittances have been conducted to investigate what factors influence the decisions and the amounts of remittances sent by migrants. However, it might not be only migrant characteristics but also household ones that affect the decisions on whether migrants send money or not and about the amounts sent. The purpose of this chapter is to provide an empirical account of the remittance-receiving households in the Philippines. In order to identify the Filipino households with and without receipt of different types of remittances, we mainly use the Family Income and Expenditure Survey (FIES).

As of December 2010, the FIES is available for a long period of time from 1985 to 2006⁴³ and is used to examine which household characteristics determine the receipt of internal and international remittances among Filipino households. The advantage of using the FIES is that we have detailed information on the Filipino households (welfare levels, household composition, educational levels and types of work of household heads, and places of living) for an extended period of time. More importantly, there are data on both amounts of transfers sent from within the Philippines and amounts originally sent from abroad. Therefore, it is possible to examine what sort of household characteristics influence the propensity for Filipino households to receive remittances. Thus, the main emphasis of the analysis using the FIES falls on investigating which household characteristics are most associated with the receipt of remittances. The analysis does not focus on migrant workers' decisions on sending remittances. Recent studies have found that remittances are driven by the need to support migrant workers' families, rather than by migrants' investment considerations alone (see for example, Aggarwal and Spatafora, 2005). In addition, according to the new economics of migration, international migration represents a strategic behaviour that migrant families, not individuals, undertake (Massey, D.S. et. al., 1998; 125). We mainly follow the theory of the new economics of migration for the analysis undertaken in this chapter. Of course, it is also very important to look at not only the household characteristics but migrant characteristics to investigate the determinants of remittances. However, the FIES data have not been collected primarily for migration statistics and thus do not contain any information on overseas migrant workers. Thus, it is not possible to investigate the significant relationships of remitters and remittances using only the FIES.

⁴³ Before 1985, the FIES was conducted in 1957, 1961, 1965, 1971, 1975, and 1979. However, the new sampling methods, questionnaires, methods of collection and recall were introduced from 1985 (Erica and Fabian, 2009:2). Moreover, before 1985 remittances were compulsory. This means the decision to remit was not purely an individual choice.

In order to examine the household characteristics influencing the receipt of remittances, we will take into consideration both domestic and international remittances. However, receiving remittances from abroad could change the propensity to receive remittances from within the Philippines. Far too little attention has been paid to investigating the extent to which receiving one type of remittance is replaced by receiving another type. Therefore, in this chapter, with regard to the determinants of remittances, we will also investigate the displacement effect of international remittances on domestic remittances.

This chapter is structured as follows. The next section examines motivations of remittances. Section Three describes profiles of remittance-receiving households. This chapter has three main research questions. The first question is “*What are the determinants of whether the households receive remittances or not?*” The second research question is “*Which household characteristics affect the amount of receiving remittances?*” The third question is “*How much does the receipt of international remittances influence the receipt of domestic remittances?*” The methodology of examining these three questions will be explained in Section Four. Then, the empirical results are discussed in Section Five. The last section of this chapter offers some conclusions.

4.2 Motivations for Remittances

The literature on migration and remittances states that there are two possible motivations for remittances: altruism and exchange (Cox, D., 1987; Cox, D., Eser, Z. and Jiminez, E., 1998). Becker (1974) modelled and analysed altruism motives in the household. With altruistic motive, migrants care about the well-being of their children

or other family members. If remittances rise with the age of migrants' parents, or with the number of other younger siblings in the household, then it suggests that an altruism motive makes migrants support their parents, children or younger siblings. Another example is that if altruism is a migrant's motivation to remit, a decline in the household welfare should encourage more remittances (Ruiz and Vargas-Silva, 2009). On the other hand, with an exchange motive, migrants remit for services received from their parents such as childcare, education, bequests and inheritance. For example, some migrants send money back home in order to benefit from their families' gratitude and ultimately receive a portion of an inheritance (Ruiz and Vargas-Silva, 2009). Another example is the migrants' loan repayments for the initial family investment in their education (Piracha and Saraogi, 2011). Moreover, the exchange motive can be divided into insurance and investment motives. If the amount of remittance increases with the level of education of a migrant, it suggests that an exchange motive makes migrants repay their parents' investment in them. If the amount of remittances rises with the level of income or assets in migrants' household receiving the remittances, it is said that an exchange motive also encourages migrants to maintain their rights to bequests and inheritance (Bernheim, Shleifer, and Summers 1985). de la Briere et. al. (2002: 320) summarized the expected relationship between insurance motives, investment motives or both motives and the amount of remittances migrants send. In addition to insurance and investment motives summarised by de la Briere et al. (2002: 320), we can also consider the expected relationship between an altruistic motive and the amount of remittances sent.

Table 4.1 reports the expected signs of the relationship between the probabilities of migrants' remitting and the determinants as a case in point. The table reveals that the

older a household head gets, the more likely a migrant has an altruism motive to remit; the more lost working days a recipient household has, the more remittances a migrant with insurance motives sends; and that the greater the parents' household income becomes, the more money a migrant with an investment motive remit. Migrants may have both insurance and investment motives at the same time. In this case, the expected sign of parents' household income on the amount of remittances migrants' household receive shows that investment motives dominate insurance motives (de la Briere et al. 2002: 320).

Table 4. 1: The probability of migrants' remitting as a case in point (expected signs of relationship)

| | Altruism Motive | Insurance Motive | Investment Motive |
|------------------------------|-----------------|------------------|-------------------|
| Migrants' asset and earnings | + | + | + |
| Parents' household income | - | - | + |
| Number of lost working days | 0 | + | 0 |
| Age of household head | + | 0 | +/- |
| Parents' inheritable assets | - | 0 | + |
| Number of heirs | +/- | 0 | +/- |

Source: Based on de la Briere et al. (2002) p.11

With regard to remittance motives for overseas Filipino workers (OFWs) and their households left in the Philippines, using the 2003 FIES and SOF Alba and Sugui (2009) found that altruism motives seem to dominate exchange motives for households with migrants who are likely to be the primary bread-winners of their recipient households. This is because almost all heads and heads' spouses send money to support the livelihood of their family left in the Philippines. In addition, the needs of the young family members were found to be significantly important in terms of motivations for remittances among the said households.

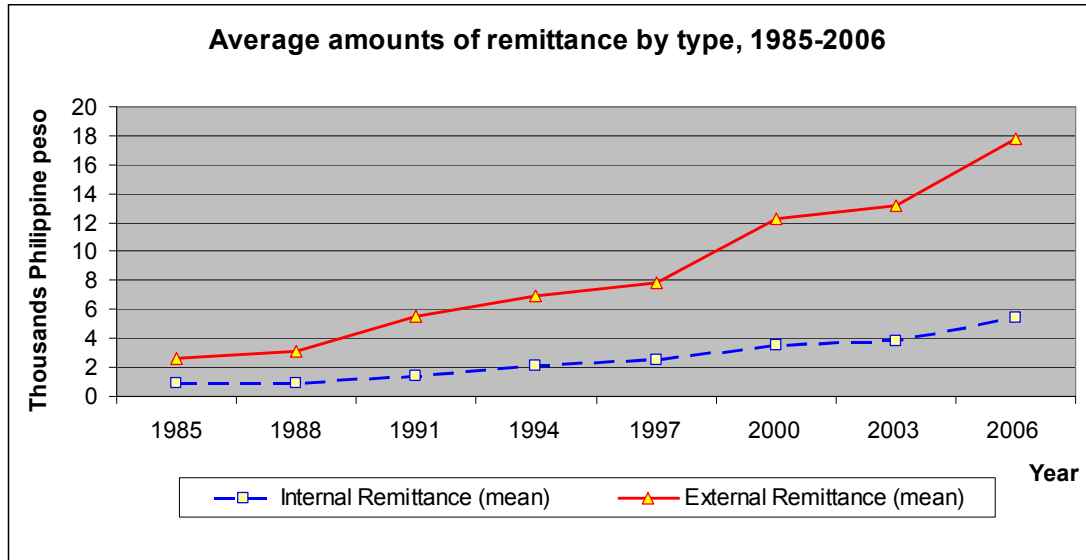
As Ruiz and Vargas-Silva (2009) summarised, a migrant's motivation for remittances is rather complex. In order to examine the motivation to remit, the rich data on migrant and household characteristics are needed. Based on the results derived from the FIES having only variables for households not migrants, it would be too hard to articulate which remittance motives migrants have though some possible arguments will be made. As with Alba and Sugui (2009), combining the FIES with the SOF enables us to investigate remittance motives using both migrant and household characteristics. However, it is not feasible to do this research for all the survey years (i.e., 1985-2006), as noted in Chapter Three, as such combined datasets are available only after 2000. Moreover, combining the two datasets reduces the number of sample households who did not have migrants working abroad during the survey period. This means that the sample households with domestic remittances but having no migrant as well as those with no remittance income cannot be used for the analysis of this chapter. This is a drawback to the research on the comparison between domestic and international remittances as well as between households with and without remittance incomes. Hence, in this chapter, we will cast light more on the relationship between remittances and household characteristics. Are there any household factors influencing the incidence and the amount of remittances? Before examining this question, we will first summarise the profiles of remittance-receiving households in the next section.

4.3 Profile of remittance-receiving households

For research on remittances, a strong advantage of using the Family Income and Expenditure Survey (FIES), which is a nationally representative household survey, is the availability of both the amounts of remittances from within the Philippines and from overseas, as mentioned in Chapter Three. The mean remittances both from within the

country and from abroad have increased more than six-fold between 1985 and 2006. The average remittances from abroad are nearly three times those from within the country (Figure 4.1).

Figure 4. 1: Average amounts of remittance by type, 1985-2006



Source: Family Income and Expenditure Survey (FIES)

The distribution of remittance-receiving households among the sample observations of FIES by type of the receipt of remittances is summarised in Table 4.2. Depending on the types of remittances received, Filipino households can be classified into four categories: no remittance (*dnorem*), internal remittances only (*dinrem*), international remittances only (*dexrem*), both internal and international remittances (*dbothrem*). Among Philippine households in the FIES, the majority did not receive any remittances (i.e. *dnorem*). The second major household group in the FIES is one in receipt of only internal remittances (i.e., *dinrem*). With regard to the international remittances, the proportion of Filipino households who received remittances from abroad has been steadily increasing between 1985 and 2006. In addition to the data on the amounts of internal and international remittances received, the FIES also captures household characteristics in detail. Mainly these characteristics consist of two parts: household

head characteristics and household member characteristics. While the former have the information on the household head's gender, age, marital status, educational attainment, and type of work, whereas the latter includes household size, age categories⁴⁴, and the number of employed members. Furthermore, the detailed information on family income and family expenditure both in cash and in kind, which are the main feature of the FIES, is also available.

Table 4. 2: Distribution of remittance-receiving households by type of receiving remittances

| Year | <i>dnorem</i> | <i>dinrem</i> | <i>dexrem</i> | <i>dbothrem</i> |
|-------------|----------------------|----------------------|----------------------|------------------------|
| 1985 | 8570 (51.81%) | 5460 (33%) | 1476 (8.92%) | 1035 (6.27%) |
| 1988 | 9939 (53.93%) | 5632 (30.56%) | 1862 (10.10%) | 996 (5.40%) |
| 1991 | 13635 (56.52%) | 6232 (25.83%) | 2932 (12.15%) | 1325 (5.49%) |
| 1994 | 12732 (52.69%) | 6620 (27.39%) | 3093 (12.80%) | 1720 (7.12%) |
| 1997 | 22069 (57.41%) | 9736 (25.33%) | 4627 (12.04%) | 2010 (5.23%) |
| 2000 | 21439 (54.12%) | 11021 (27.82%) | 5048 (12.74%) | 2107 (5.32%) |
| 2003 | 19410 (46.11%) | 13955 (33.15%) | 5058 (12.02%) | 3671 (8.72%) |
| 2006 | 15962 (41.48%) | 13548 (35.21%) | 5067 (13.17%) | 3903 (10.14%) |

Source: Family Income and Expenditure Survey (FIES)

Note: Non-Remittance receiving Households (*dnorem*), Internal Remittance-receiving Households (*dinrem*), External Remittance-receiving Households (*dexrem*), Both internal and external Remittance-receiving Households (*dbothrem*).

Table 4.3 reveals the profile of Filipino households. Overall, mean total family income and expenditure are increasing over time. With regard to family composition, average family size is decreasing from 5.5 in 1985 to 4.8 in 2006. The mean proportions of family members employed and aged 25 and over are increasing over the period of 1985-2006. On the other hand, the average share of family members aged less than 25 are

⁴⁴ The category of household member's age is as follows. Household member less than one year old, 1-6 years old, 7-14 years old, 15-24 years old, and 25 years old and over (or 25-59 years old and 60 years old and over only for the 2006 FIES).

gradually decreasing over the same period. When it comes to the characteristics of household heads, their average age is late 40s. The majority of household heads are male, married, and employed. As for their educational attainments, around ten per cent of heads graduated from universities. Approximately one-third of heads finished either elementary school or high school. With regard to the place of living, about a quarter of the sample households are living in Mindanao in all survey years. There are considerable differences in the characteristics of remittance-receiving households with respect to total income and expenditure, household heads and their educational attainment and job information, and urban/rural residence and regional information. The mean total income and expenditure among the Philippine households with the receipt of remittances from abroad are greater than any other households. What is interesting is that among the households who received remittances from abroad, the proportion of female household heads is much higher. Similarly, the share of household heads not employed is greater among households in receipt of international remittances. These might be because among the remittance-receiving households there are many female parents left behind relying on remittance incomes from male partners. Moreover, the proportion of agricultural households is much greater among non-remittance-receiving households than remittance-receiving households. This is because agricultural households depend on family members as labour force at home and prefer not to send them abroad. In addition, they might not be able to afford migration costs for their family members. When it comes to the location of sample households, the majority of international remittance-receiving households are living in urban areas.⁴⁵ From the table, it is apparent that there are regional differences in the receipt of remittances. Among non-remittance-receiving households, the proportion of households living in Mindanao

⁴⁵ Some rural households might move to urban areas because of the receipt of international remittances.

is higher. Households in Southern Luzon, Bicol, Western Visayas, and Eastern Visayas have a higher propensity to receive remittances from within the Philippines. In regard to international remittance-receiving households, the proportion of Filipino households who live in Ilocos, Central Luzon, and National Capital Region (NCR) are greater than other households. Furthermore, households with the receipt of both internal and international remittances have a greater representation in Ilocos, Central Luzon, Southern Luzon, and NCR.

Table 4. 3: Profile of Filipino households by type of the receipt of remittances (mean)**Table 4.3a: All households (*Total*)**

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|--|------------------|------------------|------------------|------------------|-------------------|--------------------|--------------------|--------------------|
| Sample Size | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 42094 | 38480 |
| <u>Remittance (in peso, nominal)</u> | | | | | | | | |
| Total amount received | 3527 (11627) | 4036 (13185) | 6950 (21934) | 8949 (26447) | 10314 (31327) | 15817 (54130) | 16936 (56568) | 23244 (78242) |
| International remittance | 2636 (11275) | 3092 (12819) | 5498 (21226) | 6885 (25036) | 7811 (30090) | 12271 (51699) | 13158 (55082) | 17780 (75835) |
| Domestic remittance | 890 (2982) | 944 (3126) | 1452 (5240) | 2064 (7860) | 2503 (8985) | 3546 (14511) | 3777 (12218) | 5464 (18216) |
| <u>Welfare Level (in peso, nominal)</u> | | | | | | | | |
| Total Family Income | 30212 (27024) | 39729 (35602) | 63207 (56634) | 82169 (71615) | 111188 (97314) | 142531 (197581) | 137758 (250922) | 163533 (201754) |
| Total Family Expenditure | 26781 (21668) | 32687 (26024) | 51667 (42469) | 67836 (54838) | 91367 (71821) | 115237 (128630) | 114959 (120646) | 138895 (143130) |
| <u>Family Composition</u> | | | | | | | | |
| Family Size | 5.5 (2.3) | 5.3 (2.2) | 5.3 (2.2) | 5.3 (2.2) | 5.2 (2.2) | 5.1 (2.3) | 4.8 (2.2) | 4.8 (2.2) |
| Share (%): | | | | | | | | |
| Employed | 34% | 33% | 34% | 35% | 37% | 38% | 42% | 43% |
| Age 0-6 | 17% | 17% | 17% | 15% | 16% | 13% | 15% | 13% |
| Age 7-14 | 19% | 19% | 19% | 19% | 18% | 18% | 17% | 17% |
| Age 15-24 | 19% | 18% | 18% | 18% | 17% | 18% | 17% | 17% |
| Age 25+ | 45% | 46% | 47% | 48% | 49% | 51% | 50% | 53% |
| <u>Household Head</u> | | | | | | | | |
| Age | 46.5 (13.9) | 45.6 (14.0) | 46.2 (14.0) | 47.6 (13.8) | 46.7 (14.0) | 48.9 (13.9) | 46.3 (14.2) | 48.4 (14.0) |
| Female (%) | 14% | 14% | 14% | 15% | 15% | 18% | 16% | 18% |
| Married (%) | 85% | 85% | 84% | 84% | 83% | 81% | 82% | 80% |
| Not Employed (%) | 14% | 12% | 14% | 15% | 14% | 16% | 13% | 15% |
| Education Level (%): | | | | | | | | |
| Pre-Elementary | 34% | 31% | 29% | 28% | 26% | 25% | 27% | 26% |
| Elementary | 24% | 35% | 35% | 35% | 34% | 32% | 32% | 32% |
| High School | 34% | 26% | 27% | 28% | 31% | 32% | 31% | 32% |
| University | 8% | 9% | 9% | 9% | 9% | 11% | 10% | 10% |
| <u>Urban households (%)</u> | 47% | 47% | 60% | 60% | 59% | 59% | N.A | 45% |
| <u>Agricultural households (%)</u> | 37% | 34% | 32% | 30% | 27% | 24% | 30% | 27% |
| <u>Regions (%)</u> | | | | | | | | |
| Ilocos | 7% | 6% | 6% | 6% | 5% | 5% | 6% | 6% |
| Cagayan | 5% | 4% | 4% | 4% | 4% | 4% | 5% | 5% |
| Cluzon | 10% | 10% | 11% | 11% | 10% | 10% | 8% | 8% |
| Sluzon | 14% | 13% | 14% | 14% | 16% | 16% | 14% | 14% |
| Bicol | 6% | 6% | 6% | 6% | 5% | 5% | 6% | 6% |
| Wvisayas | 9% | 9% | 8% | 8% | 8% | 8% | 7% | 7% |
| Cvisayas | 7% | 8% | 7% | 7% | 6% | 6% | 7% | 7% |
| Evisayas | 5% | 5% | 5% | 5% | 6% | 6% | 5% | 5% |
| Mindanao | 22% | 22% | 22% | 22% | 27% | 27% | 28% | 27% |
| NCR | 14% | 14% | 15% | 15% | 10% | 10% | 9% | 12% |
| CAR | N.A. | 2% | 2% | 2% | 4% | 4% | 4% | 4% |

Source: Author's computation based on the FIES.

Note: Parentheses denote the standard errors.

Table 4.3b: Non-Remittance receiving Households (*dnorem*)

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|--|------------------|------------------|------------------|------------------|-------------------|--------------------|--------------------|--------------------|
| Sample Size | 8570 | 9939 | 13635 | 12732 | 22069 | 21439 | 19410 | 15962 |
| <u>Welfare Level (in peso, nominal)</u> | | | | | | | | |
| Total Family Income | 28084 (25024) | 39392 (35602) | 60511 (54258) | 78093 (69178) | 111025 (98594) | 143412 (220483) | 133750 (315325) | 164381 (223793) |
| Total Family Expenditure | 24738 (20134) | 31852 (25498) | 48899 (40424) | 63325 (52053) | 88958 (70700) | 112437 (134521) | 106589 (116879) | 134179 (150047) |
| <u>Family Composition</u> | | | | | | | | |
| Family Size | 5.6 (2.3) | 5.5 (2.2) | 5.4 (2.2) | 5.4 (2.2) | 5.3 (2.2) | 5.3 (2.2) | 4.9 (2.2) | 4.9 (2.2) |
| Share (%): | | | | | | | | |
| Employed | 35% | 35% | 36% | 37% | 38% | 40% | 43% | 45% |
| Age 0-6 | 17% | 18% | 17% | 16% | 16% | 14% | 15% | 13% |
| Age 7-14 | 20% | 19% | 19% | 19% | 18% | 19% | 17% | 17% |
| Age 15-24 | 18% | 18% | 18% | 18% | 17% | 18% | 18% | 17% |
| Age 25+ | 45% | 45% | 46% | 47% | 48% | 50% | 50% | 53% |
| <u>Household Head</u> | | | | | | | | |
| Age | 45.2 (12.9) | 44.1 (13.0) | 44.8 (13.0) | 46.0 (12.8) | 45.1 (13.1) | 47.2 (12.9) | 44.5 (13.2) | 46.6 (13.0) |
| Female (%) | 9% | 9% | 9% | 10% | 10% | 12% | 10% | 12% |
| Married (%) | 88% | 88% | 88% | 87% | 86% | 84% | 85% | 84% |
| Not Employed (%) | 7% | 7% | 8% | 9% | 8% | 10% | 7% | 9% |
| Education Level (%): | | | | | | | | |
| Pre-Elementary | 36% | 31% | 30% | 29% | 26% | 26% | 29% | 28% |
| Elementary | 25% | 35% | 36% | 36% | 33% | 31% | 32% | 31% |
| High School | 32% | 25% | 26% | 27% | 30% | 32% | 29% | 31% |
| University | 7% | 9% | 9% | 8% | 10% | 12% | 10% | 11% |
| <u>Urban households (%)</u> | 40% | 45% | 58% | 56% | 57% | 57% | N.A | 43% |
| <u>Agricultural households (%)</u> | 46% | 39% | 38% | 37% | 32% | 30% | 38% | 35% |
| <u>Regions (%):</u> | | | | | | | | |
| Ilocos | 5% | 4% | 4% | 4% | 3% | 4% | 4% | 4% |
| Cagayan | 6% | 5% | 5% | 5% | 4% | 5% | 6% | 5% |
| Cluzon | 7% | 7% | 9% | 8% | 8% | 7% | 6% | 5% |
| Sluzon | 12% | 12% | 13% | 13% | 15% | 14% | 12% | 11% |
| Bicol | 6% | 5% | 5% | 5% | 5% | 5% | 5% | 4% |
| Wvisayas | 9% | 9% | 8% | 8% | 6% | 6% | 6% | 6% |
| Cvisayas | 8% | 8% | 8% | 8% | 6% | 6% | 7% | 6% |
| Evisayas | 6% | 5% | 5% | 5% | 5% | 6% | 5% | 4% |
| Mindanao | 31% | 30% | 29% | 30% | 33% | 34% | 37% | 35% |
| NCR | 11% | 13% | 13% | 12% | 9% | 10% | 8% | 14% |
| CAR | N.A. | 3% | 2% | 3% | 5% | 5% | 5% | 5% |

Source: Author's computation based on the FIES.

Note: Parentheses denote the standard errors.

Table 4.3c: Internal Remittance-receiving Households (*dinrem*)

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|---|------------------|------------------|------------------|------------------|------------------|-------------------|------------------|--------------------|
| Sample Size | 5460 | 5632 | 6232 | 6620 | 9736 | 11021 | 13955 | 13548 |
| Remittance (in peso, nominal) | | | | | | | | |
| Total amount received | 2132 (4106) | 2544 (4602) | 4330 (8274) | 5597 (11976) | 8061 (14974) | 10018 (21671) | 8318 (17325) | 11335 (25459) |
| Welfare Level (in peso, nominal) | | | | | | | | |
| Total Family Income | 23953 (19626) | 29597 (24104) | 45813 (40106) | 62012 (52029) | 80074 (68605) | 95181 (112795) | 93403 (92433) | 110365 (110618) |
| Total Family Expenditure | 22661 (17499) | 26387 (19526) | 40308 (32144) | 54729 (42898) | 72130 (55862) | 85928 (93321) | 86454 (75037) | 102551 (88463) |
| Family Composition | | | | | | | | |
| Family Size | 5.3 (2.3) | 5.2 (2.3) | 5.1 (2.2) | 5.1 (2.3) | 5.0 (2.2) | 4.9 (2.3) | 4.7 (2.3) | 4.7 (2.3) |
| Share (%): | | | | | | | | |
| Employed | 34% | 33% | 34% | 35% | 36% | 37% | 41% | 43% |
| Age 0-6 | 17% | 17% | 17% | 15% | 16% | 13% | 15% | 14% |
| Age 7-14 | 19% | 19% | 19% | 19% | 18% | 18% | 18% | 18% |
| Age 15-24 | 18% | 17% | 16% | 16% | 16% | 16% | 16% | 16% |
| Age 25+ | 46% | 46% | 48% | 49% | 49% | 52% | 50% | 53% |
| Household Head | | | | | | | | |
| Age | 47.4 (14.7) | 46.9 (15.0) | 47.7 (15.0) | 49.2 (14.7) | 48.5 (15.0) | 50.7 (14.8) | 47.1 (15.0) | 49.2 (14.6) |
| Female (%) | 16% | 14% | 16% | 17% | 17% | 20% | 17% | 18% |
| Married (%) | 82% | 82% | 80% | 79% | 80% | 76% | 79% | 78% |
| Not Employed (%) | 15% | 13% | 16% | 17% | 16% | 18% | 13% | 15% |
| Education Level (%): | | | | | | | | |
| Pre-Elementary | 37% | 36% | 35% | 33% | 31% | 31% | 32% | 32% |
| Elementary | 26% | 37% | 37% | 38% | 38% | 36% | 36% | 36% |
| High School | 32% | 22% | 23% | 24% | 26% | 27% | 27% | 28% |
| University | 6% | 5% | 5% | 5% | 5% | 6% | 5% | 5% |
| Urban households (%) | 47% | 40% | 54% | 57% | 55% | 55% | N.A | 40% |
| Agricultural households (%) | 35% | 36% | 34% | 32% | 28% | 26% | 31% | 30% |
| Regions (%): | | | | | | | | |
| Ilocos | 7% | 6% | 6% | 6% | 5% | 4% | 5% | 5% |
| Cagayan | 4% | 3% | 3% | 3% | 3% | 2% | 4% | 4% |
| Cluzon | 12% | 13% | 13% | 13% | 10% | 12% | 8% | 9% |
| Sluzon | 18% | 14% | 15% | 15% | 15% | 17% | 17% | 16% |
| Bicol | 9% | 10% | 8% | 8% | 9% | 8% | 9% | 10% |
| Wvisayas | 10% | 10% | 11% | 10% | 11% | 10% | 9% | 8% |
| Cvisayas | 8% | 9% | 8% | 8% | 6% | 7% | 7% | 7% |
| Evisayas | 5% | 7% | 6% | 6% | 7% | 7% | 7% | 6% |
| Mindanao | 14% | 16% | 16% | 17% | 22% | 22% | 23% | 25% |
| NCR | 13% | 10% | 12% | 13% | 9% | 7% | 8% | 7% |
| CAR | N.A. | 1% | 1% | 1% | 3% | 3% | 3% | 3% |

Source: Author's computation based on the FIES.

Note: Parentheses denote the standard errors.

Table 4.3d: External (or International) Remittance-receiving Households (*dexrem*)

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|--------------------------------------|------------------|------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
| Sample Size | 1476 | 1862 | 2932 | 3093 | 4627 | 5048 | 5058 | 5067 |
| Remittance (in peso, nominal) | | | | | | | | |
| Total amount received | 22034 (26886) | 23810 (29439) | 35877 (45392) | 39978 (49754) | 52362 (63881) | 78990 (114911) | 78689 (122643) | 95502 (166460) |
| Welfare Level | | | | | | | | |
| Total Family Income | 56972 (38578) | 66547 (46360) | 103537 (71239) | 127469 (87773) | 167877 (111541) | 229760 (217811) | 245091 (282850) | 276325 (268539) |
| Total Family Expenditure | 45688 (28254) | 51244 (33283) | 80387 (51833) | 101454 (66111) | 132983 (83025) | 177119 (145144) | 193523 (172124) | 221538 (188452) |
| Family Composition | | | | | | | | |
| Family Size | 5.7 (2.5) | 5.3 (2.3) | 5.3 (2.3) | 5.2 (2.2) | 5.1 (2.2) | 5.0 (2.3) | 4.8 (2.2) | 4.7 (2.3) |
| Share (%): | | | | | | | | |
| Employed | 27% | 28% | 29% | 33% | 31% | 33% | 41% | 41% |
| Age 0-6 | 14% | 13% | 14% | 12% | 13% | 11% | 12% | 11% |
| Age 7-14 | 19% | 19% | 19% | 18% | 17% | 17% | 16% | 16% |
| Age 15-24 | 23% | 22% | 21% | 21% | 20% | 20% | 20% | 19% |
| Age 25+ | 45% | 47% | 47% | 50% | 50% | 52% | 52% | 54% |
| Household Head | | | | | | | | |
| Age | 49.0 (14.3) | 47.9 (14.1) | 48.1 (14.3) | 49.7 (14.0) | 49.3 (14.4) | 51.0 (14.1) | 48.7 (14.3) | 49.8 (13.9) |
| Female (%) | 32% | 31% | 30% | 28% | 31% | 31% | 27% | 29% |
| Married (%) | 83% | 82% | 82% | 82% | 79% | 79% | 80% | 80% |
| Not Employed (%) | 35% | 29% | 32% | 30% | 31% | 32% | 27% | 28% |
| Education Level (%): | | | | | | | | |
| Pre-Elementary | 18% | 17% | 17% | 16% | 15% | 14% | 14% | 14% |
| Elementary | 21% | 27% | 29% | 29% | 28% | 26% | 25% | 24% |
| High School | 44% | 38% | 38% | 40% | 42% | 40% | 42% | 41% |
| University | 16% | 18% | 16% | 16% | 15% | 19% | 19% | 20% |
| Urban households (%) | 67% | 66% | 74% | 72% | 72% | 72% | N.A | 57% |
| Agricultural households (%) | 9% | 10% | 10% | 10% | 8% | 7% | 10% | 11% |
| Regions (%): | | | | | | | | |
| Ilocos | 13% | 12% | 10% | 10% | 10% | 9% | 11% | 11% |
| Cagayan | 5% | 4% | 3% | 5% | 4% | 5% | 6% | 7% |
| Cluzon | 17% | 15% | 15% | 14% | 14% | 12% | 13% | 8% |
| Sluzon | 13% | 11% | 17% | 17% | 18% | 16% | 12% | 12% |
| Bicol | 3% | 2% | 2% | 3% | 2% | 3% | 3% | 3% |
| Wvisayas | 7% | 8% | 6% | 6% | 8% | 8% | 6% | 6% |
| Cvisayas | 4% | 5% | 5% | 5% | 4% | 4% | 6% | 6% |
| Evisayas | 2% | 2% | 2% | 2% | 3% | 3% | 3% | 4% |
| Mindanao | 8% | 9% | 10% | 11% | 17% | 16% | 18% | 19% |
| NCR | 27% | 28% | 26% | 25% | 15% | 18% | 16% | 17% |
| CAR | N.A. | 3% | 3% | 3% | 5% | 6% | 5% | 6% |

Source: Author's computation based on the FIES.

Note: Parentheses denote the standard errors.

Table 4.3e: Both Internal and International Remittance-receiving Households (*dbothrem*)

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|---|------------------|------------------|------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
| Sample Size | 1035 | 996 | 1325 | 1720 | 2010 | 2107 | 3671 | 3903 |
| Remittance (in peso, nominal) | | | | | | | | |
| Total amount received | 13695 (18340) | 15778 (20835) | 26784 (33253) | 32297 (43736) | 37678 (47752) | 55740 (84439) | 54154 (79964) | 65838 (104151) |
| International remittance | 10712 (17482) | 12704 (19415) | 20715 (30303) | 24834 (39142) | 28854 (44129) | 41476 (69191) | 42460 (75644) | 51312 (96837) |
| Domestic remittance | 2983 (5742) | 3074 (5620) | 6069 (9563) | 7463 (14135) | 8824 (13616) | 14264 (31796) | 11693 (18294) | 14526 (25675) |
| Welfare Level (in peso, nominal) | | | | | | | | |
| Total Family Income | 42682 (30236) | 50241 (38322) | 83517 (61681) | 108463 (79374) | 133192 (101940) | 172258 (168301) | 179681 (168441) | 198193 (181354) |
| Total Family Expenditure | 38470 (24981) | 41954 (29287) | 70033 (48712) | 91223 (62161) | 115199 (79912) | 148784 (126825) | 159327 (136123) | 177047 (147133) |
| Family Composition | | | | | | | | |
| Family Size | 5.6 (2.4) | 5.1 (2.2) | 5.2 (2.4) | 5.2 (2.3) | 4.9 (2.3) | 4.9 (2.3) | 4.7 (2.2) | 4.8 (2.2) |
| Share (%): | | | | | | | | |
| Employed | 27% | 28% | 28% | 30% | 31% | 31% | 38% | 38% |
| Age 0-6 | 15% | 15% | 14% | 14% | 15% | 12% | 14% | 13% |
| Age 7-14 | 19% | 19% | 19% | 19% | 16% | 17% | 17% | 17% |
| Age 15-24 | 20% | 19% | 18% | 18% | 17% | 19% | 18% | 17% |
| Age 25+ | 45% | 48% | 49% | 49% | 51% | 53% | 51% | 53% |
| Household Head | | | | | | | | |
| Age | 49.3 (15.3) | 48.8 (15.3) | 50.1 (15.9) | 50.1 (14.9) | 50.2 (15.8) | 52.2 (15.4) | 48.9 (15.5) | 51.5 (15.3) |
| Female (%) | 24% | 26% | 28% | 26% | 26% | 28% | 26% | 27% |
| Married (%) | 79% | 78% | 75% | 77% | 75% | 75% | 76% | 75% |
| Not Employed (%) | 32% | 29% | 34% | 33% | 32% | 33% | 27% | 29% |
| Education Level (%): | | | | | | | | |
| Pre-Elementary | 21% | 22% | 19% | 19% | 18% | 17% | 15% | 17% |
| Elementary | 19% | 34% | 30% | 32% | 30% | 29% | 30% | 30% |
| High School | 46% | 31% | 39% | 38% | 40% | 42% | 42% | 41% |
| University | 13% | 13% | 12% | 10% | 11% | 12% | 13% | 13% |
| Urban households (%) | 67% | 57% | 72% | 77% | 71% | 73% | N.A | 55% |
| Agricultural households (%) | 11% | 12% | 9% | 9% | 8% | 7% | 8% | 9% |
| Regions (%): | | | | | | | | |
| Ilocos | 17% | 15% | 10% | 8% | 13% | 9% | 10% | 12% |
| Cagayan | 3% | 2% | 2% | 2% | 4% | 2% | 3% | 5% |
| Cluzon | 17% | 21% | 16% | 18% | 15% | 17% | 14% | 16% |
| Sluzon | 17% | 16% | 17% | 15% | 17% | 19% | 20% | 16% |
| Bicol | 3% | 5% | 3% | 4% | 4% | 4% | 4% | 5% |
| Wvisayas | 6% | 7% | 7% | 7% | 10% | 10% | 7% | 7% |
| Cvisayas | 4% | 4% | 5% | 3% | 4% | 6% | 6% | 6% |
| Evisayas | 2% | 3% | 3% | 2% | 3% | 4% | 5% | 4% |
| Mindanao | 3% | 7% | 6% | 8% | 11% | 13% | 14% | 15% |
| NCR | 28% | 20% | 30% | 32% | 16% | 13% | 14% | 10% |
| CAR | N.A. | 1% | 1% | 1% | 3% | 4% | 3% | 3% |

Source: Author's computation based on the FIES.

Note: Parentheses denote the standard errors.

4.4 Econometric Methodology

In order to examine the determinants of remittances, we first assume that both internal and international remittances are independent. It means that the probability of receiving international remittances does not affect that of internal remittances, and *vice-versa*. Then, we will take into consideration the mutual dependence between internal and international remittances.

In recent years, there has been an increasing amount of literature on the determinants of migration. Several attempts have been made to examine the determinants of being migrants and/or remitters (Hoddinot 1992, 1994; Brown and Connel 2006; Banerjee 1984; Liu and Reilly, 2004). These previous studies have reported that migrants' earnings, parental land holdings, migrants' age, migrants' educational attainment, and migrants' asset holdings positively affect the decisions of being migrants or remitters, while male household heads' educational attainment and their assets in the home country negatively influence migrants' remittance behaviours. Several studies have also produced estimates of the determinants of sending remittances by migrants (for example, Johnson and Whitelaw, 1974; Rempel and Lobdell, 1978; Banerjee, 1984; Lucas and Stark, 1985; Knight et al., 1999; Liu and Reilly, 2004; Brown and Connell, 2006; Markova and Reilly, 2007). However, little attention has been paid to the determinants of receiving remittances by recipient households (for example, Piracha and Sraogi, 2011). Thus, this research complements evidence from the existing literature on determinants of remittances. Furthermore, as mentioned before, we also have a limitation in terms of the data on remittances. This research relies on use of household surveys. Thus, we can only use the household-level variables for modelling purposes. To investigate the factors influencing the receipt of remittances, we use the following

household variables: total family expenditures; household characteristics, job-related information, and regional information. Table 4.4 reports the definition of the variables used in the analysis.

Table 4. 4: Variable Description

| Variable Name | Variable Description |
|------------------------------------|---|
| <u>Remittance</u> | |
| <i>Remittance Incidence</i> | |
| dinrem | =1 if the household received remittances from within the Philippines; =0 otherwise |
| dexrem | =1 if the household received remittances from abroad; =0 otherwise |
| <i>Remittance Amount</i> | |
| inrem | The amount of remittances received from within the Philippines (Philippine pesos, in thousands) |
| exrem | The amount of remittances received from abroad (Philippine pesos, in thousands) |
| <u>Welfare</u> | |
| ltotex | The natural logarithm of the total family expenditures |
| <u>Family composition</u> | |
| empsh | The share of the employed members out of total household members |
| age 0-6 | The share of the members aged between 0 and 6 |
| age 7-14 | The share of the members aged between 7 and 14 |
| age 15-24 | The share of the members aged between 15 and 24 |
| age 25+ | The share of the members aged 25 or over |
| <u>Head Characteristics</u> | |
| hage | The age of the household head |
| hage2 | The age of the household head (squared) |
| hfemale | =1 if the household head is female; =0 otherwise |
| hmarried | =1 if the household head marital status is married; =0 otherwise |
| hedu1 | =1 if household head did not finish elementary school; =0 otherwise |
| hedu2 | =1 if the household head finished elementary school; =0 otherwise |
| hedu3 | =1 if the household head finished high school; =0 otherwise |
| hedu4 | =1 if the household head finished University or Post Graduate; =0 otherwise |
| hnojob | =1 if the household head is not employed; =0 otherwise |
| <u>Urban/Rural</u> | |
| urban | =1 if the household lives in the urban area; =0 otherwise |
| <u>Farming</u> | |
| agri | =1 if the household is an agricultural one; =0 otherwise |
| <u>Region</u> | |
| Ilocos | =1 if the household lives in Ilocos Region; =0 otherwise |
| Cagayan | =1 if the household lives in Cagayan Valley; =0 otherwise |
| Cluzon | =1 if the household lives in Central Luzon; =0 otherwise |
| Sluzon | =1 if the household lives in Southern Luzon; =0 otherwise |
| Bicol | =1 if the household lives in Bicol Region; =0 otherwise |
| Wvisayas | =1 if the household lives in Western Visayas; =0 otherwise |
| Cvisayas | =1 if the household lives in Central Visayas; =0 otherwise |
| Evisayas | =1 if the household lives in Eastern Visayas; =0 otherwise |
| Mindanao | =1 if the household lives in Mindanao; =0 otherwise |
| NCR | =1 if the household lives in National Capital Region (NCR); =0 otherwise |
| CAR | =1 if the household lives in Cordillera Administrative Region (CAR); =0 otherwise |

In order to examine the nature of remittance-receiving households in the Philippines, we will first separately attempt to examine the determinants of the probability of internal and international remittances using a probit model. Then, we will consider the mutual correlation between internal and external remittances within a simultaneous equations model using two binary variables.

4.4.1 Methodology for the probability of receiving remittances

4.4.1.1. *Probit Model*

A probit model is used to examine the probability of receiving remittances. The probit model assumes that there is an underlying response variables y_i^* defined by the regression relationship.

$$(4-1) \quad y_i^* = X_i' \beta + u_i \quad (i=1, \dots, N)$$

In practice, y_i^* is unobservable. The dummy variable y_i , which we can observe and denotes whether households receive remittances or not, is defined as:

$$(4-2) \quad \begin{aligned} y_i &= 1 \text{ if } y_i^* > 0 \\ y_i &= 0 \text{ otherwise} \end{aligned}$$

From the relations (4-1) and (4-2), we get the equation (4-3).

$$(4-3) \quad \text{Prob}(y_i = 1) = \text{Prob}(u_i > -X_i' \beta) = \text{Prob}(u_i < X_i' \beta) = \Phi(X_i' \beta)$$

where $\Phi(\cdot)$ is the function of the standard normal distribution. Then, the likelihood functions for the probit model to determine the probability to receive internal (\mathcal{G}_1) and external remittances (\mathcal{G}_2) are written, respectively as follows:

$$(4-4) \quad \mathcal{G}_1 = \prod_{i=1}^N [\Phi(X'_1 \beta_1)]^{y_1} [1 - \Phi(X'_1 \beta_1)]^{(1-y_1)}$$

$$(4-5) \quad \mathcal{G}_2 = \prod_{i=1}^N [\Phi(X'_2 \beta_2)]^{y_2} [1 - \Phi(X'_2 \beta_2)]^{(1-y_2)}$$

where y_1 and y_2 are the dummy variables on whether households receive remittances from within the Philippines and abroad, respectively. $\Phi(\cdot)$ denotes the cumulative distribution function. Taking natural logarithms where $L = \log_e(\theta)$ yields the log likelihood function for the probit model as:

$$(4-6) \quad L_1 = \sum_{i=1}^N y_1 \times \log_e [\Phi(X'_1 \beta_1)] + \sum_{i=1}^N (1 - y_1) \times \log_e [1 - \Phi(X'_1 \beta_1)]$$

$$(4-7) \quad L_2 = \sum_{i=1}^N y_2 \times \log_e [\Phi(X'_2 \beta_2)] + \sum_{i=1}^N (1 - y_2) \times \log_e [1 - \Phi(X'_2 \beta_2)]$$

Our object is to find the unknown parameters β_1 and β_2 which maximise the above log likelihood functions. If the regressor X is a continuous variable, marginal effects will be computed, whereas if X is a dummy variable, the impact effects will be calculated (see Greene, 2007).

4.4.1.2. Bivariate Probit Models

The question which we consider next concerns the issue of whether the receipts of internal and external remittances are mutually dependent. In this case, the errors may be correlated, that is, $Cov(u_1, u_2) = \rho \neq 0$, thus we need to estimate the equations (4-6) and (4-7) simultaneously. The parameter ρ measures the degree of correlation in the unobservables between two equations. Given that ρ is positive (negative), it appears that households with unobserved characteristics that suggest they should receive remittances from abroad are more (less) likely to receive domestic remittances. This simultaneous equations model with two binary variables is also called the bivariate probit model. The bivariate probit model can be written as follows:

$$(4-8) \quad \begin{aligned} y_1^* &= X_1' \beta_1 + u_1, & y_1 &= 1 \text{ if } y_1^* > 0 \\ & & &= 0 \text{ otherwise} \\ y_2^* &= X_2' \beta_2 + u_2, & y_2 &= 1 \text{ if } y_2^* > 0 \\ & & &= 0 \text{ otherwise} \end{aligned}$$

where $E(u_1) = E(u_2) = 0$, $Var(u_1) = Var(u_2) = 1$, and $Cov(u_1, u_2) = \rho \neq 0$.

The joint probabilities to receive both internal and international remittances, only internal remittances, only international remittances, and no remittance are written as follows. For convenience, let $X_1' \beta_1 = c_1$ and $X_2' \beta_2 = c_2$.

$$(4-9) \quad \Phi_{11} = \text{Prob} [y_1 = 1, y_2 = 1] = BVN [c_1, c_2, \rho]$$

$$(4-10) \quad \Phi_{10} = \text{Prob} [y_1 = 1, y_2 = 0] = BVN [c_1, -c_2, -\rho]$$

$$(4-11) \quad \Phi_{01} = \text{Prob} [y_1 = 0, y_2 = 1] = BVN [-c_1, c_2, -\rho]$$

$$(4-12) \quad \Phi_{00} = \text{Prob} [y_1 = 0, y_2 = 0] = BVN [-c_1, -c_2, \rho]$$

where BVN denotes the cumulative distribution function of the bivariate normal distribution. The likelihood function for the bivariate probit is given by:

$$(4-13) \quad \mathcal{L}_{bip} = \prod \Phi_{11}^{y_1 y_2} \Phi_{10}^{y_1 (1-y_2)} \Phi_{01}^{(1-y_1) y_2} \Phi_{00}^{(1-y_1)(1-y_2)}$$

Taking natural logarithms where $L = \log_e(\theta)$ yields the log likelihood function for the bivariate probit model as:

$$(4-14) \quad L_{bip} = \sum_{i=1}^N y_{i1} y_{i2} \times \log_e \Phi_{11} + \sum_{i=1}^N y_{i1} (1 - y_{i2}) \times \log_e \Phi_{10} + \sum_{i=1}^N (1 - y_{i1}) y_{i2} \times \log_e \Phi_{01} + \sum_{i=1}^N (1 - y_{i1}) (1 - y_{i2}) \times \log_e \Phi_{00}$$

By maximising the above log likelihood function, the parameters we estimate (β_1 , β_2 and ρ) can be computed. For a continuous variable, Z , which appears in X'_1 and X'_2 , the marginal effects of the bivariate probit model can be estimated, while the impact effects can be calculated for a dummy variable, D , which also appear in X'_1 and X'_2 (see Appendix).

A Wald test for the bivariate probit model tests the null hypothesis that ρ equals zero (see Table 4.5). The null hypothesis is rejected for the 2000 and 2003 FIES. This means that it is more appropriate to use the bivariate probit to investigate the determinants of the decision of the receipt of remittances for these two survey years. On the other hand, for the rest of the years, we can rely on the univariate probit models. In brief, our findings which will be presented in the next section will be derived from the bivariate

probit model for 2000 and 2003 and from the probit model for the other survey years.⁴⁶ In 2000, the parameter ρ was significantly negative. One explanation for the negative ρ is that Filipino households with unobservable characteristics associated with the receipt of international remittances are dependent more on family members working abroad and are less likely to receive financial support from those within the country. On the other hand, ρ was positive and significant in 2003. This means that the unobservable factors move the probability of receiving both domestic and international remittances in the same direction. However, the issue of identification of the ρ parameter is a difficult one. The presence of continuous measures used for the analysis serves, to some extent, to identify the ρ parameter. Ideally, we would need variables in one equation but not the other to identify the correlation term. Unfortunately, this did not prove possible only using the FIES. Thus, we need to interpret the results around the correlation coefficients reported in Table 4.5 with some degree of caution. The issue of identification, we believe, is perhaps more adequately addressed using the instrumental variable (IV) probit modelling approach as examined later in the chapter.

Table 4. 5: The correlation of the residuals (ρ) from two remittance equations in the bivariate probit models

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|---------------------------|---------------------|---------------------|---------------------|--------------------|---------------------|------------------------|-----------------------|--------------------|
| rho | -0.0083 (0.0176) | -0.0157 (0.0164) | -0.0171 (0.0142) | 0.0124 (0.0132) | -0.0028 (0.0111) | -0.0543*** (0.0108) | 0.0377*** (0.0101) | 0.0003 (0.0101) |
| Wald test of rho=0 | 0.2215 | 0.9243 | 1.4657 | 0.8783 | 0.0639 | 25.0879 | 13.9724 | 0.0007 |
| Prob > chi2 = | 0.638 | 0.336 | 0.226 | 0.349 | 0.800 | 0.000 | 0.000 | 0.979 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

⁴⁶ Appropriate comparison of the estimation results between the univariate probit and the bivariate probit models can be made because if there is no correlation of the error terms the bivariate probit results are equivalent to those derived from the univariate probit.

4.4.2 Methodology for the amount of receiving remittances

In this section, we will first conduct a censored regression model to investigate the factors that affect the amounts of the receipt of remittances received from within the Philippines and those from abroad, separately. Then, the simultaneous censored regression model will be used to examine determinants of remittances taking into account the mutual correlation between internal and international remittances.

With regard to the determinants of the amount of remittances migrants send to their family members living in their home country, the early literature used three econometric methodologies; ordinary least squares (OLS), Heckman two-step procedures, and Tobit models. First, it may be problematic to use OLS regression analysis for the estimation of the determinants of the size of remittances because this analysis does not take into account the households with migrants who did not remit. Hoddinott (1992) argued that some previous studies have not taken into consideration zero remittance observations (Johnson and Whitelaw, 1974; Rempel and Lobdell, 1978; Knowles and Anker, 1981). Thus, these results could be potentially misleading. In the case of non-remitters, we obviously have no data on their remittances. This means that the amount of remittances, which is the dependent variable in remittance functions, is censored at zero. Tobin (1958) emphasized the problem of the censored regression in another context. With Tobit models⁴⁷, which were first used by Tobin (1958), we assume that there is only one remittance decision, in which the decisions as to whether to remit or not and how much to remit occur simultaneously. This may be viewed as a strong assumption, but one that

⁴⁷ Maddala (2001: 335-336) mentioned the limitation of the Tobit model. He argued that ‘The simple censored regression model (or the Tobit model) is applicable only in those cases where the latent variable can, in principle, take negative values and the observed zero values are consequence of censoring and nonobservability (Maddala, 2001: 336)’. He also said that if the observed zero values are due to the decisions of individuals, not to censoring, the proper method would be to model the decisions that cause the zero observations rather than use the Tobit model mechanically (Maddala, 2001: 335).

is empirically testable. Furthermore, Hoddinott (1992: 209) has noted that some previous theoretical literature on migration and remittances did not make any distinction between factors influencing the decision of whether to remit and the level of remittances. Among the earlier literature on migration and remittances, Banerjee (1984) examined the determinants of the decision to remit and of the amount remitted by migrants in Delhi to their place of origin with the Heckman (1979) two-step procedure, which distinguishes between factors which determine the decision to remit and those which determine the size of the remittance flow. The decision to remit is estimated by a probit model, whereas the size of the remittance is estimated by an OLS model with a correction term for potential selection effects.

With regard to past studies on the remittance functions, with OLS analysis, Johnson and Whitelaw (1974) investigated the size and the determinants of urban-rural remittances sent by urban workers in Nairobi. Rempel and Lobdell (1978) examined the extent and the determinants of urban-rural remittances in Kenya. In addition, Knowles and Anker (1981) also explained the characteristics and determinants of remittances and transfers in Kenya using household survey data. On the other hand, by using Tobit regression analysis, Brown (1997) estimated the size of overseas remittances based on the survey data on Tongan and Western Samoan migrants in Sydney, whereas Knight et. al. (1999) investigated the size of urban-rural remittances sent by migrants who were employed in enterprises in four Chinese cities (Beijing, Shenzhen, Wuhan, and Suzhou). Moreover, Markova and Reilly (2007) also used the Tobit model to investigate to what extent the role of a migrant's legal status affects the amount of remittances sent by Bulgarian immigrants in Madrid. As an example of remittance research using a Heckman procedure, Hoddinott (1994), and Brown and Connell (2006) derived a remittance

function by controlling for the censorship bias. The data on migrants in Western Kenya, and the data on nurses from Fiji, Tonga and Samoa in Australia and New Zealand were used, respectively. Furthermore, Lucas and Stark (1985) estimated a remittance equation with the National Migration Study of Botswana 1978-79 by taking into account the censorship bias using the same procedure. Banerjee (1984), Hoddinott (1992), and Liu and Reilly (2004) showed both results of Tobit and Heckman model. These studies consider the size and the determinants of urban-rural remittances sent by migrants in Delhi, in Kenya, and in China, respectively.

In the literature mentioned above, there are some unique features of the datasets used. First, almost all studies used single-year data. A great deal of effort has been made on the empirical analysis of remittance functions. What seems to be lacking, however, is the analysis of the changes of remittance function over time. The survey years of the FIES used for this chapter are between 1985 and 2006. The richness of these data allows us to make a comparative analysis of many issues related to remittance behaviour over time. Second, compared with the data used in the previous studies, the sample sizes of the FIES are large. Thus, it provides more adequate data to address our key research questions on migration and remittances. Third, sample observations are migrants in the above previous research and many studies in the field of the determinants of remittances focussed on migrants. Therefore, previous studies mainly dealt with the characteristics of migrants and those of households living with migrants in the remittance-sending countries. On the other hand, in the case of the FIES, we can treat migrant household characteristics in greater detail as the data are on migrant households and not on migrants. Thus, the main emphasis of this chapter falls on the characteristics of the remittance-receiving households to examine the role of origin

household-level determinants of remittances. The new economics of migration theory argues that international migration is a strategic behaviour undertaken by migrant families, rather than by individual migrants (Massey, D.S. et. al., 1998; 125). The determinants of remittances would be influenced not only by the characteristics of migrants, but also by those of migrant households. It is said that remittance is an outcome of household decision-making (Stark and Bloom, 1985). Thus, it is better to use both information on migrants and households, if both types of data are available. Therefore, family characteristics of the migrants are likely to be as important factors as migrant characteristics themselves.

4.4.2.1. Tobit model

As shown above, when it comes to the size of remittances, it is problematic to analyse the determinants of remittances received by households with OLS regression analysis because some households receive no remittance income at all. Here, we have two options for the analysis: the Heckman two step-procedure and the Tobit model. In the case of the former method, we need at least one variable in the selection equation not included in the regression equation in order to identify the parameter on the selectivity term.⁴⁸ In the case of FIES, however, we could not find appropriate variables influencing the decision to remit and not the level of remittances.⁴⁹ Thus, in this chapter,

⁴⁸ For example, as a suitable instrument for the specification of the selection equation, Amuedo-Dorantes and Pozo (2006) used the per capita count of Western Union offices as a proxy variable indicating accessibility of recipient households to remittance services in regions. However, for this thesis, we decided not to use this because it would strongly correlate with regional variables and also as in addition to Western Union various remittance service providers are available for overseas Filipinos as mentioned in Chapter Two. Furthermore, due to geographical diversity with the nature of archipelagic country, even the regions near from Metro Manila have some remote islands. Thus, it would be difficult to apply the said variable to capture the regional accessibility to remittance services.

⁴⁹ The availability of possible instruments can be investigated by separately running the regression for the probability and the level of remittances. This result is the same as those derived from the Two-Part model with same covariates for two remittance equations. The first part of the model is a binary outcome equation using the probit or logit regression to determine the probability of remittances, while the second

a censored Tobit model is used which does not require these identifying variables. We define the remittance equation of the Tobit model as:

$$(4-15) \quad Y_i^* = X_i' \beta + u$$

where Y^* is a partial latent dependent variable, X is a vector of remittance determining variables, β is a vector of fixed unknown coefficients to be estimated, and $u \sim N(0, \sigma^2)$.

Thus:

$$(4-16) \quad \begin{aligned} Y_i &= Y_i^* && \text{if } X_i' \beta + u_i > 0 \quad \text{and} \\ Y_i &= 0 && \text{if } X_i' \beta + u_i \leq 0 \end{aligned}$$

where Y_i represents the actual amount of remittances received by the i^{th} household.

Thus, Y_i is either positive ($Y_i > 0$) or zero ($Y_i = 0$). The likelihood function for the standard censored Tobit model is as follows where we drop the independent subscripts:

$$(4-17) \quad \theta_1 = \prod_{i=1}^N \left[\frac{\phi(Y_1 - X_1' \beta_1) \div \sigma_1}{\sigma_1} \right]^{y_1} \left[1 - \Phi \left[\frac{X_1' \beta_1}{\sigma_1} \right] \right]^{1-y_1}$$

where $y_1 = 1$ if $Y_1 > 0$, and $y_1 = 0$ if $Y_1 = 0$.

$$(4-18) \quad \theta_2 = \prod_{i=1}^N \left[\frac{\phi(Y_2 - X_2' \beta_2) \div \sigma_2}{\sigma_2} \right]^{y_2} \left[1 - \Phi \left[\frac{X_2' \beta_2}{\sigma_2} \right] \right]^{1-y_2}$$

where $y_2 = 1$ if $Y_2 > 0$, and $y_2 = 0$ if $Y_2 = 0$.

part exploits the linear regression only using the subsample with positive remittance amounts to examine the determinants of its level. These two parts are assumed to be independent and are estimated separately. The coefficient estimates of the Two-Part model were reported in the Appendix.

Y_1 and Y_2 denote the amount of remittances received from the Philippines and from abroad, respectively. y_1 and y_2 are the dummy variables on whether households receive remittances from within the Philippines and from abroad, respectively. σ_1 and σ_2 are the standard deviation of the error term in each of the two separate Tobit models. Taking natural logarithms where $L = \log_e(\theta)$ yields the log likelihood function for the Tobit model as:

$$(4-19) \quad L_1 = \sum_{i=1}^N y_1 \times \log_e \left[\frac{\phi(Y_1 - X_1' \beta_1) \div \sigma_1}{\sigma_1} \right] + \sum_{i=1}^N (1 - y_1) \times \log_e \left[1 - \Phi \left[\frac{X_1' \beta_1}{\sigma_1} \right] \right]$$

$$(4-20) \quad L_2 = \sum_{i=1}^N y_2 \times \log_e \left[\frac{\phi(Y_2 - X_2' \beta_2) \div \sigma_2}{\sigma_2} \right] + \sum_{i=1}^N (1 - y_2) \times \log_e \left[1 - \Phi \left[\frac{X_2' \beta_2}{\sigma_2} \right] \right]$$

Our object is to find the unknown parameters (i.e., β_1 and β_2 , σ_1 and σ_2) to maximise the above log likelihood functions. In addition to the Tobit coefficient results, the marginal effects of the Tobit models are computed as follows.

$$(4-21) \quad \text{Marginal effects} = \beta_i \times \Phi(Z_i) \quad (i = 1, 2)$$

$$\text{where } \left[\frac{X_1' \beta_1}{\sigma_1} \right] = Z_1 \text{ and } \left[\frac{X_2' \beta_2}{\sigma_2} \right] = Z_2.$$

$$(4-22) \quad \text{Impact effects} = E[Y_i | X_i, Y_j, D = 1] - E[Y_i | X_i, Y_j, D = 0] \quad (i \neq j)$$

4.4.2.2. *Bivariate Tobit Model*

In the case of a simultaneous equations model with both censored variables (i.e., the bivariate Tobit model here), the structural equation system can be written as follow.

$$(4-23) \quad Y_1^* = X_1' \beta_1 + \varepsilon_1, \quad Y_1 = \text{MAX}(0, Y_1^*)$$

$$(4-24) \quad Y_2^* = X_2' \beta_2 + \varepsilon_2, \quad Y_2 = \text{MAX}(0, Y_2^*)$$

$$\text{where } [\varepsilon_1, \varepsilon_2] \sim \text{BVN}[(0,0), (\sigma_{11}, \sigma_{22}), \rho\sigma_{11}\sigma_{22}]$$

The null hypothesis of the bivariate Tobit model that the degree of correlation in the unobservables between the two equations (4-23) and (4-24) is zero is strongly rejected at the one per cent level of significance (see Table 4.6). The diagnostic test result justifies the use of a bivariate Tobit model to examine the determinants of the amounts of internal and international remittances. This also means that using a univariate Tobit model could be misleading when investigating the determinants of remittances from within the country and from overseas as the sizes of these remittances Filipino households rely on would not be independent of each other. Therefore, in the next section, our findings will mainly rely on the estimation results derived from the bivariate Tobit model. Furthermore, the parameter ρ was significant and negative over time. The negative ρ denotes that there is a trade-off between domestic and international remittances in terms of their amounts Filipino households received. This leads us to further investigation on the effect of international remittances on domestic remittances explained in the next section.

Table 4. 6: The correlation of the residuals (ρ) from two remittance equations in the bivariate Tobit models

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| rho | -0.1089 *** (0.0142) | -0.0986 *** (0.0121) | -0.0864 *** (0.0115) | -0.0616 *** (0.0101) | -0.0895 *** (0.0097) | -0.0850 *** (0.0054) | -0.0630 *** (0.0082) | -0.0922 *** (0.0059) |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Like the bivariate probit model, there is also, however, a potential problem in the identification of ρ in the bivariate Tobit model as the receipts of remittances from abroad or those from within the Philippines are not randomly assigned. In order to address this identification issue, further data is required, and this is discussed below but such data are only available by merging the FIES and the SOF only for three of our survey years (2000, 2003 and 2006).

4.4.3 The effect of International Remittances on Domestic Remittances

When households send their family members abroad and they start sending remittances back to the home country, those who used to rely on domestic transfers might not need any support from family or relatives living within the country. This means that domestic remittances could be displaced by international remittances due to continuous and greater amounts of financial support from migrant workers. In order to capture this displacement effect of international remittances, we then add the international remittance variable into the internal remittance equations in the probit model and the Tobit model which are explained above. However, this adding variable would generate a potential problem for a two-way relationship between internal and international remittances. In order to correct for this possible endogeneity problem, we use the instrumental variable (IV) estimation with instruments which affect remittances from

abroad but do not directly affect those from within the country except the effect through those from abroad.

The instruments used are derived from migrant characteristics (i.e., educational attainment, length of stay in destination country, gender, and age). The migrants' educational attainment, gender and age are used as proxy measures of their income as the wage of migrants is not available in the SOF. Migrants with high educational attainment and older migrants are assumed to have higher earnings, and thereby the amounts of money they can send would be greater. We use the completion of tertiary education as a dummy instrumental variable. The age of migrant workers is used as a continuous instrument. With regard to the effect of migrants' educational level on the amounts of remittances they send, Alba and Sugui (2009) found that compared to Filipino migrants who finished the tertiary education, the amounts of remittances sent are estimated to decline by 56 per cent and 31 per cent for those who only finished elementary and secondary education respectively. The period of stay abroad as a migrant worker would also increase the level of money they send. Migration costs are often deducted from the first six month's salary of migrants by the recruitment agencies or employers. Thus, at the beginning of stay in destination country, migrants could not have any money to send back home. Moreover, under new work environment, they might not be familiar with modes of remittances. In order to capture these relationships between the length of stay abroad and remittance amounts, we add the number of months when migrants stay abroad as a possible instrument. This assumption is supported by the finding of Alba and Sugui (2009) which reported that the length of stay abroad is estimated to exert a positive linear effect of the length of stay abroad on amounts remitted. They found that each month of stay increases the remittance amounts

by one per cent. Furthermore, the gender of migrants could potentially affect the amount of international remittances they send. As mentioned in Chapter Two, there is evidence that male Filipino migrant workers sent, on average, more remittances back to the home country from almost all major destination countries due to the gender earning gaps. In addition to this, based on the 2003 FIES and SOF, Alba and Sugui (2009) also found that male migrants sent 16 per cent more than female counterparts due to the higher earning capacities of male migrants. Whether a migrant is female is added as a dummy variable into the sets of potential instruments. These variables of characteristics of Filipino migrants would be uncorrelated with the decision on receiving remittances from within the country as they do not directly determine the incidence or the level of domestic remittances.

The Family Income and Expenditure Survey (FIES) do not contain any information on migrants but the Survey of Overseas Filipinos (SOF) do. The use of the linked data of the FIES and the SOF enables us to deal with both migrant and household characteristics and the data is available only after 2000. The sample households used for the computation are those with only international remittances (i.e., *dexrem*) and those with both domestic and international remittances (i.e., *dbothrem*). By comparing these two household groups, we will investigate how much international remittances displace domestic remittances. For this chapter, the estimation results derived from the 2003 FIES only will be reported in the results section.

In order to investigate which migrant characteristics can be selected as better instruments, we tested three important issues: (1) over-identifying restrictions; (2) weak instruments; (3) regressor exogeneity.

The identifying instruments have to be uncorrelated with the errors. This validity of an instrument cannot be tested in the just-identified case, whereas it is possible to test the validity of over-identifying instruments in an overidentified model (Cameron and Trivedi, 2010: 191). We report the Amemiya-Lee-Newey minimum chi-square statistic (see Newey, 1987; Lee, 1992) and test the joint null hypothesis that all instruments are valid, meaning that they are uncorrelated with the error term and correctly excluded from the estimated equation. If the null hypothesis is rejected, this casts doubt on the validity of the instruments.

We assume that the chosen instruments are valid. Our second concern is about whether the selected instruments are weak. When instruments are weak, point estimators derived from the instrumental-variable (IV) estimators are biased and Wald tests of the coefficient on the endogenous variable become unreliable. We report several tests of weak instruments such as the Anderson-Rubin (AR) test, the conditional likelihood ratio (CLR) test, and the combination of the Lagrange multiplier (LM) and the J over-identification tests. All of these tests are robust to weak instruments as the instruments get weaker, the confidence interval around the parameter of interest gets wider. Thus, if the null hypothesis that the coefficient on the endogenous variable (i.e., *exrem*) is zero cannot be rejected, the chosen instruments are weak.

We also test whether a regressor is endogenous. If there is little difference in the results between models with and without treating it as an endogenous regressor (i.e., *probit* and *ivprobit* models, *tobit* and *ivtobit* models for this chapter), then we conclude that the regressor is exogenous. We conduct the Durbin-Wu-Hausman (DWH) test of

endogeneity (see Durbin, 1954; Wu, 1973; Hausman, 1978). If the robustified DWH test rejects the null hypothesis that a regressor (i.e., *exrem*) is exogenous, we conclude that it is endogenous.

The tests are reported by examining all possible combinations of four migrant characteristics as potential instruments (see the Appendix for details). Based on all the results, we concluded that the completion of tertiary education, the length of stay in destination country, and the gender provide an adequate set of instruments for the model determining the incidence of domestic remittances (i.e., *dinrem*), while the gender and the age of migrant workers are chosen as the potentially best instruments for the model with the level of domestic remittances (i.e., *inrem*). The selected instruments satisfy all the above-mentioned conditions for their use as identifying instrumental variables. However, with a small statistic obtained from the tests of weak instruments as well as with wider confidence sets derived from the tests, some caution must be applied as there might be still need to correct for weak instruments.

4.5 Estimation Results

As mentioned in the previous section, with regard to the probability of remittances, our findings rely on the bivariate probit models for the 2000 and the 2003 FIES and on the probit model for the rest of the survey years (i.e., the 1985-1997 FIES and the 2006 FIES), whereas the estimation results derived from the bivariate Tobit model will be used for all survey years to investigate the factors influencing the level of remittances. First, this section attempts to answer our research question, “*What are the determinants of both the probability and the size of remittances received at the level of the household?*”. The results of the marginal effects of each explanatory variable in all

models used for the analyses are reported in the Appendix. Then, the section also provides the results about the displacement effect of international remittances on domestic remittances.

4.5.1 Determinants of remittances

In Section 4.3, profiles of Filipino households are shown depending on their receipt of remittances. However, it is still not clear what characteristics affect the receipt of remittances. With regard to their incidence and the amount, regression analyses were used to examine the determinants of remittances. The determining factors used for the analyses are household welfare levels, family composition, household head characteristics, job-related information, and geographical disparity. In the same order of these explanatory variables, the results are reported and interpreted below.

Household welfare level

We focus on the estimated coefficients of the logarithm of total family expenditure (i.e., *ltotex*). In addition to the average remittance effect on the welfare at the mean across all sample households, we exploit piecewise linear splines using knots based on quintile values of the logarithm of total household expenditure.⁵⁰ This allows us to further investigate the impact of household welfare at different parts of the welfare distribution (e.g., by welfare quintile here) on the receipt of international and domestic remittances. The estimation results are reported in Table 4.7 for international remittances and Table 4.8 for domestic remittances.

⁵⁰ In Stata, the command *mkspline* is used to create variables containing a linear spline of total household expenditure.

Table 4. 7: Marginal effects of household expenditure levels on international remittances**Table 4.7a: Probability of international remittances by welfare level**

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Welfare level | | | | | | | | |
| Itotex | 0.1019*** (0.0044) | 0.0819*** (0.0045) | 0.1048*** (0.0043) | 0.1090*** (0.0048) | 0.0979*** (0.0034) | 0.1104*** (0.0033) | 0.1347*** (0.0036) | 0.1441*** (0.0041) |
| Welfare quintile | | | | | | | | |
| Bottom 20% | 0.1707*** (0.0347) | 0.0918*** (0.0280) | 0.1018*** (0.0245) | 0.0971*** (0.0278) | 0.1015*** (0.0199) | 0.1224*** (0.0166) | 0.1093*** (0.0204) | 0.1251*** (0.0227) |
| Bottom 20%-40% | 0.0599* (0.0346) | 0.0765** (0.0330) | 0.0772*** (0.0299) | 0.1628*** (0.0322) | 0.1400*** (0.0239) | 0.1544*** (0.0235) | 0.1780*** (0.0250) | 0.1345*** (0.0290) |
| Middle | 0.1067*** (0.0289) | 0.0676** (0.0303) | 0.1624*** (0.0265) | 0.0389 (0.0290) | 0.1124*** (0.0211) | 0.1197*** (0.0207) | 0.1373*** (0.0216) | 0.1886*** (0.0249) |
| Top 20%-40% | 0.1489*** (0.0198) | 0.1299*** (0.0211) | 0.1133*** (0.0184) | 0.2053*** (0.0214) | 0.1060*** (0.0154) | 0.1444*** (0.0144) | 0.1824*** (0.0146) | 0.1997*** (0.0170) |
| Top 20% | 0.0609*** (0.0101) | 0.0510*** (0.0112) | 0.0715*** (0.0110) | 0.0478*** (0.0124) | 0.0538*** (0.0093) | 0.0547*** (0.0075) | 0.0848*** (0.0078) | 0.0821*** (0.0094) |

Table 4.7b: Level of international remittance by welfare level (in '000 pesos)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|
| Welfare level | | | | | | | | |
| Itotex | 1.7631*** (0.0826) | 1.9508*** (0.0995) | 3.7225*** (0.1443) | 4.8931*** (0.1881) | 5.2937*** (0.1650) | 9.6051*** (0.3544) | 10.6978*** (0.3792) | 16.8868*** (1.1489) |
| Welfare quintile | | | | | | | | |
| Bottom 20% | 2.3315*** (0.4618) | 1.5344*** (0.4848) | 2.9144*** (0.6488) | 3.0107*** (0.8765) | 4.2228*** (0.7987) | 7.7501*** (1.0844) | 6.0997*** (1.2335) | 10.0405*** (2.1113) |
| Bottom 20%-40% | 0.8633* (0.4459) | 1.3998*** (0.5339) | 2.1121*** (0.7610) | 4.9636*** (0.9670) | 5.6719*** (0.9196) | 10.0337*** (1.4827) | 10.2556*** (1.4493) | 10.7962*** (2.4214) |
| Middle | 1.5683*** (0.3575) | 1.3544*** (0.4806) | 4.2913*** (0.6649) | 2.0461** (0.8568) | 5.1721*** (0.8015) | 8.4740*** (1.2801) | 9.3016*** (1.2510) | 17.8587*** (2.3982) |
| Top 20%-40% | 2.0834*** (0.2572) | 2.5974*** (0.3523) | 4.0743*** (0.4808) | 7.0972*** (0.6684) | 5.3580*** (0.6051) | 10.4487*** (0.9748) | 10.1946*** (0.8853) | 14.3756*** (1.4622) |
| Top 20% | 1.8429*** (0.1761) | 2.1555*** (0.2417) | 4.1074*** (0.3531) | 5.5020*** (0.4987) | 5.4997*** (0.4522) | 10.0921*** (0.8228) | 13.1587*** (0.8660) | 22.2397*** (2.2362) |

Note: Welfare effects are reported by expenditure quintile (Bottom 20%, Bottom 20%-40%, Middle, Top 20%-40%, Top 20%). Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%

Table 4. 8: Marginal effects of household expenditure levels on domestic remittances**Table 4.8a: Probability of domestic remittances by welfare level**

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Welfare level | | | | | | | | |
| Itotex | -0.1015*** (0.0077) | -0.0940*** (0.0073) | -0.1098*** (0.0060) | -0.1106*** (0.0063) | -0.1116*** (0.0048) | -0.1135*** (0.0046) | -0.1097*** (0.0049) | -0.1111*** (0.0052) |
| Welfare quintile | | | | | | | | |
| Bottom 20% | -0.0569* (0.0297) | -0.1158*** (0.0277) | -0.0838*** (0.0225) | -0.1830*** (0.0231) | -0.1122*** (0.0182) | -0.1142*** (0.0140) | -0.1355*** (0.0169) | -0.1686*** (0.0186) |
| Bottom 20%-40% | -0.0230 (0.0462) | -0.0113 (0.0421) | -0.1283*** (0.0334) | -0.0734** (0.0351) | -0.0551** (0.0273) | -0.0713*** (0.0263) | 0.0072 (0.0283) | 0.0097 (0.0312) |
| Middle | -0.0785 (0.0487) | -0.1213*** (0.0462) | -0.1309*** (0.0356) | -0.0857** (0.0377) | -0.1254*** (0.0284) | -0.1404*** (0.0280) | -0.0946*** (0.0295) | -0.0974*** (0.0315) |
| Top 20%-40% | -0.2266*** (0.0400) | -0.0934** (0.0374) | -0.1146*** (0.0292) | -0.1222*** (0.0308) | -0.1841*** (0.0238) | -0.1660*** (0.0228) | -0.1642*** (0.0226) | -0.1507*** (0.0240) |
| Top 20% | -0.0960*** (0.0232) | -0.1230*** (0.0237) | -0.0877*** (0.0199) | -0.0966*** (0.0200) | -0.0685*** (0.0166) | -0.0717*** (0.0142) | -0.1333*** (0.0138) | -0.1250*** (0.0146) |

Table 4.8b: Level of domestic remittance by welfare level (in '000 pesos)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Welfare level | | | | | | | | |
| Itotex | -0.0570 (0.0356) | -0.1203*** (0.0337) | -0.2965*** (0.0457) | -0.2694*** (0.0736) | -0.6086*** (0.0650) | -0.5231*** (0.1075) | -0.2436*** (0.0899) | 0.1482 (0.1397) |
| Welfare quintile | | | | | | | | |
| Bottom 20% | 0.0607 (0.0908) | -0.1366 (0.0912) | -0.1073 (0.1316) | -0.9753*** (0.1890) | -0.5349*** (0.1875) | -0.5833*** (0.1937) | -0.7795*** (0.1896) | -1.3609*** (0.2803) |
| Bottom 20%-40% | 0.0059 (0.1478) | 0.0795 (0.1559) | -0.6940*** (0.2111) | -0.5539* (0.3123) | -0.3553 (0.3144) | -0.8942** (0.4207) | 0.4307 (0.3422) | 0.9934** (0.4983) |
| Middle | -0.0135 (0.1704) | -0.1011 (0.1900) | -0.4532* (0.2498) | -0.0487 (0.3653) | -0.8859** (0.3536) | -0.7684 (0.5027) | 0.0981 (0.4044) | 0.0532 (0.5753) |
| Top 20%-40% | -0.4914*** (0.1873) | -0.3816** (0.1862) | -0.5143* (0.2671) | -1.2182*** (0.4085) | -1.5168*** (0.3434) | -3.4781*** (0.7477) | -1.5101*** (0.5262) | -1.3585* (0.7012) |
| Top 20% | 0.1734 (0.1756) | -0.0328 (0.1550) | 0.2960 (0.2550) | 1.3039*** (0.4666) | 0.3853 (0.3047) | 2.6896*** (0.8150) | 0.5650 (0.5848) | 2.0947*** (0.7701) |

Note: Welfare effects are reported by expenditure quintile (Bottom 20%, Bottom 20%-40%, Middle, Top 20%-40%, Top 20%). Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%

What is interesting is that an increase in the household expenditure level has a positive effect on the probability and the level of international remittances received by Filipino households, while it has the opposite effect on domestic remittances. For example, from the 2000 FIES of Table 4.7, it was found that a one per cent increase in total household expenditure, on average and ceteris paribus, increases the probability of receiving international remittances by around 0.0011 probability points and also raises the amounts by 96 pesos. In contrast, a one per cent decrease in total household expenditure was estimated to increase the probability of receiving remittances from the Philippines by around 0.0011 probability points and their levels by 52 pesos (see Table 4.8). Based on the results, it is conjectured that the richer the households are, the more international

remittances they receive, while the poorer they are, the more likely they are to rely on domestic remittances.

Taking into consideration the nonlinear relationship between two variables and using welfare quintiles, we can further investigate in detail how much the household welfare level affects the receipt of remittances in terms of their incidences and levels. Table 4.7 revealed that if the household expenditure increases at the same rate, the probability of receiving international remittances increases the most among the middle welfare groups. On the other hand, with regard to the level, we could not find any obvious pattern. However, our findings might suggest that in recent years the top welfare group (i.e., Top 20 per cent) tends to have a high propensity to receive more remittances from abroad as their welfare level goes up. Based on the 2006 FIES, it was found that a one per cent increase in their welfare increases the amount of international remittances by 222 pesos (or US\$ 4.33) among this group, which is more than twice the increase among the bottom 20 per cent group. When it comes to the relationship between domestic remittances and the welfare level, it was found that a decline in the household welfare raises the incidence of receiving the remittances at any welfare level but it does not affect the level of the remittances in the same way. It was also found that it raised the amounts only among the bottom 20 per cent and the top 20-40 per cent groups. In 2006, a one per cent decrease in the welfare was found to increase the amount remitted, on average and *ceteris paribus*, by only 13.6 pesos (or US\$ 0.265) among these groups (see Table 4.8).

As mentioned above, we found that across the survey years an increase in a household welfare level increases the probability of international remittances and the amount a

household receives. What interests us now is the temporal change in the effect of the welfare. The t-tests reported in Table 4.9 show how significant the changes are by comparing the results in 1994, in 2000, and in 2006 of Table 4.7 and Table 4.8. The t-tests revealed that between 2000 and 2006, the welfare effects on both the probability and the amount of international remittances significantly increased. This increase is mainly accounted for by a rise among the middle, the top 20-40 per cent, and the top 20 per cent welfare groups. This rise in the effects among the middle and the top groups would contribute to widening the welfare gap between rich and poor. The effects of international remittances on an increase in the expenditure gap will be investigated in Chapter Five. With regard to domestic remittances, among the poorest of the poor the complementary effect of the remittances on welfare loss declined from 1994 to 2000 and significantly increased during 2000-2006. This result suggests that the poorer households are more likely to rely on remittances from family members living within the home country over the latter period. Among the poor, their family and relatives might have less chance to work abroad as many of them are unqualified to work overseas and also because the cost of migration is enormous for them and they cannot afford it.

Table 4. 9: The t-tests for temporal changes in the effects of welfare levels on remittances

Table 4.9a: Probability of remittances

| | Domestic Remittances | | | International Remittances | | |
|-------------------------|----------------------|-----------------------|--------------------|---------------------------|----------------------|----------------------|
| | 1994-2000 | 2000-2006 | 1994-2006 | 1994-2000 | 2000-2006 | 1994-2006 |
| Welfare level | | | | | | |
| | -0.003 (0.008) | 0.002 (0.007) | -0.001 (0.008) | 0.001 (0.006) | 0.034 *** (0.005) | 0.035 *** (0.006) |
| Welfare quintile | | | | | | |
| Bottom 20% | 0.069 ** (0.027) | -0.054 ** (0.023) | 0.014 (0.030) | 0.025 (0.032) | 0.003 (0.028) | 0.028 (0.036) |
| Bottom 20%-40% | 0.002 (0.044) | 0.081 ** (0.041) | 0.083 * (0.047) | -0.008 (0.040) | -0.020 (0.037) | -0.028 (0.043) |
| Middle | -0.055 (0.047) | 0.043 (0.042) | -0.012 (0.049) | 0.081 ** (0.036) | 0.069 ** (0.032) | 0.150 *** (0.038) |
| Top 20%-40% | -0.044 (0.038) | 0.015 (0.033) | -0.029 (0.039) | -0.061 ** (0.026) | 0.055 ** (0.022) | -0.006 (0.027) |
| Top 20% | 0.025 (0.025) | -0.053 *** (0.020) | -0.028 (0.025) | 0.007 (0.014) | 0.027 ** (0.012) | 0.034 ** (0.016) |

Table 4.9b: Level of remittances (in '000 pesos)

| | Domestic Remittances | | | International Remittances | | |
|-------------------------|-----------------------|----------------------|----------------------|---------------------------|-----------------------|-----------------------|
| | 1994-2000 | 2000-2006 | 1994-2006 | 1994-2000 | 2000-2006 | 1994-2006 |
| Welfare level | | | | | | |
| | -0.254 * (0.130) | 0.671 *** (0.176) | 0.418 *** (0.158) | 4.712 *** (0.401) | 7.282 *** (1.202) | 11.994 *** (1.164) |
| Welfare quintile | | | | | | |
| Bottom 20% | 0.392 (0.271) | -0.778 ** (0.341) | -0.386 (0.338) | 4.739 *** (1.394) | 2.290 (2.374) | 7.030 *** (2.286) |
| Bottom 20%-40% | -0.340 (0.524) | 1.888 *** (0.652) | 1.547 *** (0.588) | 5.070 *** (1.770) | 0.763 (2.839) | 5.833 ** (2.607) |
| Middle | -0.720 (0.621) | 0.822 (0.764) | 0.102 (0.681) | 6.428 *** (1.540) | 9.385 *** (2.718) | 15.813 *** (2.547) |
| Top 20%-40% | -2.260 *** (0.852) | 2.120 ** (1.025) | -0.140 (0.812) | 3.352 *** (1.182) | 3.927 ** (1.757) | 7.278 *** (1.608) |
| Top 20% | 1.386 (0.939) | -0.595 (1.121) | 0.791 (0.900) | 4.590 *** (0.962) | 12.148 *** (2.383) | 16.738 *** (2.291) |

Note: Welfare effects are reported by expenditure quintile (Bottom 20%, Bottom 20%-40%, Middle, Top 20%-40%, Top 20%).

Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%

When we look at the effects of the welfare levels on remittances, the results should be interpreted with caution because of a potential endogeneity problem. The receipt of remittance income can improve the welfare level, thus the result of the welfare effects on the decision and the amount of receiving remittances may be biased without controlling for this potential endogeneity. The later rounds of the FIES (i.e., the 2000, 2003 and 2006 FIES) contain some variables influencing household welfare level such as ownership of household assets. These did not, however, provide valid instruments as

they were also correlated with the probability of receiving remittances either from abroad or from within the Philippines. In addition, even if some variables only found in the last three rounds can be used as instruments, they would not permit investigating comparable specifications during the period of 1985-2006. Unfortunately, we do not have appropriate instruments to resolve this potential endogeneity of the household welfare measure due to the limitations of the variables available from the FIES. This is clearly an important issue for future research, however.

Family composition

In order to investigate the effects of family composition on the receipt of remittances, this research used the following age categories (age 0-6, age 7-14, age 15-24, and age 25 and over). The research found that households with a higher share of family members over 25 years old have the greater probability and amount of receiving international remittances than any other households. This means that the need for remittances is the greatest when households members are 25 years and older. Alba and Sugui (2009) mentioned that altruistic and insurance motives would be consistent with a positive coefficient for this age group especially for migrants who are not primary bread-winners. While with regard to domestic remittances, the estimation results also found that if households have a higher share of family members under 15 years of age, it significantly raises the incidence of the receipt of domestic remittances but not their amounts. This might be driven by altruistic or insurance motives because domestic remittances would be sent from family members, relatives or siblings living remotely for specific purposes especially because of lack of money for food and/or child education.

Household head characteristics

The age of a household head has a significant impact on the probability of receiving remittances. It was found that the age and the remittances have a U-shaped relationship. With regard to the probability of receiving remittances, the turning points could be found at the age of 24-33 years old for domestic remittances and 39-46 years old for international remittances. Actually, the average age of household head is late 40s (see Table 4.3). This finding suggests that the older a household head is, the higher the incidence and the amount of remittances a Filipino household has. This remitting behaviour can be motivated by altruism if migrants send money to care for an aging head, or it might be driven by investment motives if they are planning to go back and therefore concentrate their investment within the home country.

When it comes to the gender of a household head, female headed households are more likely to receive international remittances than those with a male household head and also tend to have more amounts of the remittances. The households with a female head, which would be in a more financially vulnerable position, might need or have to rely on support for their livelihoods from families or relatives working abroad. If this is true, migrants send remittances mainly for altruistic reasons.

In terms of a household head's marital status, the estimation results found that having a married household head increased the probability and the level of receiving international remittances. This result could be explained by the fact that most of Filipino migrant workers are married and that they send money back to support the livelihoods of their families or relatives left in the home country (see Table 4.10). If migrants send remittances to support them and to improve their living conditions, the motive is

altruistic. On the other hand, households with a married head have a significantly lower probability and level of receiving domestic remittances. This is probably because the financial situation of the households is relatively better than other households and they don't need to rely on money transfers from family members working within the country.

Table 4. 10: Share of OFWs by Marital Status (%)

| Year | Marital Satus | | | Total |
|------|---------------|---------|--------|-------|
| | Single | Married | Others | |
| 1988 | 36.8 | 61.6 | 1.6 | 100 |
| 1989 | 35.1 | 63.2 | 1.7 | 100 |
| 1990 | 29.7 | 68.1 | 2.2 | 100 |
| 1991 | 33.7 | 63.6 | 2.7 | 100 |
| 1992 | 35.4 | 60.5 | 4.1 | 100 |
| 1993 | 33.3 | 64.2 | 2.5 | 100 |
| 1994 | 38.5 | 58 | 3.5 | 100 |
| 1995 | 40.9 | 55.9 | 3.2 | 100 |
| 1996 | 37.8 | 59.2 | 3.0 | 100 |
| 1997 | 33.9 | 62.9 | 3.3 | 100 |
| 1998 | 37.3 | 58.6 | 4.1 | 100 |
| 1999 | 36.6 | 59.6 | 3.8 | 100 |
| 2000 | 35.2 | 60.8 | 3.9 | 100 |
| 2001 | 37.1 | 58.5 | 4.4 | 100 |
| 2002 | 35.5 | 59.3 | 5.2 | 100 |
| 2003 | 30.3 | 64.8 | 4.8 | 100 |
| 2004 | 32.9 | 62.5 | 4.6 | 100 |

Source: Ducanes and Abella (2008) p.13 Annex Table1

The educational attainment of a household head also yields some interesting results. The results suggest that having a household head with a high school education significantly increases the probability and the level of the receipt of international remittances compared to the households having a head who did not finish even elementary education. On the other hand, having a household head who completed a tertiary education decreases the probability of receiving domestic remittances but had no significant effect on the probability of receiving international remittances except for the cases of the 1988 and 1991 FIES. Also, it seems not to contribute to an increase in the amount of international remittances received. This is because the livelihoods of the

household with a household head who completed university or postgraduate school could be less vulnerable and they don't need to rely on remittance incomes, whereas the household head with lower educational attainment has to send members of the family abroad and depend on their money transfers from abroad to sustain the livelihoods due to lack of job opportunities within the country.

Job-related factors

An increase in the share of employed family members significantly reduces the probability of remittances received both from within the Philippines and from abroad. The household with a higher share of employed family members might not need to rely on remittance incomes. Conversely, if there are lower shares of the employed among the Filipino households, they tend to depend on financial support from family members or relatives living either in the Philippines or overseas. In addition, the employment status of a household head also influences the receipt of remittances. It was found that having a household head with no job significantly increases the probability and the amount of receiving international remittances. It is clear that these households rely on remittance incomes sent by family members working abroad and so among these households, there might be a heavy dependency on international remittances. If migrants send money to help their non-working head, they are motivated by altruism. While if migrants think they can have a coinsurance agreement with their families in the home country in which they send remittance to support their families during tough time and the families then support them when they face some problems in their destination, their remitting behaviour is driven by insurance motives. Of course, it is possible that after receiving remittance incomes from family members working abroad, some migrant families quit their jobs and fail to find a new job.

Furthermore, if the household earns their income mainly through agricultural activities, the probability of receiving either internal or international remittances declines. Agricultural households might be reluctant to send their family members to work abroad as they are an essential work force for their labour intensive activities. These agricultural households would possibly want their family members to stay together and help in agricultural activities. In addition, these households would have lack of access to information on overseas employment and also they might not afford to work abroad due to the high opportunity cost as well as the actual cost of migration.

Geographical disparity

Surprisingly, the latest available household data (2006 FIES) reveals that households not living in the National Capital Region (NCR) had a higher probability of receiving either internal or international remittances compared to those living in the NCR and also received higher levels. The results of this research found a general increasing trend in the dependency on remittance incomes outside the NCR. This finding suggests that Filipino households living in NCR might have been less dependent on remittance incomes compared to households in other regions. If we look at the percentage distribution of OFWs derived from the 2008 Survey on Overseas Filipinos (SOF), it was found higher in Central Luzon, South Luzon, and Mindanao regions than in NCR (see Table 4.11). There are more recruitment agencies for overseas employment in NCR and the surrounding regions such as Central and South Luzon. Most of OFWs deployed from the provinces in Mindanao go to the Middle-East. Their families are under extremely poor conditions and they have to send a family member at any cost to survive. Based on the data from the FIES, it was also revealed that the share of sample

households living in NCR received international remittances has been declining over time (see Table 4.3). These features of the Filipino households could affect the results of this study. Moreover, the recent increase in the dependency of Filipino households living outside the NCR on remittance incomes, especially those from abroad could result from a lack of adequate employment opportunities in non-NCR regions.

Table 4. 11: Percentage Distribution of OFWs in 2008, by gender and region of origin (%)

| Region | Total | Male | Female |
|---|--------------|-------------|---------------|
| Total No of OFWs (in '000) | 2,002 | 1,034 | 968 |
| <i><u>Percentage Distribution of OFWs (%)</u></i> | | | |
| Ilocos | 7.8 | 5.6 | 10.2 |
| Cagayan Valley | 5.5 | 2.8 | 8.4 |
| Central Luzon | 14.5 | 17.2 | 11.7 |
| South Luzon | 20.6 | 24.3 | 16.7 |
| Bicol | 3.1 | 3.4 | 2.7 |
| Western Visayas | 7.8 | 7 | 8.6 |
| Central Visayas | 5.6 | 7.2 | 3.9 |
| Eastern Visayas | 2.9 | 2.9 | 2.9 |
| Mindanao | 16.4 | 12.1 | 20.6 |
| NCR | 14 | 16.2 | 11.7 |
| CAR | 1.9 | 1.1 | 2.7 |
| Total | 100 | 100 | 100 |

Source: Survey on Overseas Filipinos 2008

Note: The estimates cover overseas Filipinos whose departure occurred within the last five years and who are working or had worked abroad during the past six months (April to September) of 2008.

4.5.2 The effect of International Remittances on Domestic Remittances

When Filipino households receive remittances from abroad, they might no longer need to rely on any financial support from families or relatives living within the home country or would lose incentives to receive such domestic money transfers because of their smaller amounts. This effect of the receipt of international remittances displacing the receipt of domestic remittances becomes greater as the size of remittances from abroad increases. Hence, in this section we first investigate the effect of international remittances on domestic remittances by simply including the variable denoting the amount of international remittances (i.e., *exrem*), rather than the incidence (i.e., *dexrem*), into the domestic remittance equations in the probit and Tobit models.

Table 4. 12: Marginal effects of international remittances on the receipt of domestic remittances

Table 4.12a: Probability of domestic remittances

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| exrem | -0.0052*** (0.0006) | -0.0037*** (0.0005) | -0.0021*** (0.0002) | -0.0015*** (0.0002) | -0.0014*** (0.0001) | -0.0010*** (0.0001) | -0.0006*** (0.0001) | -0.0006*** (0.0001) |

Table 4.12b: Level of domestic remittances (in '000 pesos)

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| exrem | -0.0292*** (0.0032) | -0.0208*** (0.0034) | -0.0185*** (0.0023) | -0.0181*** (0.0031) | -0.0234*** (0.0022) | -0.0164*** (0.0052) | -0.0129*** (0.0022) | -0.0156*** (0.0036) |

Table 4.12c: t-tests for temporal changes in the effects of international remittances

| | Probability of domestic remittances | | | Level of domestic remittances | | |
|-------|-------------------------------------|------------------------|------------------------|-------------------------------|--------------------|--------------------|
| | 1994-2000 | 2000-2006 | 1994-2006 | 1994-2000 | 2000-2006 | 1994-2006 |
| exrem | 0.0005 ** (0.0002) | 0.0004 *** (0.0001) | 0.0009 *** (0.0002) | 0.0017 (0.0061) | 0.0008 (0.0063) | 0.0025 (0.0048) |

Note:

- (a) exrem denotes the amount of international remittances (in '000 pesos).
- (b) Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%.
- (c) Remittance equations include controls for household welfare quintiles, family composition, household head characteristics (age, gender, marital status, educational attainment, employment status), urban/rural, farming, and regions. All coefficient estimates are reported in the Appendix.

Table 4.12 reports only the estimation results of the marginal effects of international remittances. The results show that an increase in the amount of international remittances decreased the incidence and the amount of domestic remittances households received.

However, the t-test revealed that the effects of international remittances on the incidence of the receipt of domestic remittances have been significantly weakening over time while there was no significant temporal change in the effects on the level of domestic remittances.

Next, we move on to a potential problem for a two-way relationship between domestic and international remittances. When this reverse causation occurs, the explanatory variables are correlated through their error terms. In this situation, standard regression analyses provide biased and inconsistent estimates. To correct for this possible endogeneity problem, we use the instrumental variable (IV) estimation technique. If there are valid and relevant instruments available, we can obtain consistent estimates.

We consider four potential identifying instruments which are based on migrant characteristics derived from the SOF (i.e., educational attainment, length of stay in destination country, gender, and age). As mentioned before, these four migrant characteristics are used as proxy measures of their income as the wages of migrants are not available in the SOF. In order to investigate which migrant characteristics can be selected as better instruments, we tested three important issues on the instrumental variables: (1) over-identifying restrictions; (2) weak instruments; (3) regressor exogeneity. Based on the all test results reported in the appendix, we concluded that the completion of tertiary education, the length of stay in destination country, and the gender are the better set of instruments for the model determining the incidence of domestic remittances (i.e., *dinrem*), while the gender and the age of migrant workers are chosen as the best instruments for the model with the level of domestic remittances (i.e., *inrem*). Table 4.13 shows the estimation results. The term *ivprobit* and *ivtobit* denotes

the probit and Tobit models with this IV technique. The coefficients on the instruments used have the expected sign. The educational attainment and the age of migrants and the migrant's length of stay in the host country increase the amount of international remittances that the recipient household received though the age effect is not statistically significant, while households with female migrants receive less money. The selected instruments pass the tests corresponding to regressor exogeneity, over-identifying restrictions, and weak instruments although the results must be interpreted with caution because the test statistic of weak instruments is relatively small and the confidence intervals obtained from these tests are wider than the confidence interval from the Wald test. Furthermore, for the level of domestic remittances, the Wald test of exogeneity does not strongly reject the null hypothesis that the *exrem* variable is exogenous.

The results reveal that an increase in the amount of international remittances decreases the incidence of receiving domestic remittances and their level. Among the households who received remittances from abroad, for example an increase in the amount of international remittances by 1,000 pesos (or US\$ 18.4) decreased the probability of receiving domestic remittances by 0.0018 probability points, which is three times greater than the estimates derived from the model without considering the endogeneity problem reported in Table 4.12. Similarly, it also reduced the amount of domestic transfers received by 126.9 pesos (or US\$ 2.3). These displacement effects of international remittances are nearly ten times greater than the model without instrumental variables. After controlling for endogeneity, the international remittances variable was found to decrease the amount of domestic remittances by around 12.7 per cent, on average and *ceteris paribus*. This seems to be a significant effect because there

is a huge difference in the absolute amount between domestic and international remittances. Importantly, this implies that the receipt of international remittances not only helps the recipient households but also remitters living within the Philippines. These family members sending domestic remittances might need to send less or have no need to send money. This enables them to increase their disposable income and improves their welfare. On the other hand, heavy reliance on international money transfers might be risky. During the tough economic times like the global economic and financial crisis, some migrant workers were displaced or retrenched. Moreover, the sharp appreciation of the Philippine peso against the currency migrants earned also affected the amount of the remittances. International remittances are vulnerable to these external shocks and can be volatile. In order to hedge the risk of dropping into poverty, it might be important for some households to keep depending on both sources of remittances.

Table 4. 13: ivprobit and ivtobit estimation results using 2003 FIES

Table 4.13a: Probability of domestic remittances (or *dinrem*)

| Dependent variable: | First stage regression | | Structural equation | | Marginal effects | |
|---|------------------------|------------------|--|------------------|----------------------|------------------------|
| | <i>exrem</i> | | <i>dinrem</i> | | <i>dinrem</i> | |
| Explanatory variables | Coef. | Robust Std. Err. | Coef. | Robust Std. Err. | dy/dx | Delta-method Std. Err. |
| Instruments variables | | | | | | |
| Migrant's education level (=1 if completed tertiary; =0 otherwise) | 20.121 *** | 7.1309 | | | | |
| Length of stay abroad (months) | 0.4162 *** | 0.1326 | | | | |
| Female migrant (=1 if female; =0 if male) | -11.683 ** | 5.7173 | | | | |
| Remittance amount | | | | | | |
| <i>exrem</i> * | | | -0.0059 *** | 0.0019 | -0.0018 *** | 0.0006 |
| Welfare | | | | | | |
| <i>ltotex</i> | 119.74 *** | 7.3283 | 0.6567 *** | 0.2524 | 0.2007 ** | 0.0829 |
| Family composition | | | | | | |
| <i>empsh</i> | -15.286 | 12.407 | -0.2072 | 0.1393 | -0.0633 | 0.0426 |
| <i>age0-6</i> | -49.003 * | 25.551 | 0.0806 | 0.3561 | 0.0246 | 0.1085 |
| <i>age7-14</i> | 10.654 | 14.378 | 0.2735 | 0.1702 | 0.0836 | 0.0515 |
| <i>age15-24</i> | -6.4160 | 11.785 | -0.1811 | 0.1397 | -0.0554 | 0.0427 |
| (age25+ omitted) | | | | | | |
| Head characteristics | | | | | | |
| <i>hage</i> | -0.3603 | 1.1110 | -0.0400 *** | 0.0143 | -0.0023 ** | 0.0011 |
| <i>hage2</i> | -0.0089 | 0.0115 | 0.0003 ** | 0.0002 | | |
| <i>hfemale</i> | 58.824 *** | 6.8946 | 0.2910 * | 0.1510 | 0.0889 * | 0.0486 |
| <i>hmarried</i> | 47.898 *** | 7.1876 | 0.1498 | 0.1434 | 0.0458 | 0.0450 |
| (hedu1 omitted) | | | | | | |
| <i>hedu2</i> | -16.521 *** | 6.4248 | -0.0700 | 0.0981 | -0.0214 | 0.0302 |
| <i>hedu3</i> | -31.971 *** | 8.3118 | -0.2458 ** | 0.1053 | -0.0751 ** | 0.0329 |
| <i>hedu4</i> | -43.897 *** | 11.311 | -0.3639 *** | 0.1203 | -0.1112 *** | 0.0376 |
| <i>hnojob</i> | 27.334 *** | 6.6005 | 0.2980 *** | 0.0804 | 0.0911 *** | 0.0257 |
| Farming | | | | | | |
| <i>agri</i> | -8.4281 | 8.0178 | -0.2705 * | 0.1480 | -0.0827 * | 0.0447 |
| Region | | | | | | |
| <i>llocos</i> | 55.285 *** | 9.4625 | 0.2263 | 0.1729 | 0.0692 | 0.0544 |
| Cagayan | 46.383 *** | 9.5271 | -0.0250 | 0.1965 | -0.0077 | 0.0599 |
| Cluzon | 5.8524 | 8.0342 | -0.0255 | 0.1182 | -0.0078 | 0.0361 |
| Sluzon | 45.539 *** | 11.326 | 0.5160 *** | 0.1113 | 0.1577 *** | 0.0361 |
| Bicol | 63.705 *** | 19.842 | 0.2531 | 0.2406 | 0.0773 | 0.0750 |
| Wvisayas | 55.750 *** | 10.978 | 0.2790 | 0.1742 | 0.0853 | 0.0551 |
| Cvisayas | 52.469 *** | 17.450 | 0.3697 ** | 0.1839 | 0.1130 * | 0.0581 |
| Evisayas | 38.417 ** | 18.566 | 0.5119 ** | 0.2081 | 0.1565 ** | 0.0647 |
| Mindanao | 44.249 *** | 9.8717 | 0.1097 | 0.1672 | 0.0335 | 0.0519 |
| (NCR omitted) | | | | | | |
| CAR | 60.915 *** | 15.203 | 0.2033 | 0.2177 | 0.0621 | 0.0678 |
| constant | -1360.0 *** | 90.513 | -6.9249 ** | 2.9633 | | |
| <i>/athrho</i> | 0.6005 * | 0.3281 | | | | |
| <i>/lnsigma</i> | 4.7357 *** | 0.0510 | | | | |
| <i>rho</i> | 0.5374 | 0.2333 | | | | |
| <i>sigma</i> | 113.95 | 5.8096 | | | | |
| Test of regressor exogeneity (H_0: <i>exrem</i> is exogenous.) | | | | | | |
| Durbin-Wu-Hausman test | | | Wald test of exogeneity (H_0: $\alpha = 0$) | | | |
| | | | chi2=11.84 | p-value= 0.0006 | chi2(1)= 3.35 | |
| Test of over-identifying restrictions (H_0: all instruments are valid.) | | | Prob > chi2= 0.0672 | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | chi2=3.864 | p-value= 0.1449 | | |
| Tests of weak instruments (H_0: <i>exrem</i>*=0) | | | | | Wald chi2(25) | 180.25 |
| Wald test | | | chi2=5.07 | p-value= 0.0243 | Prob > chi2 | 0.0000 |
| Conditional Likelihood Ratio test | | | statistic=6.31 | p-value= 0.0161 | Log pseudolikelihood | -13826.748 |
| Anderson-Rubin test | | | chi2=10.11 | p-value= 0.0176 | Number of obs | 2072 |
| Lagrange Multiplier & J overidentification test | | | H_0 is rejected | | | |

Note: (a) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (b) *exrem** denotes the predicted value of the amount of international remittances derived from the first stage regression.

Table 4.13b: Level of domestic remittances in '000 pesos (or *inrem*)

| Dependent variable: | First stage regression | | | Structural equation | | | Marginal effect | |
|---|------------------------|-----|------------------|--|----------|------------------|-------------------------|------------------------|
| | <i>exrem</i> | | | <i>inrem</i> | | | <i>inrem</i> | |
| Explanatory variables | Coef. | | Robust Std. Err. | Coef. | | Robust Std. Err. | dy/dx | Delta-method Std. Err. |
| Instruments variables | | | | | | | | |
| Female migrant (=1 if female; =0 if male) | -12.094 | *** | 4.6035 | | | | | |
| Migrant's age (years) | 0.4946 | | 0.3490 | | | | | |
| Remittance amount | | | | | | | | |
| <i>exrem</i> * | | | | -0.3572 | * | 0.2158 | -0.1269 | 0.0893 |
| Welfare | | | | | | | | |
| <i>ltotex</i> | 124.50 | *** | 7.4618 | 47.212 | * | 27.682 | 16.778 | 11.494 |
| Family composition | | | | | | | | |
| <i>empsh</i> | -14.147 | | 12.604 | -11.582 | * | 6.4533 | -4.1162 | 2.4713 |
| <i>age0-6</i> | -49.133 | * | 25.824 | -9.1893 | | 15.627 | -3.2658 | 5.7864 |
| <i>age7-14</i> | 4.4852 | | 14.525 | 9.4655 | | 6.6685 | 3.3639 | 2.4406 |
| <i>age15-24</i> | -12.727 | | 11.912 | -6.1696 | | 5.9190 | -2.1926 | 2.2090 |
| (age25+ omitted) | | | | | | | | |
| Head characteristics | | | | | | | | |
| <i>hage</i> | -0.2924 | | 1.1142 | -1.0338 | * | 0.5638 | -0.1413 | 0.1102 |
| <i>hage2</i> | -0.0091 | | 0.0116 | 0.0063 | | 0.0059 | | |
| <i>hfemale</i> | 57.240 | *** | 6.9906 | 18.252 | | 14.003 | 6.4867 | 5.6237 |
| <i>hmarried</i> | 46.109 | *** | 7.1337 | 10.012 | | 11.619 | 3.5580 | 4.4754 |
| (hedu1 omitted) | | | | | | | | |
| <i>hedu2</i> | -16.234 | ** | 6.4485 | -3.1782 | | 4.7298 | -1.1295 | 1.7649 |
| <i>hedu3</i> | -30.380 | *** | 8.1613 | -9.3978 | | 7.0725 | -3.3399 | 2.8096 |
| <i>hedu4</i> | -37.428 | *** | 10.432 | -16.794 | * | 9.0601 | -5.9684 | 3.7325 |
| <i>hnojob</i> | 29.038 | *** | 6.6284 | 15.699 | * | 7.5530 | 5.5793 | 3.1885 |
| Farming | | | | | | | | |
| <i>agri</i> | -9.9009 | | 8.0073 | -9.3525 | * | 5.4992 | -3.3238 | 2.1049 |
| Region | | | | | | | | |
| <i>llocos</i> | 57.961 | *** | 9.4075 | 16.279 | | 13.600 | 5.7855 | 5.3845 |
| <i>Cagayan</i> | 50.504 | *** | 9.4817 | 8.2601 | | 11.693 | 2.9355 | 4.4261 |
| <i>Cluzon</i> | 8.2534 | | 8.0194 | 0.0968 | | 5.0358 | 0.0344 | 1.7910 |
| <i>Sluzon</i> | 46.606 | *** | 11.373 | 19.150 | | 11.665 | 6.8055 | 4.7784 |
| <i>Bicol</i> | 65.928 | *** | 19.725 | 17.656 | | 16.679 | 6.2747 | 6.4939 |
| <i>Wvisayas</i> | 62.492 | *** | 10.887 | 19.233 | | 14.204 | 6.8351 | 5.6949 |
| <i>Cvisayas</i> | 59.786 | *** | 17.535 | 21.881 | | 14.673 | 7.7761 | 5.9237 |
| <i>Evisayas</i> | 46.518 | ** | 18.384 | 33.790 | * | 17.298 | 12.009 | 6.9939 |
| <i>Mindanao</i> | 51.295 | *** | 9.6948 | 12.682 | | 11.749 | 4.5069 | 4.5981 |
| (NCR omitted) | | | | | | | | |
| <i>CAR</i> | 66.243 | *** | 15.135 | 19.841 | | 15.457 | 7.0514 | 6.1474 |
| <i>constant</i> | -1419.7 | *** | 91.716 | -531.49 | * | 315.73 | | |
| <i>/alpha</i> | 0.3184 | | 0.2164 | | | | | |
| <i>/lns</i> | 3.3355 | *** | 0.0929 | | | | | |
| <i>/lnv</i> | 4.7398 | *** | 0.0509 | | | | | |
| <i>s</i> | 28.093 | | 2.6106 | | | | | |
| <i>v</i> | 114.42 | | 5.8278 | | | | | |
| Test of regressor exogeneity (H_0: <i>exrem</i> is exogenous.) | | | | Wald test of exogeneity (H_0: $\alpha = 0$) | | | | |
| Durbin-Wu-Hausman test | | | | chi2=11.83 | p-value= | 0.0006 | chi2(1)= | 2.16 |
| Test of over-identifying restrictions (H_0: all instruments are valid.) | | | | | | | Prob > chi2= | 0.1412 |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | chi2=1.506 | p-value= | 0.2197 | | |
| Tests of weak instruments (H_0: <i>exrem</i>*=0) | | | | | | | Wald chi2(25) | 34.68 |
| Wald test | | | | chi2= 3.66 | p-value= | 0.0556 | Prob > chi2 | 0.0941 |
| Conditional Likelihood Ratio test | | | | statistic=6.94 | p-value= | 0.0136 | Log pseudolikelihood | -15679.068 |
| Anderson-Rubin test | | | | chi2=8.35 | p-value= | 0.0154 | uncensored observations | 492 |
| Lagrange Multiplier & J overidentification test | | | | H_0 is rejected | | | Number of obs | 2072 |

Note: (a) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (b) *exrem** denotes the predicted value of the amount of international remittances derived from the first stage regression.

4.6 Concluding Remarks

This chapter has investigated the determinants of receiving either domestic or international remittances using probit and bivariate probit models. Furthermore, by using Tobit and bivariate Tobit models, the determinants of the size of the remittances were investigated. One of the more significant findings to emerge from this chapter is that the amounts of domestic and international remittances are mutually related, whereas the probabilities are not interrelated except for 2000 and 2003. Furthermore, it was also revealed that several explanatory factors such as the level of total household expenditure, the household heads' characteristics, the job-related information, and the regional disparities are significant in determining both the incidence and the size of remittances. Based on the results of explanatory factors, possible explanations on motivations for remittances were also made. However, these motives are too complex to articulate. Depending on the situation of migrants or recipient households, different motives can be applied. More detailed information on determining variables, especially those for migrants, will help identify which motives could be driving remitting behaviour.

In this chapter, we found that an increase in the household welfare level increases the incidence and the amount of international remittances while it decreases those of domestic remittances. However, the results should be interpreted with caution because there is still an issue of welfare endogeneity here. The receipt of remittance incomes can improve the welfare level, thus the result could be potentially biased without controlling for this potential endogeneity. We could not solve this issue here due to a lack of appropriate instruments. Clearly, further research and better data are required to explore this issue further.

In addition to examining the factors influencing the receipt of remittances in terms of the incidence and the level, we also investigated the effect of international remittances on the receipt of domestic remittances. However, to estimate this effect, there is another potential endogeneity problem of a two-way relationship (or reverse causality) between internal and international remittances. To correct for this potential problem, we used instrumental variable (IV) estimation with instruments which affect international remittances but not directly domestic transfers. By merging the 2003 SOF with the 2003 FIES, we consider four migrant characteristics (i.e., migrant's educational attainment, gender, age, as well as length of stay abroad as a migrant) as possible instrumental variables. In order to select the better set of instruments, we tested three important issues: (1) over-identifying restrictions; (2) weak instruments; (3) regressor exogeneity. Based on the all test results, we concluded that the completion of tertiary education, the length of stay in destination country, and the gender provide the best set of instruments for the model of the incidence of domestic remittances (i.e., *dinrem*), whereas migrant's gender and age are optimal identifying instruments for the model with the level of domestic remittances (i.e., *inrem*).

Our findings revealed that among the households who received international remittances, an increase in the amount of remittances from abroad significantly decreased both the incidence of domestic remittances received and their level. These findings support the idea that there is a displacement effect of international remittances on domestic remittances. This is because the receipt of remittances from abroad would contribute more to improving the household welfare than those from within the country because of the greater value amounts. This displacement effect has a positive impact not only on

the recipient but also family members who live within the Philippines and send domestic remittances. After the recipient households received international remittances, these family members might need to send less than before or have no need to send money any more. This enables them to increase their disposable income and helps improve their welfare. On the other hand, however, the receipt of remittances from abroad might widen the gap in the welfare between households with and without the remittances. This research on the effect of remittances on the welfare and its inequality will be pursued in the next chapter.

With altruistic motives, migrants frequently send money to support the livelihoods of their families and relatives in the home country. This is one of the greatest economic benefits for the recipients. However, overseas migration costs substantial sums even at the household level. There are several costs that need to be paid. Migrant workers or households have to raise money for migration (e.g., airfare, visa etc.). Migration costs are often deducted from the first six month's salary of migrants by the recruitment agencies or employers. This is a huge front-end cost. Among households, there is also a psychological cost of separation due to the migration of their members. The cost can be tremendous among some migrant households especially if family members left behind miss a person working overseas so much. It is possible that some potential migrant workers have no motivations for migration because they do not want their families to be separated. This psychological aspect of motivations for migration is always difficult to examine and is well beyond the scope of this chapter.

Chapter 5: Remittances and their effects on Household Expenditure Inequality in the Philippines before and after a set of crises during the late 1990s

5.1 Introduction

In the early history of development economics, remittances were not considered as a key factor for developing countries. In the global economy, however, remittances especially from abroad have become a central issue and have been interpreted as potentially important for poverty reduction in developing countries. The receipt of remittances from abroad directly affects poverty through an increase in the income of their recipients, while receiving remittances also indirectly influences poverty through their impact on economic growth, inflation, exchange rates, and access to capital (World Bank, 2006:118). Recently, researchers have shown an increased interest in using household survey data to investigate the effects of remittances. Using the household survey, previous research has concluded that international remittances reduced poverty (Adams, 2004; Gustafsson and Makonnen, 1993; Yang and Martinez, 2005; Taylor et al., 2005; Lokshin et al., 2007). At the national level, Adams and Page (2005) found the evidence that international remittances could significantly reduce poverty based on data from international migration, remittances, inequality, and poverty for 71 developing countries. In addition, it is said that remittances from abroad had more impact on reducing poverty for the poorest of the poor (World Bank, 2006:121). In the case of the Philippines, the poverty indices⁵¹ significantly continued to decline in the 1980s and 1990s whereas the expenditure Gini increased after 1997 mainly due to the increase in the share of the richest ten per cent of the population in total expenditure (Balisacan and Hill 2003:319). With regard to the linkage between remittances and poverty in the

⁵¹ The headcount index, the poverty gap index, and the Foster-Greer-Thorbecke measure were used as the poverty indices, (for more details, see Balisacan and Hill 2003: 340).

Philippines, it was argued that the direct and indirect impact of the increases in remittance flows into the Philippines, caused by a sharp appreciation of a migrant's currency against the Philippine peso during the period of 1997-1998, could reduce poverty in the Philippines (Yang and Martinez 2005). In contrast to the impact of remittances on poverty, the link between remittances and inequality seems to be less clear. If remittances are sent disproportionately to better-off households, it may cause disparities between households to widen. On the other hand, if remittances are sent to the households who are worse off, it might lead to a contraction in inequality between rich and poor households (World Bank, 2006:121).

Table 5. 1: The expenditure Gini coefficient, 1985-2006 (by receipt of remittances)

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Total | 0.385 | 0.387 | 0.406 | 0.405 | 0.409 | 0.464 | 0.445 | 0.445 |
| dnorem | 0.378 | 0.387 | 0.400 | 0.401 | 0.413 | 0.481 | 0.454 | 0.458 |
| dexrem | 0.351 | 0.354 | 0.369 | 0.370 | 0.360 | 0.401 | 0.410 | 0.416 |
| dinrem | 0.353 | 0.348 | 0.366 | 0.372 | 0.376 | 0.402 | 0.387 | 0.385 |
| dbothrem | 0.338 | 0.357 | 0.386 | 0.355 | 0.359 | 0.387 | 0.389 | 0.393 |

Source: Author's computation based on FIES

The Gini coefficient on grouped (or *Total*) households, measured on a per capita household expenditure basis, increased to 0.464 in 2000. This was the highest Gini coefficient recorded over time (see Table 6.1). We also computed the Gini coefficient by types of the receipt of remittances: no remittances (*dnorem*), international remittances only (*dexrem*), internal remittances only (*dinrem*), both internal and international remittances (*dbothrem*). Within non-remittance receiving households (i.e., *dnorem*), the inequality of expenditure distribution was higher than remittance receiving households (i.e., *dexrem*, *dinrem*, *dbothrem*) and dramatically increased in 2000. However, we do not exactly know the extent to which the receipt of remittances contributes to the level of increased expenditure inequality.

When we look at the effect of remittances on poverty and inequality, remittance incomes can be treated as a simple exogenous income transfer that migrants sent, or as a potential substitute for domestic earnings to examine the effect of each type of remittance on inequality. For the latter, past studies found it important to estimate the counterfactual loss of income that migrants might experience due to migration to examine the effect on poverty and inequality of income (see Ratha, 2007; McKenzie and Sasin, 2007; Adams, 2006).

Instead of income, however, in this section household expenditure will be used as the welfare metric to investigate inequality across those Filipino households with and without remittances. There are several reasons why expenditure is used as a measure of well-being. First, household expenditure is a direct measure of well-being. Second expenditure is less subject to underreporting bias. For example, in the case of the FIES, there is a serious underreporting bias of property income and entrepreneurial income among the upper-income group and an underestimation of non-cash income among the lower-income group. Third, especially in developing countries, expenditure is better measured than income for poor households because income might be somewhat lumpy among poor households such as agricultural workers due to shocks like natural disasters, and also because the measurement of self-employed income is notoriously inaccurate (see Meyer and Sullivan, 2003; Deaton, 1997: 26-32; World Bank, 2001:17; Estudillo, 1997: 72; Akita and Miyata, 2008: 149). Moreover, another advantage to using an expenditure measure is that the consumption is much closer to a logarithmic normal distribution than is the income distribution (Battistin, Blundell, and Lewbel, 2007).

Thus, it is more appropriate to take the logarithm of expenditure in the expenditure equations used in our analysis.

There have been a number of empirical studies that have attempted to analyse which factors influence expenditure inequality in developing countries by decomposing inequality (see for example, Mishra and Parikh, 1992⁵² for India; Tsakloglou, 1993⁵³ for Greece; Akita et al., 1999⁵⁴ for Indonesia; Nguyen, 2008⁵⁵ for Vietnam; Balisacan and Fuwa, 2004⁵⁶ for the Philippines). Past studies have found that the differentials in educational attainment and in geographical location accounted for a large part of expenditure inequality (Akita and Miyata, 2008:148). In the case of the Philippines, using Fields (2003) decomposition, which is a regression-based inequality decomposition approach and allows for the contribution of each explanatory variable to inequality to be investigated, Balisacan and Fuwa (2004) found that spatial inequality, which includes both rural-urban disparity and regional disparities, accounted for approximately 19 per cent and 11 per cent of the total expenditure inequality in 1985 and 2000, respectively. The contribution of spatial inequality has decreased over time, whereas the importance of family size to expenditure inequality has increased especially in the 1990s. Another main factor contributing to the variance in household expenditure is the educational level of the household head. It is revealed that about one-third of the

⁵² Theil's entropy measure, Theil's second measure, and Atkinson's measure were used for the decomposition analysis. Expenditure inequality in India was decomposed by regions (states) and by sectors (urban or rural).

⁵³ Expenditure per equivalent adult was decomposed into the following factors: regional (region and locality of residence), demographic (age of household head) and educational (educational level of household head). Among the factors included in the decomposition analysis, only an educational factor accounts for a relatively large part of aggregate inequality.

⁵⁴ Two Theil indices (T and L) were used to measure inequality in the distribution of household expenditures. Total inequality was decomposed into rural-urban disparity, region, age, education, household size, and gender.

⁵⁵ Gini coefficient and Two Theil indices (T and L) were used to measure inequality. Inequality was decomposed by the receipt of international remittances. It was found that international remittances slightly increased inequality.

⁵⁶ Two Theil T indices (T and L) were used to measure inequality. Expenditure inequality was decomposed into locality (urban or rural), region, and sector of employment.

total expenditure inequality can be explained by a household head's educational attainment from 1985 to 2000. In addition, a household head's employment status and access to infrastructure ⁵⁷ were also significant factors in determining expenditure inequality (see Balisacan and Fuwa, 2004: 12).

The primary aim of this chapter is to examine the effect of the receipt of different types of remittances on household expenditure differences among Filipino households. In particular, the analysis focuses on changes before and after the crises which were comprised of a combination of the economic crisis and the severe drought which occurred in the period covering 1997 to 1998. A key research question is to establish if Filipino households without any remittances in the poorest segment of the population represent the most vulnerable group in the Philippines during both the economic crisis in 1997 and the severe drought of 1998. The impact of these crises might persist long after the crises were over. Thus, we decided to compare two survey periods which are before and after the above-mentioned crises. As mentioned in Chapter Three, the FIES are available every three years from 1985 to 2006. For the analysis in this chapter, we focused on the 1994 and 2000 FIES. The two survey years span a period before and after the Asian economic crisis as well as the drought attributed to El Niño. If we find evidence that there is a positive and significant impact of remittances on a household's expenditure among the group that received remittances in the above survey period, receiving remittances could thus significantly affect poverty reduction by improving the welfare of the poorer Filipino households. This also means that if poor households without remittances had actually received remittances, it could have assisted in terms of improving their living conditions. It is quite important for policymakers to know the

⁵⁷ Access to electricity was used as a representative infrastructure variable.

counterfactual impact of the receipt of remittances, especially on the poor in their countries. If receiving remittances could have more impact on improving the expenditure level of the poor rather than the rich, expenditure gaps between rich and poor would contract over time. On the other hand, if receiving remittances could improve a poor household's expenditure less than that of a rich household, the differences could widen over time. So far, however, there has been little discussion about such a counterfactual analysis with regard to the effects of the receipt of different types of remittance on expenditure inequality not only between poor households with and without remittance income but also between rich and poor households among remittance-receiving households.

For the counterfactual analysis, we will investigate the per capita expenditure differentials between households with and without remittances and examine the extent to which welfare differentials originate from differences in household characteristics (i.e., endowment differences) and differences in household expenditure patterns caused by the receipt of remittances (i.e., treatment differences) in the welfare equations, which can be expressed differently depending on the type of remittance receipt. The Oaxaca (1973) / Blinder (1973) decomposition can be used to estimate these effects under the assumption of the exogeneity of remittance receipt which means that remittances are treated as an exogenous income transfer that the recipient households received. This standard decomposition technique focuses only on average effects. When we look at the inequality between rich and poor, estimating only average treatment effects is unhelpful. It is more useful to use the quantile decomposition approach which estimates quantile endowment and treatment differences using quantile regression analysis. This decomposition enables us to examine the entire portrait of inequality among households

from all parts of the conditional household expenditure distribution. To our knowledge, no research has been conducted to examine the effects of remittances on inequality using such a decomposition method at selected quantiles of welfare levels.

The Philippines is renowned as one of the countries which receive a large amount of remittances from abroad. However, there are a lot of households which also receive remittances from within the Philippines, especially from near Metro Manila such as central and southern Luzon. Thus, in this chapter, Filipino households are classified into four categories depending on the types of remittances received: no remittances (*dnorem*), internal remittances only (*dinrem*), international remittances only (*dexrem*), both internal and international remittances (*dbothrem*). It is likely that these four categories of remittance receipt exert a distinctive impact on expenditure inequality between rich and poor.

The empirical analysis of the impact of remittances on inequality begins by providing a brief overview of remittances and the Philippine economy during a set of crises in the late 1990s. It will then go on to outline an econometric framework to investigate the determinants of household expenditure depending on the types of remittances received and also provide an explanation of the decomposition methodology used in the analysis. This methodology, which was introduced by Melly (2006), can decompose expenditure differences in the conditional distribution using a quantile regression method. In recent years, there has been some literature on examining wage inequality using this quantile decomposition analysis (for example, Burda, Fitzenberger, Lembcke and Vogel 2008; Naticchioni, Ricci and Rustichelli 2008; Wahlberg 2008). After explaining the

decomposition technique used, the empirical results are discussed. Finally, this chapter offers some conclusions.

5.2 Philippine economy during the 1990s

In the Philippines, average per capita household expenditures declined in 1994 by two per cent from their level in 1991. This was mainly due to the impact of the economic contraction over the period of 1992-1993. Then, GDP growth accelerated from 1995 to 1997 because of renewed political stability and strengthened policy and institutional reforms. Real mean expenditure was approximately 21 per cent higher in 1997 compared to 1994. However, the overall growth rate slowed between 1998 and 2000 because of the impact of the combination of the Asian financial crisis, the El Niño phenomenon in 1998, and political uncertainty (Balisacan and Hill, 2003: 318-319). There are a number of reports describing the impact of the Asian crisis on Philippine households since the crisis erupted in late 1997 (see Lim 1999; Reyes et al., 1999; Datt and Hoogeveen, 2003). However, informed discussion has been constrained by a lack of representative household survey data. The data could be used to investigate changes in the economic well-being of various household groups, for example, household economic conditions before the crisis, changes in these conditions during the crisis, and the impact of government policies and programs implemented to address the crises (Balisacan and Hill, 2003: 336).

In the case of the Philippines, what has complicated the analysis of the impact of the crises on the poor households was that the Asian economic crisis was concurrent with the onset of a severe drought caused by the El Niño phenomenon in many parts of the country. Using the 1998 Annual Poverty Indicators Survey (APIS), Datt and Hoogeveen

(2000) estimated that the combined impacts of the above two external shocks accounted for approximately a five per cent reduction in average living standards, a nine per cent increase in the incidence of poverty, and an 11 and a 13 per cent increase in the depth and severity of poverty, respectively. These findings suggest that the El Niño shock accounted for the largest share of the overall impact on poverty. Given the overlap of two national surveys covering the crises period, that is, the 1997 FIES and the 1998 APIS, Balisacan (2001) found that households, which had reported experiencing the adverse effects of the crises such as a rise in prices, or a reduction in wages as well as the El Niño phenomenon, were generally concentrated among the poorer households. Loss of domestic jobs affected the middle deciles of the expenditure distribution more, while loss of overseas jobs was more likely to affect the upper expenditure deciles. Households responded differently to the Asian economic crisis and to the El Niño phenomenon depending on their household attributes, and most importantly pre-crisis living standards and location. The panel data analysis suggested that the households' probabilities of not eating out, of taking children out of school, or of increasing their working hours were inversely related to their pre-crisis living standard. Thus, it appeared that a macro-economic shock like the Asian crisis tended to hit most severely and, systematically, the poorest groups in Philippine society. On the other hand, the probability of receiving assistance and relief from the public sector or from other households was not significantly related to pre-crisis living standards. These findings suggested that social safety nets, whether from formal or informal sources, did not have a pro-poor bias during the crises (Balisacan and Hill, 2003: 336-337). Following these findings, it could be said that during the crises the most vulnerable group in the Philippines was the poor, especially the poor who did not receive any financial support, such as remittance incomes, from their family members or relatives. During the Asian

financial crisis, with regard to the volume of overseas remittances, there was a steep increase in 1998. It is said that the sudden depreciation of the Philippine exchange rate during the Asian economic crisis actively increased the size of remittances from the OFWs (Yang, 2006). Then, before and after the crises, to what extent could remittances sent by family members working either abroad or within the Philippines, or in both places financially assist the expenditure levels of the Filipino households, especially those of the poor? The sets of crises (that is, the Asian financial crisis, the severe drought, and political uncertainty) might differentially impact the expenditure patterns of each Filipino household with and without remittances. However, such a detailed analysis is beyond the scope of the current study. In this chapter, the above three types of shock to Filipino households will be regarded as a set of crises that occurred over the period of 1997-1998 and the contribution of the receipt of remittances to the differentials in the levels of total expenditure per capita of pre-crisis and of post-crisis Filipino households will be examined.

5.3 Methodology of Analysis

5.3.1 Conditional quantile regression

The methodology is mainly outlined in two parts. In the first part, to find evidence for the effects of the receipt of remittances on the entire conditional expenditure distribution (including the poor, the middle, and the rich), we begin by investigating the extent to which the differentials in the household expenditure distribution between households with and without receipt of remittances can be attributed to differences in the characteristics of these households. The impacts of the characteristics on the conditional expenditure distribution for each household category can be estimated using a quantile

regression framework (see Koenker and Bassett 1978; Koenker and Hallock 2001; Koenker 2005). The conditional quantile function, $q_y(\vartheta | X)$, given the set of covariates X , can be expressed using a linear specification as follows:

$$(5-1) \quad q_y(\vartheta | X) = X_i \beta(\vartheta) \quad \text{for all } \vartheta \in (0,1)$$

where y_i is the dependent variable and denotes the natural logarithm of per capita total household expenditure, X_i is a matrix of all explanatory variables, $\beta(\vartheta)$ are the different quantile coefficient vectors to be estimated. The subscript i refers to the household. We assume that all quantiles of y conditional on X are linear in X . Then, the conditional quantiles of y can be estimated by linear quantile regression in the specific percentiles, $\vartheta \in (0,1)$.

It is arguable that the allocation of households across the four remittance categories is not random and some correction for selectivity bias is thus required. However, there are a number of reasons why this is not done here. First, the absence of adequate identifying instruments remains a problem. Second, although Buchinsky (1998, 2001) and Albrecht, van Vuuren and Vroman (2009) have developed selection correction procedures for quantile regression models, these are fairly complex to implement and require relatively large sample sizes to work effectively. Third, and most relevant given our approach, the Melly (2006) decomposition has not been modified to incorporate the use of selection effects.

5.3.2 Decomposition of unconditional quantile regression

There is an advantage of the unconditional quantile regression over the conditional quantile regression by Koenker and Bassett (1978). The estimated coefficients are regarded as the effects of changes in the distribution of covariates on the quantiles of the unconditional distribution of the dependent variable (see Le and Booth, 2010: 5-6). The second part of the procedure is to decompose the welfare differences ($\Delta\hat{q}$) of the unconditional quantile functions between the households with and without remittances (denoted by $\hat{q}(\vartheta, \hat{\beta}^{rem}, X^{rem})$ and $\hat{q}(\vartheta, \hat{\beta}^{norem}, X^{norem})$) at any welfare level (ϑ) as follows:

$$(5-2) \quad \hat{q}(\vartheta, \hat{\beta}^{rem}, X^{rem}) - \hat{q}(\vartheta, \hat{\beta}^{norem}, X^{norem}) = \left[\hat{q}(\vartheta, \hat{\beta}^{rem}, X^{rem}) - \hat{q}(\vartheta, \hat{\beta}^{norem}, X^{rem}) \right] + \left[\hat{q}(\vartheta, \hat{\beta}^{norem}, X^{rem}) - \hat{q}(\vartheta, \hat{\beta}^{norem}, X^{norem}) \right], \vartheta \in (0,1)$$

where $\hat{q}(\vartheta, \hat{\beta}^{norem}, X^{rem})$ is the estimated counterfactual quantile function outlined by Melly (2006), who gives a detailed explanation on this approach and its statistical properties.⁵⁸ This quantile function denotes the welfare levels for *dnorem* if their endowments were the same as the remittance-receiving households (i.e., *dinrem*, *dexrem*, or *dbothrem*). The first bracketed term denotes the effect of coefficients (or the quantile

⁵⁸ If the number of simulations used in the Machado and Mata (2005) procedure goes to infinity, it is noted that the decomposition technique by Melly (2006) is numerically identical to the decomposition approach proposed by Machado and Mata (2005), which has been used in various applications to estimate counterfactual conditional wage distributions (for example, see Pham and Reilly 2009). Using a large number of quantile regression (e.g., 99, one for each percentile from 1 to 99), the Melly (2006) decomposition can be a more straightforward and efficient decomposition method because the Machado and Mata (2005) method use a simulation approach where quantiles are drawn at random, which is computationally demanding and becomes quite cumbersome for datasets with more than a few thousand observations (see Fortin, Lemieux, and Firpo, 2010: 60).

treatment effects) and the second represents the effect of household characteristics (or the quantile endowment effects).⁵⁹

To determine the level of household expenditure, the expenditure equations used in the analysis will include the following set of explanatory variables: family composition, household head's characteristics (such as gender, age, marital status, educational attainment, and employment status), and geographical location, which includes rural-urban and regional differences. As Balisacan and Fuwa (2004) noted, in the Philippines household head's educational attainment and location (including both rural-urban disparity and regional disparities) accounted for a significantly large portion of expenditure inequality. Other household head's characteristics (gender, age, marital status, and employment status) are also used in the analysis following Balisacan and Fuwa (2004). It is also found that agriculture has consistently had the lowest mean living standard among all sectors. So, in addition to the above explanatory variables, we add a dummy variable to identify whether households earn their income mainly from agricultural activities or not. We assume that not only the receipt of remittances but also the household characteristics affect household expenditure gaps between households with and without remittances. Although the FIES collected a good deal of information on Filipino households as shown above, there are some limitations with these data. For example, the FIES have the information on educational attainment only for the household head, but not for all family members. It only enables us to investigate how household heads' educational attainment, not other family members' educational levels, would affect the differences in household expenditure. In addition, we cannot capture the number within the different age categories, for example, those aged over 60 with the

⁵⁹ The stata command `rqdeco`, which is provided by Melly (2007), was used to compute the quantile endowment and treatment effects.

exception of the 2006 FIES. This could affect, for example, the expenditure on health care. Moreover, there is the possibility of sample selection bias. The receipt of a remittance type is potentially not random and consequently households with and without remittance incomes potentially have different characteristics. Sample selection bias arises when some component of the remitting decision is relevant to the expenditure determining process. We can control for this using selection correction procedures, but these are not well developed in the quantile regression framework. In addition, the FIES have no information on factors influencing the remitting decision. Thus, we are not able to obtain good and valid instruments. Thus, here we do not explicitly deal with selection correction. Table 5.2 and Table 5.3 report the definition of the variables and the summary statistics of the data used in the analysis, respectively. In the next section, the results of the quantile treatment and endowment effects on expenditure inequality at the 9th quantile of the unconditional distribution of the total household expenditure will be discussed.

Table 5. 2: Descriptive Statistics

| Variable Name | Variable Description |
|------------------------------------|---|
| <u>Welfare</u> | |
| lpctotex | The natural logarithm of per capita total family expenditures (in pesos) |
| <u>Remittance</u> | |
| dnorem | =1 if the household received no remittance; =0 otherwise |
| dinrem | =1 if the household received only internal remittances; =0 otherwise |
| dexrem | =1 if the household received only external remittances; =0 otherwise |
| dbothrem | =1 if the household received both internal and external remittances; =0 otherwise |
| <u>Family composition</u> | |
| empsh | The share of household employed members out of total household members |
| age 0-6 | The share of the members with greater than 1 and less than 7 year old |
| age 7-14 | The share of the members with greater than 7 and less than 15 years old |
| age 15-24 | The share of the members with greater than 15 and less than 25 year old |
| age 25+ | The share of the members with 25 year old and over |
| <u>Head Characteristics</u> | |
| hfemale | =1 if the household head is female; =0 otherwise |
| hage | The age of the household head |
| hage2 | The square of the age of the household head |
| hmarried | =1 if the household head marital status is married; =0 otherwise |
| hedu1 | =1 if household head did not finish elementary school; =0 otherwise |
| hedu2 | =1 if the household head finished elementary school; =0 otherwise |
| hedu3 | =1 if the household head finished high school; =0 otherwise |
| hedu4 | =1 if the household head finished University or Post Graduate; =0 otherwise |
| hnojob | =1 if the household head is not employed; =0 otherwise |
| <u>Urban/Rural</u> | |
| urban | =1 if the household lives in the urban area; =0 otherwise |
| <u>Farming</u> | |
| agri | =1 if the household is an agricultural one; =0 otherwise |
| <u>Region</u> | |
| Ilocos | =1 if the household lives in Ilocos Region; =0 otherwise |
| Cagayan | =1 if the household lives in Cagayan Valley; =0 otherwise |
| Cluzon | =1 if the household lives in Central Luzon; =0 otherwise |
| Sluzon | =1 if the household lives in Southern Luzon; =0 otherwise |
| Bicol | =1 if the household lives in Bicol Region; =0 otherwise |
| Wvisayas | =1 if the household lives in Western Visayas; =0 otherwise |
| Cvisayas | =1 if the household lives in Central Visayas; =0 otherwise |
| Evisayas | =1 if the household lives in Eastern Visayas; =0 otherwise |
| Mindanao | =1 if the household lives in Mindanao; =0 otherwise |
| NCR | =1 if the household lives in National Capital Region (NCR); =0 otherwise |
| CAR | =1 if the household lives in Cordillera Administrative Region (CAR); =0 otherwise |

Table 5. 3: Summary Statistics

| | 1994 FIES | | 2000 FIES | |
|------------------------------------|-----------|-----------|-----------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. |
| <u>Welfare</u> | | | | |
| lpctotex (nominal) | 9.302 | 0.735 | 9.822 | 0.784 |
| lpctotex (real) | 9.679 | 0.735 | 9.822 | 0.784 |
| <u>Remittance</u> | | | | |
| dnorem | 52.7% | | 54.1% | |
| dinrem | 27.4% | | 27.8% | |
| dexrem | 12.8% | | 12.7% | |
| dbothrem | 7.1% | | 5.3% | |
| <u>Family composition</u> | | | | |
| empsh | 0.353 | 0.223 | 0.378 | 0.235 |
| age 0-6 | 0.149 | 0.181 | 0.131 | 0.169 |
| age 7-14 | 0.191 | 0.19 | 0.182 | 0.19 |
| age 15-24 | 0.178 | 0.202 | 0.177 | 0.204 |
| age 25+ | 0.482 | 0.235 | 0.509 | 0.246 |
| <u>Head Characteristics</u> | | | | |
| hfemale | 15.2% | | 17.5% | |
| hage | 47.6 | 13.8 | 48.9 | 13.9 |
| hmarried | 83.5% | | 80.6% | |
| hedu1 | 27.6% | | 25.3% | |
| hedu2 | 35.3% | | 31.7% | |
| hedu3 | 28.5% | | 32.0% | |
| hedu4 | 8.5% | | 11.0% | |
| hnojob | 15.2% | | 16.3% | |
| <u>Urban/Rural</u> | | | | |
| urban | 59.8% | | 59.4% | |
| <u>Farming</u> | | | | |
| agri | 30.2% | | 24.4% | |
| <u>Region</u> | | | | |
| Ilocos | 5.5% | | 4.8% | |
| Cagayan | 4.0% | | 3.9% | |
| Cluzon | 10.8% | | 9.5% | |
| Sluzon | 14.4% | | 15.6% | |
| Bicol | 5.7% | | 5.3% | |
| Wvisayas | 8.2% | | 7.6% | |
| Cvisayas | 7.3% | | 5.9% | |
| Evisayas | 4.6% | | 5.7% | |
| Mindanao | 22.3% | | 27.1% | |
| NCR | 15.1% | | 10.5% | |
| CAR | 2.0% | | 4.2% | |
| Number of Obs | 24165 | | 39615 | |

Note: Standard errors are reported only for continuous variables. CPI=68.6 in 1994 and CPI=100 in 2000.

5.4 Empirical Results

5.4.1 Conditional quantile regression results

Before moving on to the detailed analysis on the effects of the receipt of remittances on the expenditure inequality, we report the household welfare level depending on the types of the remittances. Table 5.4 shows per capita household expenditures of the households with and without remittances. The welfare of households with only international remittances (i.e., *dexrem*) was the greatest for both survey years. This result is consistent at the 10th, 50th and 90th welfare level. The expenditure gaps between median and rich households account for most of the gaps between rich and poor. So, the mean per capita expenditures are greater than the median estimates regardless of the receipt of remittances. This means that the welfare distribution is skewed to the right.

Table 5. 4: Per capita household expenditures (in pesos) and their gaps by types of remittances

| Per capita expenditure | 1994 FIES | | | | 2000 FIES | | | |
|------------------------|------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|
| | mean | 10th | 50th | 90th | mean | 10th | 50th | 90th |
| Total | 14702 | 4444 | 10436 | 29484 | 26340 | 7153 | 17210 | 52105 |
| dnorem | 13326 | 4178 | 9371 | 26794 | 24848 | 6860 | 15998 | 49029 |
| dexrem | 22720 | 7183 | 17878 | 42983 | 41476 | 11954 | 31002 | 78841 |
| dinrem | 12309 | 4186 | 9110 | 23028 | 20459 | 6710 | 14353 | 37328 |
| dbothrem | 19679 | 6656 | 15603 | 36432 | 36025 | 11308 | 25679 | 64827 |
| Expenditure Gaps | No. of Obs | 50th-10th | 90th-50th | 90th-10th | No. of Obs | 50th-10th | 90th-50th | 90th-10th |
| Total | 24165 | 5992 | 19048 | 25041 | 39615 | 10057 | 34895 | 44952 |
| | | (23.9) | (76.1) | (100) | | (22.4) | (77.6) | (100) |
| dnorem | 12732 | 5194 | 17422 | 22616 | 21439 | 9138 | 33032 | 42169 |
| | | (23.0) | (77.0) | (100) | | (21.7) | (78.3) | (100) |
| dexrem | 3093 | 10695 | 25105 | 35800 | 5048 | 19049 | 47838 | 66887 |
| | | (29.9) | (70.1) | (100) | | (28.5) | (71.5) | (100) |
| dinrem | 6620 | 4923 | 13919 | 18842 | 11021 | 7643 | 22976 | 30618 |
| | | (26.1) | (73.9) | (100) | | (25.0) | (75.0) | (100) |
| dbothrem | 1720 | 8946 | 20829 | 29775 | 2107 | 14371 | 39148 | 53519 |
| | | (30.0) | (70.0) | (100) | | (26.9) | (73.1) | (100) |

Source: Author's computation based on the FIES.

Note: Parentheses denote the percentage.

Next, we examine the effects of the receipt of remittances on household expenditures. Assuming that between households, regardless of remittance incomes, there is no difference in the effects of household characteristics on expenditure levels, we

conducted pooled regression analysis. The remittance dummy variables (i.e., *dexrem*, *dinrem*, and *dbothrem*) are included into the welfare equation which capture how much the receipt of remittances contributes to the expenditure level. Table 5.5 and Table 5.6 summarise the coefficient estimates of the remittance variables. The former reports the results derived from the mean regression and the quantile regressions at the specific quantiles (10th, 50th, and 90th), while the latter provides the estimates from the interquantile regressions between the said quantiles (i.e., 50th-10th, 90th-50th, and 90th-10th).

Table 5. 5: Pooled regression on expenditure levels (*lpctotex*)

Table 5.5a: Effects of remittances on expenditure levels

| | 1994 FIES | | | | 2000 FIES | | | |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | mean | 10th | 50th | 90th | mean | 10th | 50th | 90th |
| dexrem | 0.235 *** (0.011) | 0.216 *** (0.017) | 0.228 *** (0.012) | 0.256 *** (0.019) | 0.291 *** (0.009) | 0.275 *** (0.012) | 0.292 *** (0.011) | 0.332 *** (0.014) |
| dinrem | -0.064 *** (0.007) | -0.045 *** (0.012) | -0.074 *** (0.009) | -0.061 *** (0.014) | -0.080 *** (0.006) | -0.047 *** (0.009) | -0.083 *** (0.008) | -0.085 *** (0.010) |
| dbothrem | 0.146 *** (0.013) | 0.145 *** (0.020) | 0.136 *** (0.015) | 0.143 *** (0.024) | 0.235 *** (0.012) | 0.234 *** (0.017) | 0.242 *** (0.015) | 0.225 *** (0.019) |

Table 5.5b: t-tests for temporal change in the effects of remittances on expenditure levels

| | 1994 FIES-2000 FIES | | | |
|----------|----------------------|----------------------|----------------------|----------------------|
| | mean | 10th | 50th | 90th |
| dexrem | 0.056 *** (0.014) | 0.059 *** (0.021) | 0.064 *** (0.016) | 0.076 *** (0.024) |
| dinrem | -0.016 * (0.009) | -0.002 (0.015) | -0.009 (0.012) | -0.024 (0.017) |
| dbothrem | 0.089 *** (0.018) | 0.089 *** (0.026) | 0.106 *** (0.021) | 0.082 *** (0.031) |

Note:

- (a) Parentheses denote the standard errors. * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$.
 (b) These equations include controls for family composition, household head characteristics (age, gender, marital status, educational attainment, employment status), urban/rural, farming, and regions. All coefficient estimates are reported in the Appendix.

Table 5.5 reveals that at the mean as well as the above quantiles of the household expenditure, with other things being the same, households who received international remittances had higher welfare levels and those with domestic remittances got lower levels compared to non-remittance receiving households. So, given that the assumption of this pooled regression analysis, the receipt of international remittances seems to have a significant and positive effect on household welfare. Moreover, this effect is greater

among the rich. On the other hand, the negative coefficient of the receipt of domestic remittances suggests that Filipino households with such remittances were significantly poorer than those with no remittances. The t-test shows that regardless of welfare level, the effect was significantly greater in 2000 than 1994 (see Table 5.5b). In order to investigate whether international remittances contribute to widening the welfare gaps between rich and poor, the inter-quantile regression was estimated. In 2000, a coefficient estimate of the international remittance dummy (i.e., *dexrem*) on the gaps between 90th and 10th percentile was found to be statistically significant and positive (see Table 5.6a). This supports evidence that the receipt of international remittances widened the inequality between rich and poor in that year. The result also finds that this inequality is mainly accounted for by the welfare gaps between the middle and affluent groups. However, the t-test reported in the table shows that the significant temporal changes in the effects of remittances on welfare differences were not found between 1994 and 2000 (see Table 5.6b).

Table 5. 6: Interquantile regression (pooled) on expenditure gaps (*lpctoex*)

Table 5.6a: Effects of remittances on expenditure gaps

| | 1994 FIES | | | 2000 FIES | | |
|----------|----------------------|------------------|-------------------|-----------------------|---------------------|-----------------------|
| | 50th-10th | 90th-50th | 90th-10th | 50th-10th | 90th-50th | 90th-10th |
| dexrem | 0.012 (0.019) | 0.028 (0.019) | 0.040 (0.025) | 0.017 (0.014) | 0.040 ** (0.016) | 0.057 *** (0.020) |
| dinrem | -0.030 ** (0.013) | 0.013 (0.012) | -0.016 (0.016) | -0.036 *** (0.009) | -0.002 (0.011) | -0.038 *** (0.014) |
| dbothrem | -0.009 (0.019) | 0.007 (0.028) | -0.002 (0.031) | 0.007 (0.021) | -0.016 (0.021) | -0.009 (0.026) |

Table 5.6b: t-tests for temporal change in the effects of remittances on expenditure gaps

| | 1994 FIES-2000 FIES | | |
|----------|---------------------|-------------------|-------------------|
| | 50th-10th | 90th-50th | 90th-10th |
| dexrem | 0.005 (0.024) | 0.012 (0.025) | 0.017 (0.032) |
| dinrem | -0.006 (0.016) | -0.015 (0.016) | -0.022 (0.021) |
| dbothrem | 0.016 (0.028) | -0.023 (0.035) | -0.007 (0.040) |

Note:

- (a) Parentheses denote the standard errors. * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$.
 (b) These equations include controls for family composition, household head characteristics (age, gender, marital status, educational attainment, employment status), urban/rural, farming, and regions. All coefficient estimates are reported in the Appendix.

Here, we relax the assumption that between households, regardless of the receipt of remittance incomes, there is no difference in the effects of household characteristics on expenditure levels. We conduct the separate regression analysis for each household group (i.e., *dnorem*, *dexrem*, *dinrem*, and *dbothrem*). The mean regression analysis reported in Table A5.3 in the appendix reveals that the effects of some household characteristics on the welfare operate in opposite directions. For example, in 2000, households with a female or married head had higher welfare among those who received only international remittances (i.e., *dexrem*) on average and *ceteris paribus*, while lower among those with the receipt of domestic remittances (i.e., *dinrem*) or with no remittances (i.e., *dnorem*).

Table 5.7 reports the results of conditional quantile regression and contains the effects of covariates included in the analysis on the level of household expenditure per capita for each household category across the following percentiles (10th, 50th, and 90th). The tables reveal that the effects of some household characteristics on the household welfare significantly differ between rich and poor. In 1994, the effect of the share of the employed was the greatest for the rich among the households who received domestic remittances and non-remittance receiving households, while for the poor among those with the receipt of remittances from abroad. On the other hand, among all household categories the effect gets bigger for the rich than the poor household in 2000. Having a highly-educated household head affects the expenditure level positively and its effect gets greater. Regardless of whether the household received remittances, the effect was greater among the affluent group. It was also revealed that households with an unemployed head had even higher welfare for the middle and the rich groups if they received international remittances and for the rich households with the receipt of

domestic remittances. This means that households with an unemployed head heavily rely on remittance incomes either from abroad or from within the Philippines. The receipt of remittances could increase the expenditure even though household heads are not working either due to lack of job opportunities within the country or to retirement because of the age or disability. For the poor households, however, the amount of remittances they received might not be enough to improve their welfare level.

Table 5. 7: Quantile regression results

Table 5.7a: the 1994 FIES

| | <i>dnorem</i> | | | <i>dexrem</i> | | | <i>dinrem</i> | | | <i>dbothrem</i> | | |
|-------------------------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|-----------------|-------------|-------------|
| | 10th | 50th | 90th | 10th | 50th | 90th | 10th | 50th | 90th | 10th | 50th | 90th |
| empsh | 0.2032 *** | 0.2918 *** | 0.3579 *** | 0.3789 *** | 0.2493 *** | 0.2530 ** | 0.1966 *** | 0.2818 *** | 0.3607 *** | 0.4321 *** | 0.3008 *** | 0.1534 |
| age 0-6 | -1.3755 *** | -1.4166 *** | -1.3284 *** | -1.1124 *** | -1.2495 *** | -1.3826 *** | -1.3883 *** | -1.2860 *** | -1.3911 *** | -1.1076 *** | -1.1411 *** | -1.3905 *** |
| age 7-14 | -1.0561 *** | -1.0963 *** | -1.0813 *** | -0.7927 *** | -0.9014 *** | -1.0518 *** | -0.9414 *** | -1.0342 *** | -1.0834 *** | -0.8440 *** | -0.9283 *** | -0.9037 *** |
| age 15-24 (age25+ omitted) | -0.4452 *** | -0.5907 *** | -0.5683 *** | -0.3726 *** | -0.5456 *** | -0.6052 *** | -0.4729 *** | -0.4584 *** | -0.4765 *** | -0.3177 *** | -0.4364 *** | -0.4446 *** |
| hfemale | -0.0369 | -0.0052 | 0.0775 * | 0.1468 *** | 0.2174 *** | 0.2831 *** | 0.0064 | 0.0629 ** | 0.1158 ** | 0.1123 | 0.2427 *** | 0.1449 ** |
| hage | -0.0146 *** | -0.0150 *** | -0.0148 *** | -0.0201 ** | -0.0116 * | -0.0305 *** | -0.0151 *** | -0.0093 *** | -0.0156 ** | -0.0101 | -0.0107 | -0.0209 ** |
| hage2 | 0.0001 ** | 0.0001 *** | 0.0001 *** | 0.0002 ** | 0.0001 | 0.0003 ** | 0.0001 *** | 0.00004 | 0.0001 * | 0.0001 | 0.0001 | 0.0002 ** |
| hmarried (hedu1 omitted) | -0.0420 | -0.0493 ** | -0.0404 | 0.1049 ** | 0.0846 * | 0.0396 | -0.0337 | -0.0938 *** | -0.1263 ** | 0.0065 | -0.0048 | -0.1750 ** |
| hedu2 | 0.1141 *** | 0.1372 *** | 0.1571 *** | 0.1160 ** | 0.1144 ** | 0.2089 *** | 0.0859 *** | 0.1078 *** | 0.1485 *** | 0.1406 ** | 0.1150 *** | 0.1517 ** |
| hedu3 | 0.3349 *** | 0.3955 *** | 0.4974 *** | 0.3389 *** | 0.3160 *** | 0.4813 *** | 0.2972 *** | 0.3455 *** | 0.4268 *** | 0.3177 *** | 0.3502 *** | 0.4207 *** |
| hedu4 | 0.7793 *** | 0.9257 *** | 1.0519 *** | 0.7189 *** | 0.7596 *** | 0.8819 *** | 0.7160 *** | 0.7867 *** | 0.9320 *** | 0.7070 *** | 0.7302 *** | 0.8373 *** |
| hnojob | -0.0304 | -0.0054 | 0.0145 | 0.1001 ** | 0.0981 *** | 0.1077 * | -0.0079 | 0.0104 | 0.1201 *** | 0.0155 | 0.0832 * | 0.0758 |
| urban | 0.1009 *** | 0.1407 *** | 0.1415 *** | 0.1087 *** | 0.1831 *** | 0.1625 *** | 0.1351 *** | 0.1309 *** | 0.1635 *** | 0.0986 * | 0.1458 *** | 0.0492 |
| agri | -0.1895 *** | -0.2494 *** | -0.2995 *** | -0.2079 *** | -0.3007 *** | -0.2810 *** | -0.1474 *** | -0.2153 *** | -0.2030 *** | -0.1863 *** | -0.1530 *** | -0.2448 ** |
| llocos | -0.5380 *** | -0.5046 *** | -0.5144 *** | -0.5699 *** | -0.4482 *** | -0.4377 *** | -0.4959 *** | -0.5188 *** | -0.6054 *** | -0.6443 *** | -0.5641 *** | -0.5301 *** |
| Cagayan | -0.5095 *** | -0.4430 *** | -0.3545 *** | -0.5326 *** | -0.2117 *** | -0.0850 | -0.5475 *** | -0.4878 *** | -0.5014 *** | -0.5650 ** | -0.2134 * | -0.0470 |
| Cluzon | -0.3254 *** | -0.2540 *** | -0.2627 *** | -0.3507 *** | -0.2168 *** | -0.2457 *** | -0.2882 *** | -0.2694 *** | -0.3138 *** | -0.2385 *** | -0.2050 *** | -0.2477 *** |
| Sluzon | -0.3962 *** | -0.2849 *** | -0.2019 *** | -0.3051 *** | -0.1541 *** | -0.1000 * | -0.3265 *** | -0.2825 *** | -0.2920 *** | -0.2605 *** | -0.1818 *** | -0.2166 *** |
| Bicol | -0.6240 *** | -0.5359 *** | -0.5284 *** | -0.5384 *** | -0.3665 *** | -0.3267 *** | -0.6184 *** | -0.6087 *** | -0.5393 *** | -0.6477 *** | -0.4614 *** | -0.4452 *** |
| Wvisayas | -0.4840 *** | -0.3805 *** | -0.3552 *** | -0.3987 *** | -0.1730 *** | -0.1838 ** | -0.4355 *** | -0.4548 *** | -0.4638 *** | -0.4148 *** | -0.4389 *** | -0.4013 *** |
| Cvisayas | -0.7236 *** | -0.5521 *** | -0.4766 *** | -0.6702 *** | -0.4764 *** | -0.3585 *** | -0.7776 *** | -0.7085 *** | -0.5980 *** | -0.7067 *** | -0.5153 *** | -0.3329 |
| Evisayas | -0.6659 *** | -0.6161 *** | -0.5435 *** | -0.6720 *** | -0.5275 *** | -0.5965 *** | -0.6956 *** | -0.6403 *** | -0.6281 *** | -0.6929 *** | -0.7227 *** | -0.8226 *** |
| Mindanao (NCR omitted) | -0.6127 *** | -0.4826 *** | -0.3861 *** | -0.5337 *** | -0.4205 *** | -0.3494 *** | -0.6579 *** | -0.5647 *** | -0.4887 *** | -0.4983 *** | -0.4624 *** | -0.3282 *** |
| CAR | -0.3800 *** | -0.3166 *** | -0.2929 *** | -0.5660 *** | -0.3698 *** | -0.3660 *** | -0.3998 *** | -0.4850 *** | -0.3098 *** | -0.2706 ** | -0.4208 *** | -0.5266 *** |
| constant | 9.8529 *** | 10.2705 *** | 10.6625 *** | 9.7965 *** | 10.1713 *** | 11.1679 *** | 9.8074 *** | 10.1598 *** | 10.8051 *** | 9.5799 *** | 10.0512 *** | 11.1925 *** |
| Pseudo R2 | 0.3088 | 0.3718 | 0.3913 | 0.2873 | 0.2840 | 0.2769 | 0.3118 | 0.3392 | 0.3459 | 0.2847 | 0.2930 | 0.2494 |

Note: Parentheses for each percentile in the columns of the 1994 and 2000 FIES denote standard errors with 200 bootstrap replications for standard error estimates.

Parentheses in the column of gaps between the 1994 and 2000 FIES denote the standard errors in the case of unequal variance. * p<0.01, ** p<0.05, *** p<0.01 (two-tailed).

Table 5.7: Quantile regression results (continued)

Table 5.7b: the 2000 FIES

| | <i>dnorem</i> | | | <i>dexrem</i> | | | <i>dinrem</i> | | | <i>dbothrem</i> | | |
|-------------------------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|-----------------|-------------|-------------|
| | 10th | 50th | 90th | 10th | 50th | 90th | 10th | 50th | 90th | 10th | 50th | 90th |
| empsh | 0.2944 *** | 0.3142 *** | 0.4302 *** | 0.2727 *** | 0.3941 *** | 0.4506 *** | 0.2585 *** | 0.2309 *** | 0.3046 *** | 0.3235 *** | 0.1985 ** | 0.3593 *** |
| age 0-6 | -1.3111 *** | -1.3977 *** | -1.3261 *** | -1.2994 *** | -1.1095 *** | -1.1722 *** | -1.2335 *** | -1.3344 *** | -1.4899 *** | -1.3346 *** | -1.4385 *** | -1.3821 *** |
| age 7-14 | -0.9706 *** | -1.0446 *** | -1.0660 *** | -0.8825 *** | -0.8838 *** | -0.9961 *** | -0.9295 *** | -1.0674 *** | -1.1717 *** | -0.8548 *** | -1.1219 *** | -1.2887 *** |
| age 15-24 (age25+ omitted) | -0.5191 *** | -0.5635 *** | -0.5917 *** | -0.3756 *** | -0.3636 *** | -0.5287 *** | -0.3584 *** | -0.4409 *** | -0.5066 *** | -0.3798 *** | -0.5444 *** | -0.4822 *** |
| hfemale | -0.0229 | -0.0331 | -0.0181 | 0.2452 *** | 0.2871 *** | 0.2540 *** | -0.0136 | 0.0198 | 0.0169 | 0.0710 | 0.1496 *** | 0.1433 *** |
| hage | -0.0092 *** | -0.0086 *** | -0.0093 ** | -0.0191 *** | -0.0231 *** | -0.0146 * | -0.0094 ** | -0.0147 *** | -0.0199 *** | -0.0112 | -0.0136 * | -0.0454 *** |
| hage2 | 0.00003 | 0.00005 ** | 0.0001 ** | 0.0001 ** | 0.0002 *** | 0.0001 | 0.00003 | 0.0001 *** | 0.0001 *** | 0.0001 | 0.0001 | 0.0004 *** |
| hmarried (hedu1 omitted) | -0.0172 | -0.0533 ** | -0.0951 *** | 0.1381 *** | 0.1232 *** | -0.0366 | -0.0100 | -0.0699 *** | -0.1391 *** | -0.0205 | -0.0081 | -0.0449 |
| hedu2 | 0.1124 *** | 0.1140 *** | 0.1359 *** | 0.1848 *** | 0.1531 *** | 0.2608 *** | 0.1365 *** | 0.1427 *** | 0.1576 *** | -0.0284 | 0.1239 *** | 0.2335 *** |
| hedu3 | 0.3294 *** | 0.3885 *** | 0.5193 *** | 0.3856 *** | 0.3960 *** | 0.5532 *** | 0.2822 *** | 0.3515 *** | 0.4549 *** | 0.2475 *** | 0.3337 *** | 0.4361 *** |
| hedu4 | 0.8843 *** | 1.0325 *** | 1.2142 *** | 0.8065 *** | 0.8265 *** | 0.9670 *** | 0.8004 *** | 0.9866 *** | 1.2009 *** | 0.6613 *** | 0.8280 *** | 0.9315 *** |
| hnojob | -0.0163 | -0.0121 | 0.0222 | 0.0469 | 0.1148 *** | 0.1637 *** | 0.0183 | 0.0090 | 0.1199 *** | 0.0377 | 0.1010 ** | 0.1759 * |
| urban | 0.1656 *** | 0.1784 *** | 0.2059 *** | 0.1452 *** | 0.1895 *** | 0.1838 *** | 0.1313 *** | 0.1647 *** | 0.1992 *** | 0.1860 *** | 0.1739 *** | 0.1464 *** |
| agri | -0.1821 *** | -0.2438 *** | -0.3023 *** | -0.2079 *** | -0.3054 *** | -0.3234 *** | -0.1177 *** | -0.1885 *** | -0.2819 *** | -0.1885 *** | -0.1808 *** | -0.3196 *** |
| llocos | -0.4806 *** | -0.4883 *** | -0.4969 *** | -0.3916 *** | -0.3923 *** | -0.3659 *** | -0.4772 *** | -0.4382 *** | -0.3096 *** | -0.3351 *** | -0.5167 *** | -0.6307 *** |
| Cagayan | -0.3822 *** | -0.3413 *** | -0.3105 *** | -0.3616 *** | -0.3243 *** | -0.3520 *** | -0.4080 *** | -0.3724 *** | -0.3664 *** | -0.4015 ** | -0.4644 *** | -0.4136 *** |
| Cluzon | -0.2448 *** | -0.2777 *** | -0.2785 *** | -0.2522 *** | -0.2379 *** | -0.2374 *** | -0.2841 *** | -0.2691 *** | -0.2961 *** | -0.2265 *** | -0.2937 *** | -0.3790 *** |
| Sluzon | -0.2690 *** | -0.2279 *** | -0.2339 *** | -0.1416 *** | -0.1207 *** | -0.0997 ** | -0.3720 *** | -0.2988 *** | -0.2414 *** | -0.1532 ** | -0.1796 *** | -0.2021 * |
| Bicol | -0.5384 *** | -0.5189 *** | -0.5021 *** | -0.4830 *** | -0.3244 *** | -0.3672 *** | -0.6437 *** | -0.5229 *** | -0.4956 *** | -0.4583 *** | -0.4842 *** | -0.4175 *** |
| Wvisayas | -0.5029 *** | -0.4469 *** | -0.3919 *** | -0.3731 *** | -0.2372 *** | -0.1557 ** | -0.4904 *** | -0.4635 *** | -0.3600 *** | -0.2713 *** | -0.3125 *** | -0.3787 *** |
| Cvisayas | -0.6754 *** | -0.5821 *** | -0.4684 *** | -0.4667 *** | -0.3760 *** | -0.2521 *** | -0.7847 *** | -0.6109 *** | -0.4689 *** | -0.4895 *** | -0.6209 *** | -0.4656 *** |
| Evisayas | -0.6917 *** | -0.6224 *** | -0.5370 *** | -0.5350 *** | -0.5304 *** | -0.2316 *** | -0.6733 *** | -0.6298 *** | -0.5240 *** | -0.6012 *** | -0.6305 *** | -0.7105 *** |
| Mindanao (NCR omitted) | -0.6164 *** | -0.5438 *** | -0.5054 *** | -0.6360 *** | -0.5372 *** | -0.4177 *** | -0.7009 *** | -0.5991 *** | -0.5356 *** | -0.5485 *** | -0.5896 *** | -0.4892 *** |
| CAR | -0.3847 *** | -0.3363 *** | -0.2365 *** | -0.2889 *** | -0.2673 *** | -0.3466 *** | -0.4939 *** | -0.4071 *** | -0.3315 *** | -0.1485 * | -0.2619 *** | -0.2762 ** |
| constant | 10.0375 *** | 10.5457 *** | 11.0045 *** | 10.1775 *** | 10.7203 *** | 11.2282 *** | 10.0391 *** | 10.7039 *** | 11.4122 *** | 10.2164 *** | 10.8689 *** | 12.2262 *** |
| Pseudo R2 | 0.3147 | 0.3909 | 0.4129 | 0.2768 | 0.2756 | 0.2495 | 0.2661 | 0.3138 | 0.3478 | 0.2459 | 0.2810 | 0.3052 |

Note: Parentheses for each percentile in the columns of the 1994 and 2000 FIES denote standard errors with 200 bootstrap replications for standard error estimates. Parentheses in the column of gaps between the 1994 and 2000 FIES denote the standard errors in the case of unequal variance. * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

5.4.2 Quantile Decomposition results of Expenditure Inequality

Table 5.8 reports the unconditional quantile decomposition results of the expenditure differences at the specific percentiles (10th, 50th, and 90th) in the case of the 1994 and the 2000 FIES, but also includes the mean regression results of the standard mean Oaxaca/Blinder decomposition. In the table, the quantile endowment effect (QEE) tells us how strong the difference is due to differences in household characteristics, while the quantile treatment effect (QTE) shows how strong the effect is attributable to differentials in household expenditure relationships across the remittance categories. The gaps in each effect between 1994 and 2000, which reveal the trends in expenditure differences among Filipino families over time, are also shown on the right-hand side of Table 5.8.⁶⁰

The table shows the extent of the endowment and treatment effects on the welfare differences comparing expenditure per capita of non-remittance receiving households (i.e., *dnorem*) and remittance receiving households (i.e., *dinrem*, *dexrem*, and *dbothrem*). For example, among the poor households (at the 10th percentile of the expenditure distributions), expenditure per capita of *dexrem* were 0.567 log points in 1994 and 0.603 log points in 2000 higher than that of *dnorem*. Holding the characteristics determining *dexrem* constant, 0.242 log points (or 42.7 per cent) in 1994 and 0.296 log points (or 49.1 per cent) in 2000 of the foregoing differences are due to treatment differences. The remaining differences of 0.325 log points (or 57.3 per cent) in 1994 and 0.307 log points (or 50.9 per cent) in 2000 are due to differences in the distribution of the characteristics between households with and without international remittances.

⁶⁰ With the t-test for unequal variances (see for example, Ruxton 2006), we tested whether the endowment and treatment effects were statistically different between two survey years.

Table 5. 8: Decomposition results of the expenditure differences in distribution (including mean results)

| | | 1994 FIES | | | | | | 2000 FIES | | | | | | Gaps (2000-1994) | | | | | |
|-----------------|-------------|-----------|-----|---------|-----|---------|-----|-----------|-----|---------|-----|---------|-----|------------------|-----|---------|-----|---------|-----|
| | | Total | | QEE | | QTE | | Total | | QEE | | QTE | | Total | | QEE | | QTE | |
| dexrem | Mean | 0.575 | *** | 0.322 | *** | 0.253 | *** | 0.584 | *** | 0.263 | *** | 0.321 | *** | 0.009 | | -0.059 | *** | 0.068 | *** |
| | | (0.014) | | (0.012) | | (0.012) | | (0.012) | | (0.010) | | (0.010) | | (0.018) | | (0.015) | | (0.016) | |
| | 10th | 0.567 | *** | 0.325 | *** | 0.242 | *** | 0.603 | *** | 0.307 | *** | 0.296 | *** | 0.036 | | -0.018 | | 0.054 | *** |
| | | (0.020) | | (0.014) | | (0.017) | | (0.015) | | (0.010) | | (0.013) | | (0.025) | | (0.017) | | (0.021) | |
| | 50th | 0.619 | *** | 0.351 | *** | 0.267 | *** | 0.624 | *** | 0.271 | *** | 0.353 | *** | 0.006 | | -0.080 | *** | 0.086 | *** |
| dinrem | Mean | -0.047 | *** | 0.012 | | -0.060 | *** | -0.126 | *** | -0.061 | *** | -0.065 | *** | -0.078 | *** | -0.073 | *** | -0.005 | |
| | | (0.010) | | (0.009) | | (0.008) | | (0.008) | | (0.007) | | (0.007) | | (0.013) | | (0.011) | | (0.010) | |
| | 10th | 0.005 | | 0.034 | *** | -0.029 | *** | -0.008 | | 0.009 | | -0.017 | *** | -0.013 | | -0.025 | *** | 0.012 | |
| | | (0.011) | | (0.008) | | (0.009) | | (0.009) | | (0.007) | | (0.008) | | (0.014) | | (0.011) | | (0.012) | |
| | 50th | -0.033 | *** | 0.016 | * | -0.050 | *** | -0.118 | *** | -0.052 | *** | -0.065 | *** | -0.084 | *** | -0.069 | *** | -0.016 | |
| dbothrem | Mean | -0.125 | *** | -0.064 | *** | -0.062 | *** | -0.261 | *** | -0.178 | *** | -0.083 | *** | -0.135 | *** | -0.114 | *** | -0.022 | |
| | | (0.017) | | (0.014) | | (0.013) | | (0.014) | | (0.011) | | (0.011) | | (0.023) | | (0.017) | | (0.017) | |
| | 10th | 0.453 | *** | 0.287 | *** | 0.166 | *** | 0.438 | *** | 0.179 | *** | 0.259 | *** | -0.015 | | -0.108 | *** | 0.093 | *** |
| | | (0.017) | | (0.014) | | (0.014) | | (0.017) | | (0.012) | | (0.013) | | (0.024) | | (0.019) | | (0.019) | |
| | 50th | 0.494 | *** | 0.312 | *** | 0.181 | *** | 0.517 | *** | 0.266 | *** | 0.250 | *** | 0.023 | | -0.046 | *** | 0.069 | *** |
| dbothrem | Mean | 0.497 | *** | 0.322 | *** | 0.174 | *** | 0.456 | *** | 0.193 | *** | 0.262 | *** | -0.041 | | -0.129 | *** | 0.088 | *** |
| | | (0.017) | | (0.013) | | (0.015) | | (0.019) | | (0.012) | | (0.015) | | (0.026) | | (0.018) | | (0.021) | |
| | 50th | 0.339 | *** | 0.204 | *** | 0.135 | *** | 0.330 | *** | 0.058 | *** | 0.273 | *** | -0.009 | | -0.147 | *** | 0.138 | *** |
| | | (0.028) | | (0.018) | | (0.027) | | (0.028) | | (0.018) | | (0.023) | | (0.040) | | (0.026) | | (0.036) | |
| | 90th | | | | | | | | | | | | | | | | | | |

Note:

- Quantile endowment effects (QEE), Quantile treatment effects (QTE)
- Parentheses for each percentile in the columns of the 1994 and 2000 FIES denote standard errors with 200 bootstrap replications for standard error estimates.
- Parentheses in the column of gaps between the 1994 and 2000 FIES denote the standard errors in the case of unequal variance. * p<0.01, ** p<0.05, *** p<0.01 (two-tailed).
- Internal Remittance-receiving Households (Inrem), External Remittance-receiving Households (Exrem), Both internal and external Remittance-receiving Households (Bothrem).

The most obvious result to emerge from Table 5.8 is that compared to Filipino households with no remittance incomes (i.e., *dnorem*), the households which receive international remittances (i.e., *dexrem* or *dbothrem*) have the greater treatment effects at any percentile of the per capita household expenditure distribution and the effects are getting larger after the crises with other things held constant. This result may be explained by the fact that households receiving remittances from abroad could smooth their budget constraints and would have higher propensities to spend rather than households without remittance incomes. Especially, as the conditional quantile regression results revealed that having a female or an unemployed household head, regardless of the household expenditure level, could significantly increase the welfare level in 2000 among households who had received international remittances, compared to households who did not receive any remittance income. Clearly, international remittance-receiving households with a female or an unemployed household head would rely heavily on remittance incomes from their family members working abroad. On the other hand, with regard to the household expenditure differences between households with and without remittances from within the Philippines, the quantile treatment effects are always negative and recorded no statistically significant difference at any quantile between 1994 and 2000. This means that households in the receipt of remittances from within the Philippines have a lower propensity to spend than those with no receipt of remittance, with other things the same, over the period of 1994-2000. In particular, the effects of household heads' high educational attainment on the welfare level were significantly lower among the domestic remittance-receiving households than non-remittance-receiving households in 2000. An explanation for this is that households with highly educated heads and which do not rely on remittances could be better-off due to better job opportunities within the Philippines, compared with

households which depend on remittances from within the country. The findings in this chapter reveal that the receipt of international remittances could significantly contribute to an improvement in Filipino households' livelihoods at any welfare level and could be a major factor in increasing household expenditure inequality between Filipino households in the period of 1994-2000. Unlike the conditional quantile regression results reported in Table 5.5 and Table 5.6, unconditional quantile decomposition analysis revealed that the receipt of international remittances increases the household welfare the most among the middle welfare group. The remittances enable the middle class to climb up the economic ladder and it makes the welfare gaps widen between the poor and the middle rather than the middle and the rich welfare groups.

After the receipt of the remittances, households could spend broadly across several expenditure items such as food, education, housing, health care, durables and leisure. Among these items, international remittance recipient (RR) households are likely to increase the share of expenditures on education and housing (see Table 5.9). Education seems to be one of the main usages of international remittances. Its share increased from 3.8 per cent to 4.5 per cent among RR households and the gap in education expenditures between households with and without the remittances widened during the period of 1994-2000. If receiving the remittances actually contributes to an increase in educational expenditures, it could make the households improve not only their welfare but household characteristics such as educational attainments and the number of school attending children. The continuous receipt of the remittances will make endowments of the recipient households better and it would contribute to a steady increase in the welfare level in the longer term. In addition, another finding of this research is that households could not significantly have improved their welfare even if they had

received remittances from within the Philippines due to the relatively small amounts of such transfers. Households who receive domestic remittances are likely to have the lower welfare levels than non-remittance recipients. This was mainly because they have the lower endowments as well as the lower propensity to spend. The results tell us that the differences in household characteristics between households with and without either international remittances or domestic remittances accounted for the gaps in the welfare level. However, even after controlling for the effects of endowments, we found that the receipt of international remittances significantly changes household expenditure patterns and it can make the households improve their welfare level.

Table 5. 9: Shares of Household Expenditure among International Remittance Recipient (RR) and Non-Recipient (NR) Households, 1994-2000

| | 1994 FIES | | | | 2000 FIES | | | |
|--------------------------|-----------|-------|----------|--------|-----------|-------|----------|--------|
| | RR | NR | Gap | t-test | RR | NR | Gap | t-test |
| Expenditure Items | | | | | | | | |
| Food | 48.5% | 57.3% | -8.7% ** | 39.80 | 44.9% | 54.5% | -9.6% ** | 52.73 |
| Education | 3.8% | 2.3% | 1.5% ** | 15.53 | 4.5% | 2.7% | 1.8% ** | 20.47 |
| Health Care | 2.3% | 1.7% | 0.6% ** | 6.96 | 2.3% | 1.4% | 0.8% ** | 11.82 |
| House | 14.8% | 10.6% | 4.2% ** | 25.11 | 14.7% | 11.4% | 3.3% ** | 25.80 |
| Durables | 2.0% | 1.4% | 0.6% ** | 6.54 | 2.1% | 1.2% | 1.0% ** | 12.63 |
| No. of Obs | 4813 | 19352 | | | 7155 | 32460 | | |

Note: t-test denotes the mean comparisons between 1994 and 2000. * p<0.01, ** p<0.05

5.5 Concluding Remarks

This chapter has attempted to investigate the effect of the receipt of remittances on household expenditure inequality in the Philippines over periods before and after the Asian financial crisis in 1997 and the severe drought of 1998 when the inequality of the welfare distribution dramatically increased. Three different analyses were used at mean and at the specific quantile (i.e., 10th, 50th, and 90th) based on the types of the receipt of remittance incomes (i.e., *dinrem*, *dexrem*, and *dbothrem*) in the period of 1994-2000 using the Philippine Family Income and Expenditure Survey (FIES). First, ordinary least square (OLS) and conditional quantile regressions were used with remittance dummy variables which capture the effects of the receipt of remittances on the household welfare level. Assuming that there is no difference in the effects of household characteristics on the welfare level between households who received remittances and those who did not, we found that the receipt of international remittances significantly increased their livelihoods and that its effect increased from 1994 to 2000 at any selected point on the welfare distribution. Second, conditional interquantile regressions were used to investigate whether the remittances contributed to widening the welfare gaps between the poor and the middle and the affluent households. The results show that in 2000 the receipt of international remittances significantly increased the gaps between rich and poor, which were mainly explained by the differences between the middle and the rich groups. This implies that the remittances contributed the most to the rich and it could thus increase the welfare inequality. Finally, an unconditional quantile decomposition approach was used to estimate the endowment and remittance effects on the quantiles of the unconditional distribution of the welfare. The result revealed that even after controlling for the effect of household characteristics on the level of household expenditure, the study found that receiving international remittances change

household expenditure patterns causing expenditure gaps between Filipino households to widen between 1994 and 2000. One of the more significant findings to emerge from the unconditional quantile decomposition is that unlike conditional quantile regressions, the receipt of international remittances contributed to an improvement in the welfare of the middle class the most followed by the rich, and widens the welfare differences between poor and middle welfare households.

In contrast, the receipt of remittances from within the Philippines did not exert a significant impact on improving the welfare of Filipino households. The results of this study also suggest that widening the expenditure inequality in the Philippines from 1994 to 2000 is mainly accounted for by the receipt of international remittances. These money transfers from abroad are often used to improve their welfare level. A case in point is child education. Some migrant workers go abroad and remit to send their children to better schools, in many cases to private schools. This important relationship between remittances and education will be examined in Chapter Six.

The results also indicate that there is an importance in dealing with the expenditure differentials by taking into account the types of households in terms of the receipt of remittances. The current findings add to our understanding of the expenditure gaps between Filipino households which do or do not receive international remittances as well as domestic ones. The quantile decomposition results for this study enhance our understanding of the welfare gaps as we can decompose the gaps at any point of the welfare distribution. The result of the Blinder-Oaxaca decomposition approach which decomposes the mean expenditure differentials needs to be interpreted with caution because the mean expenditure gaps reported in this chapter are significantly different

from the median and other quantile expenditure differences. It was found that mean expenditure differentials were smaller than the median ones (see Table 5.8). Suggesting that focusing on the mean regression decomposition analysis could lead researchers or policymakers to underestimate the effect of remittances on the household welfare and actually it does not give any clues to understanding the gaps between rich and poor. Further investigations are needed to estimate the effect of remittances on the inequality with due consideration of the issue of sample selection bias mentioned before. There is, therefore, a need for more detailed information on the decisions of remitting and migration itself to enable us to apply the quantile regression procedure which can deal with this type of selection issue, as developed by Buchinsky (1998, 2001) and Albrecht, van Vuuren and Vroman (2009), though it is acknowledged that these are very complicated procedures to implement and ideally require considerably larger sample sizes than those currently available to us.

Chapter 6: The effects of remittances on education expenditures among Filipino households

6.1 Introduction

The Philippines is one of the major labour-exporting and remittance receiving countries in the world. It is estimated that more than 1.4 million Filipino workers went abroad in 2009 (POEA, 2009). As of December 2008, over 8.2 million Filipinos (or almost ten per cent of the population) live outside the country. Nearly half of them are temporary contract workers, mostly based in Middle East countries (CFO, 2008). The top three destinations of the land-based overseas Filipino workers (OFWs) in 2009 are Saudi Arabia (26.7 per cent of total land-based workers), followed by United Arab Emirates (18.0 per cent) and Hong Kong (9.2 per cent). About 80 per cent of Filipino workers emigrating each year are land-based, and the remaining 20 per cent are seamen, which constitute almost one quarter of the world's seamen on commercial vessels (IOM, 2005).

In terms of remittances, the total amount of remittances sent by OFWs reached 18.76 billion US dollars in 2010 which accounts for almost ten per cent of the Philippines GDP.⁶¹ The considerable amount of these remittances from abroad has attracted the attention of governments, international organizations, and the academic community, especially on their potential to benefit the economy and recipient households.

The remittances transferred from abroad potentially influence the households' spending behaviour. A typical example of a positive use of remittances is to finance education for migrant family members as it becomes a part of human investment that contributes to a

⁶¹ According to the World Economic Outlook Database (IMF, April 2011), the nominal gross domestic product (GDP) in the Philippines was 188.719 billion US dollars in 2010.

long term economic growth. In fact, one of the main reasons many Filipino working abroad send remittances back to the Philippines is because of education for their children or siblings. Therefore, this chapter focuses on examining the effects of remittances on education spending at the household level by looking specifically at whether the education spending among households that received remittances is significantly higher than those with no remittance incomes. In doing so, it employs both statistical and a variety of econometric methods to confirm the overall robustness of the results. The next two sections briefly summarise the key features of education in the Philippines to establish the context for the analysis. The following section describes the key findings from the previous literature on the effects of remittances on education spending to date and highlights the contributions of this chapter especially in using the complete data series and methodological approach. Section Four then describes the data used followed by Section Five that outlines the empirical methodology adopted in this study. Section Six discusses the main results that inform the conclusions and policy implication summarised in the last section.

6.2 Education in the Philippines

The education system in the Philippines is strongly influenced by the American system, which consists of primary, secondary and tertiary levels. For primary education, there are six compulsory grades in public schools, and seven in some private schools. For secondary education, there are just four grades. Thus, students leave secondary school at the age of 15 or 16. Tertiary education starts from the age of 16. Tertiary education levels are divided into college, masters and doctorate level.

The English speaking nature of schooling in the Philippines provides the basis for a potential employment opportunity abroad, especially in English-speaking countries. For example, there is a demand for nurses in Canada, United States, and United Kingdom, caregivers in Canada, mathematics and science teachers as well as IT engineers in United States. Furthermore, a booming Chinese economy has created a demand for Filipino teachers and housemaids because of their fluency in the English language. With regard to Philippine nurses, the number of nursing schools has mushroomed and generates a huge number of graduates every year. In 2009, over 70,000 graduates passed nursing licensure examinations (Lorenzo et.al, 2009). Most successful candidates plan to work abroad. In contrast, mathematics, science, and engineering are not popular programs at the tertiary level though these subjects are very important for technological innovation which provides a potential engine for economic growth.

Table 6.1 reports the recent school enrolment ratios in selected Asian countries, which is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education. In the case of the Philippines, in 2005, the primary, secondary and tertiary school gross enrolment ratios were 112.5 per cent⁶², 85.2 per cent and 28.1 per cent respectively. These figures can be compared favourably with some economically more advanced Asian countries such as Malaysia, Thailand, and China although the enrolment ratios for tertiary education in Malaysia and in Thailand are higher. The level of educational attainment in the Philippines is relatively high compared to neighbouring countries and returns to education are substantial (see Hossain and Psacharopoulos, 1994; Maluccio, 1998; Sakellariou, 2004). However, the

⁶² School enrolment ratios with a value in excess of 100 per cent could be explained by the incidence of under-aged and/ or over-aged school enrolment. As for over-aged enrolment, it would be explained by late entrance into primary education or the incidence of repetition. In many developed countries, primary education is mandatory. Thus, primary school enrolment ratios are usually 100 per cent.

quality of education in the Philippines has been declining due to the modest state budget for basic education, which is less than three per cent of GDP (Alba, 2009).

Table 6. 1: School Enrolment Ratios by the level of education and by gender

| | Malaysia | Thailand | China | Philippines | Indonesia | Vietnam |
|----------------------------|----------|----------|-------|-------------|-----------|---------|
| <u>Primary Education</u> | 95.8 | 97.1 | 112.8 | 112.5 | 117.3 | 94.5 |
| <i>Male</i> | 96.0 | 99.6 | 113.5 | 113.1 | 119.4 | 97.6 |
| <i>Female</i> | 95.6 | 94.6 | 112.0 | 111.8 | 115.1 | 91.3 |
| <u>Secondary Education</u> | 76.4 | 70.3 | 74.3 | 85.2 | 63.1 | 75.8 |
| <i>Male</i> | 71.6 | 69.0 | 74.2 | 80.7 | 63.5 | 76.7 |
| <i>Female</i> | 81.4 | 71.6 | 74.5 | 90.0 | 62.8 | 74.8 |
| <u>Tertiary Education</u> | 32.0 | 43.0 | 20.3 | 28.1 | 17.1 | 16.0 |
| <i>Male</i> | 27.9 | 40.7 | 20.8 | 25.3 | 19.0 | 18.7 |
| <i>Female</i> | 36.4 | 45.4 | 19.8 | 31.0 | 15.1 | 13.2 |

Note: The figures are based on Year 2005, except for Malaysia, where data is collected in 2004.

Source: World Development Indicators 2007.

As for gender differences, the female enrolment ratios for secondary and tertiary education in the Philippines are significantly larger than the male enrolment rates. These features are also reported for Malaysia and Thailand as well.

In the Philippines, as for secondary education, there has been an increasing trend towards public education in the 1990s (Orbeta, 2003: 18). This might be explained by the free secondary education policy as mandated by the Free Public Secondary Education Act of 1988 (or RA 6655). The reduction in the educational costs arising from this act could make the incidence of child labour in the Philippines less likely.⁶³ With regard to tertiary education, it is much more obvious that there is a disparity in school attendance of school-age population due to household income (see Orbeta, 2003: 62). The school enrolment in this level is predominantly private.⁶⁴ In the Philippines,

⁶³ According to the 1999 Annual Poverty Indicator Survey, the incidence of child labour in the Philippines in the 12-17 age group exceeds ten per cent (Sakellariou, 2006: 475).

⁶⁴ The public tertiary schools consist of state universities and colleges and other public institutions, whereas private tertiary schools are subdivided into sectarian and non-sectarian institutions.

unlike many other Asian countries, the enrolment in higher education has always been dominated by private education and there are a large number of private tertiary education institutions across the country (see Table 6.2).

Table 6. 2: Distribution of Tertiary Education Institutions by region and by type (as of July 18, 2002)

| Region | Public Schools | Private Schools | TOTAL | Private/Public |
|-------------------|----------------|-----------------|-------|----------------|
| Ilocos | 7 | 68 | 75 | 9.7 |
| Cagayan | 8 | 44 | 52 | 5.5 |
| Central Luzon | 15 | 126 | 141 | 8.4 |
| Southern Luzon | 18 | 197 | 215 | 10.9 |
| Bicol | 20 | 91 | 111 | 4.6 |
| Western Visayas | 17 | 76 | 93 | 4.5 |
| Central Visayas | 7 | 87 | 94 | 12.4 |
| Eastern Visayas | 14 | 47 | 61 | 3.4 |
| Western Mindanao | 6 | 38 | 44 | 6.3 |
| Northern Mindanao | 7 | 49 | 56 | 7.0 |
| Southern Mindanao | 5 | 76 | 81 | 15.2 |
| Central Mindanao | 6 | 65 | 71 | 10.8 |
| NCR | 20 | 247 | 267 | 12.4 |
| CAR | 7 | 23 | 30 | 3.3 |
| ARMM | 9 | 13 | 22 | 1.4 |
| Caraga | 4 | 35 | 39 | 8.8 |
| Grand Total | 170 | 1282 | 1452 | 7.5 |
| % to Total | 11.7% | 88.3% | 100% | |

Source: Orbeta (2003) p.19, Table 9

However, the enrolment ratio in the private tertiary schools decreased from 89.7 per cent in the period of 1970-1971 to 73.1 per cent in the period of 2000-2001 (see Orbeta, 2003:18). This is because many households found private education less affordable. As for the difference in education expenditures between public and private institutions, private school unit costs vary widely and their variation is determined by school quality and location. While public school unit costs are also very variable, the costs are largely determined by school enrolment size. The costs are less expensive with larger enrolments. Table 6.3 reports the detailed tertiary education expenditure depending on the type of institutions. The total education expenditure for tertiary level is 1.7 times

higher in the private than in the public sector. The largest gap is for tuition and other fees, which cost 3.8 times more in private institutions.

Table 6. 3: Tertiary Education expenditure (in Philippine pesos) by type in 1995

| | Public | | Private | | Private/Public Ratio |
|------------------------|--------|------------|---------|------------|-------------------------|
| | Level | % to Total | Level | % to Total | |
| Tuition and other fees | 1908 | 13.6% | 7190 | 29.8% | 3.8 |
| PTA | 80 | 0.6% | 231 | 1.0% | 2.9 |
| Other fees | 655 | 4.7% | 1253 | 5.2% | 1.9 |
| Books | 922 | 6.6% | 1717 | 7.1% | 1.9 |
| School supplies | 779 | 5.5% | 1091 | 4.5% | 1.4 |
| Other materials | 812 | 5.8% | 1481 | 6.1% | 1.8 |
| Uniforms | 1748 | 12.4% | 2062 | 8.5% | 1.2 |
| Transport | 3308 | 23.6% | 3706 | 15.3% | 1.1 |
| Board and lodgings | 3833 | 27.3% | 5422 | 22.4% | 1.4 |
| Total | 14045 | 100% | 24153 | 100% | 1.7 |

Note: Tertiary education includes technical, vocational education & training

Source: Orbeta (2003) p.15, Table 6

With regard to the participation in higher education, it is known to be skewed towards richer households. In public schools selective admission discriminates against poor students, whereas in the private schools high-quality institutions have both selective admissions procedures and higher tuition fees (Orbeta, 2003:33). The disparity in the tertiary school attendance based on household income is more evident in rural than in urban areas. Maximum and minimum differences in school attendance rates across income groups reveal that the gaps in tertiary school attendance rates within rural Filipino households widened from 21.6 per cent to 30.7 per cent between 1988 and 2000, while the differences within urban families increased by just 3.8 percentage points from 16 per cent to 19.8 per cent (see Table 6.4). Between 1988 and 2000, the total attendance rates for tertiary level increased both in urban and rural areas, except for the poor in urban areas. The rates were higher in urban areas compared to rural areas across all income groups in 1988, whereas there was a significant increase in school attendance rates among rural households in the middle and high income deciles in 2000.

This shows the clear evidence that among Filipino households living within both urban and rural areas the disparity in access to higher education between rich and poor has grown from 1988 to 2000.

Table 6. 4: School attendance of tertiary education by income deciles by location, 1988-2000

| | | 1988 | | 2000 | | Changes (2000-1988) | |
|---------------------|----|-------|-------|-------|-------|------------------------|-------|
| | | Urban | Rural | Urban | Rural | Urban | Rural |
| Total | | 36.2 | 25.6 | 38.4 | 32.3 | 2.2 | 6.7 |
| Lowest Income | 1 | 37.0 | 22.0 | 29.5 | 23.5 | -7.5 | 1.5 |
| | 2 | 34.9 | 21.4 | 36.2 | 23.8 | 1.3 | 2.4 |
| | 3 | 25.5 | 19.8 | 25.8 | 26.8 | 0.3 | 7.0 |
| | 4 | 28.0 | 22.0 | 31.4 | 33.3 | 3.4 | 11.3 |
| | 5 | 33.1 | 24.6 | 32.2 | 33.2 | -0.9 | 8.6 |
| | 6 | 30.4 | 26.8 | 34.2 | 36.0 | 3.8 | 9.2 |
| | 7 | 37.4 | 24.0 | 38.3 | 42.2 | 0.9 | 18.2 |
| | 8 | 36.5 | 33.1 | 39.5 | 34.8 | 3.0 | 1.7 |
| | 9 | 41.5 | 41.4 | 45.6 | 54.2 | 4.1 | 12.8 |
| | 10 | 41.4 | 39.2 | 45.6 | 46.7 | 4.2 | 7.5 |
| Highest Income | | | | | | | |
| Max-Min Differences | | 16.0 | 21.6 | 19.8 | 30.7 | | |

Note: Primary 10-12 years; Secondary 13-16 years; Tertiary 17-24 years

Source: Orbeta (2003) p. 63, Table 24

6.3 Effects of Remittances on Household Education Expenditures

A large and growing body of literature has investigated the effect of remittances on household expenditure patterns (see for example, Adams, 2005 for Guatemala; Castaldo and Reilly, 2007 for Albania; Yang, 2004 and Tabuga, 2007 for the Philippines). There is some evidence that the receipt of remittances stimulates expenditure in education. For example, it was found that the sudden depreciation of the Philippine exchange rate during the Asian economic crisis increased remittances from the OFWs and also increased educational expenditures in the Philippines (Yang, 2004). Moreover, in Guatemala, Adams (2005) suggested that, at the margin, households receiving international remittances spend more on education than do households with internal remittances. Furthermore, using the 2003 Family Income and Expenditure Survey (FIES), Tabuga (2007) also found that remittance from abroad positively influenced an

increase in the budget share of education among those Filipino households with members aged between 7 and 24 years. Furthermore, it has recently been argued that it seems to be common for OFW parents to say that the primary reason for working abroad is to provide a good education for their children (PIDS, 2008: 3; Edillon, 2008: 21). It is found that education expenditure of OFW families is nearly twice that of non-OFW families (PIDS, 2008: 4; Edillon, 2008: 29).

Households seem to have different expenditure patterns depending on their receipt of different types of remittance. However, it is not straightforward to measure the impact of remittances on consumption or investment. This is because remittances are fungible. For example, even if migrants send remittances for a child's education, recipient households might not use the remittance for the original intended purpose and could spend it in different ways. Also, it seems not possible to divide remittance incomes into the amount of each expenditure item the households purchased. Furthermore, it is also difficult to separate remittances from other sources of income (World Bank 2006, 126). Using household budget surveys would be appropriate to investigate the effect of remittances on changes in household expenditure patterns. By using Filipino household surveys, this chapter focuses on analysing the effect of the receipt of international remittances on changes in household expenditure on education.

In the last few years, several studies have been devoted to an investigation of the effect of remittances on a migrant household's expenditure pattern (Adams, 1998, 2005; Castaldo and Reilly, 2007; Taylor and Mora, 2006; Zarate-Hoyos, 2004; Tabuga, 2007). Using data from the 469 households on a wide range of topics, including income, expenditures, education, employment, migration, and household assets in rural Pakistan,

Adams (1998) concluded that all remittance income is not the same. It was found that households who received external remittances tended to treat such earnings from abroad as temporary shocks to income and were more likely to invest them. By contrast, households who received internal remittances tended to treat such earnings as a mixture of permanent and transitory income, which should be used for both consumption and investment activities. Moreover, Adams (2005) used a large household data set from Guatemala to analyse how the receipt of internal remittances (from Guatemala) and international remittances (from the United States) affected the marginal spending behaviour of households on various consumption and investment goods. It was found that households who received remittances actually spent less at the margin on consumption – food and consumer goods and durables – than did households with no remittances. Instead of spending on consumption, households receiving remittances tended to spend more on investment goods, like education, health and housing. It is known from previous studies that a large amount of remittances goes into education. At the margin, households receiving internal and international remittances spent 45 and 58 per cent more, respectively, on education than households who receive no remittances. These increased expenditures on education represent an investment in human capital. Like other studies, Adams (2005) also found that remittance-receiving households spent more at the margin on housing. This increase in expenditures on housing represents a type of investment for the migrant as well as a means for boosting local economic development through creating new income and employment opportunities for both skilled and unskilled workers. Similarly, Castaldo and Reilly (2007) investigated the extent to which the expenditure patterns of Albanian households are affected by the receipt of migrant remittances. They found that households who received internal remittances did not behave differently from those who did not receive this source of

transfer. On the other hand, households who received remittances from abroad spent, on average, a lower share of their expenditure on food and a higher share on durables than households who did not receive this type of transfer. In addition, Taylor and Mora (2006) examined how migration affects household expenditure patterns using the Mexico National Rural Household Survey of 2003, surveyed in January and February, which has 1,782 sample households in rural Mexico. They concluded that households with migrants abroad have higher marginal budget shares for investment, health and durable consumption, whereas they have smaller shares for food and housing. On the other hand, households that have migrants working in Mexico have higher marginal budget shares for health, housing, services, and education, while they have smaller shares for supermarkets, durable consumption, and investments. Furthermore, using another Mexican survey, the Mexican Income and Expenditure Survey for 1989, Zarate-Hoyos (2004) also examined the expenditure patterns of remittance-receiving households. It concluded that households that receive remittances have higher budget shares in investment than those that do not receive remittances. It was also noted that households with remittances have smaller income elasticities for current consumption and for durable consumption than those with no remittances. In the case of the Philippine research, Tabuga (2007) examined the influence of remittances from abroad on Filipino families' expenditure patterns with respect to various commodity groups using the 2003 FIES and found that remittances induce households to spend more on education, medical care, housing, consumer goods, leisure, and durable goods, and to spend less on food, especially on eating-out. Moreover, using the 2006 FIES, Ang, Sugiyarto, and Jha (2009) examined the effect on household expenditure share on several expenditure items such as food, education, health, housing, tobacco & alcohol, gifts, and leisure activities. They used the instrumental variable technique to address the

endogeneity bias caused by reverse causation between remittance and household expenditure. With regard to the impact of remittances on education, they found that households with the receipt of international remittances had a lower budget share of education compared to those without remittance incomes though this particular result was not found to be statistically significant.

6.4 Data

Education

In the Family Income and Expenditure Survey (FIES) household education expenditure is defined as the sum of tuition fees, study allowance away from home, books, school supplies, and other education supplies. As of December 2010, the FIES in the Philippines is available every three years from 1985 to 2006. With regard to the Philippine education policy, however, the free secondary education policy was mandated by the Free Public Secondary Education Act (or RA 6655) in 1988. Therefore, we cannot simply compare the impacts of remittances on the household educational expenditure patterns before and after 1988 because public secondary education has become free after 1988 and Filipino households would have quite different motivations to spend remittance incomes on education before and after 1988. Hence, in this chapter, our research focuses on comparing the results from the data available after 1988.

With regard to the mean budget share on education expenditures, the FIES results show that the share of all Filipino households rose, on average, from 3.0 per cent in 1988, to 3.5 per cent in 1994, to 4.1 per cent in 2000, and to 4.0 per cent in 2006. In real terms (standardised at 2005 prices by CPI), the absolute value of average education expenditures also increased from 4,864 pesos in 1988, to 6,461 pesos in 1994, and to

9,057 pesos in 2000 but slightly declined to 8,110 pesos in 2006 (see Table 6.5). This trend of the education expenditures is the same regardless of whether or not remittances are received. By distinguishing households with and without international remittances as well as domestic remittances, they are divided into four types; households who received both domestic and international remittances (*dbothrem*), those who received only external remittances (*dexrem*), those who received only internal remittances (*dinrem*), and those who received no remittances at all (*dnorem*). The mean education expenditures among the *dexrem* households were greater than other households. They were twice and three times as much as the *dnorem* households' and the *dinrem* households', respectively (see Table 6.5). From the above results, we assume that there would be a strong relationship between the international remittances households received and their education expenditures. Needless to say, other factors, for example the numbers of students and their age, and household welfare levels, also affect the level of education expenditures. We will analyse the effects of remittances and other household characteristics on education later in this chapter.

Table 6. 5: The average share (*edush*) and the average absolute value (*educ*) of education expenditures among households who spent on education (Philippine pesos, in real terms), 1988-2006

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|-----------------|-----------|-----------|-----------|-----------|
| Total | | | | |
| educsh | 0.030 | 0.035 | 0.041 | 0.040 |
| educ (in real) | 4,864 | 6,461 | 9,057 | 8,110 |
| No. of Obs | 12,664 | 17,857 | 28,833 | 27,188 |
| Share (%) | (100%) | (100%) | (100%) | (100%) |
| dnorem | | | | |
| educsh | 0.028 | 0.033 | 0.038 | 0.035 |
| educ (in real) | 4,503 | 5,742 | 8,279 | 6,964 |
| No. of Obs | 6,780 | 9,370 | 15,669 | 11,008 |
| Share (%) | (53.5%) | (52.5%) | (54.3%) | (40.5%) |
| dinrem | | | | |
| educsh | 0.026 | 0.029 | 0.035 | 0.032 |
| educ (in real) | 3,375 | 4,347 | 5,761 | 4,605 |
| No. of Obs | 3,710 | 4,718 | 7,714 | 9,365 |
| Share (%) | (29.3%) | (26.4%) | (26.8%) | (34.4%) |
| dexrem | | | | |
| educsh | 0.045 | 0.052 | 0.061 | 0.061 |
| educ (in real) | 9,593 | 11,752 | 17,263 | 16,586 |
| No. of Obs | 1,449 | 2,438 | 3,869 | 3,910 |
| Share (%) | (11.4%) | (13.7%) | (13.4%) | (14.4%) |
| dbothrem | | | | |
| educsh | 0.035 | 0.042 | 0.053 | 0.054 |
| educ (in real) | 6,415 | 9,329 | 12,767 | 12,345 |
| No. of Obs | 725 | 1,331 | 1,581 | 2,905 |
| Share (%) | (5.7%) | (7.5%) | (5.5%) | (10.7%) |

Note: CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Remittances

Furthermore, the FIES ask respondents to report on a variety of transfers, including remittances, both in-kind and cash, from domestic sources and from overseas. With respect to the detailed information on remittances, the data on cash receipts from abroad and those from within the Philippines are separately collected. For the FIES, cash receipts from both abroad and within the Philippines and gifts and other assistance in kind⁶⁵ from any of the above two sources were separately reported in the datasets.

However, the basic public use files of the FIES have only the aggregated figures of both

⁶⁵ Gifts and other assistance in kind are measured in cash to calculate the total amount of domestic and international remittances.

transfers from abroad and from within the Philippines, not figures relating to the fine classification (Tabuga, 2007). Thus the total amounts of transfers from abroad and domestic sources are used in the analysis.

The number of sample households depending on their receipt of remittances and their average amount of remittances received, which were derived from the FIES, are reported in Table 6.6. Among households who received only external remittances (or *dexrem*) or those with both internal and external remittances (or *dbothrem*), the mean values of remittances have continuously increased in nominal terms in the survey years and are much bigger than that of total remittances though they slightly declined in real terms from 2000 to 2006. On average, households who received remittances only from abroad (or *dexrem*) have the higher mean values of remittances than any other households (i.e., *dnorem*, *dinrem*, and *dbothrem*).

Table 6.7 and Table 6.8 report the definition of the variables used in the analysis and the summary statistics of the 1988, the 1994, the 2000 and the 2006 FIES used in the analysis, respectively.

Table 6. 6: Type of remittances received and their average amounts (in Philippine pesos), 1988-2006

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|---------------------|-----------|-----------|-----------|-----------|
| Total | | | | |
| Amount (in nominal) | 4,036 | 8,949 | 15,817 | 23,244 |
| Amount (in real) | 10,926 | 13,045 | 15,817 | 16,856 |
| No. of Obs | 18,429 | 24,165 | 39,615 | 38,480 |
| Share (%) | (100%) | (100%) | (100%) | (100%) |
| dinrem | | | | |
| Amount (in nominal) | 2,544 | 5,597 | 10,018 | 11,335 |
| Amount (in real) | 6,887 | 8,159 | 10,018 | 8,220 |
| No. of Obs | 5,632 | 6,620 | 11,021 | 13,548 |
| Share (%) | (30.6%) | (27.4%) | (27.8%) | (35.2%) |
| dexrem | | | | |
| Amount (in nominal) | 23,810 | 39,978 | 78,990 | 95,502 |
| Amount (in real) | 64,455 | 58,277 | 78,990 | 69,255 |
| No. of Obs | 1,862 | 3,093 | 5,048 | 5,067 |
| Share (%) | (10.1%) | (12.8%) | (12.7%) | (13.2%) |
| dbothrem | | | | |
| Amount (in nominal) | 15,778 | 32,297 | 55,740 | 65,838 |
| Amount (in real) | 42,712 | 47,080 | 55,740 | 47,743 |
| No. of Obs | 996 | 1,720 | 2,107 | 3,903 |
| Share (%) | (5.4%) | (7.1%) | (5.3%) | (10.1%) |
| dnorem | | | | |
| No. of Obs | 9,939 | 12,732 | 21,439 | 15,962 |
| Share (%) | (53.9%) | (52.7%) | (54.1%) | (41.5%) |

Note:

(a) The amounts of remittances are shown both in nominal and in real terms. Thus, the exchange rate and inflation rate are not considered to estimate the average amount of remittances received.

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Table 6. 7: Definition of the variables used in the analysis

| Variable Name | Variable Description |
|------------------------------------|--|
| <u>Education</u> | |
| edush | The budget share for education expenditure among all households |
| educsh if educ>0 | The budget share for education expenditure among households who spent on education |
| educ (in real) | The education expenditures (Philippine pesos in real terms) among all households |
| educ (in real) if educ>0 | The education expenditures (Philippine pesos in real terms) among households who spent on education |
| <u>Welfare</u> | |
| totex (in real) | The total family expenditures (Philippine pesos in real terms) |
| lpctotex | The natural logarithm of the total family expenditures per capita |
| <u>Remittance</u> | |
| <u>Remittance incidence</u> | |
| dnorem | =1 if the household received no remittance; =0 otherwise |
| dinrem | =1 if the household received only internal remittances; =0 otherwise |
| dexrem | =1 if the household received only external remittances; =0 otherwise |
| dbothrem | =1 if the household received both internal and external remittances; =0 otherwise |
| <u>Remittance amount</u> | |
| inrem (in real) | The amount of remittances received from within the Philippines (Philippine pesos in thousands in real terms) |
| exrem (in real) | The amount of remittances received from abroad (Philippine pesos in thousands in real terms) |
| <u>Family composition</u> | |
| totmember | The number of total household members |
| age 7-14 | =1 if there is a member aged between 7 and 14; =0 otherwise |
| age 15-24 | =1 if there is a member aged between 15 and 24; =0 otherwise |
| <u>Head characteristics</u> | |
| hfemale | =1 if the household head is female; =0 otherwise |
| hage | The age of the household head |
| hmarried | =1 if the household head marital status is married; =0 otherwise |
| hedu1 | =1 if household head did not finish elementary school; =0 otherwise |
| hedu2 | =1 if the household head finished elementary school; =0 otherwise |
| hedu3 | =1 if the household head finished high school; =0 otherwise |
| hedu4 | =1 if the household head finished University or Post Graduate; =0 otherwise |
| hnojob | =1 if the household head is not employed; =0 otherwise |
| <u>Urban/Rural</u> | |
| urban | =1 if the household lives in the urban area; =0 otherwise |
| <u>Farming</u> | |
| agri | =1 if the household is an agricultural one; =0 otherwise |
| <u>Region</u> | |
| Ilocos | =1 if the household lives in Ilocos Region; =0 otherwise |
| Cagayan | =1 if the household lives in Cagayan Valley; =0 otherwise |
| Cluzon | =1 if the household lives in Central Luzon; =0 otherwise |
| Sluzon | =1 if the household lives in Southern Luzon; =0 otherwise |
| Bicol | =1 if the household lives in Bicol Region; =0 otherwise |
| Wvisayas | =1 if the household lives in Western Visayas; =0 otherwise |
| Cvisayas | =1 if the household lives in Central Visayas; =0 otherwise |
| Evisayas | =1 if the household lives in Eastern Visayas; =0 otherwise |
| Mindanao | =1 if the household lives in Mindanao; =0 otherwise |
| NCR | =1 if the household lives in National Capital Region (NCR); =0 otherwise |
| CAR | =1 if the household lives in Cordillera Administrative Region (CAR); =0 otherwise |

Note: CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005).

Table 6. 8: Summary Statistics**Table 6.8a: the 1988 FIES**

| Variable | Total | | dnorem | | dinrem | | dexrem | | dbothrem | |
|------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|----------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| <u>Education</u> | | | | | | | | | | |
| educsh | 0.021 | 0.041 | 0.019 | 0.039 | 0.017 | 0.036 | 0.035 | 0.058 | 0.025 | 0.045 |
| educsh if educ>0 | 0.030 | 0.047 | 0.028 | 0.045 | 0.026 | 0.042 | 0.045 | 0.062 | 0.035 | 0.050 |
| educ (in real) | 3343 | 9268 | 3072 | 8501 | 2223 | 6691 | 7466 | 16166 | 4670 | 9246 |
| educ (in real) if educ>0 | 4864 | 10844 | 4503 | 9975 | 3375 | 8005 | 9593 | 17761 | 6415 | 10309 |
| <u>Welfare</u> | | | | | | | | | | |
| totex (in real) | 114854 | 91441 | 111919 | 89593 | 92718 | 68609 | 180059 | 116949 | 147415 | 102909 |
| lpcotex | 8.577 | 0.698 | 8.528 | 0.698 | 8.440 | 0.626 | 9.083 | 0.663 | 8.900 | 0.650 |
| <u>Family composition</u> | | | | | | | | | | |
| totmember | 5.337 | 2.234 | 5.451 | 2.202 | 5.191 | 2.268 | 5.288 | 2.275 | 5.118 | 2.215 |
| age 7-14 | 0.583 | | 0.596 | | 0.567 | | 0.574 | | 0.573 | |
| age 15-24 | 0.538 | | 0.542 | | 0.512 | | 0.596 | | 0.532 | |
| <u>Head characteristics</u> | | | | | | | | | | |
| hfemale | 0.137 | | 0.090 | | 0.144 | | 0.306 | | 0.255 | |
| hage | 45.6 | 14.0 | 44.1 | 13.0 | 46.9 | 15.0 | 47.9 | 14.1 | 48.8 | 15.3 |
| hmarried | 0.850 | | 0.880 | | 0.820 | | 0.821 | | 0.776 | |
| hedu1 | 0.307 | | 0.31 | | 0.359 | | 0.172 | | 0.221 | |
| hedu2 | 0.348 | | 0.35 | | 0.371 | | 0.266 | | 0.343 | |
| hedu3 | 0.257 | | 0.249 | | 0.221 | | 0.380 | | 0.309 | |
| hedu4 | 0.088 | | 0.09 | | 0.048 | | 0.181 | | 0.126 | |
| hnojob | 0.122 | | 0.067 | | 0.134 | | 0.289 | | 0.286 | |
| <u>Urban/Rural</u> | | | | | | | | | | |
| urban | 0.466 | | 0.454 | | 0.405 | | 0.657 | | 0.572 | |
| <u>Farming</u> | | | | | | | | | | |
| agri | 0.335 | | 0.386 | | 0.359 | | 0.099 | | 0.124 | |
| <u>Region</u> | | | | | | | | | | |
| Ilocos | 0.060 | | 0.039 | | 0.063 | | 0.119 | | 0.147 | |
| Cagayan | 0.042 | | 0.050 | | 0.035 | | 0.039 | | 0.019 | |
| Cluzon | 0.104 | | 0.072 | | 0.128 | | 0.154 | | 0.207 | |
| Sluzon | 0.130 | | 0.121 | | 0.144 | | 0.114 | | 0.164 | |
| Bicol | 0.064 | | 0.055 | | 0.098 | | 0.021 | | 0.046 | |
| Wvisayas | 0.089 | | 0.085 | | 0.105 | | 0.077 | | 0.068 | |
| Cvisayas | 0.075 | | 0.075 | | 0.092 | | 0.047 | | 0.040 | |
| Evisayas | 0.051 | | 0.050 | | 0.065 | | 0.024 | | 0.028 | |
| Mindanao | 0.224 | | 0.300 | | 0.160 | | 0.087 | | 0.074 | |
| NCR | 0.138 | | 0.127 | | 0.099 | | 0.283 | | 0.200 | |
| CAR | 0.022 | | 0.027 | | 0.012 | | 0.035 | | 0.007 | |
| No. of Obs | 18429 | | 9939 | | 5632 | | 1862 | | 996 | |
| (% of total) | (100%) | | (53.9%) | | (30.6%) | | (10.1%) | | (5.4%) | |
| No. of Obs (if educ>0) | 12664 | | 6780 | | 3710 | | 1449 | | 725 | |
| (% of total Obs) | (68.7%) | | (68.2%) | | (65.9%) | | (77.8%) | | (72.8%) | |

Note: Standard errors are reported only for continuous variables.

CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005).

Table 6.8b: the 1994 FIES

| Variable | Total | | dnorem | | dinrem | | dexrem | | dbothrem | |
|------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|----------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| <u>Education</u> | | | | | | | | | | |
| edush | 0.026 | 0.050 | 0.024 | 0.047 | 0.021 | 0.042 | 0.041 | 0.064 | 0.033 | 0.055 |
| educsh if educ>0 | 0.035 | 0.055 | 0.033 | 0.053 | 0.029 | 0.047 | 0.052 | 0.069 | 0.042 | 0.059 |
| educ (in real) | 4775 | 12308 | 4226 | 11500 | 3098 | 8528 | 9263 | 17841 | 7219 | 15559 |
| educ (in real) if educ>0 | 6461 | 13932 | 5742 | 13077 | 4347 | 9830 | 11752 | 19355 | 9329 | 17122 |
| <u>Welfare</u> | | | | | | | | | | |
| totex (in real) | 128355 | 103760 | 119819 | 98492 | 103555 | 81169 | 191965 | 125091 | 172607 | 117616 |
| lpctotex | 9.302 | 0.735 | 9.209 | 0.721 | 9.162 | 0.674 | 9.784 | 0.693 | 9.662 | 0.66 |
| <u>Family composition</u> | | | | | | | | | | |
| totmember | 5.288 | 2.207 | 5.415 | 2.16 | 5.118 | 2.28 | 5.152 | 2.181 | 5.243 | 2.258 |
| age 7-14 | 0.591 | | 0.606 | | 0.585 | | 0.541 | | 0.583 | |
| age 15-24 | 0.53 | | 0.531 | | 0.506 | | 0.577 | | 0.534 | |
| <u>Head characteristics</u> | | | | | | | | | | |
| hfemale | 0.152 | | 0.097 | | 0.167 | | 0.285 | | 0.257 | |
| hage | 47.6 | 13.8 | 46 | 12.8 | 49.2 | 14.7 | 49.7 | 14.0 | 50.1 | 14.9 |
| hmarried | 0.835 | | 0.868 | | 0.794 | | 0.823 | | 0.768 | |
| hedu1 | 0.276 | | 0.29 | | 0.329 | | 0.156 | | 0.194 | |
| hedu2 | 0.353 | | 0.361 | | 0.378 | | 0.289 | | 0.320 | |
| hedu3 | 0.285 | | 0.266 | | 0.243 | | 0.399 | | 0.382 | |
| hedu4 | 0.085 | | 0.084 | | 0.051 | | 0.156 | | 0.105 | |
| hnojob | 0.152 | | 0.085 | | 0.166 | | 0.304 | | 0.325 | |
| <u>Urban/Rural</u> | | | | | | | | | | |
| urban | 0.598 | | 0.557 | | 0.572 | | 0.725 | | 0.767 | |
| <u>Farming</u> | | | | | | | | | | |
| agri | 0.302 | | 0.370 | | 0.322 | | 0.097 | | 0.093 | |
| <u>Region</u> | | | | | | | | | | |
| Ilocos | 0.055 | | 0.038 | | 0.06 | | 0.099 | | 0.081 | |
| Cagayan | 0.040 | | 0.048 | | 0.026 | | 0.047 | | 0.020 | |
| Cluzon | 0.108 | | 0.080 | | 0.130 | | 0.139 | | 0.178 | |
| Sluzon | 0.144 | | 0.133 | | 0.154 | | 0.166 | | 0.151 | |
| Bicol | 0.057 | | 0.053 | | 0.082 | | 0.027 | | 0.038 | |
| Wvisayas | 0.082 | | 0.079 | | 0.100 | | 0.064 | | 0.068 | |
| Cvisayas | 0.073 | | 0.081 | | 0.081 | | 0.048 | | 0.031 | |
| Evisayas | 0.046 | | 0.047 | | 0.060 | | 0.025 | | 0.022 | |
| Mindanao | 0.223 | | 0.297 | | 0.169 | | 0.113 | | 0.085 | |
| NCR | 0.151 | | 0.118 | | 0.127 | | 0.247 | | 0.319 | |
| CAR | 0.020 | | 0.026 | | 0.010 | | 0.025 | | 0.009 | |
| No. of Obs | 24165 | | 12732 | | 6620 | | 3093 | | 1720 | |
| (% of total) | (100%) | | (52.7%) | | (27.4%) | | (12.8%) | | (7.1%) | |
| No. of Obs (if educ>0) | 17857 | | 9370 | | 4718 | | 2438 | | 1331 | |
| (% of total Obs) | (73.9%) | | (73.6%) | | (71.3%) | | (78.8%) | | (77.4%) | |

Note: Standard errors are reported only for continuous variables.

CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005).

Table 6.8c: the 2000 FIES

| Variable | Total | | dnorem | | dinrem | | dexrem | | dbothrem | |
|------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|----------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| <u>Education</u> | | | | | | | | | | |
| edush | 0.030 | 0.056 | 0.028 | 0.053 | 0.024 | 0.049 | 0.047 | 0.072 | 0.040 | 0.068 |
| educsh if educ>0 | 0.041 | 0.062 | 0.038 | 0.059 | 0.035 | 0.056 | 0.061 | 0.077 | 0.053 | 0.074 |
| educ (in real) | 6592 | 18844 | 6051 | 17874 | 4033 | 15332 | 13231 | 26114 | 9580 | 20272 |
| educ (in real) if educ>0 | 9057 | 21577 | 8279 | 20462 | 5761 | 18052 | 17263 | 28639 | 12767 | 22518 |
| <u>Welfare</u> | | | | | | | | | | |
| totex (in real) | 149578 | 166962 | 145943 | 174608 | 111534 | 121131 | 229901 | 188396 | 193122 | 164619 |
| lpctotex | 9.822 | 0.784 | 9.76 | 0.783 | 9.634 | 0.691 | 10.343 | 0.737 | 10.198 | 0.713 |
| <u>Family composition</u> | | | | | | | | | | |
| totmember | 5.122 | 2.280 | 5.267 | 2.235 | 4.931 | 2.343 | 5.003 | 2.264 | 4.934 | 2.329 |
| age 7-14 | 0.563 | | 0.582 | | 0.552 | | 0.524 | | 0.525 | |
| age 15-24 | 0.524 | | 0.529 | | 0.494 | | 0.561 | | 0.538 | |
| <u>Head characteristics</u> | | | | | | | | | | |
| hfemale | 0.175 | | 0.119 | | 0.201 | | 0.315 | | 0.279 | |
| hage | 48.9 | 13.9 | 47.2 | 12.9 | 50.7 | 14.8 | 51.0 | 14.1 | 52.2 | 15.4 |
| hmarried | 0.806 | | 0.841 | | 0.756 | | 0.786 | | 0.746 | |
| hedu1 | 0.253 | | 0.260 | | 0.309 | | 0.137 | | 0.171 | |
| hedu2 | 0.317 | | 0.308 | | 0.363 | | 0.264 | | 0.291 | |
| hedu3 | 0.320 | | 0.317 | | 0.268 | | 0.404 | | 0.422 | |
| hedu4 | 0.110 | | 0.116 | | 0.059 | | 0.195 | | 0.116 | |
| hnojob | 0.163 | | 0.099 | | 0.181 | | 0.324 | | 0.332 | |
| <u>Urban/Rural</u> | | | | | | | | | | |
| urban | 0.594 | | 0.575 | | 0.549 | | 0.717 | | 0.727 | |
| <u>Farming</u> | | | | | | | | | | |
| agri | 0.244 | | 0.297 | | 0.257 | | 0.067 | | 0.067 | |
| <u>Region</u> | | | | | | | | | | |
| Ilocos | 0.048 | | 0.037 | | 0.042 | | 0.091 | | 0.087 | |
| Cagayan | 0.039 | | 0.047 | | 0.024 | | 0.046 | | 0.024 | |
| Cluzon | 0.095 | | 0.070 | | 0.118 | | 0.120 | | 0.167 | |
| Sluzon | 0.156 | | 0.142 | | 0.172 | | 0.161 | | 0.194 | |
| Bicol | 0.053 | | 0.046 | | 0.081 | | 0.027 | | 0.041 | |
| Wvisayas | 0.076 | | 0.059 | | 0.103 | | 0.082 | | 0.098 | |
| Cvisayas | 0.059 | | 0.056 | | 0.072 | | 0.044 | | 0.058 | |
| Evisayas | 0.057 | | 0.058 | | 0.069 | | 0.034 | | 0.038 | |
| Mindanao | 0.271 | | 0.337 | | 0.220 | | 0.160 | | 0.128 | |
| NCR | 0.105 | | 0.103 | | 0.069 | | 0.180 | | 0.126 | |
| CAR | 0.042 | | 0.045 | | 0.030 | | 0.055 | | 0.039 | |
| No. of Obs | 39615 | | 21439 | | 11021 | | 5048 | | 2107 | |
| (% of total) | (100%) | | (54.1%) | | (27.8%) | | (12.7%) | | (5.3%) | |
| No. of Obs (if educ>0) | 28833 | | 15669 | | 7714 | | 3869 | | 1581 | |
| (% of total Obs) | (72.8%) | | (73.1%) | | (70.0%) | | (76.6%) | | (75.0%) | |

Note: Standard errors are reported only for continuous variables.

CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005).

Table 6.8d: the 2006 FIES

| Variable | Total | | dnorem | | dinrem | | dexrem | | dbothrem | |
|------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|----------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| <u>Education</u> | | | | | | | | | | |
| edush | 0.028 | 0.058 | 0.024 | 0.053 | 0.022 | 0.049 | 0.047 | 0.077 | 0.040 | 0.070 |
| educsh if educ>0 | 0.040 | 0.066 | 0.035 | 0.061 | 0.032 | 0.056 | 0.061 | 0.083 | 0.054 | 0.077 |
| educ (in real) | 5730 | 17659 | 4803 | 16269 | 3183 | 10760 | 12799 | 27675 | 9188 | 22210 |
| educ (in real) if educ>0 | 8110 | 20544 | 6964 | 19203 | 4605 | 12687 | 16586 | 30493 | 12345 | 24976 |
| <u>Welfare</u> | | | | | | | | | | |
| totex (in real) | 130736 | 134723 | 126298 | 141233 | 96527 | 83267 | 208525 | 177383 | 166648 | 138491 |
| lpctotex | 10.08 | 0.787 | 10.01 | 0.795 | 9.876 | 0.677 | 10.60 | 0.786 | 10.40 | 0.716 |
| <u>Family composition</u> | | | | | | | | | | |
| totmember | 4.817 | 2.240 | 4.921 | 2.214 | 4.740 | 2.258 | 4.749 | 2.288 | 4.754 | 2.198 |
| age 7-14 | 0.534 | | 0.535 | | 0.546 | | 0.505 | | 0.524 | |
| age 15-24 | 0.497 | | 0.502 | | 0.476 | | 0.534 | | 0.506 | |
| <u>Head characteristics</u> | | | | | | | | | | |
| hfemale | 0.180 | | 0.121 | | 0.184 | | 0.291 | | 0.268 | |
| hage | 48.4 | 14.0 | 46.6 | 13.0 | 49.2 | 14.6 | 49.8 | 13.9 | 51.5 | 15.3 |
| hmarried | 0.804 | | 0.836 | | 0.780 | | 0.805 | | 0.752 | |
| hedu1 | 0.263 | | 0.280 | | 0.315 | | 0.143 | | 0.169 | |
| hedu2 | 0.316 | | 0.307 | | 0.359 | | 0.241 | | 0.298 | |
| hedu3 | 0.320 | | 0.306 | | 0.276 | | 0.415 | | 0.407 | |
| hedu4 | 0.101 | | 0.108 | | 0.050 | | 0.201 | | 0.127 | |
| hnojob | 0.155 | | 0.088 | | 0.150 | | 0.276 | | 0.288 | |
| <u>Urban/Rural</u> | | | | | | | | | | |
| urban | 0.449 | | 0.430 | | 0.396 | | 0.568 | | 0.553 | |
| <u>Farming</u> | | | | | | | | | | |
| agri | 0.275 | | 0.349 | | 0.303 | | 0.109 | | 0.090 | |
| <u>Region</u> | | | | | | | | | | |
| Ilocos | 0.059 | | 0.039 | | 0.046 | | 0.108 | | 0.117 | |
| Cagayan | 0.049 | | 0.049 | | 0.042 | | 0.073 | | 0.049 | |
| Cluzon | 0.081 | | 0.054 | | 0.089 | | 0.084 | | 0.160 | |
| Sluzon | 0.137 | | 0.115 | | 0.163 | | 0.117 | | 0.162 | |
| Bicol | 0.058 | | 0.036 | | 0.098 | | 0.030 | | 0.051 | |
| Wvisayas | 0.071 | | 0.060 | | 0.085 | | 0.064 | | 0.073 | |
| Cvisayas | 0.065 | | 0.064 | | 0.070 | | 0.061 | | 0.058 | |
| Evisayas | 0.051 | | 0.043 | | 0.065 | | 0.040 | | 0.044 | |
| Mindanao | 0.274 | | 0.352 | | 0.246 | | 0.195 | | 0.155 | |
| NCR | 0.116 | | 0.139 | | 0.072 | | 0.173 | | 0.098 | |
| CAR | 0.040 | | 0.049 | | 0.026 | | 0.056 | | 0.033 | |
| No. of Obs | 38480 | | 15962 | | 13548 | | 5067 | | 3903 | |
| (% of total) | (100%) | | (41.5%) | | (35.2%) | | (13.2%) | | (10.1%) | |
| No. of Obs (if educ>0) | 27188 | | 11008 | | 9365 | | 3910 | | 2905 | |
| (% of total Obs) | (70.7%) | | (69.0%) | | (69.1%) | | (77.2%) | | (74.4%) | |

Note: Standard errors are reported only for continuous variables.

CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005).

6.5 Methodology of Analysis

6.5.1 Engel Curve Framework

The receipt of remittances could affect a household's consumption and investment behaviour. To analyse the expenditure patterns of households with and without receiving remittances, many studies have used an Engel curve framework (Adams, 2005; Castaldo and Reilly, 2007; Taylor and Mora, 2006; Zarate-Hoyos, 2004; Tabuga, 2007). An Engel curve shows the households' budget shares on specific types of goods out of total household expenditure. There are several models for the Engel curve. Past studies highlighted the features of these models (see Leser, 1963; Prais and Houthakker, 1955: 87). For this framework, one popular functional form is the Working-Leser model (Working 1943; Leser 1963). This model assumes that the budget shares of each household expense (for example, food, clothing, housing, education, and health care etc.) are linearly related to the logarithm of total expenditure. This Working-Leser model was developed to take into account several factors which might affect the budget shares of different types of goods (Deaton 1997). The main focus of this chapter is to examine how the receipt of international remittances affects a household's expenditure on education over time while taking into account various household characteristics. Therefore, the dummy variable capturing the receipt of remittances from abroad is added to the explanatory variables of the functional form together with the following explanatory variables: family composition, household head's characteristics (such as gender, age, marital status, educational attainment, and employment status), and geographical location. The model can be expressed as follows.

$$(6-1) \text{educsh}_i = X_i'b + v_i = \alpha + \beta \ln(\text{pctotex}_i) + Z_i'\gamma + \kappa_i \cdot \text{dinrem}_i + \lambda_i \cdot \text{dexrem}_i + \mu_i \cdot \text{dbothrem}_i + v_i,$$

$$i = 1, 2, \dots, n$$

In addition to the above model, we also consider the following model with the absolute value of education expenditure as a dependent variable to examine the effect of remittances on the level of education expenditures. The model is given by:

$$(6-2) \quad educ_i = X'_i b + v_i = \alpha + \beta \ln(pctotex_i) + Z'_i \gamma + \kappa_i \cdot dinrem_i + \lambda_i \cdot dexrem_i + \mu_i \cdot dbothrem_i + \varepsilon_i, \\ i = 1, 2, \dots, n$$

where $educsh_i$ and $educ_i$ are the budget share and the absolute value of education expenditure in household i , respectively. X'_i is a vector of all the variables corresponding to the i th households including the intercept term, b is a vector of the unknown parameters, and v_i and ε_i are error terms that captures the unknown variation in the expenditure budget share for the i th household and for which standard econometric assumptions are made. The $pctotex_i$ is the total household expenditure per capita in household i . Z'_i is a vector of the other household and regional characteristics for the i th household. The α and β are unknown parameters we estimate, and γ is also an unknown parameter vector to be estimated. The $dinrem_i$, $dexrem_i$, and $dbothrem_i$ are the dummy variables capturing whether or not the household receives internal remittances only, international remittances only, or both internal and international remittances, respectively. The κ_i , λ_i , and μ_i are unknown parameters that when estimated provide some judgment on the estimated effect of the receipt of different types of remittances on changes in the education expenditure in household i .

With regard to the effect of remittances on education, we can also estimate how much remittance incomes affect education by adding the variables of the amounts of remittances into the education equation instead of remittance dummies (i.e., *dinrem*, *dexrem*, and *dbothrem*). The model can be written as follows:

$$(6-3) \text{educsh}_i = \alpha + \beta \ln(\text{pctotex}_i) + Z'_i \gamma + \xi_i \cdot \text{inrem}_i + \psi_i \cdot \text{exrem}_i + v_i, \quad i = 1, 2, \dots, n$$

Ideally, the equation should be estimated as part of a wider expenditure system using the seemingly unrelated regression equations (SURE) approach since the error terms are assumed to be correlated across the equations for expenditure items. However, the only advantage to such an approach would be more efficient estimates. Given our sample sizes are reasonably large, this is not seen as providing a great advantage in the current case. In addition, estimating these systems within the framework of the limited dependent variable (LDV) models such as probit or Tobit estimators is not straightforward. In any event, our primary research theme is around educational expenditures, not other categories in this chapter.

In addition to estimating the above education expenditure share equation, we can also consider the model with the absolute value of education expenditures as a dependent variable. The model is given by:

$$(6-4) \text{educ}_i = \alpha + \beta \ln(\text{pctotex}_i) + Z'_i \gamma + \xi_i \cdot \text{inrem}_i + \psi_i \cdot \text{exrem}_i + \varepsilon_i, \quad i = 1, 2, \dots, n$$

where *inrem_i* and *exrem_i* are the amounts of domestic and international remittances in household *i*, respectively.

6.5.2 Censored Regression Model

When there are households with no education expenditures, it is reasonable to use the censored regression model, such as the Tobit, the Heckman, or Powell's censored least absolute deviations (CLAD) estimators, to take into consideration zero education expenditure observations. The Heckman (1979) two-step procedure allows us to distinguish between factors that determine the decision to have a non-zero budget of education expenditure and those that determine its level. The decision for the expenditure is estimated by the probit model, whereas its amount is estimated by ordinary least squares (OLS) model with a correction for selection. However, as with our earlier empirical analysis, we could not obtain appropriate instruments to control for selectivity for our analysis.⁶⁶ Therefore, in this chapter, we focus on two other estimators: the Tobit and the CLAD estimators.

6.5.2.1 Tobit estimator

The Tobit models, which were first used by Tobin (1958), can be written in the following form.

$$(6-5) \ w_i = \max(0, X'_i b_{TOBIT} + v_i), \quad i = 1, \dots, n; \ v_i \sim (0, \sigma^2)$$

where the dependent variable w_i and the regression vector X'_i are observed for each i^{th} household, while the parameter vector b_{TOBIT} and normally distributed error term v_i are

⁶⁶ As with Chapter Four, we also report the coefficient estimates of the Two-Part model which separately run the regression for the probability and the level of remittances. The probability is determined using the probit model, while the level is estimated by the linear regression using the subsample with positive remittance amounts. The estimation results were reported in the Appendix. The estimation results reveal that during the whole survey years there is no single variable which influence only the selection of remittances, not the level.

not observed. The Tobit model assumes that the decisions as to whether to spend on education or not and how much to spend on it occur simultaneously. The parameter values \hat{b}_{TOBIT} and $\hat{\sigma}$ for a censored Tobit model are found by maximising the following natural logarithm of the likelihood function.

$$(6-6) \quad L(b_{TOBIT}, \sigma) = \sum_{i=1}^N D_i \times \log_e \left[\frac{\phi(w_i - X_i' b_{TOBIT})}{\sigma} \right] + \sum_{i=1}^N (1 - D_i) \times \log_e \left[1 - \Phi \left[\frac{X_i' b_{TOBIT}}{\sigma} \right] \right]$$

where $D_i = 1$ if $w_i > 0$, and $D_i = 0$ if $w_i = 0$.

6.5.2.2. Instrumental-variable Tobit (IV Tobit) estimator

The issue of endogeneity appears when the explanatory variables are correlated with the error terms given a potential for reverse causality between education and remittances. The instrumental variable (IV) estimator is used to solve these problems as it provides unbiased and consistent estimates for the variables of interest (see Baum, 2006). We assumed that there would be a potential problem for two-way relationships between the education expenditure and the amount of remittance incomes. To correct for this possible endogeneity problem, we used IV estimation with instruments which affect the level of international remittances but not directly education expenditures except through their effect from remittance incomes from abroad. The instruments selected for the analysis are ownership of durables. These variables should be uncorrelated with the education spending decision as the ownership of such items is unlikely to directly affect a child's education. In contrast, the variables would be highly correlated with the level of international remittances (see Ang, Sugiyarto, and Jha, 2009; Cattaneo, 2010).

Moreover, there is evidence that the proportion of households with some durables (such as a TV set, a refrigerator, a washing machine) is higher among those who received international remittances (Tullao, Cortez and See, 2007). Filipino households having more TV sets, refrigerators, washing machines tend to rely more on income transfers from abroad, which are readily available and more stable income flows.

The data on the ownership of durable goods are only available for the 2003 FIES and the 2006 FIES and thereby the IV estimation results can be obtained for these two survey years. For this chapter, the estimation results derived from the 2006 FIES only will be reported in the results section. In addition, in this chapter we control for the potential endogeneity of international remittances only and not domestic remittances. There are two reasons for this approach. First, we could not find satisfactory identifying instruments for the latter measure. Second, some of the tests used to determine the validity of instruments are only available for a model containing one endogenous regressor. Moreover, unlike Chapter Four, we decided not to use migrant characteristics as possible instruments because the use of the linked data of the FIES and the SOF drops the sample households receiving only domestic remittances and those without any remittance incomes. This makes it difficult to examine the effects of both domestic and international remittances on education expenditures and compare them.

Using the 2006 FIES, we investigate which variables provide valid instruments. We consider three potential instruments, which are the presence of a refrigerator, of a washing machine, and of a television set.⁶⁷ In order to select the better combination of

⁶⁷ It is possible to combine three instruments and create one variable denoting the wealth of households. However, using a single instrument variable makes us lose our options to select the appropriate instrument and also it would be more correlated with the welfare variable (measured by per capita total family expenditure) used in this chapter.

these potential instruments, we again tested for: (1) over-identifying restrictions; (2) weak instruments; (3) regressor exogeneity.

The tests are reported for all possible combinations of three potential instruments (see Appendix in detail). Based on the all results, we concluded that the ownership of a washing machine and of a television set are selected as the best instruments for the model with the share of education expenditures as a dependent variable, while the ownership of all three items (i.e., a washing machine, a television set, and a refrigerator) are chosen for the model with their absolute value. The selected instruments satisfy the necessary conditions for valid instrumental variables.

6.5.2.3 Censored Least Absolute Deviations (CLAD) estimator

In contrast to the standard estimators of the censored regression model such as Tobit or other maximum likelihood approaches, Powell's (1984, 1986a) CLAD estimator, which is a generalization of the least absolute deviations estimator for the linear regression model, is robust to heteroscedasticity and is consistent and asymptotically normal for a wide class of error distributions (see Arabmazar and Schmidt, 1981; Vijverberg, 1987; Amemiya, 1985:383). Furthermore, if the assumptions of homoscedasticity or independence of the residuals are violated, the conventional standard errors using a method suggested by Koenker and Bassett (1982) are not robust. The use of bootstrap standard errors is suggested in the literature (see Rogers, 1993). Some empirical studies have suggested that heteroscedasticity causes greater bias in standard maximum likelihood estimation than nonnormality (Powell, 1986b). Powell's CLAD estimator

\hat{b}_{CLAD} is found by minimising the sum of absolute deviations of w_i from the median function for w_i , that is, $\max\{0, X_i' b_{CLAD}\}$ over all explanatory variables. It is given by:

$$(6-7) \quad S(b_{CLAD}) = \frac{1}{n} \sum_{i=1}^n |w_i - m(X_i', b_{CLAD})| = \frac{1}{n} \sum_{i=1}^n |w_i - \max\{0, X_i' b_{CLAD}\}|$$

where $m(X_i', b_{CLAD})$ is the median of w_i , which is some known function of the regressors X_i' and unknown parameters b_{CLAD} . However, suppose the error term u_i is continuously distributed with median zero, and that the density function is positive at zero, so that the median of u_i is unique. Then, it is easy to verify that the median function for w_i is expressed as $\max\{0, X_i' b_{CLAD}\}$. This function means that the median of w_i is $X_i' b_{CLAD}$ if the probability that $w_i = 0$ is less than one-half, whereas the median of w_i is zero if the probability that $w_i = 0$ exceeds one-half (see Powell, 1984).

The stata command *clad*, which is provided by Jolliffe, et al. (2000), was used for Powell's CLAD estimator. For this command, Buchinsky's (1994) iterative linear programming algorithm (ILPA) was used. Buchinsky's algorithm works with the following steps. First, the ILPA estimates a quantile regression for the full sample, and then deletes the observations for which the predicted value of the dependent variable is less than zero. Second, another quantile regression is estimated on the new sample, and again negative predicted values are dropped. Finally, convergence occurs when there are no negative predicted values on two consecutive iterations.

6.6 Estimation Results

6.6.1 Mean comparison

In this section, we briefly examine the features of education expenditures using average figures. The estimated figures will be reported with the following categories: by welfare levels of households and by their places of living. The average share of education expenditures is also compared with other expenditure items at the end of this section.

Household Spending on Education

Table 6.9 shows the mean household expenditure on education depending on their welfare level, measured by per capita total family expenditure. By welfare quintiles, higher-income groups tended to spend more in absolute terms on education expenditures than lower-income groups.

Table 6. 9: Sample Mean Household Expenditure on Education by welfare level (Philippine pesos, in real terms)

| Welfare Level | 1985 | 1988 | 1991 | 1994 | 1997 | 2000 | 2003 | 2006 |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| First quintile (0-20%) | 1,014 | 938 | 1,022 | 1,155 | 1,321 | 1,423 | 1,191 | 1,143 |
| Second quintile (20-40%) | 2,200 | 1,795 | 2,136 | 2,287 | 2,651 | 2,894 | 2,250 | 2,230 |
| Third quintile (40-60%) | 3,566 | 3,259 | 3,683 | 4,232 | 4,893 | 5,237 | 3,991 | 4,231 |
| Fourth quintile (60-80%) | 6,452 | 6,147 | 6,742 | 7,873 | 9,831 | 10,049 | 8,234 | 9,409 |
| Fifth quintile (80-100%) | 15,392 | 14,118 | 15,967 | 19,242 | 23,049 | 30,278 | 26,491 | 28,518 |

Note: (a) Welfare level is measured by per capita total family expenditure

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

In 1988, among all quintile groups, mean household expenditure on education declined from 1985 in real terms. This would be mainly because of the benefits of free public secondary education. Since then, the average household educational expenditure has been increasing significantly for the top quintile groups, while other groups have

experienced the relatively stable levels of household expenditure on education over time. During the period of 1997-2000, there was a sharp increase in educational expenditure among the fifth quintile group. This would be partly because of a dramatic increase in the amount of international remittances into the Philippines. The sudden depreciation of the Philippine exchange rate during the 1997 Asian economic crisis increased remittances from the OFWs and also could increase educational expenditures in the Philippines (see Yang, 2004).

Table 6.10 reveals that since 1985 the average educational expenditure has been greater in National Capital Region (NCR) than any other regions. There was a sharp increase in household expenditure on education between 1997 and 2000, especially among households in NCR and CAR. The mean household expenditure on education has been continuously decreasing. In 2006, it declined to the same level as that in 1997. The total mean household expenditure on education is still larger in NCR than other regions.

Table 6. 10: Sample Mean Household Expenditure on Education by region (Philippine pesos, in real terms)

| Region | 1985 | 1988 | 1991 | 1994 | 1997 | 2000 | 2003 | 2006 |
|----------|-------|-------|-------|--------|--------|--------|--------|--------|
| Ilocos | 6,457 | 4,353 | 5,317 | 6,754 | 8,837 | 9,579 | 7,106 | 7,943 |
| Cagayan | 6,384 | 4,790 | 6,513 | 8,174 | 8,772 | 9,568 | 8,769 | 9,773 |
| Cluzon | 7,200 | 5,564 | 6,019 | 6,961 | 8,519 | 10,190 | 9,956 | 11,353 |
| Sluzon | 6,026 | 6,030 | 6,873 | 8,759 | 9,556 | 11,350 | 9,679 | 10,565 |
| Bicol | 5,528 | 3,999 | 4,363 | 5,021 | 6,570 | 6,963 | 7,227 | 6,214 |
| Wvisayas | 4,134 | 4,389 | 4,901 | 4,921 | 8,129 | 8,561 | 6,628 | 6,765 |
| Cvisayas | 3,365 | 3,287 | 4,461 | 3,927 | 5,452 | 7,180 | 7,019 | 7,857 |
| Evisayas | 2,724 | 3,258 | 3,437 | 2,788 | 5,408 | 6,739 | 5,982 | 6,732 |
| Mindanao | 4,501 | 4,336 | 4,132 | 5,235 | 6,300 | 6,375 | 5,314 | 5,919 |
| NCR | 8,507 | 8,216 | 9,034 | 10,802 | 12,518 | 18,177 | 15,435 | 13,078 |
| CAR | N.A. | 6,311 | 8,702 | 8,683 | 10,424 | 14,307 | 11,241 | 12,488 |

Source: Author's computation based on the FIES

Note: (a) * p<0.10, ** p<0.05, *** p<0.01

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

However, with regard to the average household expenditure on education, the data must be interpreted with caution because mean values of educational expenditure in each quantile of the household welfare were smaller among households living in NCR

compared to other regions. In short, educational expenditures in NCR are, on average, higher than that in other regions without taking into account the household welfare level, while mean expenditure on education in each welfare quintile in NCR is lower than that in non-NCR. This situation results from the high proportion of NCR households in the top welfare quintile group. Nearly half of the households in NCR who had spent on education were rich households. Thus, even if the mean of educational expenditure in each quintile is lower in NCR, the mean value across the whole distribution can be higher than that in other regions (see Table 6.11).

Table 6. 11: Mean Educational Expenditure/ budget share for education in 2006

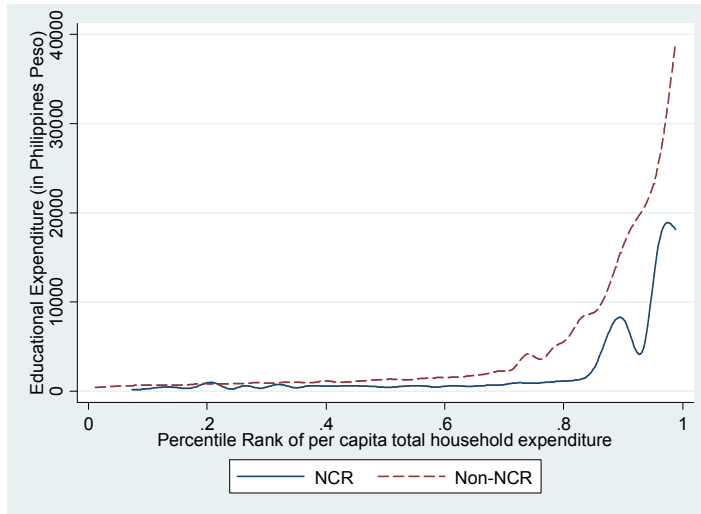
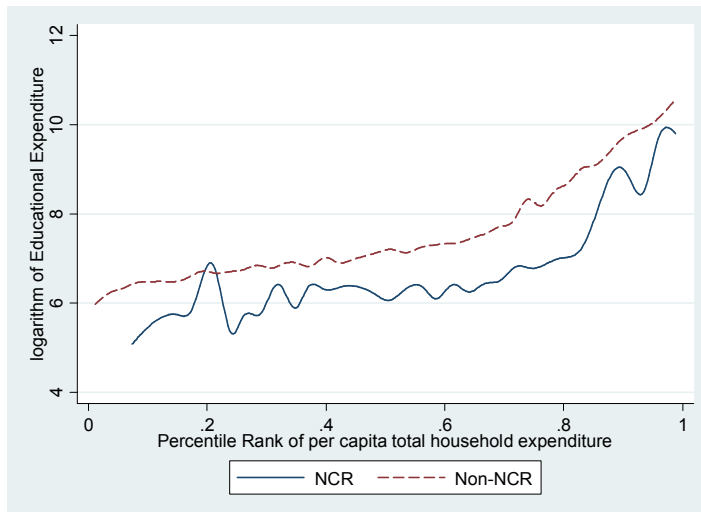
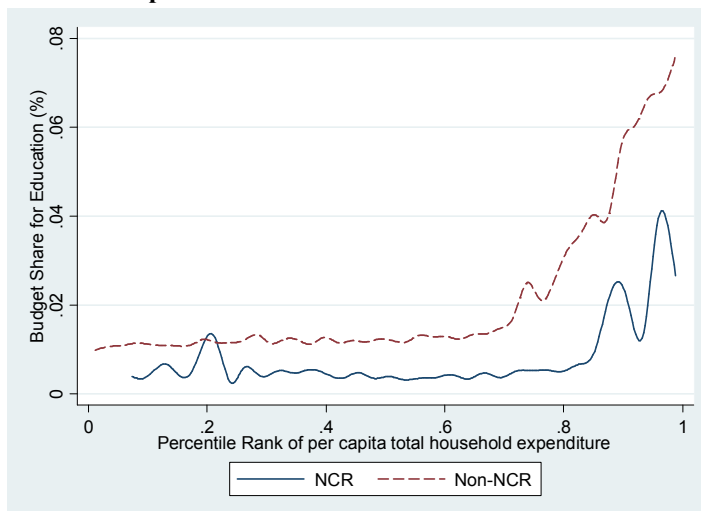
| | Total | First Quintile | Second Quintile | Third Quintile | Fourth Quintile | Fifth Quintile |
|---|------------------|------------------|------------------|------------------|------------------|------------------|
| Households with Educ>0 (Total) | | | | | | |
| Mean Educational Expenditure | 8616 (21826) | 1074 (1852) | 2091 (3783) | 3836 (7576) | 8677 (15458) | 27402 (39910) |
| Mean Budget Share for Education | 0.040 (0.066) | 0.017 (0.024) | 0.024 (0.038) | 0.032 (0.056) | 0.048 (0.077) | 0.076 (0.091) |
| No. of Observation (% of total) | 27188 (100%) | 5438 (20.0%) | 5437 (20.0%) | 5438 (20.0%) | 5437 (20.0%) | 5438 (20.0%) |
| Households with Educ>0 (in NCR) | | | | | | |
| Mean Educational Expenditure | 13078 (28737) | 463 (471) | 869 (983) | 1391 (3948) | 4223 (9972) | 22552 (36908) |
| Mean Budget Share for Education | 0.034 (0.059) | 0.005 (0.004) | 0.008 (0.009) | 0.009 (0.022) | 0.020 (0.044) | 0.051 (0.069) |
| No. of Observation (% of total) | 3021 (100%) | 18 (0.6%) | 111 (3.7%) | 418 (13.8%) | 926 (30.7%) | 1548 (51.2%) |
| Households with Educ>0 (in Non-NCR) | | | | | | |
| Mean Educational Expenditure | 8058 (20735) | 1076 (1855) | 2116 (3815) | 4040 (7768) | 9592 (16208) | 29331 (40888) |
| Mean Budget Share for Education | 0.040 (0.067) | 0.017 (0.024) | 0.025 (0.038) | 0.034 (0.058) | 0.054 (0.081) | 0.085 (0.097) |
| No. of Observation (% of total) | 24167 (100%) | 5420 (22.4%) | 5326 (22.0%) | 5020 (20.8%) | 4511 (18.7%) | 3890 (16.1%) |

Note: (a) Welfare level is measured by per capita total family expenditure.

(b) Values in parentheses under mean figures denote standard errors.

Source: Author's computation based on the 2006 FIES

In addition to the mean figures, the median plot of educational expenditure, its logarithm, and the budget share for education over household welfare levels, measured by percentile ranks of per capita total household expenditure also yields the same result (see Figure 6.1). All of these three results clearly revealed that at the median level households in NCR tend to spend less on education or to allocate a smaller budget for education compared to those living in any other regions. There would be several reasons to explain this interesting finding on education expenditures. First, households not in NCR might have more children attending schools. Table 6.12 shows the average number of children aged 7-14. Households living in the NCR region had fewer kids on average. Especially among the rich group, the mean figures are smaller. Moreover, most of the NCR households have only one child aged 7-14 (see Figure 6.2). All of these results tell us that the NCR households who spent on education are categorised into the rich welfare group and they are likely to have fewer children and spend higher expenditure per student. Due to the differences in the number of kids, the average total education expenditures of NCR households can be lower than non-NCR households depending on the welfare cut-off points. As mentioned above, however, most of them are in the top welfare group. Thus, overall the mean figure of education expenditures of households in NCR was higher than households in non-NCR (see Table 6.11). Of course, the number of kids would not be only an answer for the higher total education expenditures in non-NCR by welfare quintiles. Parents in non-NCR might prefer sending their kids to private schools because there might be no good public schools in the region. In NCR, there are more and better public schools, so even households in the top quintile group would be willing to send their kids there.

Figure 6. 1: Median-Spline plots of Educational Expenditure**Figure 6.1a: Educational Expenditure vs Percentile Rank of per capita total household expenditure****Figure 6.1b: Logarithm of Educational Expenditure vs Percentile Rank of per capita total household expenditure****Figure 6.1c: Budget Share for Educational Expenditure vs Percentile Rank of per capita total household expenditure**

Source: Author's computation based on the 2006 FIES

Table 6. 12: The average number of family members aged 7-14 among households who spent on education, in 2006

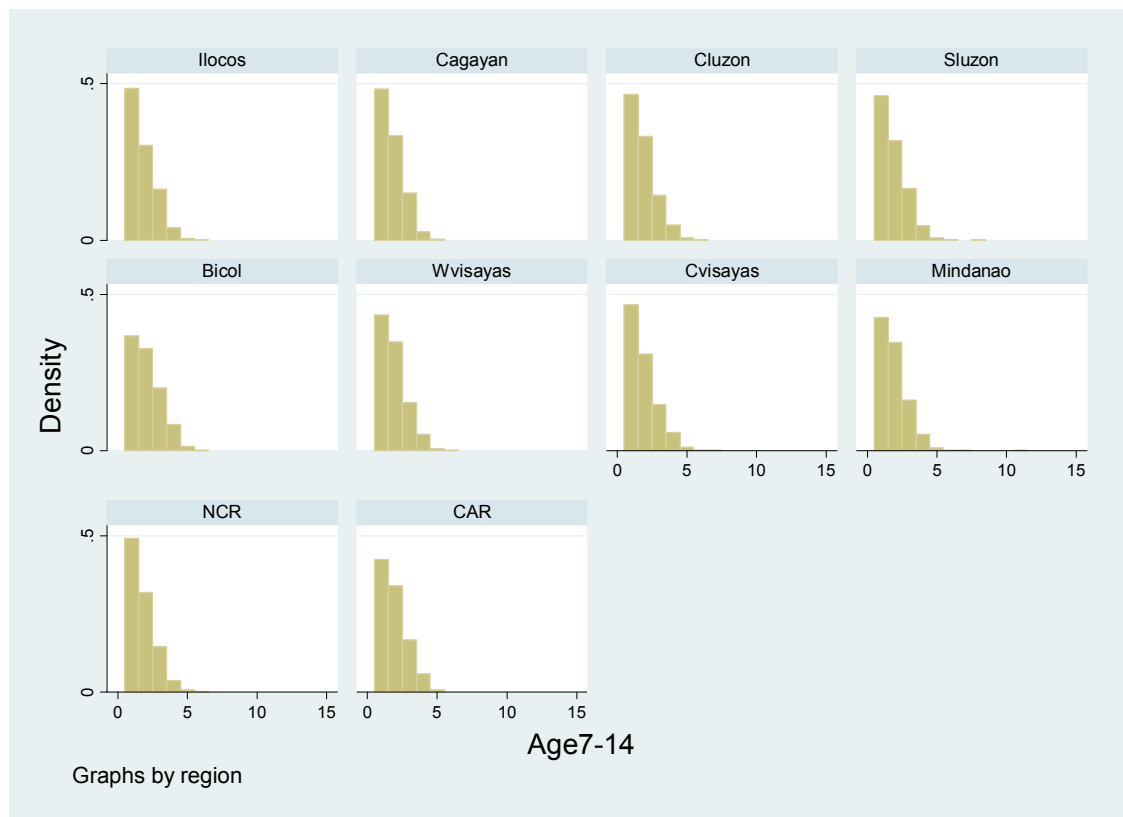
| | Total | First Quintile | Second Quintile | Third Quintile | Fourth Quintile | Fifth Quintile |
|------------------|--------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|
| Ilocos | 1.270 | 2.190 | 1.579 | 1.223 | 0.872 | 0.710 |
| | (0.028) | (0.086) | (0.057) | (0.051) | (0.050) | (0.056) |
| No of Obs | 1557 | 189 | 373 | 417 | 337 | 241 |
| Cagayan | 1.279 | 1.946 | 1.470 | 1.183 | 0.902 | 0.910 |
| | (0.029) | (0.075) | (0.058) | (0.051) | (0.057) | (0.068) |
| No of Obs | 1330 | 204 | 332 | 350 | 245 | 199 |
| Cluzon | 1.313 | 2.135 | 1.843 | 1.499 | 1.150 | 0.886 |
| | (0.024) | (0.124) | (0.066) | (0.046) | (0.040) | (0.042) |
| No of Obs | 2191 | 96 | 313 | 565 | 640 | 577 |
| Sluzon | 1.334 | 2.185 | 1.708 | 1.394 | 1.042 | 0.828 |
| | (0.018) | (0.052) | (0.047) | (0.038) | (0.032) | (0.029) |
| No of Obs | 3810 | 536 | 637 | 770 | 946 | 921 |
| Bicol | 1.584 | 2.307 | 1.696 | 1.303 | 0.978 | 0.663 |
| | (0.031) | (0.057) | (0.055) | (0.061) | (0.066) | (0.060) |
| No of Obs | 1662 | 492 | 428 | 323 | 229 | 190 |
| Wvisayas | 1.352 | 2.205 | 1.561 | 1.070 | 0.905 | 0.676 |
| | (0.026) | (0.057) | (0.046) | (0.051) | (0.054) | (0.048) |
| No of Obs | 1919 | 405 | 503 | 400 | 327 | 284 |
| Cvisayas | 1.365 | 2.013 | 1.443 | 1.252 | 0.982 | 0.761 |
| | (0.029) | (0.060) | (0.059) | (0.060) | (0.055) | (0.058) |
| No of Obs | 1715 | 462 | 332 | 322 | 331 | 268 |
| Mindanao | 1.436 | 1.999 | 1.514 | 1.162 | 0.925 | 0.736 |
| | (0.013) | (0.024) | (0.025) | (0.027) | (0.029) | (0.031) |
| No of Obs | 7498 | 2375 | 1862 | 1409 | 1063 | 789 |
| NCR | 1.090 | 2.167 | 2.099 | 1.782 | 1.249 | 0.724 |
| | (0.020) | (0.283) | (0.126) | (0.057) | (0.036) | (0.023) |
| No of Obs | 3021 | 18 | 111 | 418 | 926 | 1548 |
| CAR | 1.329 | 2.016 | 1.732 | 1.282 | 1.023 | 0.722 |
| | (0.035) | (0.084) | (0.077) | (0.080) | (0.067) | (0.054) |
| No of Obs | 1105 | 193 | 231 | 220 | 213 | 248 |
| Total Obs | 27,188 | 5,438 | 5,437 | 5,438 | 5,437 | 5,438 |

Note: (a) Welfare level is measured by per capita total family expenditure

(b) Parentheses denote the standard errors of the mean figures.

Source: Author's computation based on the 2006 FIES

Figure 6. 2: The number of family members aged 7-14 among households who spent on education, in 2006



Source: Author's computation based on the 2006 FIES

As for the shares of household expenditure, on average, based on the Family Income and Expenditure Survey (FIES) 2000-2006, it was found that Filipino households with the receipt of remittances from abroad have larger budget shares of education, health, durable goods, transport and communications, and housing as well as lower shares of food compared to non-remittance receiving households (see Ang, Sugiyarto, and Jha, 2009:17). The same trends in household propensities to spend were shown even for a longer period of 1985-2006. The gaps between Remittance Recipient (RH) and Non-Recipient (NR) households in mean shares of most expenditure items were significantly different based on the results of t-tests. Since 1988, the gap in share of education expenditure between two household groups has been widening from 1.3 per cent in 1988 to 2.1 per cent in 2006. Moreover, from 2000, the share of transportation & communication expenses have increased and the differences in this budget share have significantly widened (see Table 6.13). Based on the statistical evidence that there is a significant difference in the education expenditure between households with and without the receipt of international remittances, we move on to examining the extent to which remittances affect education expenditure.

Table 6. 13: Shares of Household Expenditure among International Remittance Recipient (RR) and Non-Recipient (NR) Households 1985-2006

| | 1985 FIES | | | | | 1988 FIES | | | | | 1991 FIES | | | | | 1994 FIES | | | | | | | | |
|------------------------------|-----------|-------|--------|--------|-------|-----------|-------|-------|--------|----|-----------|--------|-------|--------|-------|-----------|-------|--------|--------|-------|-------|----|-------|--------|
| | | | | t-test | | | | | t-test | | | | | t-test | | | | | t-test | | | | | |
| | RR | NR | Gap | t | p | RR | NR | Gap | t | p | RR | NR | Gap | t | p | RR | NR | Gap | t | p | | | | |
| No. of Observation | 2511 | 14030 | | | | 2858 | 15571 | | | | 4257 | 19867 | | | | 4813 | 19352 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Expenditure Items | | | | | | | | | | | | | | | | | | | | | | | | |
| Food | 50.9% | 60.9% | -10.0% | ** | 34.35 | 0.0000 | 49.9% | 58.7% | -8.8% | ** | 32.14 | 0.0000 | 49.0% | 57.9% | -8.9% | ** | 39.01 | 0.0000 | 48.5% | 57.3% | -8.7% | ** | 39.8 | 0.0000 |
| Education | 4.0% | 2.2% | 1.8% | ** | 14.58 | 0.0000 | 3.2% | 1.9% | 1.3% | ** | 12.56 | 0.0000 | 3.4% | 2.0% | 1.4% | ** | 16.17 | 0.0000 | 3.8% | 2.3% | 1.5% | ** | 15.53 | 0.0000 |
| Health Care | 2.3% | 1.7% | 0.6% | ** | 6.08 | 0.0000 | 2.0% | 1.4% | 0.6% | ** | 6.278 | 0.0000 | 1.9% | 1.4% | 0.5% | ** | 6.97 | 0.0000 | 2.3% | 1.7% | 0.6% | ** | 6.964 | 0.0000 |
| House | 13.5% | 9.6% | 3.9% | ** | 18.46 | 0.0000 | 13.8% | 9.7% | 4.1% | ** | 19.27 | 0.0000 | 14.3% | 10.1% | 4.2% | ** | 23.96 | 0.0000 | 14.8% | 10.6% | 4.2% | ** | 25.11 | 0.0000 |
| Durables | 1.8% | 0.6% | 1.2% | ** | 10.48 | 0.0000 | 1.7% | 1.0% | 0.8% | ** | 7.357 | 0.0000 | 1.8% | 1.0% | 0.8% | ** | 9.60 | 0.0000 | 2.0% | 1.4% | 0.6% | ** | 6.544 | 0.0000 |
| Transport & Communication | 3.9% | 2.9% | 1.0% | ** | 11.66 | 0.0000 | 4.3% | 3.4% | 0.8% | ** | 9.447 | 0.0000 | 4.7% | 3.8% | 0.9% | ** | 11.33 | 0.0000 | 4.2% | 3.4% | 0.8% | ** | 12.65 | 0.0000 |
| Household Operation | 2.3% | 2.2% | 0.1% | ** | 2.93 | 0.0034 | 2.5% | 2.3% | 0.2% | ** | 3.525 | 0.0004 | 2.6% | 2.6% | 0.0% | | 0.40 | 0.6888 | 2.3% | 2.3% | 0.0% | | 0.51 | 0.6098 |
| Personal Care | 2.5% | 1.8% | 0.7% | ** | 14.53 | 0.0000 | 3.8% | 3.1% | 0.7% | ** | 12.24 | 0.0000 | 3.8% | 3.1% | 0.7% | ** | 11.64 | 0.0000 | 3.7% | 3.2% | 0.5% | ** | 12.01 | 0.0000 |
| Clothing, Footwear etc. | 4.1% | 3.3% | 0.8% | ** | 12.59 | 0.0000 | 4.7% | 4.1% | 0.5% | ** | 7.685 | 0.0000 | 4.0% | 3.7% | 0.2% | ** | 5.01 | 0.0000 | 3.8% | 3.4% | 0.4% | ** | 8.215 | 0.0000 |
| Water, Gas, Electricity etc. | 5.5% | 6.2% | -0.7% | ** | 11.06 | 0.0000 | 5.6% | 5.7% | -0.1% | ** | 2.164 | 0.0305 | 6.1% | 6.1% | 0.0% | | 0.16 | 0.876 | 6.0% | 5.8% | 0.2% | ** | 4.046 | 0.0001 |
| Leisure | 2.9% | 2.0% | 0.9% | ** | 10.35 | 0.0000 | 2.9% | 2.2% | 0.7% | ** | 9.292 | 0.0000 | 3.1% | 2.2% | 0.9% | ** | 11.93 | 0.0000 | 3.1% | 2.5% | 0.6% | ** | 8.721 | 0.0000 |
| Others | 6.3% | 6.7% | -0.4% | ** | 3.67 | 0.0002 | 5.8% | 6.5% | -0.7% | ** | 5.873 | 0.0000 | 5.4% | 6.2% | -0.8% | ** | 8.67 | 0.0000 | 5.4% | 6.0% | -0.6% | ** | 7.141 | 0.0000 |

| | 1997 FIES | | | | | 2000 FIES | | | | | 2003 FIES | | | | | 2006 FIES | | | | | | | | |
|------------------------------|-----------|-------|-------|--------|------|-----------|-------|-------|--------|----|-----------|--------|-------|--------|-------|-----------|-------|--------|--------|-------|-------|----|-------|--------|
| | | | | t-test | | | | | t-test | | | | | t-test | | | | | t-test | | | | | |
| | RR | NR | Gap | t | p | RR | NR | Gap | t | p | RR | NR | Gap | t | p | RR | NR | Gap | t | p | | | | |
| No. of Observation | 6637 | 31805 | | | | 7155 | 32460 | | | | 8729 | 33365 | | | | 8970 | 29510 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Expenditure Items | | | | | | | | | | | | | | | | | | | | | | | | |
| Food | 47.0% | 55.0% | -8.1% | ** | 43.3 | 0.0000 | 44.9% | 54.5% | -9.6% | ** | 52.73 | 0.0000 | 44.2% | 54.2% | -9.9% | ** | 60.38 | 0.0000 | 43.3% | 52.7% | -9.3% | ** | 55.55 | 0.0000 |
| Education | 3.9% | 2.4% | 1.5% | ** | 17.9 | 0.0000 | 4.5% | 2.7% | 1.8% | ** | 20.47 | 0.0000 | 4.1% | 2.2% | 1.9% | ** | 25.50 | 0.0000 | 4.4% | 2.3% | 2.1% | ** | 24.57 | 0.0000 |
| Health Care | 2.4% | 1.6% | 0.7% | ** | 11.1 | 0.0000 | 2.3% | 1.4% | 0.8% | ** | 11.82 | 0.0000 | 2.4% | 1.6% | 0.9% | ** | 13.84 | 0.0000 | 3.0% | 1.9% | 1.1% | ** | 14.45 | 0.0000 |
| House | 14.6% | 11.2% | 3.4% | ** | 24.1 | 0.0000 | 14.7% | 11.4% | 3.3% | ** | 25.80 | 0.0000 | 13.8% | 10.8% | 3.0% | ** | 26.63 | 0.0000 | 13.5% | 10.8% | 2.6% | ** | 23.65 | 0.0000 |
| Durables | 2.5% | 1.8% | 0.7% | ** | 8.66 | 0.0000 | 2.1% | 1.2% | 1.0% | ** | 12.63 | 0.0000 | 2.6% | 1.4% | 1.2% | ** | 14.99 | 0.0000 | 2.2% | 1.4% | 0.8% | ** | 10.75 | 0.0000 |
| Transport & Communication | 4.8% | 3.6% | 1.2% | ** | 19.1 | 0.0000 | 6.2% | 4.2% | 1.9% | ** | 29.09 | 0.0000 | 6.9% | 4.7% | 2.2% | ** | 36.31 | 0.0000 | 7.2% | 5.6% | 1.6% | ** | 25.36 | 0.0000 |
| Household Operation | 2.0% | 2.0% | 0.1% | * | 1.8 | 0.0723 | 2.0% | 1.8% | 0.2% | ** | 7.51 | 0.0000 | 2.1% | 1.7% | 0.3% | ** | 12.30 | 0.0000 | 2.1% | 1.8% | 0.3% | ** | 10.57 | 0.0000 |
| Personal Care | 3.9% | 3.3% | 0.6% | ** | 15.1 | 0.0000 | 4.1% | 3.6% | 0.5% | ** | 13.83 | 0.0000 | 4.2% | 3.8% | 0.4% | ** | 14.24 | 0.0000 | 4.1% | 3.8% | 0.3% | ** | 11.43 | 0.0000 |
| Clothing, Footwear etc. | 3.9% | 3.2% | 0.6% | ** | 15.8 | 0.0000 | 3.1% | 2.6% | 0.5% | ** | 15.01 | 0.0000 | 3.2% | 2.7% | 0.5% | ** | 16.72 | 0.0000 | 2.6% | 2.2% | 0.4% | ** | 16.97 | 0.0000 |
| Water, Gas, Electricity etc. | 5.9% | 5.6% | 0.2% | ** | 5.65 | 0.0000 | 6.9% | 6.7% | 0.1% | ** | 3.12 | 0.0018 | 6.9% | 6.6% | 0.3% | ** | 7.23 | 0.0000 | 8.1% | 7.5% | 0.7% | ** | 14.39 | 0.0000 |
| Leisure | 3.1% | 2.3% | 0.8% | ** | 13.1 | 0.0000 | 3.3% | 2.3% | 1.0% | ** | 17.28 | 0.0000 | 3.2% | 2.3% | 0.8% | ** | 16.13 | 0.0000 | 3.4% | 2.5% | 1.0% | ** | 16.20 | 0.0000 |
| Others | 6.3% | 7.9% | -1.6% | ** | 20.5 | 0.0000 | 5.9% | 7.5% | -1.6% | ** | 20.95 | 0.0000 | 6.4% | 8.0% | -1.6% | ** | 22.37 | 0.0000 | 6.1% | 7.6% | -1.5% | ** | 21.87 | 0.0000 |

Note: t denotes t statistic of mean comparison t-test with unequal sample sizes and variance

p denotes p-value of t-test with unequal sample sizes and variance. * p<0.01, ** p<0.05

6.6.2 Engel Curve Framework

6.6.2.1 Tobit estimator

Effects of remittances

The effects of remittances on education expenditures are investigated using the Tobit estimators, which are mean regression models, were reported in Table 6.14. All other estimation results are found in the Appendix. Assuming a linear relationship between education expenditures and total household expenditures, the most important result to emerge from this research is that the receipt of remittances from abroad significantly increases the budget share of education as well as the amount of education expenditures. With regard to remittance incidences on education, on average and *ceteris paribus*, receiving international remittances raises the percentage share of education out of total household expenditure by 0.4-0.5 of a percentage point. These figures are much smaller than the differences in the share of education expenditure between households with and without international remittances reported in Table 6.13. With regard to the absolute value of education expenditure, the average amounts of education expenditures increased due to the receipt of remittances from abroad by approximately 875 pesos in 1988 and to around 1,423 pesos in 2006 (see Table 6.13). Receiving remittances from within the Philippines increased the share of education expenditures after 2000 and their level in 2000. When it comes to remittance amounts, both domestic and international remittances significantly increased the share and the level of education expenditures. Interestingly, the coefficient estimates of domestic remittances are greater than international remittances. This tells us that if households receive the same amount of money transfer either from within the country or from abroad, they spend more on education with the receipt of domestic remittances. It also means that a greater

proportion of remittance incomes, even if with the lower absolute amounts, would be used for education purposes among households receiving domestic remittances compared to those receiving international remittances. A possible explanation of this is that international remittances are allocated for purposes including food, clothing, education and savings or investment such as real estate, small enterprise, or family-owned business. ADB (2006: 157) reported that around 20 per cent of Filipino recipients use the remittances for education, while there are approximately 28 per cent who invest the money into savings (11.7 per cent), housing (12.6 per cent), and business (3.4 per cent). There is no available data on the use of domestic remittances. However, our findings from the model with remittance incomes treated as an exogenous regressor imply that a greater proportion of the remittances is allocated into education expenditures. It might be possible to say that in general domestic remittances tend to have higher propensities to support educational expenses. However, as mentioned in Table 6.6, on average the amount of international remittances is much greater than domestic remittances. Thus, the actual increase in education expenditures is also bigger among households with the receipt of remittances from abroad. It is consistent with the results of remittance incidences. Furthermore, we need to treat the remittance variable as an endogenous regressor in the education expenditure equation using the instrumental variable model mentioned in the previous section.

Table 6. 14: The Tobit estimation results of the effects of remittances on education**Table 6.14a: The share of education expenditures (or *educsh*)**

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|-----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Remittance incidence | | | | |
| dinrem | 0.00041 (0.00034) | 0.00008 (0.00036) | 0.00139*** (0.00032) | 0.00122*** (0.00032) |
| dexrem | 0.00432*** (0.00075) | 0.00424*** (0.00066) | 0.00513*** (0.00058) | 0.00559*** (0.00060) |
| dbothrem | 0.00167** (0.00077) | 0.00283*** (0.00073) | 0.00457*** (0.00081) | 0.00505*** (0.00062) |
| Remittance amount | | | | |
| inrem | 0.000089*** (0.000014) | 0.000053*** (0.000011) | 0.000053*** (0.000007) | 0.000075*** (0.000008) |
| exrem | 0.000024*** (0.000004) | 0.000036*** (0.000004) | 0.000021*** (0.000002) | 0.000026*** (0.000002) |

Table 6.14b: The absolute value of education expenditures (or *educ*)

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|-----------------------------|-----------------------|-----------------------|------------------------|------------------------|
| Remittance incidence | | | | |
| dinrem | -4.97 (62.20) | -19.51 (69.01) | 228.98** (96.45) | 99.68 (73.68) |
| dexrem | 875.00*** (173.35) | 838.05*** (152.30) | 1001.44*** (171.39) | 1423.32*** (170.83) |
| dbothrem | 183.69 (139.44) | 548.18*** (172.38) | 586.96*** (205.13) | 866.96*** (164.52) |
| Remittance amount | | | | |
| inrem | 16.92*** (2.66) | 17.49*** (2.25) | 20.83*** (2.05) | 26.25*** (2.12) |
| exrem | 8.63*** (0.70) | 13.62*** (0.78) | 11.00*** (0.62) | 14.46*** (0.54) |

Note:

- (a) Parentheses denote the standard errors. * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$.
- (b) These equations include controls for household welfare level, household head characteristics (age, gender, marital status, educational attainment, employment status), urban/rural, farming, and regions. All coefficient estimates are reported in the Appendix.
- (c) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Temporal change in the effects of remittances

The t-test of the effects of remittances on education reported in Table 6.15 examines whether or not temporal change in the effects is significant. The result reveals that between 2000 and 2006, there was a significant increase in the effects of both the incidence and the amount of international remittances on education expenditures (see Table 6.15b). This means that money transfers from abroad were used more for education compared to previous periods. Similarly, during the same period, it was also found that the effects of the amount of domestic remittances get larger. If households receive 1,000 pesos as domestic remittances, they increase their expenditures on education by 5.42 pesos from 20.83 pesos in 2000 to 26.25 pesos in 2006, all other things being held constant.

Table 6. 15: The t-test of the effects of remittances on education

Table 6.15a: The share of education expenditures (or *educsh*)

| | 1988-1994 | 1994-2000 | 2000-2006 | 1988-2006 |
|-----------------------------|---------------------------|----------------------------|--------------------------|-------------------------|
| Remittance incidence | | | | |
| dinrem | -0.00033 (0.00050) | 0.00131*** (0.00048) | -0.00017 (0.00045) | 0.00081* (0.00047) |
| dexrem | -0.00008 (0.00100) | 0.00089 (0.00088) | 0.00046 (0.00083) | 0.00127 (0.00096) |
| dbothrem | 0.00116 (0.00106) | 0.00174 (0.00109) | 0.00048 (0.00102) | 0.00338*** (0.00099) |
| Remittance amount | | | | |
| inrem | -0.000036** (0.000018) | 0 (0.000013) | 0.000022** (0.000011) | -0.000014 (0.000016) |
| exrem | 0.000012** (0.000005) | -0.000015*** (0.000004) | 0.000005* (0.000003) | 0.000002 (0.000004) |

Table 6.15b: The absolute value of education expenditures (or *educ*)

| | 1988-1994 | 1994-2000 | 2000-2006 | 1988-2006 |
|-----------------------------|--------------------|----------------------|---------------------|-----------------------|
| Remittance incidence | | | | |
| dinrem | -14.54 (92.90) | 248.49** (118.60) | -129.3 (121.37) | 104.65 (96.42) |
| dexrem | -36.95 (230.75) | 163.39 (229.28) | 421.88* (241.99) | 548.32** (243.38) |
| dbothrem | 364.49 (221.72) | 38.78 (267.94) | 280 (262.95) | 683.27*** (215.66) |
| Remittance amount | | | | |
| inrem | 0.57 (3.48) | 3.34 (3.04) | 5.42* (2.95) | 9.33*** (3.40) |
| exrem | 4.99*** (1.05) | -2.62*** (1.00) | 3.46*** (0.82) | 5.83*** (0.88) |

Note: Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

Effects of welfare levels

In order to interrogate household welfare effects, we also assume a relationship between household welfare and education expenditures. Here, we focus on the estimation coefficients of the logarithm of per capita total family expenditure (i.e., *lpctotex*). In addition, we exploit piecewise linear splines using knots based on quintile values of total household expenditure per capita.⁶⁸ This enables us to further examine the effect of the welfare level at different parts of the welfare distribution (e.g., by welfare quintile here) on education expenditures. The estimation results are reported in Table 6.16. We found strong evidence that the household welfare level positively affects both the share and the level of educational expenditure. Taking into consideration the welfare level, the estimation results revealed that among the fourth welfare quintile group, not the top quintile, a one per cent change in per capita household expenditure could make the budget share of education increase the most. In terms of the absolute amount of education expenditure, however, the impact of an increase in per capita expenditure was the greatest among the top welfare group except in 1994 and for the fourth quintile group in 1994. These results suggest that among the fourth quintile group, households tend to shift their priority on education and thus its budget share would increase the most as their welfare level goes up. While the top group relatively increases their level of expenditure on education mainly due to the general preference of private to public education or because of further spending on education (e.g., private cram schools or tutors) as their welfare increases.

⁶⁸ In Stata, the command *mkspline* is used to create variables containing a linear spline of total household expenditure per capita.

Table 6. 16: The Tobit estimation results of the effects of household welfare levels on education**Table 6.16a: The share of education expenditures (or *educsh*)**

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Welfare level | | | | |
| lpcotex | 0.00622*** (0.00036) | 0.00792*** (0.00034) | 0.00874*** (0.00030) | 0.01005*** (0.00032) |
| Welfare level by quintiles | | | | |
| Bottom 20% | 0.00157** (0.00075) | 0.00177** (0.00076) | 0.00432*** (0.00066) | 0.00318*** (0.00064) |
| Bottom20-40% | 0.00449*** (0.00150) | 0.00724*** (0.00143) | 0.00708*** (0.00125) | 0.00701*** (0.00125) |
| Middle | 0.00776*** (0.00183) | 0.00896*** (0.00185) | 0.00803*** (0.00153) | 0.01056*** (0.00155) |
| Top20-40% | 0.01025*** (0.00178) | 0.01454*** (0.00174) | 0.01616*** (0.00137) | 0.01730*** (0.00140) |
| Top20% | 0.00547*** (0.00124) | 0.00573*** (0.00109) | 0.00645*** (0.00086) | 0.00867*** (0.00090) |

Table 6.16b: The absolute value of education expenditures (or *educ*)

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|-----------------------------------|------------------------|------------------------|------------------------|------------------------|
| Welfare level | | | | |
| lpcotex | 2085.01*** (94.44) | 2866.07*** (94.46) | 4228.88*** (148.08) | 3914.31*** (114.46) |
| Welfare level by quintiles | | | | |
| Bottom 20% | 182.12 (116.40) | 116.96 (124.95) | 746.07*** (139.24) | 486.32*** (136.56) |
| Bottom20-40% | 706.78*** (210.30) | 1531.75*** (215.98) | 1673.61*** (230.76) | 1267.08*** (229.97) |
| Middle | 1784.29*** (293.56) | 1807.89*** (299.57) | 2216.11*** (343.97) | 2297.13*** (290.76) |
| Top20-40% | 2671.05*** (455.31) | 4788.41*** (379.57) | 4538.49*** (563.37) | 5008.86*** (366.64) |
| Top20% | 3717.53*** (485.33) | 4597.93*** (383.25) | 8469.53*** (689.59) | 7024.02*** (415.05) |

Note:

- (a) Parentheses denote the standard errors. * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$.
(b) These equations include controls for remittance receipts, household head characteristics (age, gender, marital status, educational attainment, employment status), urban/rural, farming, and regions. All coefficient estimates are reported in the Appendix.
(c) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Temporal change in the effects of welfare levels

Like the effects of remittances, the t-test was conducted to investigate the extent to which changes in the effects over time are statistically significant (see Table 6.17). Overall, the welfare effects on the share of education expenditures as well as their level have increased during the period of 1988-2006 mainly because the effects increased among the fourth quintile and the top groups. The welfare effects on the absolute value

of education expenditures significantly increased from 1994 to 2000, while declined during the period of 2000-2006 though it was only significant at the ten per cent level. This trend is the same as mean education expenditures reported in Table 6.5. A drop in the effects for the latter period occurred mainly because it declined significantly among the top welfare group. One possible explanation might be that richer households are more likely to have fewer children and thereby an increase in welfare levels does not simply lead to an increase in the total household expenditure for education.

Table 6. 17: The t-test of the effects of household welfare levels on education

Table 6.17a: The share of education expenditures (or *educsh*)

| | 1988-1994 | 1994-2000 | 2000-2006 | 1988-2006 |
|-----------------------------------|------------------------|------------------------|-------------------------|-------------------------|
| Welfare level | | | | |
| lpctotex | 0.0017*** (0.00050) | 0.00082* (0.00045) | 0.00131*** (0.00044) | 0.00383*** (0.00048) |
| Welfare level by quintiles | | | | |
| Bottom 20% | 0.00020 (0.00107) | 0.00255** (0.00101) | -0.00114 (0.00092) | 0.00161 (0.00099) |
| Bottom20-40% | 0.00275 (0.00207) | -0.00016 (0.00190) | -0.00007 (0.00177) | 0.00252 (0.00195) |
| Middle | 0.00120 (0.00260) | -0.00093 (0.00240) | 0.00253 (0.00218) | 0.00280 (0.00240) |
| Top20-40% | 0.00429* (0.00249) | 0.00162 (0.00221) | 0.00114 (0.00196) | 0.00705*** (0.00226) |
| Top20% | 0.00026 (0.00165) | 0.00072 (0.00139) | 0.00222* (0.00124) | 0.0032** (0.00153) |

Table 6.17b: The absolute value of education expenditures (or *educ*)

| | 1988-1994 | 1994-2000 | 2000-2006 | 1988-2006 |
|-----------------------------------|------------------------|------------------------|-----------------------|------------------------|
| Welfare level | | | | |
| lpctotex | 781.06*** (133.57) | 1362.81*** (175.64) | -314.57* (187.16) | 1829.3*** (148.39) |
| Welfare level by quintiles | | | | |
| Bottom 20% | -65.16 (170.77) | 629.11*** (187.08) | -259.75 (195.03) | 304.2* (179.44) |
| Bottom20-40% | 824.97*** (301.45) | 141.86 (316.07) | -406.53 (325.79) | 560.3* (311.63) |
| Middle | 23.60 (419.43) | 408.22 (456.13) | 81.02 (450.40) | 512.84 (413.18) |
| Top20-40% | 2117.36*** (592.77) | -249.92 (679.31) | 470.37 (672.17) | 2337.81*** (584.58) |
| Top20% | 880.40 (618.41) | 3871.6*** (788.93) | -1445.51* (804.86) | 3306.49*** (638.60) |

Note: Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

6.6.2.2 Instrumental-variable Tobit (IV Tobit) estimator

In addition to the Tobit estimation, to validate our findings on the effect of the receipt of remittances on the education expenditures, the instrumental-variable Tobit (IV Tobit) estimator was reported in Table 6.18. As mentioned in the previous section, we use the ownership of durable goods as an instrument to control for potential endogeneity issues on the relationships between education expenditures and remittance incomes. The data on the ownership of durables are only available for the 2003 FIES and the 2006 FIES, and thereby the IV estimation results can be obtained for these two survey years. For this chapter, the 2006 FIES was used for the analysis.

We consider three potential instruments (i.e., a washing machine, a television set, and a refrigerator) and conduct the tests of over-identifying restrictions, weak instrumentation, and regressor exogeneity by examining all possible combination of three instruments in order to find the optimal choice of instruments. All results of the tests are reported in the appendix. The results concluded that the ownership of a washing machine and of a television set provide the best set of identifying instruments for the model with the share of education expenditures (i.e., *educsh*) as a dependent variable, while all three variables are chosen for the model with the absolute amount of education expenditures (i.e., *educ*). It could be argued that the receipt of remittances is actually influenced by the acquisition of these ‘white goods’. However, in the current application, the acquisition of these ‘white goods’ clearly predates by a number of years the receipt of the international remittances, which was in the last 12 months so the causality is working in only one direction. Nevertheless, the question remains as to why the ownership of ‘white goods’ influences the receipt of international remittances. One possible argument is that once Filipino households have owned ‘white goods’ their demand to

upgrade and renew them increases and international remittances provides one readily available income flow which facilitates their purchase – hence an anticipated positive relationship. Another possible explanation for the causality and positive relationship between the ownership of durables and international remittances might be that households with a greater number of durable products would have a higher propensity to spend and therefore, in order to retain their lifestyle, they expect to receive more income transfers from abroad as they cannot afford to do it with their own domestic income alone.

Table 6.18 shows that the chosen instruments pass all relevant tests. In the first stage regression, the coefficients on the instruments are positive and statistically significant. This means that the numbers of ownership of the selected durable products are positively correlated with the amount of international remittances, suggesting that households having the more durable goods have a strong potential for being dependent on remittance incomes from abroad. In addition, the Wald test of exogeneity strongly rejects the null hypothesis that the amount of international remittances (or *exrem*) is exogenous for both models.

Like the results derived from the Tobit model, the IV Tobit result also revealed that regardless of their sources, remittance incomes significantly raises both the share of and the absolute value of educational expenditures. After controlling for endogeneity, however, an increase in the amount of international remittances by 1,000 pesos increases, on average and *ceteris paribus*, the share of education by 0.0289 percentage points and its level by 158 pesos, which are much greater than 0.0026 percentage points and 14 pesos suggested by the Tobit estimation results in Table 6.14. The IV Tobit

result also found that international remittances exert greater effects on both the share of and the level of household education expenditures than domestic remittances. This is the opposite of the Tobit model without an endogenous regressor. Filipino households who receive remittances from within the country are poorer, and these poor households who rely on domestic remittances tend to spend less on education than other households and spend more on immediate needs, for example, to deal with hunger among families and losses associated with natural disasters.

Table 6. 18: The IV Tobit estimation results on education using the 2006 FIES

Table 6.18a: The share of education expenditures (or *educsh*)

| Dependent variable: | First stage regression | | | Structural equation | | | Marginal effects | | |
|---|------------------------|-------------------|------------------|--|-----|----------------------|------------------|-----|------------------------|
| | <i>exrem</i> | | | <i>educsh</i> | | | <i>educsh</i> | | |
| Explanatory variables | Coef. | | Robust Std. Err. | Coef. | | Robust Std. Err. | dy/dx | | Delta-method Std. Err. |
| Instrument variables | | | | | | | | | |
| Washing machine (number) | 10.27 | *** | 1.110 | | | | | | |
| Television set (number) | 5.032 | *** | 1.036 | | | | | | |
| Remittance amount | | | | | | | | | |
| <i>exrem</i> * | | | | 0.000541 | *** | 0.000094 | 0.000289 | *** | 0.000049 |
| <i>inrem</i> | -0.218 | *** | 0.052 | 0.000296 | *** | 0.000052 | 0.000158 | *** | 0.000027 |
| Welfare | | | | | | | | | |
| <i>lpctotex</i> | 28.05 | *** | 1.619 | 0.008895 | *** | 0.003199 | 0.004744 | *** | 0.001731 |
| Family composition | | | | | | | | | |
| <i>age7_14</i> | 11.36 | *** | 0.961 | 0.043192 | *** | 0.001555 | 0.023035 | *** | 0.000915 |
| <i>age15_24</i> | 7.438 | *** | 0.698 | 0.040700 | *** | 0.001153 | 0.021706 | *** | 0.000701 |
| Head characteristics | | | | | | | | | |
| <i>hfemale</i> | 41.77 | *** | 2.041 | -0.011809 | *** | 0.004434 | -0.006298 | *** | 0.002334 |
| <i>hage</i> | -0.231 | *** | 0.034 | 0.000024 | | 0.000039 | 0.000013 | | 0.000021 |
| <i>hmarried</i> | 33.08 | *** | 1.753 | 0.002907 | | 0.003822 | 0.001551 | | 0.002046 |
| (hedu1 omitted) | | | | | | | | | |
| <i>hedu2</i> | -3.986 | *** | 0.926 | 0.008813 | *** | 0.001030 | 0.004700 | *** | 0.000543 |
| <i>hedu3</i> | -6.142 | *** | 1.339 | 0.020779 | *** | 0.001306 | 0.011082 | *** | 0.000682 |
| <i>hedu4</i> | -7.709 | *** | 2.687 | 0.030019 | *** | 0.002295 | 0.016010 | *** | 0.001214 |
| <i>hnojob</i> | 29.25 | *** | 1.703 | -0.019912 | *** | 0.003120 | -0.010619 | *** | 0.001616 |
| Urban/Rural | | | | | | | | | |
| <i>urban</i> | -4.648 | *** | 0.815 | -0.002817 | *** | 0.001079 | -0.001502 | *** | 0.000579 |
| Farming | | | | | | | | | |
| <i>agri</i> | 4.966 | *** | 0.589 | -0.004233 | *** | 0.000989 | -0.002258 | *** | 0.000523 |
| Region | | | | | | | | | |
| <i>llocos</i> | 17.74 | *** | 1.779 | 0.017624 | *** | 0.002600 | 0.009399 | *** | 0.001417 |
| <i>Cagayan</i> | 9.479 | *** | 1.618 | 0.033363 | *** | 0.002611 | 0.017793 | *** | 0.001427 |
| <i>Cluzon</i> | 12.27 | *** | 2.471 | 0.012938 | *** | 0.002351 | 0.006900 | *** | 0.001273 |
| <i>Sluzon</i> | 10.37 | *** | 1.724 | 0.020208 | *** | 0.001913 | 0.010777 | *** | 0.001050 |
| <i>Bicol</i> | 12.04 | *** | 1.868 | 0.023041 | *** | 0.002288 | 0.012288 | *** | 0.001249 |
| <i>Wvisayas</i> | 14.40 | *** | 1.777 | 0.022133 | *** | 0.002343 | 0.011804 | *** | 0.001283 |
| <i>Cvisayas</i> | 16.09 | *** | 2.075 | 0.022537 | *** | 0.002506 | 0.012019 | *** | 0.001372 |
| <i>Evisayas</i> | 16.61 | *** | 3.051 | 0.023968 | *** | 0.003004 | 0.012782 | *** | 0.001639 |
| <i>Mindanao</i> | 11.34 | *** | 1.593 | 0.025288 | *** | 0.001886 | 0.013486 | *** | 0.001045 |
| (NCR omitted) | | | | | | | | | |
| <i>CAR</i> | 10.26 | *** | 1.958 | 0.037862 | *** | 0.002834 | 0.020192 | *** | 0.001551 |
| <i>constant</i> | -315.0 | *** | 17.18 | -0.163041 | *** | 0.035368 | | | |
| <i>/alpha</i> | 0.000 | *** | 0.000 | | | | | | |
| <i>/lns</i> | -2.728 | *** | 0.012 | | | | | | |
| <i>/lnv</i> | 4.176 | *** | 0.086 | | | | | | |
| <i>s</i> | 0.065 | | 0.001 | | | | | | |
| <i>v</i> | 65.11 | | 5.595 | | | | | | |
| Test of regressor exogeneity (H_0: <i>exrem</i> is exogenous.) | | | | Wald test of exogeneity (H_0: $\alpha = 0$) | | | | | |
| Durbin-Wu-Hausman test | | chi2=20.13 | p-value= 0.000 | | | chi2(1)= 26.45 | | | |
| Test of over-identifying restrictions (H_0: all instruments are valid.) | | | | | | Prob > chi2= 0.000 | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | chi2=1.466 | p-value= 0.226 | | | | | | |
| Tests of weak instruments (H_0: $\pi^*=0$) | | | | | | Wald chi2(24) | 5323 | | |
| Wald test | | chi2=44.22 | p-value= 0.000 | | | Prob > chi2 | 0.000 | | |
| Conditional Likelihood Ratio test | | statistic=53.04 | p-value= 0.000 | | | Log pseudolikelihood | -185993 | | |
| Anderson-Rubin test | | chi2=54.51 | p-value= 0.000 | | | Uncensored obs | 27188 | | |
| Lagrange Multiplier & J overidentification test | | H_0 is rejected | | | | Number of obs | 38480 | | |

Note: (a) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (b) *exrem** denotes the predicted value of the amount of international remittances derived from the first stage regression.

Table 6.18b: The absolute value of education expenditures (or *educ*)

| Dependent variable: | First stage regression | | | Structural equation | | | Marginal effects | | |
|---|------------------------|-------------------|------------------|--|-----|------------------|------------------|-----|------------------------|
| | <i>exrem</i> | | | <i>educ</i> | | | <i>educ</i> | | |
| Explanatory variables | Coef. | | Robust Std. Err. | Coef. | | Robust Std. Err. | dy/dx | | Delta-method Std. Err. |
| Instrument variables | | | | | | | | | |
| Refrigerator (number) | 6.094 | *** | 0.979 | | | | | | |
| Washing machine (number) | 7.713 | *** | 0.959 | | | | | | |
| Television set (number) | 4.317 | *** | 0.802 | | | | | | |
| Remittance amount | | | | | | | | | |
| <i>exrem</i> * | | | | 334.0 | *** | 34.7 | 158.2 | *** | 15.3 |
| <i>inrem</i> | -0.216 | *** | 0.052 | 137.5 | *** | 26.1 | 65.1 | *** | 12.3 |
| Welfare | | | | | | | | | |
| <i>lpctotex</i> | 26.82 | *** | 1.555 | 180.2 | | 1106.2 | 85.3 | | 524.5 |
| Family composition | | | | | | | | | |
| <i>age7_14</i> | 11.04 | *** | 0.936 | 11257.1 | *** | 551.3 | 5331.8 | *** | 274.8 |
| <i>age15_24</i> | 7.244 | *** | 0.688 | 8748.1 | *** | 379.4 | 4143.5 | *** | 194.3 |
| Head characteristics | | | | | | | | | |
| <i>hfemale</i> | 41.37 | *** | 2.041 | -11346.9 | *** | 1669.5 | -5374.4 | *** | 756.1 |
| <i>hage</i> | -0.250 | *** | 0.034 | 39.1 | *** | 14.3 | 18.5 | *** | 6.7 |
| <i>hmarried</i> | 32.48 | *** | 1.785 | -4285.7 | *** | 1467 | -2029.9 | *** | 682.4 |
| (<i>hedu1</i> omitted) | | | | | | | | | |
| <i>hedu2</i> | -4.228 | *** | 0.944 | 1742.3 | *** | 348.5 | 825.2 | *** | 164.0 |
| <i>hedu3</i> | -6.789 | *** | 1.392 | 4221.0 | *** | 467.2 | 1999.2 | *** | 219.0 |
| <i>hedu4</i> | -8.665 | *** | 2.776 | 11585.8 | *** | 1001.7 | 5487.5 | *** | 472.5 |
| <i>hnojob</i> | 29.18 | *** | 1.701 | -10424.9 | *** | 1146.5 | -4937.7 | *** | 514.5 |
| Urban/Rural | | | | | | | | | |
| <i>urban</i> | -4.508 | *** | 0.813 | 750.1 | ** | 375.1 | 355.3 | ** | 176.7 |
| Farming | | | | | | | | | |
| <i>agri</i> | 5.258 | *** | 0.589 | -278.5 | | 285.6 | -131.9 | | 135.0 |
| Region | | | | | | | | | |
| <i>llocos</i> | 17.28 | *** | 1.775 | -719.4 | | 952.5 | -340.7 | | 449.9 |
| <i>Cagayan</i> | 9.246 | *** | 1.618 | 3510.8 | *** | 884.0 | 1662.9 | *** | 422.3 |
| <i>Cluzon</i> | 12.54 | *** | 2.477 | -86.3 | | 945.0 | -40.9 | | 447.5 |
| <i>Sluzon</i> | 10.03 | *** | 1.721 | 2224.7 | *** | 772.7 | 1053.7 | *** | 368.9 |
| <i>Bicol</i> | 11.66 | *** | 1.872 | 2950.7 | *** | 886.3 | 1397.6 | *** | 422.3 |
| <i>Wvisayas</i> | 13.88 | *** | 1.777 | 1370.5 | * | 830.0 | 649.1 | | 395.3 |
| <i>Cvisayas</i> | 15.33 | *** | 2.078 | 1509.6 | | 944.3 | 715.0 | | 449.6 |
| <i>Evisayas</i> | 15.85 | *** | 3.054 | 1626.0 | | 1240.6 | 770.1 | | 589.8 |
| <i>Mindanao</i> | 10.43 | *** | 1.581 | 2637.8 | *** | 733.0 | 1249.4 | *** | 350.9 |
| (<i>NCR</i> omitted) | | | | | | | | | |
| <i>CAR</i> | 10.04 | *** | 1.958 | 4592.6 | *** | 971.4 | 2175.3 | *** | 464.6 |
| constant | -301.3 | *** | 16.559 | -18409.3 | | 12291.7 | | | |
| <i>/alpha</i> | -295.9 | *** | 33.143 | | | | | | |
| <i>/lns</i> | 9.831 | *** | 0.024 | | | | | | |
| <i>/lnv</i> | 4.175 | *** | 0.086 | | | | | | |
| <i>s</i> | 18601.9 | | 455.3 | | | | | | |
| <i>v</i> | 65.07 | | 5.587 | | | | | | |
| Test of regressor exogeneity (H_0: <i>exrem</i> is exogenous.) | | | | Wald test of exogeneity (H_0: $\alpha = 0$) | | | | | |
| Durbin-Wu-Hausman test | | chi2=29.89 | p-value= 0.000 | chi2(1)= 79.71 | | | | | |
| Test of over-identifying restrictions (H_0: all instruments are valid.) | | | | Prob > chi2= 0.0000 | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | chi2=0.212 | p-value= 0.900 | | | | | | |
| Tests of weak instruments (H_0: <i>exrem</i>*=0) | | | | Wald chi2(24) | | | 2282.65 | | |
| Wald test | | chi2=154.93 | p-value= 0.000 | Prob > chi2 | | | 0.0000 | | |
| Conditional Likelihood Ratio test | | statistic=293.87 | p-value= 0.000 | Log pseudolikelihood | | | -526778 | | |
| Anderson-Rubin test | | chi2=294.06 | p-value= 0.000 | Uncensored obs | | | 27188 | | |
| Lagrange Multiplier & J overidentification test | | H_0 is rejected | | Number of obs | | | 38480 | | |

Note: (a) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (b) *exrem** denotes the predicted value of the amount of international remittances derived from the first stage regression.

6.6.2.3 Censored Least Absolute Deviations (CLAD) estimator

Furthermore, and perhaps more interestingly, taking into consideration non-normality and homoscedasticity of the error terms in the Tobit model, our results using the CLAD procedure showed that there was a strong evidence of a higher level of expenditure on education when the households received remittances from abroad compared to those with no remittance income (see Table 6.19). This result corresponds with the earlier results shown above. Thus, our findings derived from all estimation procedures used in this chapter are broadly in agreement with Adams's (2005) findings which revealed that the receipt of remittances from abroad induce households to increase the education expenditure. At the median level, if households received international remittances, they significantly increased their education expenditure by 540-680 pesos, other things held constant. Compared to the CLAD results, the Tobit estimation results were greater. It could be taken to suggest that the Tobit model overestimates the effect of international remittances on education expenditure although both results revealed evidence of a positive effect of the receipt of international remittances on education.

Table 6. 19: The CLAD estimation results of the effects of remittances on education expenditures (or educ)

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-----------------------------|-------------------------|---------|-------------------------|---------|-------------------------|---------|--------------------------|---------|
| | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME |
| Remittance Incidence | | | | | | | | |
| dinrem | -81.57275 (232.48) | -29.152 | -216.251 (377.75) | -74.106 | 595.6771 (509.92) | 171.162 | 1458.2** (985.46) | 274.133 |
| dexrem | 1567.397*** (274.90) | 560.143 | 1578.442*** (363.44) | 540.910 | 1982.116*** (663.57) | 569.543 | 3637.771*** (1093.30) | 683.878 |
| dbothrem | 1036.951*** (333.29) | 370.577 | 1865.123*** (470.11) | 639.151 | 1263.569 (1087.91) | 363.075 | 3931.692*** (1057.06) | 739.134 |
| Remittance Amount | | | | | | | | |
| inrem | 26.89594*** (10.52) | 10.587 | 34.36305*** (11.40) | 11.939 | 46.12908* (17.00) | 13.576 | 50.8708* (25.71) | 10.469 |
| exrem | 15.45862*** (2.69) | 6.085 | 22.14917*** (4.58) | 7.696 | 23.54781*** (4.45) | 6.930 | 31.0494*** (7.58) | 6.390 |

Note:

- Parentheses denote the standard errors. * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$.
- These equations include controls for household welfare level, household head characteristics (age, gender, marital status, educational attainment, employment status), urban/rural, farming, and regions. All coefficient estimates are reported in the Appendix.
- CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

6.6.3 Effects of household characteristics on education

In addition to the above findings on the effect of the receipt of remittances on education expenditure, there were also some significant effects of household characteristics on education. For example, the results clearly show that, not surprisingly, having a school age child positively affects the share and the level of education expenditure. Moreover, if a household head is female or married, it also raises education expenditures. This is because married or female heads would put their priority more on education for their children. In addition, a strong positive relationship was also found between the higher educational attainment of a household head and education expenditures. If household heads are well-educated, they are likely to spend more on education for their family members. They would know how important education is to climb up the economic ladder. Thus, they are willing to spend more on education. On the other hand, there are negative factors of household characteristics on educational expenditures. For instance, if a household head is not working or is engaging in agricultural activities, households have a lower propensity to spend for education. The households with such a head of household could not afford to send their children to schools. They would want the children to earn some monies to help their families rather than to go for study.

6.6.4 Geographical disparities

With regard to the relationship between education expenditures and geographical disparities, the Tobit models revealed that households living in the urban areas would have lower budget shares on education than in rural areas though these impacts were statistically significant only after 2000 but not so great. In addition to the urban-rural disparity, our findings of the effects of regional disparities on educational expenditures

revealed that households not living in National Capital Region (NCR) significantly have had higher educational expenditure, on average and *ceteris paribus*, compared to households in NCR over time. In other words, households living in NCR tend to have a lower level of mean educational expenditure than those in any other regions with other things being equal. This is consistent with the features of educational expenditure taking into consideration the household welfare levels by quintiles which are reported in Table 6.11 and Figure 6.1.

When we consider the effects of regional disparities, it is quite useful to normalize their effects as a deviation from an overall weighted average (see Krueger and Summers, 1988; Haisken-DeNew and Schmidt, 1997; Zanchi, 1998; Bellony and Reilly, 2009). With this normalization, we can easily interpret the regional coefficients compared to the overall regional weighted average. The detailed explanation on how to compute the normalized regional coefficients and standard errors are reported in the Appendix. Table 6.20 shows the estimation results of the normalized regional disparities on the level of education expenditure. Our findings of the normalised effects of regional disparities on the educational expenditure revealed that households living in Central Luzon and NCR had the lower educational expenditure than the overall regional weighted mean. In 2006, the level of educational expenditure is significantly lower in NCR than the national mean, while it is higher in Mindanao and CAR.

Table 6. 20: Normalized regional effects on the absolute value of education expenditures (or *educ*)

| | 1988 FIES | 1994 FIES | 2000 FIES | 2006 FIES |
|----------------------------|---------------------|----------------------|----------------------|-----------------------|
| Ilocos | -226.05 (0.779) | 122.22 (0.302) | -177.43 (0.374) | -301.56 (0.735) |
| Cagayan | 204.74 (0.549) | 486.04 (0.900) | 151.99 (0.286) | 416.12 (0.846) |
| Cluzon | -444.68* (1.902) | -589.67** (2.306) | -842.25** (2.525) | -344.34 (0.833) |
| Sluzon | 97.36 (0.358) | 141.12 (0.564) | -361.73 (1.333) | 224.50 (0.787) |
| Bicol | 220.37 (0.786) | 315.09 (1.047) | 565.91 (1.037) | 625.43 (1.433) |
| Wvisayas | 202.80 (0.842) | -120.12 (0.521) | 115.30 (0.354) | 127.34 (0.409) |
| Cvisayas | 116.35 (0.438) | -32.34 (0.133) | 197.24 (0.567) | 423.13 (1.190) |
| Evisayas | 94.04 (0.299) | -199.76 (0.707) | 628.45 (1.591) | 671.51 (1.621) |
| Mindanao | 38.33 (0.241) | 294.56* (1.754) | 156.50 (1.010) | 268.61* (1.706) |
| NCR | -148.77 (0.553) | -433.51 (1.566) | -452.20 (0.976) | -1951.58** (4.747) |
| CAR | 220.49 (0.406) | 1027.59 (1.319) | 1376.03** (2.483) | 992.42* (1.828) |
| Overall Variability | 148.77 | 433.51 | 452.20 | 1951.58 |

Note:

(a) ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively using two-tailed tests.

(b) The numbers in parentheses are t-statistic.

6.7 Concluding Remarks

This chapter has investigated how receiving remittances affects the Filipino household's education expenditures based on the 1988, the 1994, the 2000, and the 2006 Family Income and Expenditure Survey (FIES). By using the Engel curve framework, it set out to determine the effect of the receipt of remittances on the budget share and the absolute value of education expenditures controlling for a number of household characteristics derived from the FIES. The mean and median effects of remittances on education expenditures are examined by taking into account their censored nature.

With regard to the effects of remittances, we consider the issue of endogeneity that there is a potential reverse causality between education and remittances. Under this situation, the explanatory variables are correlated with the error terms and it provides the unbiased and consistent estimates. To correct for this possible endogeneity, the instrumental variable (IV) method was used with ownership of durables as identifying instruments. We consider three potential instruments, which are the presence of a refrigerator, of a washing machine, and of a television set. In order to select the better combination of these potential instruments, we tested three important issues on instrumental variables: (1) over-identifying restrictions; (2) weak instruments; (3) regressor exogeneity. Based on these tests, we concluded that the ownership of a washing machine and of a television set provide the best instruments for the model with the share of education expenditures (i.e., *educsh*) as a dependent variable, while all three variables are chosen for the model with the absolute amount of education expenditures (i.e., *educ*).

The most obvious finding to emerge from this study is that regardless of the estimation methods, the receipt of remittances from abroad increases Filipino households'

education expenditures in terms of its budget share as well as its level. If households receive remittances from family members abroad, these transfers could significantly ease the financial constraints on Filipino households. Using the instrumental-variable (IV) Tobit estimators, this study has also found that the effects of international remittances both on the share of and the absolute amount of education expenditures are greater than domestic remittances. This result supports the idea that international remittances could contribute to the future economic growth via an increase in human capital investment. Needless to say, a sufficient supply of quality education is necessary to maximise the benefits of investment in education by remittance receiving Filipino households (Aldaba and Opiniano, 2008: 14). The study has also shown that school-age population and the budget share of education expenditure have a significantly positive correlation as one would expect. It was also shown that generally a household raises education expenditures if a household head had a higher educational attainment. An implication of this finding is the possibility that education expenditure inequality between rich and poor might widen due to the reproduction of educated children by their educated parents as this may represent the transmission mechanism for inter-generational inequality. Moreover, the conclusions drawn from this study are that households in the rural and urban areas were not different in the effect on the share for education expenditure in recent years. Its impact of the rural-urban disparity on education, rather, has contracted over time. However, on average and *ceteris paribus*, households living in the capital city significantly had the lower budget share for education compared to those not living in NCR between 1994 and 2000. This may be mainly because NCR households are richer but are likely to have fewer children and spend more expenditure on education per child. Thus, the total household expenditures can be lower in NCR. Moreover, this might be simply because costs of other things are

relatively higher (e.g., utilities, rents etc.) which act to diminish the budget share and the level devoted to educational expenditures.

The findings of this study add to a growing body of literature on the significant role of remittances from abroad on human capital development in developing countries. The methods used for this study can be applied to other household expenditure categories. The most important limitation lies in the fact that we could not distinguish the expenditure for state provided education from that of private education due to the limitations of the datasets used in the analysis. Filipino households would have a different propensity to spend on public and private education. More detailed information on the education expenditure would help us to establish a greater degree of accuracy on this matter.

Chapter 7 Conclusion

This thesis has sought to examine the economic effects of the receipt of remittances on Filipino households. If migrant households receive remittances from their family members, the household's consumption or investment behaviour could be changed. Moreover, the increase in remittances might make the inequality between rich and poor widen even if the living standards for the poor improved. Based on the Family Income and Expenditure Survey (FIES) in the Philippines over the period of 1985-2006, the thesis investigated three main research questions: (1) *“What household characteristics affect the probability and the size of both domestic and international remittances Filipino households received?”*; (2) *“How do the domestic and international remittances the households received affect welfare inequality, measured by per capita total household expenditure, at the household level?”*; (3) *“How much do the domestic and international remittances also affect education expenditure at the household level?”*

This concluding chapter summarises the main results and conclusions from each chapter in turn. It also discusses the contributions, limitations of this thesis as well as some suggestions for future research, and considers the policy implications of the results obtained in this DPhil research.

Chapter Two provided a global overview of increasing international remittance flows into developing countries. It also described the trends in international remittances into the Philippines since the 1980s. In the case of the Philippines, the lion's share of the remittances has been sent by land-based overseas Filipino workers (OFWs) and their remittances have dramatically increased in the 1990s. During the Asian crisis, there was

a steep increase in overseas remittances due to a depreciation in the Philippine peso against a migrant's currency, for example the U.S. dollar. From 1997 to 1998, nominal Philippine exchange rate depreciated against currencies in OFW's destination countries such as the United States, Japan, Taiwan, and Singapore. However, the real effective exchange rate index, measured as a value of a peso against a weighted average of a several foreign currencies divided by a price deflator, appreciated. The effect of the change in real effective exchange rate can be divided into three factors: nominal effective exchange rate; domestic inflation; and foreign inflation. During the period of 1997-1998, Philippine nominal exchange rate was depreciated against major currencies. The inflation effect in the Philippines was stronger than other countries. This denotes that migrants send more remittances not only because of a sharp depreciation of Philippine peso but also price increase within the home country. Since 2004, the real effective exchange rate index has depreciated. This might partly contribute to increase in remittance flows into the Philippines though there are several factors affecting the remittance flows, which were explained in the latter of this chapter. After that, the remittance flows into the Philippines have increased continuously even during the global economic and financial crisis which commenced in September 2008. In 2010 the total amount of remittances by OFWs reached US\$ 18.76 billion. In addition to the trend in remittance flows into the Philippines, this chapter also showed the following features of the OFW's remittances: types of remittances; modes of remittances; places of origins of remittances; remittances by types of migrants' work and migrants' gender.

As mentioned above, Chapter Two also explained the main reasons why the total amount of remittances sent by OFWs has dramatically increased over time. In order to answer this question, this chapter described several factors: remittance channels;

transaction costs of remittances; expanding remittance networks and improving remittance services; exchange rate fluctuations; and an increasing stock of international migrants. Furthermore, it also explained key international migration drivers: the economic situation in the Philippines; increasing demand for labour in the global economy; and Philippine governmental policies on international migration. These factors have contributed to an increase in the numbers of deployed OFWs. Finally, the chapter described key roles of Philippine governmental institutions managing international migration for OFWs.

Chapter Three outlined the Survey on Overseas Filipinos (SOF) and the Family Income and Expenditure Survey (FIES), which are the sources of the data mainly used throughout this thesis. This chapter described their scope and coverage as well as the survey design including sampling methodology and sampling weight. In addition, the definition of main variables used in the thesis (e.g., remittance, family income and expenditure, urban/rural areas) was explained here. Finally, past studies relevant to the topics of this thesis were summarised and introduced to show the similarity and differences in the methodology.

Chapter Four examined the determinants of remittances by modelling the probability and the size of remittances received by the recipient households. It is important to deepen our understanding of determining factors of remittances as they could reduce poverty, enable recipient families to smooth consumption, and also allow the families to invest (see World Bank, 2006; Freund and Spatafora, 2008). Filipino households were categorised by the status of remittances. The households were divided into four types; households who received both domestic and international remittances (*dbothrem*), those

who received only external remittances (*dexrem*), those who received only internal remittances (*dinrem*), and those who received no remittance (*dnorem*). This categorisation enabled us to provide some insights on the differences across households based on the nature of remittance receipt.

The chapter first examined the determinants of the probability to receive either internal or international remittances using both probit and bivariate probit models. Then, by using the Tobit and the bivariate Tobit models, the determinants of the size of remittances that Filipino households received from within the Philippines or from overseas were investigated. One of the more significant findings to emerge from this chapter is that the levels of receiving internal and international remittances are mutually related, whereas the probabilities are not interrelated except for 2000 and 2003. Furthermore, it was also revealed that several explanatory factors such as the level of total household expenditure, the head of household characteristics, the job-related information, and the regional disparities are significant factors in determining both the probability and the size of receiving remittances from within the country and from abroad. Based on the results of explanatory factors, possible explanations on motivations for remittances were also made. However, these motives are too complex to articulate. Depending on the situation of migrants or recipient households, different motives can be applied. It is necessary to acquire more detailed information on the determining variables, especially those for migrants, to identify by which motives remitting behaviour would be driven.

In this chapter, we found that an increase in the household welfare level increases the incidence and the amount of international remittances while it decreases those of

domestic remittances. However, the results should be interpreted with caution because there is still an issue of welfare endogeneity here. The receipt of remittance incomes can improve the welfare level, thus the result can be biased without controlling for this endogeneity issue.

In addition to examining the factors influencing the receipt of remittances in terms of the incidence and the level, we also investigated the effect of international remittances on the receipt of domestic remittances. However, to estimate this effect, there is also a potential endogeneity problem of a two-way relationship (or reverse causality) between internal and international remittances. In order to control for this problem, we used instrumental variable (IV) estimation with instruments that were taken to affect international remittances but not directly domestic transfers. By merging the 2003 SOF into the 2003 FIES, we considered four migrant characteristics (i.e., migrant's educational attainment, gender, age, as well as length of stay abroad as a migrant) as possible instrumental variables. These migrant characteristics are used as proxy measures of their income as the wages of migrants are not available in the SOF. In order to select the better selection of the instruments, we tested three important issues on instrumental variables (i.e., over-identifying restrictions, weak instruments, and regressor exogeneity,) and concluded that the completion of tertiary education, the length of stay in destination country, and the gender are the better set of instruments for the model of the incidence of domestic remittances (i.e., *dinrem*), whereas migrant's gender and age are used as the potentially best instruments for the model with the level of domestic remittances (i.e., *inrem*).

Finally, a key finding of this chapter provided the evidence of the displacement effect of international remittances on domestic remittances. Among the Filipino households with remittances from abroad, it was found that the level of remittances from within the country decreased as the amount of international remittances increased. The receipt of remittances from abroad would contribute more to improve the household welfare than those from within the country because of the greater amounts. This displacement effect has a positive impact not only on the recipient but also family members who live within the Philippines and send domestic remittances. After the recipient households received international remittances, these family members might need to send less than before or have no need to send money any more. This enables them to increase their disposable income and helps improve their welfare. However, the receipt of remittances from abroad might widen the gap in the welfare between households with and without the remittances.

Chapter Five investigated the effect of remittances on welfare inequality, which was measured by per capita total household expenditure. Recently, the economic inequality between rich and poor in the Philippines is widening at historically high levels for the past three decades. For example, income Gini indices estimated with the 2006 FIES revealed that the richest ten per cent earns nineteen times more than the poorest ten per cent of Filipinos (Aldaba and Opiniano, 2008:2). Similarly, among most developing countries, it was found that the richest 20 per cent experienced the fastest increase in per capita expenditure than the bottom 20 per cent. In the case of the Philippines, per capita expenditures increased by 2.27 per cent for the richest 20 per cent, while by only 1.28 per cent for the poorest 20 per cent in the period of 1994-2003 (ADB, 2007).

Based on past findings on widening inequality in the Philippines, it was assumed that remittances from abroad would contribute to a widening of the Filipino households' expenditure disparities more so than remittances from within the Philippines would. In order to investigate the effect of the receipt of remittances on expenditure differences among Filipino households, three different analyses were used at mean and at the specific quantile (i.e., 10th, 50th, and 90th) based on the types of the receipt of remittance incomes (i.e., *dinrem*, *dexrem*, and *dbothrem*) in the period of 1994-2000 using the Philippine Family Income and Expenditure Survey (FIES).

First, ordinary least square (OLS) and conditional quantile regressions were used with remittance dummy variables to capture the effects of the receipt of remittances on the household welfare level. Assuming that there is no difference in the effects of household characteristics on the welfare level between households who received remittances and those who did not, we found that the receipt of international remittances significantly increased their livelihoods and that its effect has increased from 1994 to 2000 at any point of the welfare distribution.

Second, conditional interquantile regressions were used to investigate whether the remittances contributed to widening the welfare gaps between the poor and the middle and the affluent households. The results show that in 2000 the receipt of international remittances significantly accounted for the gaps between rich and poor, which were mainly explained by the differences between the middle and the rich groups. This means that the remittances contributed the most to the rich and it would increase the welfare inequality.

Finally, an unconditional quantile decomposition approach was used to estimate the endowment and remittance effects on the quantiles of the unconditional distribution of the welfare. The result revealed that even after controlling for the effect of household characteristics on the level of household expenditure, the study has also found that receiving international remittances change household expenditure patterns, make the households have higher propensity to spend, and then cause expenditure gaps between Filipino households to widen between 1994 and 2000. One of the more significant findings to emerge from the unconditional quantile decomposition is that unlike conditional quantile regressions, the receipt of international remittances contributes to improvement in the welfare the most among the middle class followed by the rich and it affects widening the welfare differences between poor and middle welfare households.

In contrast, the receipt of remittances from within the Philippines did not exert a significant impact on improving the welfare of Filipino households. The results of this study also suggest that widening the expenditure inequality in the Philippines from 1994 to 2000 is mainly accounted for by the receipt of international remittances. These money transfers from abroad are often used to improve their welfare level. A case in point is child education. Some migrant workers go abroad and remit to send their children to better schools, in many cases to private schools. This important relationship between remittances and education was then examined in Chapter Six.

The results of Chapter Five indicate that there is an importance in dealing with the expenditure differentials by taking into account the type of households in terms of the receipt of remittances. The quantile decomposition results enhance our understanding of the expenditure differences as we can decompose the gaps at any point of the welfare

distribution. The results of the Blinder-Oaxaca decomposition approach, which decomposes the mean expenditure differentials, need to be interpreted with caution because the mean expenditure gap is significantly different from the median and other quantile expenditure differences. It was found that mean expenditure differentials were smaller than the median ones. This suggested that focusing on the mean regression decomposition analysis could lead researchers or policymakers to underestimate the effect of remittances on expenditure inequality.

Chapter Six investigated the effect of receiving remittances on a Filipino household's educational expenditure behaviour. The receipt of remittances might alter a household's expenditure patterns on consumption and investment. An Engel curve framework was used to analyse the changes in household expenditure patterns. Theoretically and empirically, the past literature on the Engel curve analysis was also reviewed. And then, by using the FIES, this chapter analysed the Filipino household expenditure patterns of education with due consideration of the difference in international remittances as well as those from within the Philippines. In the chapter, the censored nature of educational expenditure was addressed using both the Tobit and CLAD models.

With regard to the effects of remittances, we consider the issue of endogeneity that there is a potential reverse causality between education and remittances. Under this situation, the explanatory variables are correlated with the error terms and it provides unbiased and inconsistent estimates. In order to control for this possible endogeneity, the instrumental variable (IV) method was used with ownership of durables as possible instruments. As explained in the chapter, the ownership of such items should be uncorrelated with the education spending decision as it is unlikely to directly affect

expenditure for child education. In contrast, these variables would be highly correlated with the level of international remittances. We consider three potential instruments, which are the presence of a refrigerator, of a washing machine, and of a television set as there is evidence that the proportion of households with some durables (such as a TV set, a refrigerator, a washing machine) is higher among those who received international remittances (Tullao, Cortez and See, 2007). Filipino households having more TV sets, refrigerators, washing machines tend to rely more on income transfers from abroad, which are readily available and more stable income flows for the recipient households.

It could be argued that the receipt of remittances is actually influenced by the acquisition of these ‘white goods’. However, in the current application, the acquisition of these ‘white goods’ clearly predates by a number of years the receipt of the international remittances, which was in the last 12 months so the causality is working in only one direction. Nevertheless, the question remains as to why the ownership of ‘white goods’ influences the receipt of international remittances. One possible argument is that once Filipino households have owned ‘white goods’ their demand to upgrade and renew them increases and international remittances provides one readily available income flow which facilitates their purchase – hence an anticipated positive relationship. Another possible explanation for the causality and positive relationship between the ownership of durables and international remittances might be that households with greater number of durable products would have higher propensity to spend and therefore in order to keep their lifestyle they expect to receive more income transfers from abroad as they cannot afford to do so with their own domestic income.

In order to select the better combination of the potential instruments, we tested three important issues on instrumental variables: (1) over-identifying restrictions; (2) weak instruments; (3) regressor exogeneity. Based on these tests, we concluded that the ownership of a washing machine and of a television set is selected as the potentially best instruments for the model with the share of education expenditures (i.e., *educsh*) as a dependent variable, while all three variables are chosen for the model with the absolute amount of education expenditures (i.e., *educ*).

The most obvious finding to emerge from this chapter is that the receipt of remittances from abroad increases both the Filipino household's budget share for education and the absolute amount. If households receive remittances from family members abroad, these transfers could significantly ease the financial constraints of Filipino households. The instrumental-variable (IV) Tobit estimators were used to control for the possible endogeneity problem for two-way relationship between education and remittances. In this chapter, we controlled for a potential endogeneity of international remittances only, not domestic remittances as we could not find good instruments to control and also because some tests used to select of instruments are only available for the model with only one endogenous regressor. Using this IV tobit model, Chapter Six has also found that the effects of international remittances both on the share of and the absolute amount of education expenditures are greater than domestic remittances. This result supports the idea that international remittances could contribute to the future economic growth via increase in human capital investment. Needless to say, a sufficient supply of quality education is necessary to maximise the benefits of investment in education by remittance receiving Filipino households (Aldaba and Opiniano, 2008: 14). This study has also shown that the shares of school-age population and the budget share of

education expenditure have significant positive correlations. It was also shown that generally the households raise the budget share for education if their household heads had acquired higher education. An implication of this finding is the possibility that education expenditure inequality between rich and poor might widen due to the reproduction of the educated children by their educated parents as this may represent the transmission mechanism for inter-generational inequality. Moreover, the conclusions drawn from this study are that between being households in the rural and urban areas did not exhibit a significant effect on the share for education expenditure in recent years. Its impact of the rural-urban disparity on education, rather, has contracted over time. However, on average and *ceteris paribus*, households living in the capital city significantly had a lower budget share for education compared to those not living in National Capital Region (NCR) between 1994 and 2000. This may be mainly because NCR households are richer but are likely to have fewer children and spend more expenditure on education per child. Thus, the total household expenditures can be lower in NCR. Moreover, this might simply be because costs of other things are relatively higher in NCR (e.g., utilities, rents etc.) which act to diminish the share and the level of education expenditures for households in this region. Furthermore, parents in non-NCR might prefer sending their kids to private schools because there might be no good public schools in the region. In NCR, there are more and better public schools, so households would be willing to send their kids there and have lower spending on education with other things being equal.

It should be pointed out that the empirical analyses conducted in this thesis are certainly not without limitation. As for the study on the determinants of remittances conducted in Chapter Four, the most important limitation lies in the fact that there is no information

on migrants in the FIES. Adding migrant characteristics into the existing explanatory variables in the analysis would help us to establish a greater degree of accuracy on this matter. In Chapter Five, further experimental investigations are needed to estimate the effect of remittances on the inequality with due consideration of the issue of sample selection bias. There is, therefore, a definite need for more detailed information on the decision of remitting or migration as well as development of quantile regression procedure which can deal with the issue in an accessible way. As far as the effect of remittances on education expenditure in Chapter Six, the most important limitation lies in the fact that we could not distinguish the expenditure on public education from that on private education due to the limitation on the datasets used in the analysis. Filipino households may have a different propensity to spend on public and private education. More detailed information on the education expenditures would thus help us to establish a greater degree of accuracy on this matter. Despite these limitations, this thesis has made an important contribution towards our understanding of the effect of remittances on Filipino households.

One important policy implication may be drawn from the findings of this thesis. The Philippine governmental policy on overseas employment goes back to the 1970s as a measure to ease domestic unemployment. The 1974 Labor Code aims to protect Filipinos who wish to work overseas, strengthen functions of government institutions for overseas employment, and rationalize the participation of private recruitment agencies (Orbeta, Abrigo, and Cabalfin, 2009). The Migrant Workers and Overseas Filipinos Act of 1995 (or RA 8042) established a higher standard of protection of OFWs and promoted the welfare of migrant workers and their families. In the Section Two of RA 8042, we can find the following statements:

“While recognizing the significant contribution of Filipino migrant workers to the national economy through their foreign exchange remittances, the State does not promote overseas employment as a means to sustain growth and achieve national development. The existence of the overseas employment program rests solely on the assurance that the dignity and fundamental human rights and freedoms of the Filipino citizens shall not, at any time, be compromised or violated. The State, therefore, shall continuously create local employment opportunities and promote the equitable distribution of wealth and the benefits of development.”

Section Two (c) Declaration of Policies, RA 8042

The above statements are out of touch with current economic situation in the Philippines. In reality, the Philippine government has been managing overseas employment and leveraging remittance flows into the country for sustainable national development.

The results of this thesis support the idea that the receipt of international remittances could enhance the budgets for education among households in the Philippines. While the receipt of international remittances could significantly contribute to an improvement in Filipino households' livelihoods at any welfare level, it would cause expenditure inequality between Filipino households to widen over time. Effective drugs tend to have side effects: They are something of a double-edged sword. Even if the receipt of remittances contributed to the human capital development via increase in educational expenditure in the short run, there will be a possibility of brain drain when the educated children will not be able to find decent jobs or jobs matching their skills. Local employment opportunities are still lacking. Today, the youth unemployment rates

remain very high at 17 per cent. The worst of it is that now an increasing proportion of the unemployed possess a tertiary education. Nevertheless, this causes a serious waste of human resources within the Philippines as well as more educated workers leaving the country. International remittances could contribute to the future Philippine economic growth via an increase in human capital investment. However, the outcomes of migration policies depend on whether there are more decent job opportunities locally as well as successful reintegration of overseas Filipinos into Philippine society in all senses: economically, socially, and psychologically. In conclusion, without better local employment and business or investment opportunities, the policy of heavy reliance on international remittance flows can hurt the country by worsening welfare inequality between rich and poor as well as through the large-scale emigration of skilled workers over time.

Bibliography

Adams, R.H. (1998) Remittances, Investment, and Rural Asset Accumulation in Pakistan, *Economic Development and Cultural Change*, 47(1), 155-173

Adams, R. H. (2004) Remittances and poverty in Guatemala, World Bank Policy Research Working Paper 3418, the World Bank

Adams, R.H. (2005) Remittances, household expenditure and investment in Guatemala, Policy Research Working Paper Series, World Bank, 3532

Adams, R. H. and Page, J. (2005), Do international migration and remittances reduce poverty in developing countries, *World Development*, 33(10): 1645-1669.

Adams, R. (2006) Remittances and Poverty in Ghana, Policy Research Working Paper, No. WPS3838, World Bank

Agarwal, R. and Horowitz, A.W. (2002) Are International Remittances Altruism or Insurance? Evidence from Guyana Using Multiple-Migrant Households, *World Development*, 30(11), 2033-2044

Aggarwal, R. and Spatafora, N. (2005) Workers' remittances and economic development. in IMF (2005) *World Economic Outlook: Globalization and External Imbalances*, April 2005. IMF, Washington, DC.

Ahortor, C.R.K., and Adenutsi, D.E. (2009) The Impact of Remittances on Economic Growth in Small-Open Developing Economies, *Journal of Applied Sciences*, 9 (18), 3275-3286

Akita, T. and Miyata, S. (2008) Urbanization, educational expansion, and expenditure inequality in Indonesia in 1996, 1999, and 2002, *Journal of the Asia Pacific Economy*, 13(2), 147-167

Akita, T., Lukman, R.A., and Yamada, Y. (1999) Inequality in the distribution of household expenditures in Indonesia: A Theil decomposition analysis, *The Developing Economies*, 37(2), 197-221

Alba, M.M. (2009) "Why has the Philippines Remained a Poor Country? Some Perspectives from Growth Economics", UPSE Discussion Papers, University of the Philippines

Alba, M.M. and Sugui, J.S.C. (2009) Motives and Giving Norms behind Remittances: the Case of Filipino Overseas Workers and their Recipient Households, PIDS Discussion Paper Series No. 2009-26, Philippine Institute for Development Studies

Albrecht, J., van Vuuren, A., and Vroman, S. (2009) Counterfactual distributions with sample selection adjustments: Econometric theory and an application to the Netherlands, *Labour Economics*, 16, 383-396

- Aldaba, F.T. and Opiniano, J.M. (2008), 'The Philippine "Diasporic Dividend": Maximizing the Development Potentials of International Migration', in M. M. B. Asis and F. Baggio (eds.), *Moving Out, Back and Up: International Migration and Development Prospects in the Philippines*, 127-161. Quezon City: Scalabrini Migration Center.
- Amador, M., Claveria, R., Co, F., and Delloro, V. (2007) Philippine Overseas Workers and Migrants' Remittances: The Dutch disease question and the cyclical issue, *Bangko Sentral Review*, January 2007. Retrieved on 20 September 2010 from the Bangko Sentral ng Pilipinas Website: www.bsp.gov.ph/downloads/publications/2007/BSR2007_01.pdf
- Amemiya, T. (1985) *Advanced Econometrics*, Harvard University Press, Cambridge, Massachusetts
- Amuedo-Dorantes, C. and Pozo, S. (2006) Migration, Remittances, and Male and Female Employment Patterns, *American Economic Review*, 96(2), 222-226
- Ang, A.P., Sugiyarto, G., and Jha, S. (2009) Remittances and Household Behavior in the Philippines, ADB Economics Working Paper Series No. 188, Asian Development Bank.
- Arabmazar, A. and Schmidt, P. (1981) Further Evidence on the Robustness of the Tobit Estimator to Heteroskedasticity, *Journal of Econometrics*, 17: 253-258
- Asian Development Bank (2006) *Workers' Remittance Flows in Southeast Asia*, Asian Development Bank
- Asian Development Bank (2007) *Inequality in Asia: Key Indicators 2007 Special Chapter Highlights*, Asian Development Bank.
- Balisacan, A.M. (2001) Poverty in the Philippines: An Update and Reexamination, *Philippine Review of Economics*, 38, 16-51
- Balisacan, A.M. and Fuwa, N. (2004) Changes in Spatial Income Inequality in the Philippines, WIDER, Research Paper No. 2004 34
- Balisacan, A.M. and Hill, H. (2003) *The Philippine Economy. Development, Policies, and Challenges*, Oxford University Press, New York
- Ballescás, C. (2009, November 19). No to mandatory insurance for our migrants!, Retrieved on 20 January 2010 from The Philippine Star Website: <http://www.philstar.com/>
- Ballescás, C. (2009, November 26). OFWs and mandatory insurance, Retrieved on 20 January 2010 from The Philippine Star Website: <http://www.philstar.com/>
- Ballescás, M.R.P. (1992) *Filipino Entertainers in Japan: An Introduction*, Quezon City: Foundation for Nationalist Studies.

- Ballesteros, M.M. (2001) The dynamics of housing demand in the Philippines. Income and lifecycle effects, The PIDS Discussion Paper Series, No. 2001-15
- Banerjee, B. (1984), The Probability, Size and Uses of Remittances from Urban to Rural Areas in India, *Journal of Development Economics* 16, p.293-311
- Bangko Sentral ng Pilipinas (2009, Dec 15). OF Remittances Hit US\$1.5 Billion in October; Year-to-date at US\$14.3 Billion, Retrieved December 16, 2009, from Bangko Sentral ng Pilipinas website: <http://www.bsp.gov.ph>
- Battistin, E., Blundell, R., and Lewbel, A. (2007) Why is Consumption More Log Normal Than Income?: Gibrat's Law Revisited, Boston College Working Papers in Economics, No.671, Boston College Department of Economics. Retrieved 2008-05-03, from <http://econpapers.repec.org/paper/bocbocoec/671.htm>.
- Baum, C.F. (2006) An Introduction to Modern Econometrics Using Stata, A Stata Press Publication StataCorp LP, College Station, Texas
- Bautista, R.M. and Lamberte, M.B. (1990) Comparative Saving Behavior of Rural and Urban Households in the Philippines, *Journal of Philippine Development*, Number Thirty One, Volume XVII, No.2, Philippine Institute for Development Studies (PIDS).
- Becker, G.S. (1974) A Theory of Social Interactions, *The Journal of Political Economy*, 82(6), pp.1063-1093
- Bellony, A. and Reilly, B. (2009) An analysis of labour market earnings in St.Lucia, *Social and Economic Studies*, September/December 2009, Vol. 58, No. 3 & 4, pp.111-147
- Berhheim, B.D., Shleifer, A., and Summers, L.H. (1985) The Strategic Bequest Motive, *The Journal of Political Economy*, 93(6), pp.1045-1076
- Blinder, A.S. (1973) Wage Discrimination: Reduced form and Structural Estimates, *Journal of Human Resources*, 8(4), 436-455.
- Brown, R.P.C. and Connell, J. (2006) Occupation-specific analysis of migration and remittance behaviour, *Asia Pacific Viewpoint*, 47 (1), pp.135-150
- Brown, R. P.C.(1997) Estimating remittance functions for Pacific island migrants, *World Development*, 25(4), 613-626
- Buchinsky, M. (1994) Changes in the U.S. Wage Structure 1963-1987: Application of Quantile Regression, *Econometrica*, 62(2): 405-459
- Buchinsky, M. (1998) The Dynamics of Changes in the Female Wage Distribution in the USA: A Quantile Regression Approach, *Journal of Applied Econometrics*, 13(1), 1-30
- Buchinsky, M. (2001) Quantile regression with sample selection: Estimating women's return to education in the U.S., *Empirical Economics*, 26, 87-113

Burda, M., Fitzenberger, B. Lembcke, A., and Vogel, T. (2008) Unionization, Stochastic Dominance, and Compression of the Wage Distribution: Evidence from Germany. Retrieved 2008-10-03, from <http://www.zew.de/en/publikationen/dfgflex/paperfitzenberger4.pdf>.

Burgess, R. and Haksar, V. (2005) Migration and Foreign Remittances in the Philippines, IMF Working Paper, No. 05 111

Cameron, A.C. and Trivedi, P.K. (2010) Microeconometrics Using Stat (Revised Edition), A Stata Press Publication StataCorp LP, College Station, Texas.

Carletto, C., Davis, B., Stampini, M., Trento, S., and Zezza, A. (2004) Internal Mobility and International Migration in Albania, ESA Working Paper No. 04-13

Carletto, C., Davis, B., Stampini, M., and Zezza, A. (2006) A Country on the Move: International Migration in Post-Communist Albania, *International Migration Review*, 40(4), 767-785

Castaldo, A., Litchfield, J., and Reilly, B. (2005) Migration and poverty in Albania: what factors are associated with an individual's predisposition to migrate?, *Journal of Southern Europe and the Balkans*, 7(2), 157-173

Castaldo, A. and Reilly, B. (2007) Do migrant remittances affect the expenditure patterns of Albanian households?, *South-Eastern Europe Journal of Economics*, 5(1), 25-54.

Castles, S. (2007) Twenty-First-Century Migration as a Challenge to Sociology, *Journal of Ethnic and Migration Studies*, 33(3) 351-371

Cattaneo, C. (2010). "Migrants' International Transfers and Educational Expenditure: Empirical Evidence from Albania", *Fondazione Eni Enrico Mattei Working Papers*

Castles, S. and Miller, M.J. (1998) *The Age of Migration: International Population Movements in the Modern World*, Second Edition,

Commission on Filipinos Overseas (2008) Stock Estimate of Overseas Filipinos as of Dec. 2008, from Commission on Filipinos Overseas Website: <http://www.cfo.gov.ph/pdf/statistics/Stock%202008.pdf>

Commission on Audit (2008) Government's Overseas Workers' Welfare Program. Management Services Report No. 2007-01 Sectoral Performance Audit. Retrieved on 14 Jan 2010 the COA website: <http://www.coa.gov.ph/GWSPA/GWSPA.htm>

Cox, D. (1987) Motives for Private Income Transfers, *Journal of Political Economy*, 95, 508-546

Cox, D., Eser, Z. and Jiminez, E. (1998) Motives for private transfers over the life cycle an analytical framework and evidence for Peru, *Journal of Development Economics*, 55, 57-80.

- Cox, D., Hansen, B.E. and Jimenez, E. (2004) How responsive are private transfers to income: Evidence from a Laissez-faire economy, *Journal of Public Economics*, 88, 2193-2219
- Datt, G. and Hoogeveen, H. (2003) El Niño or El Peso? Crisis, Poverty, and Income Distribution in the Philippines, *World Development*, 31(7), 1103-1124.
- de la Briere, Sadoulet, E., De Janvry, A. and Lambert, S. (2002) The roles of destination, gender, and household composition in explaining remittances, *Journal of development economics*, 68(2), 309-328
- Dakila, C and Dakila, F.G.(2006) Modeling the Impact of Overseas Filipino Workers Remittances on the Philippine Economy. An inter-Regional and Economy-Wide Approach, BSP Working Paper Series
- Deaton A. (1997) *The Analysis of Household Surveys: A Microeconomic Approach to Development Policy*, Baltimore, Johns Hopkins University Press for the World Bank.
- Ducanes, G. and Abella, M. (2008) Overseas Filipino Workers and their Impact on Household Poverty, ILO Asian Regional Programme on Governance of Labour Migration Working Paper No.5, International Labour Organization.
- Durbin, J. (1954) Errors in variables, *Review of the international statistical institute*, 22, 23-32
- Edillon, R. 2008. "The effects of parent's migration on the rights of children left behind", Working Paper United Nations Children's Fund (UNICEF), Policy, Advocacy and Knowledge Management Section, Division of Policy and Practice, New York
- Erieta, C. and Fabian, E. (2009) A Documentation of the Philippines Family Income and Expenditure Survey, PIDS Discussion Paper Series No. 2009-18. Philippine Institute for Development Studies
- Estudillo, J.P. (1997) Income Inequality in the Philippines, 1961-91, *The Developing Economies*, 35(1), 68-95
- Fields, G.S. (2003) Accounting for Income Inequality and its Change. A New Method with Application to the Distribution of Earnings in the United States
- Fortin, N., Lemieux, T., and Firpo, S. (2010) Decomposition Methods in Economics, NBER Working Paper No. 16045, National Bureau of Economic Research
- Freund, C. and Spatafora, N. (2008) Remittances, transaction costs, and informality, *Journal of Development Economics*, 86, 356-366
- Go, S.P. (2010) The Philippines and Return Migration: Trends, Reintegration and Service Delivery, Second Draft paper presented at the ILO Manila on 26 January 2010.
- Greene, W.H. (2007) *Econometric Analysis*, 6th ed., New Jersey: Person Education.

Gupta, S., Pattillo, C.A., and Wagh, S. (2008) Effect of Remittances on Poverty and Financial Development in sub-Saharan Africa, World Development

Gustafsson, B. and Makonnen, N. (1993) Poverty and Remittances in Lesotho, *Journal of African Economies*, 2 (1), 49-73.

Haisken-DeNew, J.P. and Schmidt, C.M. (1997) Inter-industry and Inter-region Differentials: Mechanics and Interpretation, *Review of Economics and Statistics*, 79(3), pp. 516-21.

Hatton, T. J. and Williamson, J. G. (2002). What fundamentals drive world migration? Working Paper 9159. Cambridge, National Bureau of Economic Research. NBER Working Paper Series

Hausman, J.A. (1978) Specification tests in econometrics, *Econometrica*, 46, 1251-1271

Heckman, J.J. (1979) Sample Selection Bias as a Specification Error, *Econometrica*, 47(1), pp.153-162

Hoddinott, J. (1992), Modelling Remittance Flows in Kenya, *Journal of African Economies* 1, p.206-232

Hoddinott, J. (1994) A Model of Migration and Remittances Applied to Western Kenya, *Oxford Economic Papers*, 46(3), pp. 459-476

Hossain, S. and Psacharopoulos, G. (1994) The profitability of school investments in an educationally advanced developing country, *International Journal of Educational Development*, 14(1), 35-42.

International Monetary Fund (2011) The World Economic Outlook Database (April 2011 Edition), Retrieved 2011-08-08, from <http://www.imf.org/external/pubs/ft/weo/2011/01/weodata/index.aspx>

International Organization for Migration (2005). World migration 2005: Costs and benefits of international migration. IOM World Migration Report Series Vol. 3, International Organization for Migration.

Economic Resource Center for Overseas Filipinos and International Organization for Migration (2010a) Harnessing the Development Potential of Remittances: The Italy-Philippines Migration and Remittance Corridor, IOM Manila.

Economic Resource Center for Overseas Filipinos and International Organization for Migration (2010b) Harnessing the Development Potential of Remittances: The Malaysia-Philippines Migration and Remittance Corridor, ERCOF Manila.

Jaleco, R.J. (2008), Growth in dollar remittances an illusion – WB study, <http://www.abs-cbnnews.com/pinoy-migration/04/29/08/growth-dollar-remittances-illusion-%E2%80%93wb-study-0>

- Jansen, C. (1969) Some sociological aspects of migration. In *Migration*, Jackson, J.A. (ed.). Cambridge University Press: Cambridge; 60-73
- Jennissen, R. (2004). Macro-economic determinants of international migration in Europe. Bloemgracht: Dutch University Press.
- Jo Domingo, B. (2008), 'Feasibility Study of the Electronic Money Remittance to Extend Social Security Coverage for Migrant Workers: The Case of the Philippines', ILO Asian Regional Programme on Governance of Labour Migration Working Paper No.11
- Johnson, G. and Whitelaw, W. (1974) Urban-rural income transfers in Kenya. an estimated remittances function, *Economic Development and Cultural Change*, 22, 473-79
- Jolliffe, D., Krushelnytskyy, B., and Semykina, A. (2000) Censored Least Absolute Deviations Estimator: CLAD, *Stata Technical Bulletin*, 2000, STB-58: 13-16.
- King, R. (2002) Towards a New Map of European Migration, *International Journal of Population Geography*, 8(2), 89-106
- Koenker, R. (2005) *Quantile Regression*, Econometric Society Monographs, Cambridge University Press.
- Koenker, R. and Bassett, G. (1978), Regression quantiles, *Econometrica*, 46(1), 33-50.
- Koenker, R. and Bassett, G. (1982) Robust tests for heteroscedasticity based on regression quantiles, *Econometrica*, 50: 43-61
- Koenker, R. and Hallock, K.F. (2001), Quantile Regression, *Journal of Economic Perspectives*, 15(4), 143-156.
- Krueger, A.B. and Summers, L.H. (1988) Efficiency Wages and the Inter-industry Wage Structure, *Econometrica*, 56(2), pp. 259-93.
- Knight, J., Song, L., and Hubain, J. (1999) Chinese Rural Migrants in Urban Enterprises. Three Perspectives. *Journal of Development Studies*, 35(3), p73-104
- Knowles, R. and Anker, J.C. (1981) An analysis of income transfers in a developing country. The case of Kenya, *Journal of Development Economics*, 8(3), p.205-226
- Lauby, J. and Stark, O. (1988) Individual Migration as a Family Strategy: Young Women in the Philippines, *Population Studies*, 42, 473-486
- Le, H.T., and Booth, A.L. (2010) Inequality in Vietnamese Urban-Rural Living Standards, 1993-2006, Discussion Paper Series No.7918, Centre for Economic Policy Research

- Lee, L. (1992) Amemiya's Generalized Least Squares and Tests of Overidentification in Simultaneous Equation Models with Qualitative or Limited Dependent Variables. *Econometric Reviews*, Vol. 11, No. 3, pp. 319-328.
- Leser, C. E. V. (1963) Forms of Engel Functions, *Econometrica*, 31(4), 694-703.
- Lim, J.Y. (1999) The Social Impact and Responses to the Current East Asian Economic and Financial Crisis: The Philippine Case, Country paper prepared for the United Nations Development Program/Regional Bureau for Asia and the Pacific, Bangkok.
- Liu, Q and Reilly, B. (2004) Income transfers of Chinese rural migrants, some empirical evidence from Jinan, *Applied Economics*, vol.36, 1295-1313.
- Lokshin, M., Bontch-Osmolovski, M., and Glinskaya, E. (2007) Work-Related Migration and Poverty Reduction in Nepal, World Bank Policy Research Working Paper 4231
- Lorenzo, F.M.E., J.M. Cruz, K. Martin, E. Paraguya. (2009). "2009 Second Philippine Nursing Competitiveness Conference Report", submitted to the Commission on Filipinos Overseas.
- Lucas, R. E. and Stark, O.(1985) Motivations to Remit Evidence form Botswana. *Journal of Political Economy*, 93, 901-918
- Machado, J. and Mata, J. (2005) Counterfactual Decomposition of Changes in Wage Distributions Using Quantile Regression Models, *Journal of Applied Econometrics*, 20, 445-465.
- Maddala, G.S. (2001) *Introduction to Econometrics (Third Edition)*, Chichester: John Wiley & Sons, Ltd
- Maluccio, J. (1998) Endogeneity of schooling in the wage function: Evidence from rural Philippines. Food Consumption and Nutrition Division (FCND) Discussion Paper No.54, International Food Policy Research Institute, Washington, D.C. Retrieved 2008-07-09, from <http://www.ifpri.cgiar.org/divs/fcnd/dp/papers/dp54.pdf>
- Mamanglu, S. (2010, January 31). OFW Deployment Faces Decline as Workers Age. Retrieved February 1, 2010, from the Manila Bulletin website: <http://www.mb.com.ph/articles/241223/ofw-deployment-faces-decline-workers-age>
- Markova, E. and Reilly, B. (2007) Bulgarian Migrant Remittances and Legal Status: Some Micro-level Evidence from Madrid, *South-Eastern Europe Journal of Economics*, 5(1), 55-69
- Massey, D.S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., and Taylor, J.E. (1998) *Worlds in Motion: Understanding International Migration at the End of the Millennium*, New York, Oxford University Press

McKenzie, D. and Sasin, M. (2007) Migration, Remittances, Poverty, and Human Capital: Conceptual and empirical challenges, World Bank Policy Research Working Paper 4272, the World Bank.

Melly, B. (2006), 'Estimation of counterfactual distributions using quantile regression', a chapter of the PhD thesis submitted to the University of St. Gallen in Switzerland. <http://www.alexandria.unisg.ch/publications/22644>.

Melly, B. (2007). Rqdeco: a Stata module to decompose differences in distribution: mimeo. Retrieved 2008-02-03, from <http://www.alexandria.unisg.ch/publications/40161>.

Meyer, B.D. and Sullivan, J.X. (2003) Measuring the Well-Being of the Poor Using Income and Consumption, *Journal of Human Resources*, 38(4), 1180-1220.

Mishra, P. and Parikh, A. (1992) Household consumer expenditure inequalities in India: A decomposition analysis, *Review of Income and Wealth*, 38(2), 225-236.

Naticchioni, P., Ricci, A., and Rustichelli, E. (2008) Wage Inequality, Employment Structure and Skill-biased Change in Italy, *Labour*, 22(Special Issue), 27-51.

National Economic and Development Authority (2008) 2007 growth rate highest in 31 years, but threats persist, DevPulse NEDA Development Advocacy Factsheet, Retrieved on 20 January 2010 from NEDA website: www.neda.gov.ph

National Statistics Office Web site
<http://www.census.gov.ph/data/pressrelease/2005/of04tx.html>, accessed 20/Nov/2006

National Statistics Office. The 1985, 88, 91, 94, 97, 2000, 2003, 2006 Family Income and Expenditure Survey (FIES).

National Statistics Office. The 1997-98, 1999, 2000, 2001, 2002, Survey on Overseas Filipinos (SOF)

Newey, W.K. (1987) Efficient Estimation of Limited Dependent Variable Models with Endogeneous Explanatory Variables". *Journal of Econometrics*, Vol. 36, pp. 231-250.

Niimi, Y. and Reilly, B. (2008), 'Gender Differences in Remittance Behavior: Evidence from Viet Nam', ADB Economics Working Paper Series No. 135.

Nguyen, V.C. (2008) Do Foreign Remittances Matters to Poverty and Inequality. Evidence from Vietnam, *Economics Bulletin*, 15(1), 1-11.

Nuqui, C.G. (1993) BATIS Center for women gathering support for Filipino women workers in Japan, BATIS, The Official Newsletter of BATIS, Center for Women, 4: 17-18.

Oaxaca, R. (1973) Male-Female Wage Differentials in Urban Labor Markets, *International Economic Review*, 14(3), 693-709.

- Opiniano, J. M. (2008) Informal remittances sank to seven-year low, OFW Journalism Consortium Website, Vol7, No4, from <http://www.ofwjournalism.net/previousweb/vol7no4/prevstories7404.php>
- Orbeta, A. (2003) Education, Labor Market, and Development: A Review of the Trends and Issues in the Philippines for the Past 25 Years, Philippine Institute for Development Studies (PIDS), Perspective Paper Series No.9
- Orbeta, A. and Abrigo, M. (2009) Philippine International Labor Migration in the Past 30 Years: Trends and Prospects, PIDS Discussion Paper Series No. 2009-33
- Orbeta, A., Abrigo, M. and Cabalfin, M. (2009) Institutions Serving Philippine International Labour Migrants, PIDS Discussion Paper Series No. 2009-31
- Orbeta, A.C. and Alba, M.M. (1998) Simulating the impact of macroeconomic policy changes on macronutrient availability in Households, *Journal of Philippine Development*, 45, 15(1)
- Pernia, E.M. (2008) Migration, Remittances, Poverty and Inequality: The Philippines, UP School of Economics Discussion Papers, No.0801, University of the Philippines, Quezon City.
- Pham, H.P. and Reilly, B. (2009) Ethnic Wage Inequality in Vietnam, *International Journal of Manpower*, 30(3), 192-219.
- Philippine Institute for Development Studies (2008) OFW children: wanting for more attention, 26(2), *Development Research News*, March-April, Philippine Institute for Development Studies.
- Philippine Overseas Employment Authority (2009) Compendium of OFW Statistics, <http://www.poea.gov.ph/html/statistics.html>
- Piracha, M. and Saraogi, A. (2011) Motivations for Remittances: Evidence from Moldova, IZA Discussion Paper No. 5467, Institute for the Study of Labor, Bonn.
- Piracha, M. and Vadean, F. (2010) Return Migration and Occupational Choice: Evidence from Albania, *World Development*, 38(8), 1141-1155
- Powell, J.L. (1984) Least absolute deviations estimation for the censored regression model, *Journal of Econometrics*, 25, 303-325
- Powell, J.L. (1986a) Censored Regression Quantiles, *Journal of Econometrics*, 32(1), 143-155
- Powell, J.L. (1986b) Symmetrically Trimmed Least Squares Estimation for Tobit Models, *Econometrica*, 54(6), 1435-1460.
- Prais, S.J. and Houthakker, H. (1955) *The Analysis of Family Budgets: with an application to two British surveys conducted in 1937-9*, Cambridge: Cambridge University Press

Ratha, D. (2007) Leveraging Remittances for Development. Retrieved 2008-03-09 from <http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1110315015165/LeveragingRemittancesForDevelopment.pdf>

Ratha, D., Mohaparta, S., and Silwal, A. (2009, November 3). Migration and Remittance Trends 2009: A better-than-expected outcome so far, but significant risks ahead, Migration and Development Brief 11.

Remo, M. (2009, October 30). Remittances via informal channels dip. Retrieved November 11, 2009, from Inquirer.net website: <http://inquirer.net>

Rempel, H. and Lobdell, R. A. (1978) The role of urban-to-rural remittances in rural development, *Journal of Development Studies*, 14(3), 324-341

Reyes, C.M., de Duzman, G.G., Manasan, R.G., and Orbeta, A.C. (1999) Social Impact of the Regional Financial Crisis in the Philippines, Philippine Institute for Development Studies, Makati, mimeo.

Reyes, E.A., Milan, E., and Sanchez, M.T.C. (1989) Employment Productivity and Wages in the Philippine Labor Market: An Analysis of Trends and Policies, PIDS Working Paper Series, No. 89-03, Philippine Institute for Development Studies.

Rodriguez, E.R. (1998) International migration and income distribution in the Philippines., *Economic Development and Cultural Change*, 46(2), 329-350

Rogers, W. (1993) Calculating of Quantile Regression Standard Errors, *Stata Technical Bulletin*, 1993, STB-13: 18-19.

Ruiz, I. and Vargas-Silva, C. (2009) Send, or Not to Send: That is the Question. Review of the Literature on Workers' Remittances, *Journal of Business Strategies*, 26(1), 65-90.

Ruxton, G.D. (2006) The unequal variance t-test is an underused alternative to Student's t-test and the Mann-Whitney U test, *Behavioral Ecology*, 17(4), 688-690.

Sakellariou, C. (2004) The use of quantile regressions in estimating gender wage differentials: a case study of the Philippines, *Applied Economics*, 36(9), 1001-1007.

Sakellariou, C. (2006) Education policy reform, local average treatment effect and returns to schooling from instrumental variables in the Philippines, *Applied Economics*, 38, 473-481

Semyonov, M. and Gorodzeisky, A. (2005) Labor Migration, Remittances and Household Income: A Comparison between Filipino and Filipina Overseas Workers, *International Migration Review*, 39(1), 45-68

Senate of the Philippines (2007). Jinggoy seeks bilateral labor ties with OFW host countries. Press Release October 24, Retrieved 18 Jan 2010 from Senate of the Philippines Website: http://www.senate.gov.ph/press_release/2007/1024_estradaj1.asp

- Singh, B. (2009) Workers' Remittances to India: An Examination of Transfer Cost and Efficiency, *International Migration, Early View*, Published Online: Jul 20 2009, doi:10.1111/j.1468-2435.2009.00540.x
- Skeldon, R. (2006) Interlinkages between Internal and International Migration and Development in the Asian Region, *Population, Space and Place*, 12(1), 15-30
- Stark, O. and Bloom, D.E. (1985) The new economics of labor migration, *American Economic Review*, 75(2), 173-178
- Tabuga, A.D. (2007), 'International Remittances and Households Expenditures: The Philippine Case', Philippine Institute for Development Studies (PIDS) Discussion Paper Series No. 2007-18.
- Taylor, J.E. and Mora, J. (2006) Does Migration Reshape Expenditures in Rural Households. Evidence from Mexico, World Bank Policy Research Working Paper 3842, Washington, DC. World Bank.
- Taylor, J.E., Mora, J., Adams, R., and Lopez-Feldman, A. (2005) Remittances, Inequality and Poverty: Evidence from Rural Mexico, Working Paper No. 05-003, Department of Agricultural and Resource Economics, University of California, Davis.
- Tobin, J. (1958) Estimation of Relationships for Limited Dependent Variables, *Econometrica*, 26(1), pp.24-36
- Tsakloglou, P. (1993) Aspects of inequality in Greece. Measurement, decomposition and intertemporal change: 1974, 1982, *Journal of Development Economics*, 40, 53-74.
- Tullao, T., M. Cortez., and E. See. (2007). "The economic impacts of international migration: A case study on the Philippines" report to East Asian Development Network.
- Tyner, J.A. (2001) Regional origins of Philippine overseas contract workers, *International Journal of Population Geography*, 7(3), 173-188.
- Tyner, J.A. (2004) *Made in the Philippines: Gendered discourses and the making of migrants*, London, RoutledgeCurzon.
- Vadean, F. and Piracha, M. (2009) Circular Migration or Permanent Return: What Determines Different Forms of Migration?, IZA Discussion Paper No. 4287, Institute for the Study of Labor, Bonn.
- Vijverberg, W. (1987) Non-Normality as Distributional Misspecification in Single-Equation Limited Dependent Variable Models, *Oxford Bulletin of Economics and Statistics*. 49(4): 417-430.
- Vogler, M. and Rotte. R. (2000) The effects of development on migration: Theoretical issues and new empirical evidence. *Journal of Population Economics*, 13, 485-508

Wahlberg, R. (2008) Part-Time Penalty in Sweden: Evidence from Quantile Regression, Working Papers in Economics, No.315. Retrieved 2008-10-03, from <http://gupea.ub.gu.se/dspace/handle/2077/17895>.

Working, H. (1943) Statistical Laws of Family Expenditure, *Journal of the American Statistical Association*, 38 (221), pp.43-56.

World Bank (2001) World Development Report 2000/2001 Attaching Poverty, Washington D.C., The World Bank.

World Bank (2006) Global Economic Prospects: Economic Implications of Remittances and Migration, Washington, DC, World Bank.

World Bank. World Development Finance, Washington, DC, World Bank.

World Bank. World Development Indicators, Washington, DC, World Bank.

Wu, D.-M. (1973) Alternative tests of independence between stochastic regressors and disturbances, *Econometrica*, 41, 733-750.

Yang, D. (2004) International Migration, Human Capital, and Entrepreneurship. Evidence from Philippine Households with Members Working Overseas, Available: http://elsa.berkeley.edu/users/webfac/emiguel/e271_s04/yang.pdf?bcsi_scan_7823DFCE46415F3E=0&bcsi_scan_filename=yang.pdf

Yang, D. (2006) Why do migrants return to poor countries. Evidence from Philippine Migrants' responses to exchange rate shocks, *The Review of Economics and Statistics*, 88(4), 715-735

Yang, D. (2008) International Migration, Remittances and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks, *The Economic Journal*, 118 (April), 591-630

Yang, D. and Martinez, C. (2005) Remittance and Poverty in Migrants' Home Areas: Evidence from the Philippines. Retrieved 2008-02-03, from http://www-personal.umich.edu/~claudiap/yangmartinez_poverty.pdf.

Zanchi, L. (1998), Inter-industry Wage Differentials in Dummy Variable Models, *Economics Letters*, 60(3), pp. 297-301.

Zarate-Hoyos, G.A., (2004) Consumption and Remittances in Migrant Households. Toward a Productive Use of Remittances, *Contemporary Economic Policy*, 22(4), 555-565.

Zeza, A., Carletto, G. and Davis, B. (2005) Moving away from poverty: a spatial analysis of poverty and migration in Albania, *Journal of Southern Europe and the Balkans*, 7:2, 175-193.

Appendix

Appendix I Estimation Results

Chapter 4

Table A4. 1: Probit marginal effect estimation results

Table A4.1a: Domestic Remittances ($y=dinrem$)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| ltotex | -0.1015*** (0.0077) | -0.0940*** (0.0073) | -0.1098*** (0.0060) | -0.1106*** (0.0063) | -0.1116*** (0.0048) | -0.1135*** (0.0046) | -0.1097*** (0.0049) | -0.1111*** (0.0052) |
| empsh | -0.0425* (0.0226) | -0.0889*** (0.0200) | -0.1429*** (0.0177) | -0.1093*** (0.0177) | -0.1147*** (0.0138) | -0.1380*** (0.0135) | -0.1232*** (0.0148) | -0.1267*** (0.0156) |
| age0-6 | 0.1598*** (0.0318) | 0.0997*** (0.0294) | 0.0495** (0.0245) | 0.0876*** (0.0256) | 0.0884*** (0.0192) | 0.0651*** (0.0201) | 0.1200*** (0.0213) | 0.1913*** (0.0233) |
| age7-14 | 0.1351*** (0.0278) | 0.0629** (0.0256) | 0.0511** (0.0215) | 0.0873*** (0.0219) | 0.0670*** (0.0168) | 0.0649*** (0.0172) | 0.1402*** (0.0183) | 0.1490*** (0.0195) |
| age15-24 | 0.0511** (0.0238) | 0.0012 (0.0215) | -0.0246 (0.0185) | 0.0129 (0.0194) | 0.0156 (0.0145) | 0.0285* (0.0147) | 0.0407*** (0.0146) | 0.0651*** (0.0162) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0041** (0.0020) | -0.0038** (0.0018) | -0.0028* (0.0015) | -0.0019 (0.0016) | 0.00008 (0.0012) | -0.0021* (0.0012) | -0.0023* (0.0012) | -0.0009 (0.0014) |
| hage2 | 0.00007*** (0.00002) | 0.00007*** (0.00002) | 0.00006*** (0.00001) | 0.00005*** (0.00002) | 0.00003*** (0.00001) | 0.00005*** (0.00001) | 0.00005*** (0.00001) | 0.00005*** (0.00001) |
| hfemale | -0.0138 (0.0158) | -0.0073 (0.0145) | 0.0230* (0.0122) | 0.0020 (0.0121) | 0.0159* (0.0095) | 0.0105 (0.0092) | 0.0364*** (0.0104) | 0.0136 (0.0100) |
| hmarried | -0.0579*** (0.0161) | -0.0648*** (0.0148) | -0.0597*** (0.0121) | -0.0677*** (0.0124) | -0.0299*** (0.0093) | -0.0452*** (0.0093) | -0.0257** (0.0100) | -0.0353*** (0.0100) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | -0.0030 (0.0108) | 0.0094 (0.0094) | -0.0019 (0.0079) | -0.0000 (0.0083) | 0.0049 (0.0064) | 0.0224*** (0.0067) | 0.0178*** (0.0068) | 0.0235*** (0.0073) |
| hedu3 | 0.0114 (0.0112) | -0.0065 (0.0114) | 0.0020 (0.0095) | -0.0077 (0.0098) | -0.0187** (0.0073) | 0.0007 (0.0075) | 0.0013 (0.0078) | 0.0055 (0.0082) |
| hedu4 | -0.0186 (0.0179) | -0.0558*** (0.0158) | -0.0330** (0.0134) | -0.0506*** (0.0138) | -0.0675*** (0.0100) | -0.0485*** (0.0103) | -0.0507*** (0.0113) | -0.0756*** (0.0119) |
| hnojob | 0.0400*** (0.0140) | 0.0371*** (0.0135) | 0.0137 (0.0107) | 0.0264** (0.0109) | 0.0261*** (0.0086) | 0.0063 (0.0081) | -0.0161* (0.0097) | -0.0050 (0.0095) |
| urban | 0.0442*** (0.0098) | -0.0305*** (0.0090) | -0.0218*** (0.0072) | 0.0286*** (0.0073) | -0.0051 (0.0057) | 0.0070 (0.0057) | N.A. N.A. | 0.0322*** (0.0066) |
| agri | -0.0815*** (0.0100) | -0.0642*** (0.0091) | -0.0587*** (0.0076) | -0.0496*** (0.0081) | -0.0714*** (0.0062) | -0.0707*** (0.0063) | -0.1095*** (0.0062) | -0.0926*** (0.0068) |
| llocos | 0.0376** (0.0188) | 0.0758*** (0.0194) | -0.0103 (0.0151) | -0.0606*** (0.0148) | -0.0278** (0.0127) | 0.0154 (0.0141) | -0.0432*** (0.0132) | 0.1299*** (0.0143) |
| Cagayan | -0.1012*** (0.0194) | -0.0886*** (0.0193) | -0.1521*** (0.0131) | -0.1985*** (0.0127) | -0.1429*** (0.0108) | -0.1092*** (0.0130) | -0.1266*** (0.0127) | 0.0775*** (0.0154) |
| Cluzon | 0.0709*** (0.0168) | 0.1503*** (0.0162) | 0.0129 (0.0122) | 0.0197 (0.0126) | -0.0218** (0.0103) | 0.1419*** (0.0120) | 0.0432*** (0.0122) | 0.2654*** (0.0115) |
| Sluzon | 0.0598*** (0.0155) | 0.0578*** (0.0152) | -0.0340*** (0.0110) | -0.0613*** (0.0111) | -0.0746*** (0.0089) | 0.0817*** (0.0106) | 0.0593*** (0.0109) | 0.2121*** (0.0109) |
| Bicol | 0.0461** (0.0200) | 0.1249*** (0.0194) | -0.0101 (0.0153) | -0.0224 (0.0156) | 0.0259* (0.0133) | 0.1272*** (0.0145) | 0.0598*** (0.0137) | 0.3054*** (0.0126) |
| Wvisayas | -0.0081 (0.0176) | 0.0322* (0.0169) | 0.0001 (0.0136) | -0.0536*** (0.0132) | 0.0090 (0.0118) | 0.1175*** (0.0130) | 0.0366*** (0.0130) | 0.1800*** (0.0133) |
| Cvisayas | -0.0761*** (0.0176) | 0.0066 (0.0176) | -0.0900*** (0.0125) | -0.1426*** (0.0120) | -0.0969*** (0.0106) | 0.0411*** (0.0135) | -0.0752*** (0.0124) | 0.0947*** (0.0140) |
| Evisayas | -0.1006*** (0.0194) | 0.0395* (0.0205) | -0.0537*** (0.0154) | -0.0902*** (0.0154) | -0.0636*** (0.0118) | 0.0124 (0.0134) | 0.0124 (0.0140) | 0.1781*** (0.0148) |
| Mindanao | -0.2039*** (0.0129) | -0.1193*** (0.0131) | -0.1912*** (0.0093) | -0.2049*** (0.0097) | -0.1768*** (0.0082) | -0.0837*** (0.0095) | -0.1687*** (0.0097) | 0.0177 (0.0110) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. N.A. | -0.1804*** (0.0205) | -0.2006*** (0.0143) | -0.2364*** (0.0137) | -0.1606*** (0.0103) | -0.0591*** (0.0137) | -0.1629*** (0.0131) | -0.0307* (0.0166) |
| Wald chi2 | 1160.35 | 1285.78 | 1574.92 | 1544.59 | 2415.81 | 2884.46 | 2694.52 | 3007.93 |
| Prob > chi2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Pseudo R2 | 0.0560 | 0.0562 | 0.0575 | 0.0526 | 0.0559 | 0.0625 | 0.0518 | 0.0638 |
| Log pseudolikelihood | -10461.108 | -11361.323 | -14135.106 | -14752.388 | -22338.992 | -23589.605 | -25935.824 | -23701.513 |
| Number of obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4.1: Probit marginal effect estimation results (continued)

Table A4.1b: International Remittances ($y=dexrem$)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|----------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| ltotex | 0.1019*** (0.0044) | 0.0819*** (0.0045) | 0.1048*** (0.0043) | 0.1090*** (0.0048) | 0.0979*** (0.0034) | 0.1104*** (0.0033) | 0.1347*** (0.0036) | 0.1441*** (0.0041) |
| empsh | -0.1310*** (0.0140) | -0.1561*** (0.0137) | -0.1838*** (0.0139) | -0.1495*** (0.0145) | -0.1835*** (0.0107) | -0.1770*** (0.0105) | -0.1328*** (0.0113) | -0.1510*** (0.0129) |
| age0-6 | -0.0437*** (0.0186) | -0.1221*** (0.0192) | -0.1100*** (0.0184) | -0.1109*** (0.0203) | -0.1132*** (0.0144) | -0.1426*** (0.0150) | -0.1189*** (0.0159) | -0.1013*** (0.0187) |
| age7-14 | -0.0155 (0.0164) | -0.0524*** (0.0164) | -0.0576*** (0.0159) | -0.0608*** (0.0174) | -0.0823*** (0.0127) | -0.1242*** (0.0128) | -0.0879*** (0.0136) | -0.0631*** (0.0156) |
| age15-24 | -0.0038 (0.0141) | -0.0393*** (0.0144) | -0.0475*** (0.0139) | -0.0440*** (0.0153) | -0.0418*** (0.0109) | -0.0650*** (0.0110) | -0.0625*** (0.0109) | -0.0455*** (0.0130) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0043*** (0.0011) | -0.00003 (0.0012) | -0.0040*** (0.0011) | -0.0013 (0.0013) | -0.0017* (0.0009) | -0.0028*** (0.0009) | -0.0050*** (0.0009) | -0.0047*** (0.0011) |
| hage2 | 0.00005*** (0.00001) | 0.000005 (0.00001) | 0.00005*** (0.00001) | 0.00002* (0.00001) | 0.00002*** (0.00001) | 0.00003*** (0.00001) | 0.00006*** (0.00001) | 0.00005*** (0.00001) |
| hfemale | 0.1779*** (0.0162) | 0.1822*** (0.0148) | 0.2087*** (0.0137) | 0.1996*** (0.0135) | 0.2005*** (0.0107) | 0.1905*** (0.0100) | 0.1577*** (0.0104) | 0.1756*** (0.0101) |
| hmarried | 0.0598*** (0.0065) | 0.0583*** (0.0072) | 0.0664*** (0.0071) | 0.0858*** (0.0076) | 0.0668*** (0.0057) | 0.0778*** (0.0056) | 0.0581*** (0.0065) | 0.0745*** (0.0071) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.0089 (0.0071) | 0.0047 (0.0068) | 0.0192*** (0.0068) | 0.0133* (0.0073) | 0.0165*** (0.0055) | 0.0276*** (0.0058) | 0.0178*** (0.0057) | 0.0252*** (0.0065) |
| hedu3 | 0.0219*** (0.0071) | 0.0248*** (0.0081) | 0.0513*** (0.0080) | 0.0457*** (0.0085) | 0.0395*** (0.0062) | 0.0445*** (0.0064) | 0.0466*** (0.0064) | 0.0584*** (0.0072) |
| hedu4 | 0.0048 (0.0096) | 0.0340*** (0.0114) | 0.0176* (0.0102) | 0.0116 (0.0110) | -0.0017 (0.0077) | -0.0015 (0.0077) | -0.0053 (0.0081) | 0.0134 (0.0096) |
| hnojob | 0.0661*** (0.0093) | 0.0730*** (0.0097) | 0.0732*** (0.0087) | 0.0832*** (0.0092) | 0.0748*** (0.0070) | 0.0702*** (0.0066) | 0.0496*** (0.0074) | 0.0615*** (0.0078) |
| urban | -0.0065 (0.0056) | -0.0136** (0.0057) | -0.0186*** (0.0056) | -0.0055 (0.0060) | -0.0135*** (0.0044) | -0.0191*** (0.0044) | N.A. N.A. | -0.0247*** (0.0050) |
| agri | -0.0670*** (0.0058) | -0.0663*** (0.0059) | -0.0728*** (0.0057) | -0.0856*** (0.0062) | -0.0807*** (0.0046) | -0.0813*** (0.0047) | -0.0823*** (0.0046) | -0.0964*** (0.0052) |
| llocos | 0.1020*** (0.0143) | 0.1490*** (0.0169) | 0.1428*** (0.0152) | 0.1148*** (0.0152) | 0.2255*** (0.0148) | 0.1824*** (0.0140) | 0.1941*** (0.0133) | 0.3267*** (0.0150) |
| Cagayan | 0.0060 (0.0123) | -0.0099 (0.0128) | -0.0152 (0.0124) | 0.0250 (0.0152) | 0.0909*** (0.0142) | 0.0700*** (0.0134) | 0.0956*** (0.0130) | 0.2398*** (0.0163) |
| Cluzon | 0.0198** (0.0089) | 0.0327*** (0.0096) | 0.0257*** (0.0086) | 0.0213** (0.0093) | 0.0453*** (0.0084) | 0.0494*** (0.0085) | 0.1098*** (0.0104) | 0.1394*** (0.0117) |
| Sluzon | -0.0100 (0.0072) | -0.0204*** (0.0075) | 0.0068 (0.0076) | -0.0160** (0.0079) | 0.0103 (0.0069) | 0.0088 (0.0068) | 0.0183** (0.0076) | 0.0649*** (0.0095) |
| Bicol | -0.0385*** (0.0083) | -0.0566*** (0.0082) | -0.0526*** (0.0092) | -0.0619*** (0.0099) | -0.0410*** (0.0083) | -0.0245*** (0.0093) | -0.0255*** (0.0092) | 0.0397*** (0.0130) |
| Wvisayas | -0.0124 (0.0090) | -0.0264*** (0.0085) | -0.0231*** (0.0088) | -0.0299*** (0.0095) | 0.0494*** (0.0097) | 0.0550*** (0.0099) | 0.0459*** (0.0104) | 0.1181*** (0.0133) |
| Cvisayas | -0.0319*** (0.0086) | -0.0461*** (0.0083) | -0.0327*** (0.0090) | -0.0732*** (0.0084) | -0.0092 (0.0091) | 0.0086 (0.0096) | 0.0300*** (0.0101) | 0.0844*** (0.0129) |
| Evisayas | -0.0261** (0.0110) | -0.0399*** (0.0104) | -0.0160 (0.0123) | -0.0436*** (0.0123) | -0.0034 (0.0103) | -0.0039 (0.0100) | 0.0283** (0.0116) | 0.1190*** (0.0156) |
| Mindanao | -0.0803*** (0.0055) | -0.0823*** (0.0060) | -0.0648*** (0.0065) | -0.0766*** (0.0072) | -0.0192*** (0.0065) | -0.0131** (0.0066) | 0.0095 (0.0072) | 0.0638*** (0.0090) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. N.A. | 0.0249 (0.0180) | 0.0203 (0.0176) | -0.0153 (0.0165) | 0.0467*** (0.0122) | 0.0655*** (0.0123) | 0.0624*** (0.0130) | 0.1559*** (0.0165) |
| Wald chi2 | 2442.40 | 2310.57 | 3354.63 | 3249.70 | 4729.63 | 4780.23 | 5330.34 | 4746.90 |
| Prob > chi2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Pseudo R2 | 0.2437 | 0.1963 | 0.1970 | 0.1719 | 0.1702 | 0.1664 | 0.1678 | 0.1524 |
| Log pseudolikelihood | -5327.137 | -6389.7331 | -9027.0946 | -9990.1156 | -14675.215 | -15597.724 | -16610.535 | -16553.151 |
| Number of obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 2: Bivariate probit marginal effect estimation results

Table A4.2a: Domestic Remittances ($y=dinrem$)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| ltotex | -0.0994*** (0.0088) | -0.0911*** (0.0079) | -0.1060*** (0.0068) | -0.1131*** (0.0069) | -0.1117*** (0.0054) | -0.1012*** (0.0050) | -0.1188*** (0.0054) | -0.1114*** (0.0056) |
| empsh | -0.0445* (0.0229) | -0.0917*** (0.0200) | -0.1449*** (0.0176) | -0.1079*** (0.0179) | -0.1147*** (0.0139) | -0.1442*** (0.0130) | -0.1177*** (0.0151) | -0.1265*** (0.0157) |
| age0-6 | 0.1583*** (0.0318) | 0.0957*** (0.0294) | 0.0464* (0.0243) | 0.0899*** (0.0259) | 0.0885*** (0.0194) | 0.0528*** (0.0194) | 0.1282*** (0.0217) | 0.1915*** (0.0233) |
| age7-14 | 0.1343*** (0.0278) | 0.0610** (0.0255) | 0.0491** (0.0213) | 0.0888*** (0.0221) | 0.0670*** (0.0169) | 0.0538*** (0.0166) | 0.1471*** (0.0187) | 0.1492*** (0.0195) |
| age15-24 | 0.0508** (0.0237) | 0.0002 (0.0213) | -0.0253 (0.0182) | 0.0137 (0.0195) | 0.0156 (0.0145) | 0.0227 (0.0142) | 0.0449*** (0.0148) | 0.0652*** (0.0162) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0042** (0.0020) | -0.0037** (0.0018) | -0.0029* (0.0015) | -0.0019 (0.0016) | 0.0001 (0.0012) | -0.0022* (0.0012) | -0.0020 (0.0012) | -0.0009 (0.0014) |
| hage2 | 0.00007*** (0.00002) | 0.00007*** (0.00002) | 0.00006*** (0.00001) | 0.00005*** (0.00002) | 0.00003*** (0.00001) | 0.00005*** (0.00001) | 0.00005*** (0.00001) | 0.00005*** (0.00001) |
| hfemale | -0.0118 (0.0163) | -0.0043 (0.0148) | 0.0259** (0.0124) | -0.0001 (0.0125) | 0.0159 (0.0097) | 0.0196** (0.0092) | 0.0298*** (0.0106) | 0.0134 (0.0101) |
| hmarried | -0.0565*** (0.0164) | -0.0626*** (0.0149) | -0.0573*** (0.0122) | -0.0696*** (0.0127) | -0.0300*** (0.0094) | -0.0375*** (0.0091) | -0.0296*** (0.0102) | -0.0354*** (0.0101) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | -0.0029 (0.0107) | 0.0094 (0.0093) | -0.0014 (0.0078) | -0.0002 (0.0083) | 0.0049 (0.0064) | 0.0232*** (0.0064) | 0.0171** (0.0069) | 0.0234*** (0.0073) |
| hedu3 | 0.0117 (0.0112) | -0.0059 (0.0113) | 0.0030 (0.0094) | -0.0084 (0.0099) | -0.0187** (0.0073) | 0.0035 (0.0072) | -0.0012 (0.0079) | 0.0055 (0.0082) |
| hedu4 | -0.0184 (0.0178) | -0.0544*** (0.0157) | -0.0321** (0.0132) | -0.0512*** (0.0139) | -0.0675*** (0.0100) | -0.0463*** (0.0098) | -0.0515*** (0.0116) | -0.0756*** (0.0119) |
| hnojob | 0.0407*** (0.0140) | 0.0383*** (0.0134) | 0.0149 (0.0107) | 0.0255** (0.0110) | 0.0261*** (0.0086) | 0.0101 (0.0079) | -0.0187* (0.0099) | -0.0051 (0.0095) |
| urban | 0.0439*** (0.0098) | -0.0305*** (0.0089) | -0.0219*** (0.0071) | 0.0289*** (0.0074) | -0.0051 (0.0057) | 0.0054 (0.0055) | N.A. N.A. | 0.0323*** (0.0066) |
| agri | -0.0822*** (0.0101) | -0.0653*** (0.0091) | -0.0594*** (0.0075) | -0.0486*** (0.0082) | -0.0714*** (0.0062) | -0.0733*** (0.0060) | -0.1067*** (0.0064) | -0.0924*** (0.0069) |
| llocos | 0.0387** (0.0189) | 0.0779*** (0.0194) | -0.0079 (0.0151) | -0.0623*** (0.0150) | -0.0279** (0.0129) | 0.0240* (0.0138) | -0.0517*** (0.0135) | 0.1296*** (0.0146) |
| Cagayan | -0.1005*** (0.0193) | -0.0878*** (0.0191) | -0.1494*** (0.0131) | -0.2012*** (0.0132) | -0.1429*** (0.0111) | -0.1000*** (0.0124) | -0.1336*** (0.0132) | 0.0773*** (0.0156) |
| Cluzon | 0.0710*** (0.0167) | 0.1502*** (0.0161) | 0.0132 (0.0121) | 0.0195 (0.0127) | -0.0218** (0.0104) | 0.1413*** (0.0118) | 0.0386*** (0.0123) | 0.2652*** (0.0116) |
| Sluzon | 0.0594*** (0.0155) | 0.0568*** (0.0152) | -0.0334*** (0.0109) | -0.0616*** (0.0113) | -0.0746*** (0.0089) | 0.0795*** (0.0103) | 0.0590*** (0.0110) | 0.2121*** (0.0109) |
| Bicol | 0.0451** (0.0200) | 0.1223*** (0.0196) | -0.0113 (0.0151) | -0.0215 (0.0157) | 0.0259* (0.0133) | 0.1217*** (0.0143) | 0.0619*** (0.0138) | 0.3053*** (0.0127) |
| Wvisayas | -0.0083 (0.0175) | 0.0312* (0.0167) | -0.0004 (0.0134) | -0.0536*** (0.0133) | 0.0090 (0.0118) | 0.1177*** (0.0128) | 0.0346*** (0.0131) | 0.1799*** (0.0134) |
| Cvisayas | -0.0762*** (0.0174) | 0.0052 (0.0175) | -0.0891*** (0.0124) | -0.1431*** (0.0122) | -0.0970*** (0.0107) | 0.0404*** (0.0131) | -0.0782*** (0.0127) | 0.0946*** (0.0140) |
| Evisayas | -0.1004*** (0.0192) | 0.0380* (0.0204) | -0.0532*** (0.0152) | -0.0904*** (0.0156) | -0.0636*** (0.0119) | 0.0118 (0.0129) | 0.0110 (0.0142) | 0.1780*** (0.0149) |
| Mindanao | -0.2039*** (0.0127) | -0.1201*** (0.0129) | -0.1890*** (0.0095) | -0.2060*** (0.0099) | -0.1769*** (0.0084) | -0.0805*** (0.0091) | -0.1727*** (0.0099) | 0.0176 (0.0110) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. N.A. | -0.1771*** (0.0204) | -0.1960*** (0.0146) | -0.2396*** (0.0145) | -0.1607*** (0.0106) | -0.0528*** (0.0131) | -0.1699*** (0.0137) | -0.0309* (0.0167) |
| rho | -0.0083 (0.0176) | -0.0157 (0.0164) | -0.0171 (0.0142) | 0.0124 (0.0132) | -0.0028 (0.0111) | -0.0543*** (0.0108) | 0.0377*** (0.0101) | 0.0003 (0.0101) |
| Wald test of rho=0 | 0.2215 | 0.9243 | 1.4657 | 0.8783 | 0.0639 | 25.0879 | 13.9724 | 0.0007 |
| Prob > chi2 = | 0.6379 | 0.3363 | 0.226 | 0.3487 | 0.8004 | 0.0000 | 0.0002 | 0.9793 |
| Wald chi2 | 3675.026 | 3608.109 | 4906.914 | 4688.766 | 7138.564 | 7643.963 | 8074.292 | 7726.003 |
| Prob > chi2 = | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Log pseudolikelihood | -15788.13 | -17777.77 | -23216.46 | -24815.91 | -37107.04 | -39200.07 | -42616.72 | -40314.71 |
| Number of Obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4.2: Bivariate probit marginal effects estimation results (continued)

Table A4.2b: International Remittances ($y=dexrem$)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-------------------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| ltotex | 0.1005*** (0.0053) | 0.0798*** (0.0050) | 0.1018*** (0.0049) | 0.1110*** (0.0054) | 0.0979*** (0.0040) | 0.1009*** (0.0037) | 0.1421*** (0.0041) | 0.1443*** (0.0044) |
| empsh | -0.1298*** (0.0141) | -0.1537*** (0.0137) | -0.1811*** (0.0138) | -0.1507*** (0.0148) | -0.1836*** (0.0108) | -0.1693*** (0.0100) | -0.1354*** (0.0118) | -0.1511*** (0.0130) |
| age0-6 | -0.0429** (0.0185) | -0.1192*** (0.0191) | -0.1075*** (0.0181) | -0.1129*** (0.0206) | -0.1133*** (0.0145) | -0.1321*** (0.0142) | -0.1256*** (0.0166) | -0.1015*** (0.0188) |
| age7-14 | -0.0150 (0.0162) | -0.0510*** (0.0162) | -0.0562*** (0.0157) | -0.0621*** (0.0177) | -0.0824*** (0.0128) | -0.1151*** (0.0121) | -0.0937*** (0.0142) | -0.0633*** (0.0157) |
| age15-24 | -0.0036 (0.0140) | -0.0385*** (0.0141) | -0.0467*** (0.0137) | -0.0446*** (0.0155) | -0.0418*** (0.0109) | -0.0602*** (0.0104) | -0.0656*** (0.0113) | -0.0456*** (0.0130) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0043*** (0.0011) | -0.0001 (0.0011) | -0.0039*** (0.0011) | -0.0013 (0.0013) | -0.0017* (0.0009) | -0.0027*** (0.0008) | -0.0051*** (0.0009) | -0.0047*** (0.0011) |
| hage2 | 0.00005*** (0.00001) | 0.000005 (0.00001) | 0.00005*** (0.00001) | 0.00002* (0.00001) | 0.00002*** (0.00001) | 0.00003*** (0.00001) | 0.00006*** (0.00001) | 0.00005*** (0.00001) |
| hfemale | 0.1762*** (0.0165) | 0.1794*** (0.0149) | 0.2057*** (0.0138) | 0.2016*** (0.0138) | 0.2006*** (0.0109) | 0.1813*** (0.0098) | 0.1621*** (0.0107) | 0.1758*** (0.0102) |
| hmarried | 0.0590*** (0.0067) | 0.0569*** (0.0072) | 0.0646*** (0.0071) | 0.0873*** (0.0079) | 0.0668*** (0.0058) | 0.0717*** (0.0054) | 0.0612*** (0.0069) | 0.0746*** (0.0071) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.0088 (0.0070) | 0.0046 (0.0067) | 0.0188*** (0.0066) | 0.0136* (0.0074) | 0.0165*** (0.0055) | 0.0262*** (0.0055) | 0.0181*** (0.0059) | 0.0252*** (0.0065) |
| hedu3 | 0.0217*** (0.0070) | 0.0243*** (0.0079) | 0.0504*** (0.0079) | 0.0464*** (0.0086) | 0.0395*** (0.0063) | 0.0416*** (0.0060) | 0.0484*** (0.0067) | 0.0585*** (0.0072) |
| hedu4 | 0.0047 (0.0095) | 0.0330*** (0.0113) | 0.0170* (0.0100) | 0.0121 (0.0112) | -0.0017 (0.0077) | -0.0027 (0.0072) | -0.0047 (0.0084) | 0.0135 (0.0096) |
| hnojob | 0.0656*** (0.0092) | 0.0720*** (0.0096) | 0.0720*** (0.0087) | 0.0839*** (0.0093) | 0.0748*** (0.0071) | 0.0664*** (0.0063) | 0.0518*** (0.0077) | 0.0616*** (0.0078) |
| urban | -0.0063 (0.0056) | -0.0135** (0.0056) | -0.0184*** (0.0055) | -0.0057 (0.0061) | -0.0135*** (0.0044) | -0.0176*** (0.0042) | N.A. N.A. | -0.0247*** (0.0050) |
| agri | -0.0664*** (0.0058) | -0.0653*** (0.0059) | -0.0715*** (0.0057) | -0.0865*** (0.0064) | -0.0807*** (0.0047) | -0.0768*** (0.0044) | -0.0842*** (0.0048) | -0.0964*** (0.0052) |
| llocos | 0.1012*** (0.0143) | 0.1474*** (0.0168) | 0.1402*** (0.0152) | 0.1166*** (0.0154) | 0.2256*** (0.0150) | 0.1746*** (0.0137) | 0.2008*** (0.0137) | 0.3268*** (0.0150) |
| Cagayan | 0.0056 (0.0122) | -0.0103 (0.0125) | -0.0161 (0.0120) | 0.0268* (0.0156) | 0.0909*** (0.0144) | 0.0625*** (0.0127) | 0.1026*** (0.0136) | 0.2399*** (0.0163) |
| Cluzon | 0.0197** (0.0088) | 0.0329*** (0.0095) | 0.0252*** (0.0085) | 0.0215** (0.0094) | 0.0453*** (0.0084) | 0.0497*** (0.0081) | 0.1126*** (0.0107) | 0.1393*** (0.0118) |
| Sluzon | -0.0098 (0.0072) | -0.0198*** (0.0074) | 0.0063 (0.0075) | -0.0158** (0.0080) | 0.0103 (0.0069) | 0.0101 (0.0064) | 0.0176** (0.0078) | 0.0648*** (0.0095) |
| Bicol | -0.0380*** (0.0083) | -0.0551*** (0.0082) | -0.0514*** (0.0090) | -0.0627*** (0.0101) | -0.0410*** (0.0084) | -0.0207** (0.0088) | -0.0274*** (0.0096) | 0.0396*** (0.0130) |
| Wvisayas | -0.0122 (0.0089) | -0.0257*** (0.0084) | -0.0226*** (0.0086) | -0.0300*** (0.0096) | 0.0495*** (0.0098) | 0.0546*** (0.0094) | 0.0472*** (0.0107) | 0.1180*** (0.0133) |
| Cvisayas | -0.0317*** (0.0085) | -0.0452*** (0.0082) | -0.0326*** (0.0087) | -0.0735*** (0.0086) | -0.0092 (0.0091) | 0.0091 (0.0091) | 0.0325*** (0.0105) | 0.0844*** (0.0129) |
| Evisayas | -0.0261** (0.0108) | -0.0390*** (0.0102) | -0.0161 (0.0120) | -0.0436*** (0.0125) | -0.0034 (0.0103) | -0.0034 (0.0093) | 0.0291** (0.0120) | 0.1190*** (0.0156) |
| Mindanao | -0.0797*** (0.0056) | -0.0810*** (0.0061) | -0.0646*** (0.0063) | -0.0767*** (0.0073) | -0.0192*** (0.0065) | -0.0140** (0.0061) | 0.0130* (0.0076) | 0.0638*** (0.0090) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. N.A. | 0.0230 (0.0176) | 0.0177 (0.0172) | -0.0137 (0.0169) | 0.0468*** (0.0124) | 0.0601*** (0.0117) | 0.0689*** (0.0136) | 0.1561*** (0.0166) |
| rho | -0.0083 (0.0176) | -0.0157 (0.0164) | -0.0171 (0.0142) | 0.0124 (0.0132) | -0.0028 (0.0111) | -0.0543*** (0.0108) | 0.0377*** (0.0101) | 0.0003 (0.0101) |
| Wald test of rho=0 Prob > chi2 = | 0.2215 0.6379 | 0.9243 0.3363 | 1.4657 0.226 | 0.8783 0.3487 | 0.0639 0.8004 | 25.0879 0.0000 | 13.9724 0.0002 | 0.0007 0.9793 |
| Wald chi2 Prob > chi2 = | 3675.026 0.0000 | 3608.109 0.0000 | 4906.914 0.0000 | 4688.766 0.0000 | 7138.564 0.0000 | 7643.963 0.0000 | 8074.292 0.0000 | 7726.003 0.0000 |
| Log pseudolikelihood | -15788.13 | -17777.77 | -23216.46 | -24815.91 | -37107.04 | -39200.07 | -42616.72 | -40314.71 |
| Number of Obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 3: Two-Part model Coefficient estimates on Domestic Remittances

Table A4.3a: the 1985-1994 FIES

| | 1985 FIES | | 1988 FIES | | 1991 FIES | | 1994 FIES | |
|------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | selection | level | selection | level | selection | level | selection | level |
| ltotex | -0.2654*** (0.0201) | 1.6546*** (0.2066) | -0.2535*** (0.0196) | 1.5566*** (0.1628) | -0.3146*** (0.0172) | 3.2622*** (0.2563) | -0.3032*** (0.0174) | 4.9169*** (0.5547) |
| empsh | -0.1112* (0.0592) | -2.3970*** (0.3186) | -0.2397*** (0.0538) | -3.1335*** (0.3340) | -0.4093*** (0.0507) | -3.6178*** (0.5076) | -0.2994*** (0.0485) | -5.7950*** (0.8092) |
| age0-6 | 0.4178*** (0.0833) | -2.2622*** (0.5202) | 0.2687*** (0.0793) | -3.1009*** (0.5717) | 0.1417** (0.0701) | -4.7875*** (0.8615) | 0.2400*** (0.0701) | -6.1758*** (1.1196) |
| age7-14 | 0.3534*** (0.0728) | -1.7011*** (0.3955) | 0.1696** (0.0691) | -1.9421*** (0.3856) | 0.1464** (0.0616) | -2.7090*** (0.6634) | 0.2392*** (0.0600) | -4.0539*** (0.9411) |
| age15-24 | 0.1336** (0.0622) | -0.8181** (0.3973) | 0.0032 (0.0580) | 0.7366* (0.4215) | -0.0703 (0.0529) | 0.5677 (0.6375) | 0.0353 (0.0530) | 0.7824 (1.1987) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0108** (0.0052) | -0.0668** (0.0286) | -0.0102** (0.0048) | -0.1532*** (0.0430) | -0.0081* (0.0043) | -0.2258*** (0.0636) | -0.0052 (0.0044) | -0.3505*** (0.0988) |
| hage2 | 0.0002*** (0.00005) | 0.0006** (0.0003) | 0.0002*** (0.00005) | 0.0014*** (0.0004) | 0.0002*** (0.00004) | 0.0020*** (0.0006) | 0.0001*** (0.00004) | 0.0032*** (0.0009) |
| hfemale | -0.0363 (0.0417) | 0.5179** (0.2627) | -0.0198 (0.0392) | 1.5763*** (0.3271) | 0.0650* (0.0341) | 2.0017*** (0.4820) | 0.0055 (0.0332) | 2.0188*** (0.6737) |
| hmarried | -0.1495*** (0.0412) | -0.4586* (0.2585) | -0.1711*** (0.0384) | -0.3346 (0.2895) | -0.1666*** (0.0330) | -1.0494** (0.4510) | -0.1814*** (0.0325) | -2.1834*** (0.6577) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | -0.0080 (0.0282) | -0.0464 (0.1239) | 0.0252 (0.0253) | -0.1340 (0.1160) | -0.0054 (0.0227) | -0.0714 (0.1811) | -0.0001 (0.0227) | 0.2132 (0.2622) |
| hedu3 | 0.0298 (0.0293) | 0.0423 (0.1264) | -0.0176 (0.0308) | 0.3137* (0.1798) | 0.0057 (0.0271) | -0.0894 (0.2683) | -0.0213 (0.0268) | 0.0771 (0.3662) |
| hedu4 | -0.0490 (0.0474) | 0.1509 (0.3201) | -0.1547*** (0.0451) | 0.7262* (0.3848) | -0.0965** (0.0400) | 3.0460*** (0.7940) | -0.1425*** (0.0399) | 0.4957 (0.9157) |
| hnojob | 0.1035*** (0.0359) | 1.2231*** (0.2509) | 0.0988*** (0.0354) | 0.7096*** (0.2614) | 0.0389 (0.0303) | 1.9207*** (0.3810) | 0.0716** (0.0292) | 1.9213*** (0.5296) |
| urban | 0.1156*** (0.0256) | -0.0124 (0.1042) | -0.0823*** (0.0243) | -0.0483 (0.1222) | -0.0623*** (0.0206) | -0.3778** (0.1550) | 0.0787*** (0.0202) | -0.4503** (0.2113) |
| agri | -0.2153*** (0.0268) | -0.3255*** (0.0891) | -0.1754*** (0.0252) | -0.4821*** (0.0977) | -0.1710*** (0.0227) | -0.7264*** (0.1420) | -0.1375*** (0.0227) | -0.5704** (0.2334) |
| llocos | 0.0972** (0.0481) | -0.7888*** (0.2551) | 0.1986*** (0.0497) | 0.0854 (0.3128) | -0.0298 (0.0438) | -0.6372 (0.4422) | -0.1721*** (0.0437) | 0.2370 (0.6650) |
| Cagayan | -0.2774*** (0.0562) | -0.4542* (0.2662) | -0.2519*** (0.0586) | 0.5583 (0.4399) | -0.5079*** (0.0535) | -0.4203 (0.5041) | -0.6512*** (0.0536) | 0.2702 (0.7044) |
| Cluzon | 0.1824*** (0.0425) | -0.7888*** (0.2930) | 0.3891*** (0.0409) | -0.3434 (0.3127) | 0.0367 (0.0345) | -0.8926* (0.4670) | 0.0534 (0.0341) | -1.7700*** (0.5538) |
| Sluzon | 0.1543*** (0.0396) | -1.3184*** (0.2158) | 0.1530*** (0.0396) | -0.5827** (0.2932) | -0.0994*** (0.0328) | -0.9498** (0.4405) | -0.1728*** (0.0325) | -1.3341** (0.6652) |
| Bicol | 0.1189** (0.0509) | -0.2054 (0.2751) | 0.3237*** (0.0490) | 0.2419 (0.2916) | -0.0292 (0.0444) | 0.2433 (0.4556) | -0.0620 (0.0437) | 0.8424 (0.5731) |
| Wvisayas | -0.0212 (0.0462) | -0.3078 (0.3078) | 0.0858* (0.0444) | 0.1393 (0.3047) | 0.0003 (0.0390) | 0.0146 (0.4757) | -0.1513*** (0.0384) | -0.5952 (0.5325) |
| Cvisayas | -0.2053*** (0.0491) | 0.1852 (0.3229) | 0.0179 (0.0471) | 0.3845 (0.3204) | -0.2765*** (0.0417) | 1.6874*** (0.5010) | -0.4318*** (0.0412) | 1.9738*** (0.5958) |
| Evisayas | -0.2757*** (0.0563) | -0.0696 (0.2721) | 0.1047* (0.0535) | 0.5886* (0.3451) | -0.1603*** (0.0482) | 0.7802* (0.4716) | -0.2623*** (0.0479) | 1.6265*** (0.5989) |
| Mindanao | -0.5727*** (0.0399) | -0.9668*** (0.2293) | -0.3361*** (0.0388) | -0.1727 (0.3049) | -0.6118*** (0.0342) | -0.4993 (0.4313) | -0.6189*** (0.0332) | -0.1023 (0.5957) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. | N.A. | -0.5632*** (0.0788) | 0.0799 (0.4685) | -0.7393*** (0.0760) | 0.8793 (0.7852) | -0.8415*** (0.0730) | 1.0146 (0.9683) |
| constant | 2.5312*** (0.2246) | -10.1558*** (2.0500) | 2.4867*** (0.2168) | -7.4854*** (1.5172) | 3.3444*** (0.1984) | -20.7812*** (2.2932) | 3.2247*** (0.2099) | -33.3022*** (5.3819) |
| R2 | 0.0560 | 0.1389 | 0.0562 | 0.1366 | 0.0575 | 0.1618 | 0.0526 | 0.1263 |
| Number of obs | 16541 | 6495 | 18429 | 6628 | 24124 | 7557 | 24165 | 8340 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4.3: Two-Part model coefficient estimates on Domestic Remittances (continued)

Table A4.3b: the 1997-2006 FIES

| | 1997 FIES | | 2000 FIES | | 2003 FIES | | 2006 FIES | |
|------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | selection | level | selection | level | selection | level | selection | level |
| ltotex | -0.3234*** (0.0140) | 5.2854*** (0.3703) | -0.3170*** (0.0129) | 9.6918*** (0.9839) | -0.2829*** (0.0125) | 6.3205*** (0.8111) | -0.2817*** (0.0133) | 10.0841*** (0.7532) |
| empsh | -0.3324*** (0.0399) | -5.3677*** (0.7454) | -0.3853*** (0.0378) | -6.6932*** (1.0770) | -0.3179*** (0.0382) | -5.0367*** (0.8803) | -0.3212*** (0.0396) | -2.2948** (1.0718) |
| age0-6 | 0.2561*** (0.0556) | -8.1698*** (1.1339) | 0.1819*** (0.0561) | -10.4487*** (1.7948) | 0.3096*** (0.0551) | -7.7852*** (1.0529) | 0.4850*** (0.0589) | -4.1418*** (1.4574) |
| age7-14 | 0.1940*** (0.0487) | -3.5662*** (0.9508) | 0.1812*** (0.0481) | -8.1687*** (1.4409) | 0.3616*** (0.0473) | -5.9915*** (1.0060) | 0.3778*** (0.0494) | -3.5607*** (1.1670) |
| age15-24 | 0.0451 (0.0420) | 0.4305 (0.9484) | 0.0795* (0.0412) | -2.0614 (1.5962) | 0.1051*** (0.0376) | -0.4650 (1.1298) | 0.1650*** (0.0410) | -1.0956 (1.1174) |
| (age25+ omitted) | | | | | | | | |
| hage | 0.0002 (0.0033) | -0.3214*** (0.0713) | -0.0059* (0.0034) | -0.6577*** (0.1512) | -0.0058* (0.0031) | -0.2237*** (0.0569) | -0.0023 (0.0035) | -0.4644*** (0.1504) |
| hage2 | 0.0001*** (0.00003) | 0.0030*** (0.0007) | 0.0001*** (0.00003) | 0.0060*** (0.0014) | 0.0001*** (0.00003) | 0.0024*** (0.0005) | 0.0001*** (0.00003) | 0.0051*** (0.0015) |
| hfemale | 0.0457* (0.0270) | 3.0133*** (0.7086) | 0.0291 (0.0256) | 5.5943*** (1.2293) | 0.0932*** (0.0264) | 3.6874*** (0.7075) | 0.0344 (0.0252) | 4.8916*** (0.9828) |
| hmarried | -0.0855*** (0.0262) | -0.7140 (0.6673) | -0.1240*** (0.0253) | -0.9583 (1.1266) | -0.0659** (0.0257) | -0.8612 (0.5970) | -0.0892*** (0.0252) | -1.1194 (0.8831) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.0143 (0.0186) | 0.3711 (0.2553) | 0.0621*** (0.0185) | -0.4821 (0.3593) | 0.0459*** (0.0175) | -0.0621 (0.2128) | 0.0594*** (0.0184) | 0.2430 (0.3081) |
| hedu3 | -0.0545** (0.0213) | 0.8675** (0.3600) | 0.0020 (0.0208) | -0.3946 (0.5050) | 0.0033 (0.0200) | -0.3993 (0.4230) | 0.0141 (0.0208) | 0.0356 (0.4350) |
| hedu4 | -0.2056*** (0.0323) | 3.9950*** (1.0029) | -0.1391*** (0.0303) | 5.7160*** (1.5676) | -0.1329*** (0.0302) | 2.0966* (1.1216) | -0.1947*** (0.0313) | 3.4360*** (1.2949) |
| hnojob | 0.0746*** (0.0242) | 3.4795*** (0.5690) | 0.0175 (0.0226) | 2.7592*** (0.7460) | -0.0417* (0.0252) | -0.8477 (0.5725) | -0.0128 (0.0241) | 1.1212 (0.7724) |
| urban | -0.0147 (0.0165) | -0.4652* (0.2616) | 0.0195 (0.0159) | -2.2606*** (0.3476) | N.A. N.A. | N.A. N.A. | 0.0817*** (0.0167) | -1.7719*** (0.3794) |
| agri | -0.2129*** (0.0190) | -1.7537*** (0.2097) | -0.2028*** (0.0187) | -0.9076** (0.3666) | -0.2878*** (0.0167) | -1.5886*** (0.2047) | -0.2372*** (0.0178) | -1.4632*** (0.3314) |
| llocos | -0.0824** (0.0383) | 0.4148 (0.7661) | 0.0425 (0.0387) | -3.2056* (1.8249) | -0.1129*** (0.0349) | 0.6818 (0.7063) | 0.3272*** (0.0364) | -4.2360*** (1.2162) |
| Cagayan | -0.4797*** (0.0438) | 3.6596*** (1.3042) | -0.3324*** (0.0439) | -5.7505*** (1.7168) | -0.3446*** (0.0372) | 2.5362 (1.9551) | 0.1950*** (0.0388) | -2.7900** (1.2669) |
| Cluzon | -0.0639** (0.0308) | -0.6548 (0.6792) | 0.3756*** (0.0306) | -8.7741*** (1.5275) | 0.1103*** (0.0309) | -1.6225*** (0.6083) | 0.6846*** (0.0319) | -6.4805*** (1.2850) |
| Sluzon | -0.2264*** (0.0284) | -0.0724 (0.6445) | 0.2213*** (0.0281) | -7.2676*** (1.5770) | 0.1514*** (0.0275) | -1.8248*** (0.6053) | 0.5388*** (0.0285) | -5.7391*** (1.1940) |
| Bicol | 0.0739** (0.0373) | 2.3919*** (0.7049) | 0.3363*** (0.0369) | -4.1841*** (1.4508) | 0.1524*** (0.0346) | 2.5489*** (0.9499) | 0.8019*** (0.0377) | -1.6867 (1.1728) |
| Wvisayas | 0.0259 (0.0337) | 2.0288*** (0.7029) | 0.3123*** (0.0333) | -3.9548** (1.5495) | 0.0936*** (0.0331) | 1.2392* (0.7352) | 0.4556*** (0.0346) | -2.8680** (1.2584) |
| Cvisayas | -0.3055*** (0.0370) | 2.5105*** (0.7072) | 0.1124*** (0.0362) | -4.3699*** (1.4620) | -0.1992*** (0.0339) | 0.7012 (0.7624) | 0.2383*** (0.0352) | -1.7712 (1.1695) |
| Evisayas | -0.1940*** (0.0383) | 3.7868*** (0.8415) | 0.0343 (0.0370) | -2.9147** (1.4641) | 0.0319 (0.0360) | 3.1727*** (0.8466) | 0.4509*** (0.0386) | -2.1442* (1.1579) |
| Mindanao | -0.5569*** (0.0287) | 1.4017** (0.6622) | -0.2406*** (0.0283) | -4.1624*** (1.5177) | -0.4509*** (0.0271) | 0.6750 (0.7902) | 0.0449 (0.0279) | -3.6007*** (1.1103) |
| (NCR omitted) | | | | | | | | |
| CAR | -0.5536*** (0.0446) | 3.1600*** (1.1547) | -0.1720*** (0.0418) | -6.8113*** (1.6398) | -0.4550*** (0.0410) | 1.7175* (0.8979) | -0.0783* (0.0427) | -0.3776 (1.9898) |
| constant | 3.3143*** (0.1689) | -40.2575*** (3.8514) | 3.2170*** (0.1606) | -70.0993*** (8.5320) | 3.1896*** (0.1564) | -53.6032*** (8.7016) | 2.7142*** (0.1687) | -88.2694*** (7.2321) |
| R2 | 0.0559 | 0.1242 | 0.0625 | 0.1349 | 0.0518 | 0.1059 | 0.0638 | 0.1245 |
| Number of obs | 38442 | 11746 | 39615 | 13128 | 40408 | 16573 | 36852 | 16381 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 4: Two-Part model coefficient estimates on International Remittances

Table A4.4a: the 1985-1994 FIES

| | 1985 FIES | | 1988 FIES | | 1991 FIES | | 1994 FIES | |
|------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|
| | selection | level | selection | level | selection | level | selection | level |
| ltotex | 0.6247*** (0.0270) | 18.1464*** (1.0344) | 0.4408*** (0.0247) | 17.3766*** (0.9866) | 0.5004*** (0.0206) | 26.0939*** (1.3195) | 0.4569*** (0.0203) | 30.3992*** (1.3517) |
| empsh | -0.8028*** (0.0880) | -17.0495*** (2.2862) | -0.8400*** (0.0751) | -12.0883*** (2.4536) | -0.8778*** (0.0672) | -22.0428*** (3.0300) | -0.6268*** (0.0614) | -14.7398*** (3.2138) |
| age0-6 | -0.2677** (0.1137) | -7.2044** (3.2801) | -0.6569*** (0.1033) | -3.9488 (3.6628) | -0.5255*** (0.0877) | -14.4026*** (4.2380) | -0.4648*** (0.0850) | -10.2853** (4.5710) |
| age7-14 | -0.0948 (0.1002) | -7.2268** (2.8389) | -0.2820*** (0.0883) | 1.2152 (2.8344) | -0.2751*** (0.0761) | -9.4140*** (3.6230) | -0.2549*** (0.0729) | 0.5698 (3.8165) |
| age15-24 | -0.0230 (0.0864) | -4.5325* (2.5774) | -0.2113*** (0.0774) | -0.0289 (2.2757) | -0.2267*** (0.0665) | -1.6739 (3.0365) | -0.1843*** (0.0640) | 1.3625 (3.2879) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0263*** (0.0067) | -0.4945** (0.2055) | -0.0002 (0.0062) | -0.5131*** (0.1845) | -0.0191*** (0.0052) | -0.5580* (0.2901) | -0.0055 (0.0053) | -0.8636*** (0.3097) |
| hage2 | 0.0003*** (0.00007) | 0.0040** (0.0020) | 0.000026 (0.00006) | 0.0044** (0.0018) | 0.0002*** (0.00005) | 0.0042 (0.0029) | 0.0001* (0.00005) | 0.0058** (0.0029) |
| hfemale | 0.7783*** (0.0555) | 15.6216*** (1.3498) | 0.7325*** (0.0489) | 19.2084*** (1.4244) | 0.7639*** (0.0419) | 27.7325*** (1.7835) | 0.6818*** (0.0403) | 30.3864*** (2.0764) |
| hmarried | 0.4545*** (0.0624) | 9.0017*** (1.4798) | 0.3696*** (0.0552) | 12.4523*** (1.3913) | 0.3678*** (0.0463) | 18.8563*** (1.8835) | 0.4173*** (0.0442) | 20.3017*** (2.1664) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.0537 (0.0419) | -1.4770 (1.2183) | 0.0249 (0.0363) | -2.5898** (1.0680) | 0.0902*** (0.0314) | -2.4601* (1.3929) | 0.0555* (0.0300) | -3.7177** (1.4788) |
| hedu3 | 0.1304*** (0.0410) | -2.5384** (1.2549) | 0.1287*** (0.0403) | -2.1763* (1.2142) | 0.2312*** (0.0343) | -0.5197 (1.5948) | 0.1844*** (0.0329) | -2.8679* (1.6861) |
| hedu4 | 0.0289 (0.0571) | -7.3486*** (1.7398) | 0.1681*** (0.0522) | -6.2019*** (1.6839) | 0.0809* (0.0453) | -4.4341** (2.2304) | 0.0476 (0.0443) | -1.6958 (2.4483) |
| hnojob | 0.3447*** (0.0414) | 5.9053*** (1.1361) | 0.3377*** (0.0390) | 8.4661*** (1.3523) | 0.3104*** (0.0331) | 13.0562*** (1.6018) | 0.3142*** (0.0315) | 18.3040*** (1.7945) |
| urban | -0.0400 (0.0345) | -3.3873*** (1.0878) | -0.0732** (0.0311) | -2.3001** (0.9922) | -0.0882*** (0.0264) | -5.4940*** (1.2984) | -0.0228 (0.0252) | -3.5212*** (1.2755) |
| agri | -0.4417*** (0.0425) | -5.0616*** (0.9564) | -0.3854*** (0.0378) | -3.4054*** (0.8776) | -0.3753*** (0.0326) | -4.8397*** (1.0751) | -0.3884*** (0.0311) | -5.8558*** (1.2003) |
| llocos | 0.4837*** (0.0552) | 2.0562 (1.3130) | 0.5997*** (0.0546) | 0.3296 (1.3583) | 0.5367*** (0.0475) | 8.7408*** (1.9487) | 0.4079*** (0.0472) | 12.3261*** (2.1001) |
| Cagayan | 0.0358 (0.0724) | 4.6687** (2.1633) | -0.0551 (0.0735) | 5.0591* (2.7009) | -0.0755 (0.0640) | 9.8453*** (3.2392) | 0.1001* (0.0584) | 11.9970*** (2.9003) |
| Cluzon | 0.1143** (0.0486) | 1.6987 (1.3078) | 0.1626*** (0.0447) | -0.2799 (1.3943) | 0.1166*** (0.0374) | 8.9329*** (1.8893) | 0.0863** (0.0363) | 10.9994*** (2.0122) |
| Sluzon | -0.0632 (0.0472) | 2.8049** (1.3265) | -0.1161** (0.0452) | 2.2502 (1.4257) | 0.0319 (0.0356) | 6.1113*** (1.8246) | -0.0686** (0.0347) | 8.7604*** (1.9840) |
| Bicol | -0.2785*** (0.0718) | 8.4049** (3.3914) | -0.3762*** (0.0699) | 1.1053 (2.9187) | -0.2927*** (0.0608) | 8.4965*** (2.9882) | -0.2990*** (0.0559) | 8.9963*** (3.2608) |
| Wvisayas | -0.0792 (0.0604) | 1.4823 (1.8541) | -0.1535*** (0.0540) | 3.9901* (2.1880) | -0.1165** (0.0470) | 6.4518** (2.5938) | -0.1326*** (0.0446) | 9.0823*** (2.8686) |
| Cvisayas | -0.2220*** (0.0688) | 4.2678** (1.8508) | -0.2902*** (0.0622) | 5.1522** (2.2376) | -0.1702*** (0.0511) | 11.7784*** (3.4545) | -0.3623*** (0.0505) | 8.9909*** (2.6942) |
| Evisayas | -0.1785** (0.0845) | 6.8356** (2.7733) | -0.2476*** (0.0752) | 0.6256 (1.7595) | -0.0797 (0.0640) | 8.9062*** (3.1966) | -0.2012*** (0.0631) | 18.9408*** (2.7783) |
| Mindanao | -0.6205*** (0.0544) | 0.7726 (1.5096) | -0.5314*** (0.0476) | 0.5874 (1.9555) | -0.3461*** (0.0392) | 5.1995*** (1.9388) | -0.3561*** (0.0372) | 7.3366*** (2.2809) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. | N.A. | 0.1245 (0.0844) | -0.8151 (2.7497) | 0.0922 (0.0763) | 7.1473 (4.4814) | -0.0663 (0.0739) | 7.9814** (3.4530) |
| constant | -6.9677*** (0.2975) | 161.3130*** (10.8069) | -5.4761*** (0.2785) | 161.1161*** (11.0517) | -5.9058*** (0.2377) | 257.2098*** (13.8320) | -5.8996*** (0.2482) | 307.5587*** (15.5267) |
| R2 | 0.2437 | 0.3474 | 0.1963 | 0.3562 | 0.1970 | 0.3263 | 0.1719 | 0.3388 |
| Number of obs | 16541 | 2511 | 18429 | 2858 | 24124 | 4257 | 24165 | 4813 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4.4: Two-Part model coefficient estimates on International Remittances (continued)

Table A4.4b: the 1997-2006 FIES

| | 1997 FIES | | 2000 FIES | | 2003 FIES | | 2006 FIES | |
|------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|
| | selection | level | selection | level | selection | level | selection | level |
| ltotex | 0.4590*** (0.0162) | 36.0549*** (1.3245) | 0.4996*** (0.0152) | 63.9438*** (2.9828) | 0.5738*** (0.0152) | 65.5815*** (3.0456) | 0.5400*** (0.0154) | 91.2867*** (7.8208) |
| empsh | -0.8608*** (0.0509) | -24.8206*** (3.2190) | -0.8010*** (0.0483) | -30.0206*** (6.6516) | -0.5660*** (0.0484) | -1.3995 (5.8038) | -0.5660*** (0.0487) | 11.3171 (8.5391) |
| age0-6 | -0.5311*** (0.0673) | -15.6275*** (4.8737) | -0.6455*** (0.0678) | -17.1595* (8.8510) | -0.5067*** (0.0676) | -9.6696 (7.8953) | -0.3796*** (0.0700) | 9.3963 (12.3754) |
| age7-14 | -0.3861*** (0.0594) | 3.4142 (4.2469) | -0.5619*** (0.0579) | -7.9767 (6.4744) | -0.3743*** (0.0579) | -2.0372 (6.7238) | -0.2367*** (0.0584) | 14.1609 (9.3031) |
| age15-24 | -0.1961*** (0.0512) | 2.2849 (3.5383) | -0.2942*** (0.0498) | 5.0262 (6.5546) | -0.2662*** (0.0463) | 3.9599 (5.8157) | -0.1706*** (0.0487) | -0.8258 (7.9203) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0078* (0.0041) | -0.8777*** (0.2858) | -0.0125*** (0.0041) | -0.8938* (0.5160) | -0.0212*** (0.0038) | -1.2813*** (0.4450) | -0.0176*** (0.0041) | -1.6900** (0.7317) |
| hage2 | 0.0001*** (0.00004) | 0.0067** (0.0028) | 0.0001*** (0.00004) | 0.0052 (0.0047) | 0.0003*** (0.00004) | 0.0085* (0.0043) | 0.0002*** (0.00004) | 0.0119 (0.0076) |
| hfemale | 0.7329*** (0.0331) | 49.7969*** (2.1563) | 0.6954*** (0.0314) | 64.2408*** (3.7814) | 0.5601*** (0.0323) | 83.5081*** (4.9694) | 0.5690*** (0.0296) | 78.3348*** (4.9633) |
| hmarried | 0.3591*** (0.0359) | 32.0830*** (2.1560) | 0.4046*** (0.0343) | 42.5852*** (3.7260) | 0.2727*** (0.0343) | 58.1599*** (4.7055) | 0.3065*** (0.0323) | 51.6698*** (6.1455) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.0761*** (0.0252) | -4.7551*** (1.5566) | 0.1219*** (0.0251) | -7.0772*** (2.3006) | 0.0749*** (0.0237) | -8.2225*** (2.2455) | 0.0930*** (0.0236) | -15.5790** (6.3262) |
| hedu3 | 0.1785*** (0.0271) | -3.9431** (1.6945) | 0.1938*** (0.0268) | -8.2865*** (2.6727) | 0.1915*** (0.0254) | -14.9801*** (2.7103) | 0.2120*** (0.0252) | -23.4510*** (7.5583) |
| hedu4 | -0.0081 (0.0362) | -4.7992* (2.6277) | -0.0067 (0.0351) | -7.8471** (3.9891) | -0.0227 (0.0351) | -16.1607*** (4.0710) | 0.0494 (0.0346) | -27.8690** (11.4420) |
| hnojob | 0.3117*** (0.0263) | 17.2697*** (1.7943) | 0.2874*** (0.0247) | 27.5977*** (3.1231) | 0.1954*** (0.0272) | 30.0024*** (3.7546) | 0.2151*** (0.0255) | 34.9584*** (5.0444) |
| urban | -0.0630*** (0.0205) | -7.4940*** (1.3239) | -0.0858*** (0.0198) | -10.3029*** (1.9869) | N.A. N.A. | N.A. N.A. | -0.0930*** (0.0189) | -15.8876*** (3.2363) |
| agri | -0.4231*** (0.0276) | -6.1374*** (1.2914) | -0.4136*** (0.0278) | -3.4192 (2.2498) | -0.3785*** (0.0233) | 0.8165 (2.1093) | -0.3909*** (0.0232) | 1.3958 (2.6963) |
| llocos | 0.7693*** (0.0410) | 6.1392** (2.5290) | 0.6336*** (0.0404) | 19.9282*** (5.0347) | 0.6464*** (0.0374) | 31.9068*** (3.8483) | 0.9449*** (0.0386) | 14.9140*** (5.6580) |
| Cagayan | 0.3593*** (0.0487) | 7.1701** (2.9928) | 0.2781*** (0.0475) | 8.5567 (5.2773) | 0.3509*** (0.0422) | 41.1180*** (5.0461) | 0.7188*** (0.0427) | 13.2818** (5.7706) |
| Cluzon | 0.1949*** (0.0333) | 5.7043** (2.3624) | 0.2050*** (0.0325) | 6.5444 (4.0485) | 0.3997*** (0.0333) | 19.6662*** (3.0999) | 0.4507*** (0.0339) | 14.5367* (7.8026) |
| Sluzon | 0.0473 (0.0310) | 8.8995*** (2.4876) | 0.0394 (0.0300) | 7.1719 (4.6320) | 0.0758** (0.0306) | 22.9035*** (4.5589) | 0.2268*** (0.0312) | 19.5350*** (5.6869) |
| Bicol | -0.2151*** (0.0493) | -2.7110 (3.3005) | -0.1175** (0.0475) | 12.1252* (6.6448) | -0.1147*** (0.0437) | 33.5573*** (6.4586) | 0.1412*** (0.0439) | 13.1386* (7.8852) |
| Wvisayas | 0.2107*** (0.0381) | 6.5113** (2.7187) | 0.2254*** (0.0371) | 16.6399*** (5.3920) | 0.1812*** (0.0382) | 38.2194*** (5.6386) | 0.3876*** (0.0391) | 19.9934*** (6.0006) |
| Cvisayas | -0.0441 (0.0447) | 5.6225 (3.4441) | 0.0380 (0.0420) | 8.7631* (5.2128) | 0.1214*** (0.0389) | 28.5319*** (5.9033) | 0.2855*** (0.0400) | 20.4130*** (7.7660) |
| Evisayas | -0.0163 (0.0490) | 14.5491*** (3.6726) | -0.0179 (0.0459) | 14.4936** (6.0804) | 0.1146** (0.0449) | 32.9753*** (5.1621) | 0.3886*** (0.0456) | 32.2326** (14.5602) |
| Mindanao | -0.0921*** (0.0319) | 5.7638** (2.3078) | -0.0602* (0.0308) | 10.8075** (4.5017) | 0.0401 (0.0302) | 27.6165*** (4.0498) | 0.2288*** (0.0308) | 18.0168*** (5.7804) |
| (NCR omitted) | | | | | | | | |
| CAR | 0.1987*** (0.0475) | 8.1783** (3.7532) | 0.2621*** (0.0443) | -3.5702 (5.1272) | 0.2390*** (0.0452) | 25.6758*** (5.2292) | 0.4921*** (0.0459) | 11.9145* (6.6245) |
| constant | -6.0863*** (0.1987) | 378.5570*** (15.2653) | -6.4808*** (0.1898) | 698.4159*** (35.2324) | -7.1424*** (0.1897) | 762.3839*** (38.2077) | -7.0553*** (0.1976) | -1032.68*** (84.7213) |
| R2 | 0.1702 | 0.3569 | 0.1664 | 0.2928 | 0.1678 | 0.3035 | 0.1524 | 0.2546 |
| Number of obs | 38442 | 6637 | 39615 | 7155 | 40408 | 7896 | 36852 | 8197 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 5: Tobit marginal effect estimation results

Table A4.5a: Domestic Remittances (Y=*inrem*)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ltotex | -0.0570 (0.0356) | -0.1203*** (0.0337) | -0.2965*** (0.0457) | -0.2694*** (0.0736) | -0.6086*** (0.0650) | -0.5231*** (0.1075) | -0.2436*** (0.0899) | 0.1482 (0.1397) |
| empsh | -0.6111*** (0.0986) | -0.8804*** (0.1006) | -1.4635*** (0.1466) | -1.9067*** (0.2219) | -2.0731*** (0.1946) | -3.3709*** (0.2973) | -2.6692*** (0.2412) | -2.9842*** (0.3500) |
| age0-6 | 0.0853 (0.1485) | -0.1364 (0.1453) | -0.3257* (0.1940) | -0.1110 (0.2808) | -0.0079 (0.2634) | -0.3489 (0.4199) | -0.0227 (0.3366) | 2.2836*** (0.5253) |
| age7-14 | 0.1058 (0.1176) | -0.0605 (0.1118) | -0.0256 (0.1643) | 0.2149 (0.2386) | 0.2982 (0.2300) | -0.1302 (0.3553) | 0.5836** (0.2828) | 1.7204*** (0.4232) |
| age15-24 | 0.0214 (0.1066) | 0.1631 (0.1119) | -0.0415 (0.1518) | 0.3735 (0.2615) | 0.3314 (0.2171) | 0.3894 (0.3451) | 0.5533*** (0.2706) | 1.0223*** (0.3742) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0222*** (0.0085) | -0.0407*** (0.0107) | -0.0534*** (0.0141) | -0.0730*** (0.0225) | -0.0491*** (0.0172) | -0.1372*** (0.0325) | -0.0731*** (0.0192) | -0.1296*** (0.0431) |
| hage2 | 0.0003*** (0.0001) | 0.0005*** (0.0001) | 0.0007*** (0.0001) | 0.0009*** (0.0002) | 0.0008*** (0.0002) | 0.0017*** (0.0003) | 0.0011*** (0.0002) | 0.0019*** (0.0004) |
| hfemale | -0.0158 (0.0725) | 0.2273*** (0.0879) | 0.3797*** (0.1198) | 0.2495 (0.1632) | 0.4446*** (0.1592) | 0.7935*** (0.2665) | 1.1465*** (0.2255) | 1.0990*** (0.3095) |
| hmarried | -0.3443*** (0.0842) | -0.3177*** (0.0869) | -0.6143*** (0.1234) | -1.1212*** (0.1961) | -0.6097*** (0.1583) | -1.0628*** (0.2650) | -0.5784*** (0.1918) | -1.0786*** (0.2898) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | -0.0107 (0.0405) | 0.0216 (0.0385) | -0.0014 (0.0553) | 0.0437 (0.0819) | 0.1125 (0.0783) | 0.3162*** (0.1170) | 0.2108** (0.0921) | 0.4672*** (0.1360) |
| hedu3 | 0.0557 (0.0430) | 0.0388 (0.0518) | 0.0020 (0.0706) | -0.0731 (0.1027) | -0.1261 (0.0937) | -0.0520 (0.1401) | -0.0551 (0.1241) | 0.1373 (0.1650) |
| hedu4 | -0.0397 (0.0835) | -0.1553* (0.0805) | 0.0523 (0.1321) | -0.4779*** (0.1739) | -0.5539*** (0.1558) | -0.5949** (0.2591) | -0.5499** (0.2678) | -1.2363*** (0.3101) |
| hnojob | 0.4050*** (0.0806) | 0.2716*** (0.0785) | 0.3627*** (0.1010) | 0.5903*** (0.1461) | 0.8638*** (0.1498) | 0.5783*** (0.1913) | -0.2754 (0.1699) | 0.1889 (0.2481) |
| urban | 0.1422*** (0.0382) | -0.1165*** (0.0387) | -0.1774*** (0.0507) | 0.1812** (0.0708) | -0.1296* (0.0733) | -0.1760* (0.1032) | N.A. N.A. | 0.2310* (0.1347) |
| agri | -0.3070*** (0.0335) | -0.3099*** (0.0339) | -0.4386*** (0.0479) | -0.4620*** (0.0717) | -0.9644*** (0.0688) | -1.1664*** (0.0993) | -1.5419*** (0.0881) | -1.7588*** (0.1149) |
| llocos | -0.0493 (0.0758) | 0.3297*** (0.0970) | -0.2285** (0.1038) | -0.6062*** (0.1503) | -0.3186* (0.1686) | 0.1615 (0.3481) | -0.3957* (0.2031) | 2.2143*** (0.4046) |
| Cagayan | -0.3875*** (0.0675) | -0.2182** (0.0943) | -0.9538*** (0.0920) | -1.6457*** (0.1323) | -1.2052*** (0.1680) | -2.1064*** (0.2649) | -1.1767*** (0.2577) | 1.5203*** (0.4149) |
| Cluzon | 0.0618 (0.0853) | 0.5499*** (0.0924) | -0.0836 (0.0984) | -0.1869 (0.1321) | -0.3349** (0.1428) | 1.3129*** (0.2749) | 0.1928 (0.2073) | 4.5295*** (0.4417) |
| Sluzon | -0.0718 (0.0632) | 0.1341* (0.0744) | -0.3828*** (0.0863) | -0.7574*** (0.1271) | -0.8518*** (0.1236) | 0.6146** (0.2639) | 0.3922* (0.2050) | 3.4110*** (0.3731) |
| Bicol | 0.0788 (0.0861) | 0.5292*** (0.1001) | -0.0991 (0.1104) | -0.2030 (0.1540) | 0.4615** (0.1889) | 1.6462*** (0.3306) | 1.1719*** (0.3085) | 6.4449*** (0.5124) |
| Wvisayas | -0.0751 (0.0800) | 0.1875** (0.0851) | -0.0373 (0.1085) | -0.6236*** (0.1280) | 0.3623** (0.1771) | 1.6941*** (0.3290) | 0.6112** (0.2409) | 3.5085*** (0.4568) |
| Cvisayas | -0.2186*** (0.0744) | 0.1137 (0.0879) | -0.4119*** (0.1023) | -1.0589*** (0.1291) | -0.8513*** (0.1409) | 0.3280 (0.2870) | -0.7432*** (0.1889) | 2.0491*** (0.3949) |
| Evisayas | -0.3101*** (0.0699) | 0.3017*** (0.1084) | -0.2962*** (0.1099) | -0.6535*** (0.1468) | -0.2517 (0.1771) | 0.0760 (0.2877) | 0.7570*** (0.2672) | 3.5766*** (0.4449) |
| Mindanao | -0.7647*** (0.0520) | -0.4165*** (0.0664) | -1.2354*** (0.0855) | -1.7921*** (0.1250) | -1.7816*** (0.1224) | -1.5701*** (0.2472) | -1.9239*** (0.1602) | 0.2845 (0.2955) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. N.A. | -0.6208*** (0.0834) | -1.1587*** (0.1072) | -1.9249*** (0.1529) | -1.4161*** (0.1569) | -1.4359*** (0.2756) | -1.7197*** (0.2109) | -0.0708 (0.4949) |
| Pseudo R2 | 0.0244 | 0.0205 | 0.0200 | 0.0169 | 0.0158 | 0.0124 | 0.0112 | 0.0103 |
| F | 16.7653 | 24.4244 | 27.6319 | 16.9183 | 42.7096 | 30.2057 | 30.0027 | 34.9553 |
| Log pseudolikelihood | -24895 | -26765 | -35858 | -41607 | -62708 | -74346 | -84986 | -87809 |
| Uncensored obs | 6495 | 6628 | 7557 | 8340 | 11746 | 13128 | 16573 | 16381 |
| Number of obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4.5: Tobit marginal effects estimation results (continued)

Table A4.5b: International Remittances ($Y=exrem$)

| | 1985 FIES | 1988FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|------------------------|-------------------------|
| ltotex | 1.7631*** (0.0826) | 1.9508*** (0.0995) | 3.7225*** (0.1443) | 4.8931*** (0.1881) | 5.2937*** (0.1650) | 9.6051*** (0.3544) | 10.6978*** (0.3792) | 16.8868*** (1.1489) |
| empsh | -2.1476*** (0.1869) | -2.9248*** (0.2375) | -5.5233*** (0.3733) | -5.2348*** (0.4685) | -8.0159*** (0.4336) | -12.1478*** (0.7203) | -7.0589*** (0.6889) | -10.2702*** (1.3082) |
| age0-6 | -0.7699*** (0.2422) | -1.9958*** (0.3282) | -3.1334*** (0.4849) | -3.5933*** (0.6412) | -4.7657*** (0.5819) | -8.9670*** (0.9884) | -6.5424*** (0.9463) | -6.2811*** (1.6556) |
| age7-14 | -0.4154* (0.2135) | -0.7575*** (0.2755) | -1.7424*** (0.4238) | -1.5404*** (0.5543) | -2.5564*** (0.5127) | -7.4610*** (0.8336) | -4.4593*** (0.8297) | -2.9086** (1.3626) |
| age15-24 | -0.1723 (0.1863) | -0.5656** (0.2388) | -1.0540*** (0.3603) | -0.9482** (0.4832) | -1.2376*** (0.4429) | -3.1577*** (0.7384) | -2.8202*** (0.6687) | -2.9692** (1.1940) |
| (age25+ omitted) | | | | | | | | |
| hage | -0.0687*** (0.0144) | -0.0237 (0.0193) | -0.1257*** (0.0296) | -0.1091*** (0.0408) | -0.1141*** (0.0351) | -0.2357*** (0.0605) | -0.3526*** (0.0539) | -0.4740*** (0.1006) |
| hage2 | 0.0007*** (0.0001) | 0.0003 (0.0002) | 0.0013*** (0.0003) | 0.0011*** (0.0004) | 0.0012*** (0.0003) | 0.0023*** (0.0006) | 0.0036*** (0.0005) | 0.0048*** (0.0010) |
| hfemale | 4.1950*** (0.3922) | 6.0798*** (0.4868) | 10.2295*** (0.6728) | 12.1508*** (0.8241) | 17.4278*** (0.9157) | 22.9666*** (1.2614) | 23.1598*** (1.5618) | 27.9649*** (1.6003) |
| hmarried | 0.9082*** (0.0691) | 1.3409*** (0.0921) | 2.3745*** (0.1432) | 3.5176*** (0.1957) | 3.9726*** (0.1803) | 6.6924*** (0.3365) | 6.1835*** (0.3617) | 9.1330*** (0.5164) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.0652 (0.0906) | -0.0337 (0.1104) | 0.3095* (0.1743) | 0.1270 (0.2229) | 0.3130 (0.2140) | 1.2385*** (0.3655) | 0.4526 (0.3247) | 0.8119 (0.6062) |
| hedu3 | 0.1556* (0.0906) | 0.2741** (0.1305) | 1.1393*** (0.2160) | 1.1125*** (0.2636) | 1.1629*** (0.2428) | 2.0659*** (0.4154) | 1.5579*** (0.3667) | 2.6159*** (0.6389) |
| hedu4 | -0.2027* (0.1042) | 0.2009 (0.1753) | 0.1334 (0.2556) | 0.2773 (0.3483) | -0.3210 (0.2941) | -0.5207 (0.4777) | -0.9771** (0.4489) | -0.6551 (0.9906) |
| hnojob | 1.1742*** (0.1519) | 1.8439*** (0.2259) | 2.9145*** (0.2995) | 4.5072*** (0.4038) | 4.4375*** (0.3633) | 6.5846*** (0.5437) | 5.5884*** (0.6337) | 8.6786*** (0.9350) |
| urban | -0.1865** (0.0731) | -0.2909*** (0.0945) | -0.6724*** (0.1513) | -0.3617* (0.1886) | -0.8417*** (0.1770) | -1.6303*** (0.2844) | N.A. (0.4514) | -2.8746*** (0.4514) |
| agri | -0.8979*** (0.0767) | -1.0817*** (0.0965) | -1.8911*** (0.1434) | -2.5503*** (0.1815) | -3.0034*** (0.1711) | -4.7208*** (0.3089) | -4.1510*** (0.2662) | -6.8721*** (0.5738) |
| llocos | 1.2892*** (0.2031) | 2.2561*** (0.3037) | 4.2035*** (0.4808) | 4.5199*** (0.5670) | 9.2888*** (0.7553) | 13.4399*** (1.2264) | 14.7596*** (1.1589) | 29.9851*** (2.7238) |
| Cagayan | 0.2341 (0.1807) | 0.0484 (0.2409) | 0.0832 (0.3650) | 1.6393*** (0.5571) | 3.9896*** (0.6585) | 4.6589*** (0.9627) | 9.0348*** (1.1119) | 22.1563*** (2.4062) |
| Cluzon | 0.2787** (0.1178) | 0.4811*** (0.1634) | 1.1196*** (0.2552) | 1.4450*** (0.3322) | 1.9983*** (0.3642) | 3.3121*** (0.5909) | 7.7263*** (0.7442) | 13.0875*** (1.7767) |
| Sluzon | -0.0049 (0.0971) | -0.2073 (0.1276) | 0.5020** (0.2157) | 0.1604 (0.2664) | 0.8789*** (0.3017) | 0.9918** (0.4944) | 2.6098*** (0.5606) | 7.0713*** (1.0508) |
| Bicol | -0.2336* (0.1365) | -0.8030*** (0.1333) | -0.9125*** (0.2536) | -1.1731*** (0.3326) | -1.5002*** (0.3108) | -0.9786 (0.6427) | 0.5498 (0.6818) | 4.2950*** (1.3083) |
| Wvisayas | -0.0574 (0.1227) | -0.2303 (0.1564) | -0.1894 (0.2485) | -0.1858 (0.3343) | 2.3659*** (0.4379) | 4.7141*** (0.7887) | 5.7410*** (0.8745) | 11.7425*** (1.5756) |
| Cvisayas | -0.2392** (0.1172) | -0.5451*** (0.1465) | -0.2375 (0.2816) | -1.5820*** (0.2695) | -0.1275 (0.3762) | 1.0415 (0.6672) | 3.9052*** (0.8061) | 9.0083*** (1.5333) |
| Evisayas | -0.1121 (0.1694) | -0.5649*** (0.1632) | 0.0591 (0.3581) | -0.3029 (0.4428) | 0.4635 (0.4584) | 0.4330 (0.7069) | 3.8168*** (0.8686) | 13.0547*** (2.5145) |
| Mindanao | -0.9220*** (0.0689) | -1.2551*** (0.0976) | -1.3802*** (0.1630) | -1.7543*** (0.2252) | -0.5323** (0.2587) | -0.3293 (0.4591) | 2.1943*** (0.4877) | 6.1568*** (0.9860) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. N.A. | 0.3752 (0.3076) | 0.8555 (0.5374) | 0.0248 (0.5449) | 2.1589*** (0.5662) | 3.7147*** (0.8380) | 5.4549*** (0.9741) | 13.4992*** (1.9608) |
| Pseudo R2 | 0.1268 | 0.1032 | 0.0962 | 0.0836 | 0.0822 | 0.0723 | 0.0721 | 0.0594 |
| F | 50.2708 | 48.4030 | 69.8240 | 74.5612 | 112.2230 | 50.1755 | 45.2088 | 23.3218 |
| Log pseudolikelihood | -14861 | -17644 | -27680 | -31646 | -46194 | -53134 | -57341 | -61506 |
| Uncensored obs | 2511 | 2858 | 4257 | 4813 | 6637 | 7155 | 7896 | 8197 |
| Number of obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 6: Bivariate Tobit coefficient and marginal effect estimation results

Table A4.6a: Domestic Remittances ($Y=inrem$)

| | 1985 FIES | | 1988 FIES | | 1991 FIES | | 1994 FIES | | 1997 FIES | | 2000 FIES | | 2003 FIES | | 2006 FIES | |
|------------------------|-------------|---------|-------------|---------|-------------|---------|--------------|---------|-------------|---------|--------------|---------|--------------|---------|---------------|---------|
| | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME |
| ltotex | -0.1750 * | -0.0567 | -0.3943 *** | -0.1196 | -1.1085 *** | -0.2936 | -0.9367 *** | -0.2667 | -2.3116 *** | -0.6019 | -1.9018 *** | -0.5160 | -0.4338 * | -0.1500 | 0.8424 ** | 0.3077 |
| empsh | -1.8867 *** | -0.6107 | -2.8924 *** | -0.8775 | -5.4975 *** | -1.4563 | -6.6985 *** | -1.9070 | -7.8968 *** | -2.0563 | -12.3885 *** | -3.3610 | -0.0106 *** | -0.0037 | -0.0151 *** | -0.0055 |
| age 0-6 | 0.2621 | 0.0848 | -0.4453 | -0.1351 | -1.2254 * | -0.3246 | -0.3891 | -0.1108 | 0.0231 | 0.0060 | -1.2814 | -0.3477 | 5.5369 *** | 1.9152 | 12.8048 *** | 4.6776 |
| age 7-14 | 0.3363 | 0.1089 | -0.2007 | -0.0609 | -0.0949 | -0.0251 | 0.7649 | 0.2178 | 1.1500 | 0.2995 | -0.4598 | -0.1248 | 7.0881 *** | 2.4518 | 11.4430 *** | 4.1801 |
| age 15-24 | 0.0675 | 0.0218 | 0.5335 * | 0.1619 | -0.1633 | -0.0433 | 1.3036 * | 0.3711 | 1.2624 * | 0.3287 | 1.4090 | 0.3823 | 5.5626 *** | 1.9241 | 9.3204 *** | 3.4047 |
| (age 25+ omitted) | | | | | | | | | | | | | | | | |
| hage | -0.0684 *** | -0.0221 | -0.1335 *** | -0.0405 | -0.2007 *** | -0.0532 | -0.2559 *** | -0.0729 | -0.1877 *** | -0.0489 | -0.5053 *** | -0.1371 | -0.2142 *** | -0.0741 | -0.4152 *** | -0.1517 |
| hage2 | 0.0010 *** | 0.0003 | 0.0016 *** | 0.0005 | 0.0025 *** | 0.0007 | 0.0032 *** | 0.0009 | 0.0029 *** | 0.0007 | 0.0062 *** | 0.0017 | 0.0031 *** | 0.0011 | 0.0055 *** | 0.0020 |
| hfemale | -0.0796 | -0.0258 | 0.6805 *** | 0.2065 | 1.3055 *** | 0.3458 | 0.7919 ** | 0.2254 | 1.5162 *** | 0.3948 | 2.6487 *** | 0.7186 | 1.9636 *** | 0.6792 | 2.4149 *** | 0.8822 |
| hmarried | -1.0090 *** | -0.3266 | -0.9984 *** | -0.3029 | -2.1581 *** | -0.5717 | -3.6240 *** | -1.0318 | -2.2917 *** | -0.5968 | -3.8366 *** | -1.0409 | -2.2678 *** | -0.7844 | -3.2991 *** | -1.2052 |
| (hedu1 omitted) | | | | | | | | | | | | | | | | |
| hedu2 | -0.0373 | -0.0121 | 0.0729 | 0.0221 | -0.0020 | -0.0005 | 0.1552 | 0.0442 | 0.4317 | 0.1124 | 1.1453 * | 0.3107 | 0.7954 ** | 0.2751 | 1.3988 ** | 0.5110 |
| hedu3 | 0.1730 | 0.0560 | 0.1241 | 0.0377 | 0.0176 | 0.0047 | -0.2605 | -0.0742 | -0.4699 | -0.1224 | -0.1886 | -0.0512 | 0.2322 | 0.0803 | 0.4474 | 0.1634 |
| hedu4 | -0.1218 | -0.0394 | -0.5225 ** | -0.1585 | 0.2110 | 0.0559 | -1.7804 *** | -0.5069 | -2.2205 *** | -0.5782 | -2.2987 *** | -0.6236 | -2.1731 *** | -0.7517 | -4.308014 *** | -1.5737 |
| hnojob | 1.1377 *** | 0.3683 | 0.8307 *** | 0.2520 | 1.2750 *** | 0.3378 | 1.9453 *** | 0.5538 | 3.0460 *** | 0.7932 | 2.0136 *** | 0.5463 | 0.7141 * | 0.2470 | 2.4637 *** | 0.9000 |
| urban | 0.4370 *** | 0.1415 | -0.3857 *** | -0.1170 | -0.6603 *** | -0.1749 | 0.6440 ** | 0.1833 | -0.4875 | -0.1270 | -0.6307 | -0.1711 | N.A. | N.A. | 0.8138 * | 0.2973 |
| agri | -0.9696 *** | -0.3139 | -1.0562 *** | -0.3205 | -1.7113 *** | -0.4533 | -1.6671 *** | -0.4746 | -3.9251 *** | -1.0221 | -4.5159 *** | -1.2252 | -4.7327 *** | -1.6371 | -4.9205 *** | -1.7975 |
| llocos | -0.1545 | -0.0500 | 0.9929 *** | 0.3013 | -0.9118 * | -0.2415 | -2.3301 *** | -0.6634 | -1.2680 * | -0.3302 | 0.5856 | 0.1589 | -1.6166 ** | -0.5592 | 4.9730 *** | 1.8166 |
| Cagayan | -1.3727 *** | -0.4444 | -0.7827 ** | -0.2375 | -4.6315 *** | -1.2269 | -7.7574 *** | -2.2085 | -5.4356 *** | -1.4154 | -9.3445 *** | -2.5352 | -3.8868 *** | -1.3444 | 3.2512 *** | 1.1877 |
| Cluzon | 0.1815 | 0.0588 | 1.5991 *** | 0.4852 | -0.3318 | -0.0879 | -0.6862 | -0.1954 | -1.3268 *** | -0.3455 | 4.4807 *** | 1.2156 | 0.7255 | 0.2509 | 10.2423 *** | 3.7415 |
| Sluzon | -0.2331 | -0.0755 | 0.4319 ** | 0.1310 | -1.5425 *** | -0.4086 | -2.9007 *** | -0.8258 | -3.5290 *** | -0.9189 | 2.2045 *** | 0.5981 | 1.1564 ** | 0.4000 | 8.6124 *** | 3.1461 |
| Bicol | 0.2264 | 0.0733 | 1.5315 *** | 0.4647 | -0.3845 | -0.1018 | -0.7388 | -0.2103 | 1.6970 ** | 0.4419 | 5.5006 *** | 1.4923 | 3.5817 *** | 1.2389 | 14.9386 *** | 5.4571 |
| Wvisayas | -0.2467 | -0.0799 | 0.5776 ** | 0.1752 | -0.1489 | -0.0395 | -2.3853 *** | -0.6791 | 1.3354 ** | 0.3477 | 5.6329 *** | 1.5282 | 1.4832 ** | 0.5130 | 8.2663 *** | 3.0197 |
| Cvisayas | -0.7236 *** | -0.2342 | 0.3549 | 0.1077 | -1.6896 *** | -0.4476 | -4.3206 *** | -1.2301 | -3.6030 *** | -0.9382 | 1.2144 | 0.3295 | -2.0125 *** | -0.6961 | 4.9978 *** | 1.8257 |
| Evisayas | -1.0720 *** | -0.3470 | 0.9124 *** | 0.2768 | -1.1889 ** | -0.3149 | -2.5265 *** | -0.7193 | -0.9854 | -0.2566 | 0.3056 | 0.0829 | 2.5694 *** | 0.8887 | 8.8870 *** | 3.2464 |
| Mindanao | -2.8049 *** | -0.9079 | -1.4876 *** | -0.4513 | -5.5429 *** | -1.4683 | -7.3888 *** | -2.1036 | -7.6206 *** | -1.9844 | -6.1158 *** | -1.6592 | -5.9963 *** | -2.0741 | 0.4968 | 0.1815 |
| (NCR omitted)) | | | | | | | | | | | | | | | | |
| CAR | | | -2.6575 *** | -0.8063 | -6.2571 *** | -1.6575 | -10.0986 *** | -2.8751 | -6.6486 *** | -1.7313 | -5.9331 *** | -1.6096 | -5.3843 *** | -1.8624 | 1.0725 | 0.3918 |
| constant | 2.4330 ** | | 5.5178 *** | | 15.0072 *** | | 14.2232 *** | | 24.2232 *** | | 21.9451 *** | | 0.3535 | | -21.7162 *** | |
| Scale Factor | | 0.3237 | | 0.3034 | | 0.2649 | | 0.2847 | | 0.2604 | | 0.2713 | | 0.3459 | | 0.3653 |
| Sigma(1) | 5.2143 *** | | 5.8973 *** | | 10.7447 *** | | 14.9657 *** | | 18.9642 *** | | 28.6491 *** | | 20.8131 *** | | 29.2828 *** | |
| Sigma(2) | 28.0565 *** | | 33.1112 *** | | 50.3730 *** | | 56.4322 *** | | 74.1743 *** | | 124.8148 *** | | 116.4606 *** | | 155.0845 *** | |
| rho(1,2) | -0.1089 *** | | -0.0986 *** | | -0.0864 *** | | -0.0616 *** | | -0.0895 *** | | -0.0850 *** | | -0.0630 *** | | -0.0922 *** | |
| Log Likelihood | -39722.86 | | -44381.05 | | -63510.31 | | -73236.25 | | -108856.6 | | -127433.3 | | -154187.2 | | -161757.3 | |
| Number of Obs | 16541 | | 18429 | | 24124 | | 24165 | | 38442 | | 39615 | | 42094 | | 38480 | |
| Nonlimit Obs for Inrem | 6495 | | 6628 | | 7557 | | 8340 | | 11746 | | 13128 | | 17626 | | 17451 | |
| Nonlimit Obs for Exrem | 2511 | | 2858 | | 4257 | | 4813 | | 6637 | | 7155 | | 8729 | | 8970 | |

Note: Parentheses denote standard errors. ME denotes marginal effects.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4.6: Bivariate Tobit coefficient and marginal effect estimation results (continued)

Table A4.6b: International Remittances (Y=exrem)

| | 1985 FIES | | 1988 FIES | | 1991 FIES | | 1994 FIES | | 1997 FIES | | 2000 FIES | | 2003 FIES | | 2006 FIES | |
|------------------------|--------------------------|---------|--------------------------|---------|---------------------------|---------|---------------------------|---------|---------------------------|---------|----------------------------|----------|----------------------------|---------|----------------------------|---------|
| | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME |
| ltotex | 22.7608 *** (0.6415) | 1.7480 | 20.122 *** (0.7157) | 1.9397 | 32.9055 *** (0.9136) | 3.7183 | 35.5968 *** (1.0010) | 4.9052 | 44.6292 *** (1.0964) | 5.2796 | 80.1292 *** (1.5768) | 9.6395 | 90.8563 *** (1.3920) | 12.2656 | 114.6933 *** (1.8450) | 18.5574 |
| empsh | -28.1958 *** (2.1866) | -2.1654 | -30.439 *** (2.1248) | -2.9343 | -49.01129 *** (2.8239) | -5.5383 | -38.2944 *** (2.9216) | -5.2770 | -67.57805 *** (3.2018) | -7.9945 | -101.4255 *** (5.0456) | -12.2015 | -0.0600 *** (0.0039) | -0.0081 | -0.065972 *** (0.0060) | -0.0107 |
| age 0-6 | -10.1164 *** (3.0111) | -0.7769 | -20.625 *** (3.1880) | -1.9882 | -27.8253 *** (4.0176) | -3.1443 | -25.96863 *** (4.3856) | -3.5785 | -39.55563 *** (4.6533) | -4.6794 | -74.71494 *** (8.0113) | -8.9882 | -6.2864 (6.3432) | -0.8487 | 11.77153 (8.8579) | 1.9046 |
| age 7-14 | -5.4706 ** (2.5521) | -0.4201 | -7.7086 *** (2.7350) | -0.7431 | -15.4833 *** (3.4448) | -1.7496 | -11.1699 *** (3.5862) | -1.5392 | -21.56557 *** (3.9164) | -2.5512 | -62.35598 *** (6.8922) | -7.5014 | 4.3411 (5.1953) | 0.5860 | 24.19381 *** (7.1600) | 3.9146 |
| age 15-24 | -2.3382 (2.2184) | -0.1796 | -5.5652 ** (2.3006) | -0.5365 | -9.1902 *** (3.0330) | -1.0385 | -6.7795 ** (3.2111) | -0.9342 | -10.18586 *** (3.3116) | -1.2050 | -26.07361 *** (5.4631) | -3.1367 | -3.4439 (4.5172) | -0.4649 | 3.69655 (6.5002) | 0.5981 |
| (age 25+ omitted) | | | | | | | | | | | | | | | | |
| hage | -0.8894 *** (0.1863) | -0.0683 | -0.2819 (0.1880) | -0.0272 | -1.1401 *** (0.2342) | -0.1288 | -0.8172 *** (0.2561) | -0.1126 | -1.0038 *** (0.2650) | -0.1188 | -2.0821 *** (0.4549) | -0.2505 | -1.7874 *** (0.3892) | -0.2413 | -2.2731 *** (0.5384) | -0.3678 |
| hage2 | 0.0090 *** (0.0018) | 0.0007 | 0.0029 (0.0018) | 0.0003 | 0.0118 *** (0.0022) | 0.0013 | 0.0082 *** (0.0025) | 0.0011 | 0.0105 *** (0.0025) | 0.0012 | 0.0199 *** (0.0043) | 0.0024 | 0.0183 *** (0.0038) | 0.0025 | 0.0233 *** (0.0051) | 0.0038 |
| hfemale | 27.2075 *** (1.0782) | 2.0895 | 32.8887 *** (1.1460) | 3.1705 | 49.4694 *** (1.4958) | 5.5900 | 52.4813 *** (1.5277) | 7.2319 | 78.6100 *** (1.6444) | 9.2996 | 114.6261 *** (2.6457) | 13.7895 | 102.0343 *** (2.4535) | 13.7746 | 109.5616 *** (3.2545) | 17.7271 |
| hmarried | 16.5253 *** (1.1435) | 1.2691 | 19.3849 *** (1.2420) | 1.8687 | 28.3541 *** (1.5282) | 3.2040 | 34.5352 *** (1.5779) | 4.7590 | 45.7561 *** (1.7063) | 5.4130 | 72.9454 *** (2.8250) | 8.7753 | 67.1375 *** (2.6437) | 9.0636 | 69.7213 *** (3.5480) | 11.2809 |
| (hedu1 omitted) | | | | | | | | | | | | | | | | |
| hedu2 | 0.8276 (1.1638) | 0.0636 | -0.3819 (1.1827) | -0.0368 | 2.7455 * (1.5430) | 0.3102 | 0.8995 (1.6562) | 0.1240 | 2.5292 (1.8350) | 0.2992 | 9.9344 *** (3.2614) | 1.1951 | 3.6654 (2.8292) | 0.4948 | 5.1644 (3.6143) | 0.8356 |
| hedu3 | 1.9796 * (1.1115) | 0.1520 | 2.6348 ** (1.3283) | 0.2540 | 9.3699 *** (1.6529) | 1.0588 | 9.5684 *** (1.8092) | 1.0429 | 9.3547 *** (1.9388) | 1.1067 | 16.3798 *** (3.3679) | 1.9705 | 10.9912 *** (2.9549) | 1.4838 | 16.1311 *** (3.8810) | 2.6100 |
| hedu4 | -2.8118 * (1.4524) | -0.2159 | 1.9378 (1.5948) | 0.1868 | 1.2162 (2.0416) | 0.1374 | 1.8156 (2.2281) | 0.2502 | -2.7078 (2.3750) | -0.3203 | -4.7305 (4.0087) | -0.5691 | -10.4260 *** (3.5087) | -1.4075 | -7.3917 * (4.4027) | -1.1960 |
| hnojob | 11.3320 *** (1.0804) | 0.8703 | 14.1841 *** (1.1477) | 1.3673 | 20.0252 *** (1.4739) | 2.2628 | 25.3455 *** (1.5126) | 3.4926 | 29.4098 *** (1.6991) | 3.4792 | 44.5104 *** (2.7508) | 5.3546 | 46.8613 *** (2.5079) | 6.3263 | 57.8734 *** (3.2046) | 9.3639 |
| urban | -2.4239 *** (0.9221) | -0.1862 | -3.0275 *** (1.0060) | -0.2919 | -5.8161 *** (1.2986) | -0.6572 | -2.5684 * (1.3849) | -0.3539 | -6.9535 *** (1.4571) | -0.8226 | -13.1600 *** (2.5366) | -1.5831 | N.A. (N.A.) | | -16.9103 *** (2.9494) | -2.7361 |
| agri | -12.6188 *** (1.2483) | -0.9691 | -12.2898 *** (1.3039) | -1.1847 | -18.4083 *** (1.6857) | -2.0801 | -20.4837 *** (1.8730) | -2.8227 | -29.1008 *** (2.0907) | -3.4426 | -45.0143 *** (3.6864) | -5.4152 | -32.51372 *** (2.9645) | -4.3894 | -44.9063 *** (4.0116) | -7.2658 |
| llocos | 11.8190 *** (1.5128) | 0.9077 | 15.8765 *** (1.8795) | 1.5305 | 25.1713 *** (2.3865) | 2.8444 | 24.1104 *** (2.5840) | 3.3224 | 48.3145 *** (2.8878) | 5.7156 | 72.7610 *** (4.7050) | 8.7531 | 73.3594 *** (4.2095) | 9.9035 | 116.0306 *** (6.0695) | 18.7737 |
| Cagayan | 2.7405 (1.9585) | 0.2105 | 0.3807 (2.2627) | 0.0367 | 0.5832 (3.0829) | 0.0659 | 10.3671 *** (3.1418) | 1.4286 | 25.9350 *** (3.5021) | 3.0681 | 31.9367 *** (5.8486) | 3.8420 | 48.2838 *** (4.5024) | 6.5183 | 90.2805 *** (6.7369) | 14.6074 |
| Cluzon | 3.2304 ** (1.2831) | 0.2481 | 4.4535 *** (1.4401) | 0.4293 | 8.5881 *** (1.7824) | 0.9705 | 9.3910 *** (1.8935) | 1.2941 | 14.6205 *** (2.3283) | 1.7296 | 23.9623 *** (3.9478) | 2.8827 | 44.5615 *** (3.7621) | 6.0158 | 62.7131 *** (4.6884) | 10.1470 |
| Sluzon | -0.0489 (1.2819) | -0.0038 | -2.2575 (1.4544) | -0.2176 | 4.0303 ** (1.7187) | 0.4554 | 1.1075 (1.8340) | 0.1526 | 6.9487 *** (2.0946) | 0.8220 | 8.0342 ** (3.3091) | 0.9665 | 18.2192 *** (3.0890) | 2.4596 | 36.3097 *** (4.2455) | 5.8749 |
| Bicol | -3.3468 * (1.8857) | -0.2570 | -10.4424 *** (2.1752) | -1.0066 | -9.1391 *** (3.0190) | -1.0327 | -9.4929 *** (3.0833) | -1.3081 | -14.5205 *** (3.6835) | -1.7178 | -8.3843 (5.5703) | -1.0086 | 4.1847 (4.5299) | 0.5649 | 21.3189 *** (6.5036) | 3.4494 |
| Wvisayas | -0.6390 (1.6518) | -0.0491 | -2.5071 (1.6911) | -0.2417 | -1.7521 (2.3258) | -0.1980 | -1.4010 (2.3954) | -0.1931 | 16.9002 *** (2.7459) | 1.9993 | 32.6491 *** (4.2285) | 3.9277 | 34.8363 *** (3.9572) | 4.7029 | 56.9037 *** (5.8414) | 9.2070 |
| Cvisayas | -3.3258 * (1.9582) | -0.2554 | -6.5446 *** (1.9032) | -0.6309 | -2.1999 (2.3985) | -0.2486 | -13.6461 *** (2.7931) | -1.8804 | -1.2441 (3.1679) | -0.1472 | 8.3343 (5.2383) | 1.0026 | 25.8405 *** (3.9677) | 3.4885 | 45.6693 *** (5.5240) | 7.3893 |
| Evisayas | -1.5264 (2.2811) | -0.1172 | -6.8526 *** (2.5213) | -0.6606 | 0.3716 (3.2165) | 0.0420 | -2.3770 (3.5050) | -0.3276 | 3.7938 (3.4098) | 0.4488 | 3.5685 (5.5777) | 0.4293 | 25.3264 *** (4.9127) | 3.4191 | 61.7093 *** (6.2255) | 9.9846 |
| Mindanao | -15.570 *** (1.4974) | -1.1958 | -16.018 *** (1.5089) | -1.5441 | -13.843 *** (1.9985) | -1.5643 | -14.050 *** (2.0059) | -1.9361 | -4.531 ** (2.2457) | -0.5360 | -2.317 (3.5420) | -0.2788 | 16.769 *** (3.1956) | 2.2638 | 37.308 *** (4.3930) | 6.0365 |
| (NCR omitted) | | | | | | | | | | | | | | | | |
| CAR | | | 3.3902 (2.7689) | 0.3268 | 6.5686 * (3.5705) | 0.7423 | 0.0549 (4.1478) | 0.0076 | 15.8221 *** (5.5465) | 1.8718 | 26.3712 *** (4.7727) | 3.1725 | 33.9276 *** (4.7727) | 4.5802 | 63.3675 *** (6.7131) | 10.2529 |
| constant | -245.11 *** (7.6090) | | -238.69 *** (8.1454) | | -385.28 *** (11.2735) | | -442.41 *** (12.5188) | | -579.17 *** (13.4090) | | -1027.237 *** (20.9545) | | -1216.118 *** (17.4417) | | -1549.853 *** (23.6004) | |
| Scale Factor | | 0.0768 | | 0.0964 | | 0.1130 | | 0.1378 | | 0.1183 | | 0.1203 | | 0.1350 | | 0.1618 |
| Sigma(1) | 5.2143 *** (0.0130) | | 5.8973 *** (0.0199) | | 10.7447 *** (0.0317) | | 14.9657 *** (0.0333) | | 18.9642 *** (0.0434) | | 28.6491 *** (0.0471) | | 20.8131 *** (0.0224) | | 29.2828 *** (0.0355) | |
| Sigma(2) | 28.0565 *** (0.2753) | | 33.1112 *** (0.2815) | | 50.3730 *** (0.3698) | | 56.4322 *** (0.3991) | | 74.1763 *** (0.4697) | | 124.8148 *** (0.3485) | | 116.0406 *** (0.3428) | | 155.0845 *** (0.2541) | |
| rho(1,2) | -0.1089 *** (0.0142) | | -0.0986 *** (0.0121) | | -0.0864 *** (0.0115) | | -0.0616 *** (0.0101) | | -0.0895 *** (0.0097) | | -0.0850 *** (0.0054) | | -0.0922 *** (0.0082) | | -0.0922 *** (0.0059) | |
| Log Likelihood | -39722.86 | | -44381.05 | | -63510.31 | | -73236.25 | | -108856.6 | | -127433.3 | | -154187.2 | | -161757.3 | |
| Number of Obs | 16541 | | 18429 | | 24124 | | 24165 | | 38442 | | 39615 | | 42094 | | 38480 | |
| Nonlimit Obs for Inrem | 6495 | | 6628 | | 7557 | | 8340 | | 11746 | | 13128 | | 17626 | | 17451 | |
| Nonlimit Obs for Exrem | 2511 | | 2858 | | 4257 | | 4813 | | 6637 | | 7155 | | 8729 | | 8970 | |

Note: Parentheses denote standard errors. ME denotes marginal effects.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 7: Probit marginal effects of international remittances on the probability of domestic remittances

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Remittance | | | | | | | | |
| exrem | -0.0052*** (0.0006) | -0.0037*** (0.0005) | -0.0021*** (0.0002) | -0.0015*** (0.0002) | -0.0014*** (0.0001) | -0.0010*** (0.0001) | -0.0006*** (0.0001) | -0.0006*** (0.0001) |
| Welfare level | | | | | | | | |
| Bottom 20% | -0.0535* (0.0298) | -0.1159*** (0.0278) | -0.0837*** (0.0226) | -0.1844*** (0.0231) | -0.1130*** (0.0182) | -0.1144*** (0.0141) | -0.1374*** (0.0169) | -0.1716*** (0.0187) |
| Bottom 20%-40% | -0.0241 (0.0463) | -0.0094 (0.0421) | -0.1294*** (0.0334) | -0.0721** (0.0351) | -0.0516* (0.0272) | -0.0686*** (0.0263) | 0.0085 (0.0283) | 0.0106 (0.0312) |
| Middle | -0.0672 (0.0487) | -0.1159** (0.0462) | -0.1216*** (0.0356) | -0.0813** (0.0377) | -0.1157*** (0.0284) | -0.1297*** (0.0279) | -0.0894*** (0.0295) | -0.0880*** (0.0315) |
| Top20%-40% | -0.2010*** (0.0403) | -0.0694* (0.0377) | -0.0923*** (0.0293) | -0.1033*** (0.0310) | -0.1647*** (0.0239) | -0.1419*** (0.0233) | -0.1542*** (0.0228) | -0.1418*** (0.0242) |
| Top20% | -0.0351 (0.0239) | -0.0831*** (0.0239) | -0.0480** (0.0200) | -0.0588*** (0.0203) | -0.0350** (0.0168) | -0.0319** (0.0143) | -0.0979*** (0.0141) | -0.0789*** (0.0151) |
| Family composition | | | | | | | | |
| empsh | -0.0615*** (0.0228) | -0.1054*** (0.0201) | -0.1613*** (0.0179) | -0.1224*** (0.0178) | -0.1293*** (0.0139) | -0.1526*** (0.0137) | -0.1258*** (0.0149) | -0.1295*** (0.0158) |
| age0-6 | 0.1413*** (0.0320) | 0.0903*** (0.0296) | 0.0396 (0.0246) | 0.0863*** (0.0257) | 0.0786*** (0.0193) | 0.0533*** (0.0202) | 0.1152*** (0.0214) | 0.1930*** (0.0233) |
| age7-14 | 0.1248*** (0.0281) | 0.0584** (0.0258) | 0.0480** (0.0217) | 0.0937*** (0.0221) | 0.0645*** (0.0169) | 0.0585*** (0.0173) | 0.1334*** (0.0184) | 0.1513*** (0.0196) |
| age15-24 | 0.0456* (0.0239) | -0.0021 (0.0216) | -0.0250 (0.0185) | 0.0179 (0.0195) | 0.0154 (0.0145) | 0.0284* (0.0148) | 0.0375** (0.0146) | 0.0649*** (0.0163) |
| (age25+ omitted) | | | | | | | | |
| Head characteristics | | | | | | | | |
| hage | -0.0055*** (0.0020) | -0.0043** (0.0018) | -0.0033** (0.0015) | -0.0022 (0.0016) | -0.0003 (0.0012) | -0.0025** (0.0012) | -0.0028** (0.0012) | -0.0013 (0.0014) |
| hage2 | 0.000084*** (0.000020) | 0.000069*** (0.000018) | 0.000061*** (0.000015) | 0.000051*** (0.000015) | 0.000032*** (0.000011) | 0.000053*** (0.000012) | 0.000059*** (0.000012) | 0.000049*** (0.000013) |
| hfemale | 0.0349** (0.0171) | 0.0329** (0.0157) | 0.0605*** (0.0134) | 0.0293** (0.0131) | 0.0524*** (0.0106) | 0.0419*** (0.0103) | 0.0595*** (0.0109) | 0.0365*** (0.0106) |
| hmarried | -0.0275* (0.0164) | -0.0398*** (0.0150) | -0.0358*** (0.0124) | -0.0475*** (0.0127) | -0.0085 (0.0095) | -0.0247** (0.0097) | -0.0122 (0.0102) | -0.0198* (0.0103) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | -0.0060 (0.0108) | 0.0071 (0.0094) | -0.0023 (0.0079) | 0.0004 (0.0083) | 0.0040 (0.0064) | 0.0229*** (0.0067) | 0.0146** (0.0068) | 0.0220*** (0.0073) |
| hedu3 | 0.0105 (0.0113) | -0.0073 (0.0114) | 0.0044 (0.0095) | -0.0071 (0.0098) | -0.0170** (0.0073) | 0.0028 (0.0075) | -0.0006 (0.0078) | 0.0038 (0.0082) |
| hedu4 | -0.0213 (0.0182) | -0.0572*** (0.0160) | -0.0394*** (0.0134) | -0.0571*** (0.0138) | -0.0700*** (0.0101) | -0.0552*** (0.0104) | -0.0464*** (0.0116) | -0.0769*** (0.0121) |
| hnojob | 0.0686*** (0.0144) | 0.0599*** (0.0141) | 0.0317*** (0.0111) | 0.0437*** (0.0112) | 0.0442*** (0.0089) | 0.0231*** (0.0084) | -0.0054 (0.0099) | 0.0082 (0.0097) |
| Urban/Rural | | | | | | | | |
| urban | 0.0411*** (0.0098) | -0.0336*** (0.0090) | -0.0228*** (0.0072) | 0.0282*** (0.0073) | -0.0067 (0.0057) | 0.0060 (0.0057) | N.A. N.A. | 0.0294*** (0.0066) |
| Farming | | | | | | | | |
| agri | -0.0813*** (0.0101) | -0.0637*** (0.0091) | -0.0614*** (0.0077) | -0.0500*** (0.0082) | -0.0719*** (0.0062) | -0.0721*** (0.0064) | -0.1041*** (0.0063) | -0.0892*** (0.0070) |
| Region | | | | | | | | |
| Ilocos | 0.0372** (0.0189) | 0.0785*** (0.0195) | -0.0027 (0.0153) | -0.0492*** (0.0152) | -0.0200 (0.0130) | 0.0276* (0.0145) | -0.0401*** (0.0134) | 0.1398*** (0.0145) |
| Caqayan | -0.1047*** (0.0193) | -0.0893*** (0.0193) | -0.1507*** (0.0132) | -0.1934*** (0.0130) | -0.1416*** (0.0109) | -0.1057*** (0.0131) | -0.1257*** (0.0129) | 0.0853*** (0.0156) |
| Cluzon | 0.0722*** (0.0169) | 0.1509*** (0.0163) | 0.0193 (0.0124) | 0.0283** (0.0129) | -0.0177* (0.0106) | 0.1506*** (0.0122) | 0.0439*** (0.0124) | 0.2726*** (0.0115) |
| Sluzon | 0.0585*** (0.0157) | 0.0563*** (0.0153) | -0.0312*** (0.0111) | -0.0557*** (0.0113) | -0.0724*** (0.0090) | 0.0865*** (0.0108) | 0.0609*** (0.0110) | 0.2197*** (0.0109) |
| Bicol | 0.0451** (0.0200) | 0.1220*** (0.0195) | -0.0103 (0.0153) | -0.0173 (0.0157) | 0.0249* (0.0133) | 0.1298*** (0.0146) | 0.0628*** (0.0138) | 0.3108*** (0.0126) |
| Wvisayas | -0.0111 (0.0176) | 0.0305* (0.0169) | 0.0011 (0.0137) | -0.0468*** (0.0134) | 0.0122 (0.0119) | 0.1256*** (0.0132) | 0.0397*** (0.0132) | 0.1887*** (0.0134) |
| Cvisayas | -0.0709*** (0.0177) | 0.0053 (0.0176) | -0.0893*** (0.0126) | -0.1424*** (0.0120) | -0.0965*** (0.0106) | 0.0457*** (0.0136) | -0.0725*** (0.0125) | 0.1014*** (0.0141) |
| Evisayas | -0.0973*** (0.0195) | 0.0381* (0.0205) | -0.0527*** (0.0155) | -0.0856*** (0.0155) | -0.0607*** (0.0119) | 0.0163 (0.0135) | 0.0172 (0.0142) | 0.1873*** (0.0148) |
| Mindanao | -0.2098*** (0.0128) | -0.1249*** (0.0130) | -0.1920*** (0.0093) | -0.2022*** (0.0097) | -0.1769*** (0.0083) | -0.0810*** (0.0096) | -0.1660*** (0.0097) | 0.0247** (0.0111) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. | -0.1818*** (0.0203) | -0.1994*** (0.0143) | -0.2333*** (0.0140) | -0.1589*** (0.0104) | -0.0526*** (0.0140) | -0.1635*** (0.0132) | -0.0250 (0.0167) |
| Wald chi2 | 1250.44 | 1306.88 | 1638.17 | 1608.11 | 2506.36 | 2941.84 | 2728.74 | 3049.59 |
| Prob>chi2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Pseudo R2 | 0.0634 | 0.0607 | 0.0619 | 0.0559 | 0.0603 | 0.0674 | 0.0542 | 0.0666 |
| Log pseudolikelihood | -10378.663 | -11307.698 | -14068.356 | -14700.641 | -22233.903 | -23465.176 | -25870.045 | -23629.638 |
| Number of obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Table A4. 8: Tobit marginal effects of international remittances on the level of domestic remittances

| | 1985 FIES | 1988 FIES | 1991 FIES | 1994 FIES | 1997 FIES | 2000 FIES | 2003 FIES | 2006 FIES |
|-----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Remittance | | | | | | | | |
| exrem | -0.0292*** (0.0032) | -0.0208*** (0.0034) | -0.0185*** (0.0023) | -0.0181*** (0.0031) | -0.0234*** (0.0022) | -0.0164*** (0.0052) | -0.0129*** (0.0022) | -0.0156*** (0.0036) |
| Welfare level | | | | | | | | |
| Bottom 20% | 0.0866 (0.0902) | -0.1323 (0.0912) | -0.0941 (0.1311) | -0.9760*** (0.1887) | -0.5275*** (0.1866) | -0.5690*** (0.1940) | -0.8122*** (0.1908) | -1.4207*** (0.2799) |
| Bottom 20%-40% | -0.0005 (0.1458) | 0.0947 (0.1547) | -0.6899*** (0.2093) | -0.5321* (0.3105) | -0.2876 (0.3112) | -0.8560** (0.4200) | 0.4578 (0.3409) | 1.0129** (0.4957) |
| Middle | 0.0585 (0.1682) | -0.0697 (0.1878) | -0.3678 (0.2477) | 0.0057 (0.3632) | -0.7189** (0.3494) | -0.5872 (0.4956) | 0.2184 (0.4065) | 0.3080 (0.5753) |
| Top20%-40% | -0.3395* (0.1820) | -0.2439 (0.1899) | -0.3106 (0.2601) | -0.9785** (0.3973) | -1.1749*** (0.3418) | -3.0878*** (0.8084) | -1.3076** (0.5089) | -1.0847 (0.6898) |
| Top20% | 0.5139*** (0.1917) | 0.2006 (0.1547) | 0.6533** (0.2660) | 1.7797*** (0.4981) | 0.9520*** (0.3106) | 3.3853*** (0.7927) | 1.3266** (0.6653) | 3.3919*** (0.8598) |
| Family composition | | | | | | | | |
| empsh | -0.7242*** (0.0984) | -0.9683*** (0.1024) | -1.6183*** (0.1514) | -2.0509*** (0.2275) | -2.3139*** (0.1986) | -3.6271*** (0.3106) | -2.7912*** (0.2425) | -3.2394*** (0.3528) |
| age0-6 | 0.0070 (0.1468) | -0.1916 (0.1439) | -0.3812** (0.1926) | -0.0894 (0.2793) | -0.1625 (0.2627) | -0.4735 (0.4186) | -0.1134 (0.3341) | 2.2947*** (0.5201) |
| age7-14 | 0.0904 (0.1168) | -0.0792 (0.1102) | -0.0206 (0.1636) | 0.3852 (0.2398) | 0.2820 (0.2284) | -0.1047 (0.3544) | 0.5515* (0.2833) | 1.8815*** (0.4255) |
| age15-24 | 0.0170 (0.1042) | 0.1513 (0.1114) | -0.0155 (0.1518) | 0.5070** (0.2577) | 0.3559* (0.2152) | 0.5651* (0.3362) | 0.5742** (0.2617) | 1.2075*** (0.3776) |
| (age25+ omitted) | | | | | | | | |
| Head characteristics | | | | | | | | |
| hage | -0.0278*** (0.0083) | -0.0426*** (0.0106) | -0.0555*** (0.0138) | -0.0734*** (0.0222) | -0.0537*** (0.0170) | -0.1353*** (0.0312) | -0.0772*** (0.0189) | -0.1314*** (0.0421) |
| hage2 | 0.000353*** (0.000080) | 0.000492*** (0.000100) | 0.000673*** (0.000128) | 0.000902*** (0.000204) | 0.000771*** (0.000160) | 0.001626*** (0.000299) | 0.001101*** (0.000186) | 0.001908*** (0.000426) |
| hfemale | 0.2333*** (0.0835) | 0.4712*** (0.0991) | 0.7340*** (0.1452) | 0.5794*** (0.1883) | 1.0644*** (0.1931) | 1.3299*** (0.3396) | 1.6377*** (0.2684) | 1.7057*** (0.3696) |
| hmarried | -0.1690** (0.0778) | -0.1689** (0.0804) | -0.3762*** (0.1191) | -0.8291*** (0.1838) | -0.2429 (0.1553) | -0.6590** (0.2737) | -0.2845 (0.1846) | -0.6400** (0.2993) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | -0.0158 (0.0400) | 0.0124 (0.0380) | 0.0048 (0.0547) | 0.0778 (0.0831) | 0.1148 (0.0778) | 0.3869*** (0.1172) | 0.2149** (0.0949) | 0.5353*** (0.1385) |
| hedu3 | 0.0581 (0.0424) | 0.0410 (0.0510) | 0.0343 (0.0694) | -0.0275 (0.1003) | -0.0850 (0.0930) | 0.1005 (0.1367) | 0.0292 (0.1147) | 0.2199 (0.1668) |
| hedu4 | -0.1092 (0.0857) | -0.1737** (0.0816) | -0.0522 (0.1276) | -0.6685*** (0.1837) | -0.6409*** (0.1551) | -0.9164*** (0.2759) | -0.7133** (0.3133) | -1.5973*** (0.3322) |
| hnojob | 0.5667*** (0.0895) | 0.4003*** (0.0877) | 0.5222*** (0.1069) | 0.8147*** (0.1603) | 1.1666*** (0.1598) | 0.8789*** (0.1961) | -0.0709 (0.1670) | 0.5233* (0.2733) |
| Urban/Rural | | | | | | | | |
| urban | 0.1247*** (0.0375) | -0.1302*** (0.0383) | -0.1747*** (0.0499) | 0.2047*** (0.0708) | -0.1427** (0.0727) | -0.1227 (0.1000) | N.A. N.A. | 0.2018 (0.1331) |
| Farming | | | | | | | | |
| agri | -0.3133*** (0.0334) | -0.3117*** (0.0337) | -0.4706*** (0.0475) | -0.5356*** (0.0709) | -0.9874*** (0.0686) | -1.3131*** (0.1028) | -1.5622*** (0.1041) | -1.8845*** (0.1155) |
| Region | | | | | | | | |
| Ilocos | -0.0320 (0.0762) | 0.3369*** (0.0967) | -0.1537 (0.1061) | -0.4533*** (0.1551) | -0.1532 (0.1759) | 0.5059 (0.3665) | -0.1847 (0.2216) | 2.7783*** (0.4281) |
| Cagayan | -0.3840*** (0.0662) | -0.2270** (0.0931) | -0.9301*** (0.0911) | -1.5743*** (0.1300) | -1.1347*** (0.1712) | -1.9492*** (0.2600) | -1.0284*** (0.2837) | 1.9794*** (0.4319) |
| Cluzon | 0.0708 (0.0855) | 0.5493*** (0.0921) | -0.0079 (0.0995) | -0.0105 (0.1356) | -0.2132 (0.1458) | 1.6692*** (0.2889) | 0.3800 (0.2311) | 5.0592*** (0.4636) |
| Sluzon | -0.0699 (0.0627) | 0.1217* (0.0735) | -0.3443*** (0.0857) | -0.6515*** (0.1282) | -0.7758*** (0.1236) | 0.8197*** (0.2669) | 0.5216** (0.2207) | 3.8017*** (0.3845) |
| Bicol | 0.0735 (0.0843) | 0.4934*** (0.0983) | -0.0994 (0.1102) | -0.1450 (0.1562) | 0.4559** (0.1884) | 1.7315*** (0.3349) | 1.3058*** (0.3221) | 6.8217*** (0.5280) |
| Wvisayas | -0.0883 (0.0768) | 0.1682** (0.0838) | -0.0150 (0.1090) | -0.5265*** (0.1296) | 0.4536* (0.1809) | 1.9098*** (0.3391) | 0.7922*** (0.2606) | 3.9650*** (0.4642) |
| Cvisayas | -0.2050*** (0.0731) | 0.0986 (0.0868) | -0.4046*** (0.1021) | -1.0573*** (0.1283) | -0.8164*** (0.1405) | 0.4365 (0.2885) | -0.6457*** (0.1935) | 2.3204*** (0.4007) |
| Evisayas | -0.2982*** (0.0690) | 0.2805*** (0.1067) | -0.2901*** (0.1095) | -0.6188*** (0.1472) | -0.1943 (0.1781) | 0.1364 (0.2879) | 0.9114*** (0.2796) | 3.9421*** (0.4563) |
| Mindanao | -0.7734*** (0.0508) | -0.4456*** (0.0649) | -1.2270*** (0.0840) | -1.7416*** (0.1213) | -1.7432*** (0.1215) | -1.4594*** (0.2422) | -1.8193*** (0.1587) | 0.5476* (0.2981) |
| (NCR omitted) | | | | | | | | |
| CAR | N.A. (0.0816) | -0.6240*** (0.1061) | -1.1333*** (0.1498) | -1.8535*** (0.1582) | -1.3498*** (0.2738) | -1.2013*** (0.2738) | -1.6041*** (0.2051) | 0.2564 (0.5112) |
| Pseudo R2 | 0.0298 | 0.0235 | 0.0229 | 0.0192 | 0.0183 | 0.0147 | 0.0123 | 0.0118 |
| F | 15.69 | 20.96 | 23.75 | 17.01 | 36.24 | 30.19 | 30.92 | 34.13 |
| Log pseudolikelihood | -24757 | -26682 | -35755 | -41507 | -62546 | -74168 | -84890 | -87682 |
| Uncensored obs | 6495 | 6628 | 7557 | 8340 | 11746 | 13128 | 16573 | 16381 |
| Number of obs | 16541 | 18429 | 24124 | 24165 | 38442 | 39615 | 40408 | 36852 |

Note: Parentheses denote standard errors.

*** significant at 1%; ** significant at 5%; * significant at 10%

Chapter 5

Table A5. 1: Pooled regression results on expenditure levels (including remittance dummy variables)

| | 1994 FIES | | | | 2000 FIES | | | |
|-------------------|------------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|---------------------------|
| | mean | 10th | 50th | 90th | mean | 10th | 50th | 90th |
| dexrem | 0.235*** (0.011) | 0.216*** (0.017) | 0.228*** (0.012) | 0.256*** (0.019) | 0.291*** (0.009) | 0.275*** (0.012) | 0.292*** (0.011) | 0.332*** (0.014) |
| dinrem | -0.064*** (0.007) | -0.045*** (0.012) | -0.074*** (0.009) | -0.061*** (0.014) | -0.080*** (0.006) | -0.047*** (0.009) | -0.083*** (0.008) | -0.085*** (0.010) |
| dbothrem | 0.146*** (0.013) | 0.145*** (0.020) | 0.136*** (0.015) | 0.143*** (0.024) | 0.235*** (0.012) | 0.234*** (0.017) | 0.242*** (0.015) | 0.225*** (0.019) |
| empsh | 0.446*** (0.018) | 0.381*** (0.027) | 0.464*** (0.019) | 0.480*** (0.032) | 0.465*** (0.015) | 0.413*** (0.020) | 0.474*** (0.017) | 0.530*** (0.023) |
| age0_6 | -0.288*** (0.007) | -0.296*** (0.011) | -0.276*** (0.008) | -0.294*** (0.014) | -0.289*** (0.006) | -0.287*** (0.008) | -0.277*** (0.008) | -0.293*** (0.010) |
| age7_14 | -0.229*** (0.007) | -0.222*** (0.011) | -0.221*** (0.008) | -0.229*** (0.013) | -0.227*** (0.006) | -0.208*** (0.008) | -0.228*** (0.008) | -0.231*** (0.010) |
| age15_24 | -0.089*** (0.007) | -0.080*** (0.010) | -0.091*** (0.008) | -0.087*** (0.012) | -0.092*** (0.005) | -0.058*** (0.008) | -0.087*** (0.007) | -0.105*** (0.009) |
| (age 25+ omitted) | | | | | | | | |
| hfemale | 0.065*** (0.013) | 0.024 (0.019) | 0.078*** (0.014) | 0.114*** (0.024) | 0.035*** (0.011) | 0.022* (0.013) | 0.032** (0.013) | 0.037** (0.018) |
| hage | 0.0008 (0.0016) | 0.0027 (0.0023) | 0.0037** (0.0018) | -0.0007 (0.0030) | 0.0010 (0.0014) | 0.0012 (0.0017) | 0.0014 (0.0016) | -0.0034 (0.0022) |
| hage2 | 0.000001 (0.000016) | -0.000030 (0.000023) | -0.000026 (0.000017) | 0.000032 (0.000029) | -0.000006 (0.000013) | -0.000021 (0.000017) | -0.000010 (0.000016) | 0.000058*** (0.000021) |
| hmarried | -0.015 (0.013) | 0.019 (0.018) | 0.003 (0.014) | -0.036 (0.023) | -0.003 (0.011) | 0.026** (0.013) | 0.006 (0.012) | -0.044** (0.018) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.134*** (0.008) | 0.090*** (0.013) | 0.125*** (0.009) | 0.165*** (0.015) | 0.142*** (0.007) | 0.123*** (0.010) | 0.138*** (0.009) | 0.162*** (0.012) |
| hedu3 | 0.395*** (0.010) | 0.310*** (0.015) | 0.389*** (0.011) | 0.475*** (0.018) | 0.416*** (0.008) | 0.328*** (0.011) | 0.396*** (0.010) | 0.503*** (0.013) |
| hedu4 | 0.865*** (0.014) | 0.748*** (0.021) | 0.857*** (0.015) | 0.984*** (0.024) | 1.012*** (0.011) | 0.849*** (0.015) | 0.997*** (0.013) | 1.165*** (0.017) |
| hnojob | 0.088*** (0.011) | 0.052*** (0.018) | 0.087*** (0.012) | 0.119*** (0.019) | 0.084*** (0.009) | 0.043*** (0.013) | 0.093*** (0.011) | 0.135*** (0.013) |
| urban | 0.147*** (0.007) | 0.120*** (0.012) | 0.149*** (0.008) | 0.149*** (0.013) | 0.185*** (0.006) | 0.157*** (0.009) | 0.179*** (0.008) | 0.212*** (0.010) |
| agri | -0.248*** (0.008) | -0.183*** (0.013) | -0.248*** (0.009) | -0.297*** (0.014) | -0.248*** (0.007) | -0.173*** (0.011) | -0.241*** (0.009) | -0.313*** (0.011) |
| Ilocos | -0.532*** (0.015) | -0.551*** (0.026) | -0.515*** (0.018) | -0.515*** (0.029) | -0.463*** (0.014) | -0.450*** (0.021) | -0.461*** (0.019) | -0.451*** (0.024) |
| Cagayan | -0.410*** (0.019) | -0.551*** (0.029) | -0.413*** (0.021) | -0.302*** (0.034) | -0.355*** (0.016) | -0.389*** (0.022) | -0.349*** (0.020) | -0.343*** (0.026) |
| Cluzon | -0.265*** (0.012) | -0.314*** (0.020) | -0.247*** (0.014) | -0.240*** (0.023) | -0.284*** (0.012) | -0.262*** (0.017) | -0.266*** (0.015) | -0.292*** (0.019) |
| Sluzon | -0.269*** (0.012) | -0.364*** (0.018) | -0.265*** (0.014) | -0.205*** (0.022) | -0.242*** (0.011) | -0.298*** (0.015) | -0.227*** (0.013) | -0.228*** (0.017) |
| Bicol | -0.537*** (0.016) | -0.621*** (0.025) | -0.550*** (0.018) | -0.481*** (0.030) | -0.521*** (0.014) | -0.574*** (0.020) | -0.508*** (0.018) | -0.509*** (0.023) |
| Wvisayas | -0.397*** (0.014) | -0.459*** (0.022) | -0.398*** (0.016) | -0.370*** (0.026) | -0.405*** (0.013) | -0.456*** (0.018) | -0.413*** (0.016) | -0.356*** (0.021) |
| Cvisayas | -0.594*** (0.015) | -0.737*** (0.023) | -0.596*** (0.017) | -0.482*** (0.027) | -0.565*** (0.015) | -0.698*** (0.019) | -0.561*** (0.017) | -0.455*** (0.023) |
| Evisayas | -0.615*** (0.016) | -0.681*** (0.028) | -0.593*** (0.020) | -0.581*** (0.032) | -0.607*** (0.014) | -0.671*** (0.020) | -0.607*** (0.018) | -0.556*** (0.023) |
| Mindanao | -0.501*** (0.011) | -0.622*** (0.018) | -0.506*** (0.013) | -0.404*** (0.021) | -0.569*** (0.011) | -0.641*** (0.014) | -0.546*** (0.013) | -0.515*** (0.016) |
| (NCR omitted) | | | | | | | | |
| CAR | -0.361*** (0.023) | -0.411*** (0.037) | -0.364*** (0.027) | -0.303*** (0.043) | -0.348*** (0.015) | -0.411*** (0.021) | -0.345*** (0.019) | -0.278*** (0.025) |
| constant | 9.514*** (0.044) | 9.033*** (0.064) | 9.407*** (0.048) | 10.024*** (0.079) | 9.932*** (0.037) | 9.406*** (0.048) | 9.887*** (0.044) | 10.548*** (0.061) |
| R-squared | 0.5798 | 0.3158 | 0.3674 | 0.3677 | 0.5845 | 0.3072 | 0.3717 | 0.3861 |
| Number of obs | 24165 | 24165 | 24165 | 24165 | 39615 | 39615 | 39615 | 39615 |

Note: Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%

Table A5. 2: Interquartile regression results on expenditure gaps

| | 1994 FIES | | | 2000 FIES | | |
|------------------|-----------------------|------------------------|-----------------------|----------------------|--------------------------|--------------------------|
| | 50th-10th | 90th-50th | 90th-10th | 50th-10th | 90th-50th | 90th-10th |
| dexrem | 0.012 (0.019) | 0.028 (0.019) | 0.040 (0.025) | 0.017 (0.014) | 0.040** (0.016) | 0.057*** (0.020) |
| dinrem | -0.030** (0.013) | 0.013 (0.012) | -0.016 (0.016) | -0.036*** (0.009) | -0.002 (0.011) | -0.038*** (0.014) |
| dbothrem | -0.009 (0.019) | 0.007 (0.028) | -0.002 (0.031) | 0.007 (0.021) | -0.016 (0.021) | -0.009 (0.026) |
| empsh | 0.083*** (0.025) | 0.016 (0.035) | 0.099** (0.046) | 0.060*** (0.022) | 0.056** (0.026) | 0.116*** (0.033) |
| age0_6 | 0.020 (0.012) | -0.017 (0.012) | 0.003 (0.017) | 0.010 (0.008) | -0.016* (0.009) | -0.006 (0.012) |
| age7_14 | 0.001 (0.011) | -0.008 (0.013) | -0.007 (0.018) | -0.020** (0.010) | -0.003 (0.011) | -0.024** (0.012) |
| age15_24 | -0.011 (0.010) | 0.004 (0.012) | -0.007 (0.014) | -0.029*** (0.009) | -0.018** (0.008) | -0.047*** (0.012) |
| (age25+ omitted) | | | | | | |
| hfemale | 0.053*** (0.020) | 0.037 (0.023) | 0.090*** (0.028) | 0.009 (0.018) | 0.006 (0.016) | 0.015 (0.019) |
| hage | 0.001 (0.003) | -0.004 (0.003) | -0.003 (0.004) | 0.000 (0.002) | -0.005** (0.002) | -0.005 (0.003) |
| hage2 | 0.000003 (0.00003) | 0.000058* (0.00003) | 0.000061 (0.00004) | 0.00001 (0.00002) | 0.000068*** (0.00002) | 0.000078*** (0.00003) |
| hmarried | -0.015 (0.022) | -0.040* (0.023) | -0.055* (0.029) | -0.021 (0.018) | -0.050*** (0.014) | -0.071*** (0.021) |
| (hedu1 omitted) | | | | | | |
| hedu2 | 0.035** (0.014) | 0.040*** (0.015) | 0.075*** (0.017) | 0.014 (0.010) | 0.024** (0.011) | 0.038** (0.015) |
| hedu3 | 0.079*** (0.016) | 0.086*** (0.016) | 0.165*** (0.020) | 0.068*** (0.011) | 0.107*** (0.012) | 0.175*** (0.017) |
| hedu4 | 0.109*** (0.025) | 0.128*** (0.021) | 0.236*** (0.034) | 0.149*** (0.020) | 0.168*** (0.015) | 0.317*** (0.023) |
| hnojob | 0.034* (0.021) | 0.032 (0.025) | 0.066** (0.029) | 0.050*** (0.016) | 0.042*** (0.015) | 0.092*** (0.018) |
| urban | 0.029** (0.012) | 0.00009 (0.014) | 0.029** (0.014) | 0.022** (0.009) | 0.033*** (0.011) | 0.055*** (0.012) |
| agri | -0.064*** (0.012) | -0.049*** (0.016) | -0.113*** (0.021) | -0.068*** (0.010) | -0.072*** (0.011) | -0.140*** (0.013) |
| Ilocos | 0.036 (0.029) | -0.00016 (0.028) | 0.036 (0.039) | -0.012 (0.024) | 0.010 (0.030) | -0.001 (0.036) |
| Cagayan | 0.138*** (0.035) | 0.112*** (0.038) | 0.249*** (0.044) | 0.041* (0.024) | 0.005 (0.024) | 0.046 (0.030) |
| Cluzon | 0.067*** (0.024) | 0.007 (0.024) | 0.074*** (0.028) | -0.004 (0.019) | -0.026 (0.021) | -0.030 (0.023) |
| Sluzon | 0.098*** (0.021) | 0.060*** (0.021) | 0.159*** (0.025) | 0.071*** (0.018) | -0.001 (0.022) | 0.069*** (0.023) |
| Bicol | 0.071** (0.028) | 0.069** (0.027) | 0.140*** (0.035) | 0.066*** (0.021) | -0.001 (0.028) | 0.065** (0.026) |
| Wvisayas | 0.061** (0.024) | 0.028 (0.023) | 0.089*** (0.029) | 0.044* (0.023) | 0.057** (0.027) | 0.100*** (0.025) |
| Cvisayas | 0.141*** (0.029) | 0.114*** (0.030) | 0.255*** (0.036) | 0.137*** (0.024) | 0.106*** (0.025) | 0.243*** (0.026) |
| Evisayas | 0.088*** (0.034) | 0.012 (0.039) | 0.100** (0.041) | 0.064*** (0.021) | 0.050* (0.027) | 0.115*** (0.031) |
| Mindanao | 0.116*** (0.019) | 0.102*** (0.023) | 0.218*** (0.025) | 0.094*** (0.016) | 0.031 (0.020) | 0.125*** (0.025) |
| (NCR omitted) | | | | | | |
| CAR | 0.048 (0.040) | 0.061 (0.044) | 0.109* (0.058) | 0.066*** (0.024) | 0.067** (0.027) | 0.133*** (0.030) |
| constant | 0.374*** (0.078) | 0.616*** (0.086) | 0.991*** (0.096) | 0.481*** (0.056) | 0.662*** (0.058) | 1.147*** (0.081) |
| Number of obs | 24165 | 24165 | 24165 | 39615 | 39615 | 39615 |

Note: Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%

Table A5. 3: Mean regression results on expenditure levels by types of remittances

| | 1994 FIES | | | | 2000 FIES | | | |
|------------------|------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|
| | dnorem | dexrem | dinrem | dbothrem | dnorem | dexrem | dinrem | dbothrem |
| empsh | 0.4930*** (0.0250) | 0.3582*** (0.0539) | 0.4182*** (0.0330) | 0.3995*** (0.0694) | 0.5560*** (0.0201) | 0.4291*** (0.0438) | 0.3600*** (0.0259) | 0.3818*** (0.0655) |
| age0_6 | -0.2843*** (0.0102) | -0.2849*** (0.0196) | -0.2955*** (0.0134) | -0.2664*** (0.0276) | -0.2655*** (0.0080) | -0.2840*** (0.0163) | -0.3104*** (0.0109) | -0.3490*** (0.0241) |
| age7_14 | -0.2166*** (0.0099) | -0.2783*** (0.0198) | -0.2373*** (0.0134) | -0.2231*** (0.0264) | -0.1973*** (0.0081) | -0.2428*** (0.0168) | -0.2637*** (0.0108) | -0.2977*** (0.0253) |
| age15_24 | -0.0832*** (0.0091) | -0.1423*** (0.0197) | -0.0821*** (0.0120) | -0.0584** (0.0254) | -0.0989*** (0.0074) | -0.1175*** (0.0164) | -0.0752*** (0.0098) | -0.0778*** (0.0244) |
| (age25+ omitted) | | | | | | | | |
| hfemale | -0.0153 (0.0227) | 0.1707*** (0.0261) | 0.0123 (0.0258) | 0.1316*** (0.0372) | -0.0607*** (0.0178) | 0.2359*** (0.0212) | -0.0381* (0.0206) | 0.0672* (0.0375) |
| hage | 0.0008 (0.0024) | -0.0060 (0.0049) | 0.0023 (0.0028) | -0.0003 (0.0062) | 0.0052*** (0.0020) | -0.0066* (0.0039) | -0.0001 (0.0024) | -0.0067 (0.0055) |
| hage2 | 0.00001 (0.000025) | 0.00006 (0.000048) | -0.000023 (0.000026) | 0.000025 (0.00006) | -0.000034* (0.00002) | 0.00007* (0.000037) | -0.000009 (0.000022) | 0.000066 (0.00005) |
| hmarried | -0.0351* (0.0194) | 0.0718** (0.0314) | -0.0864*** (0.0239) | -0.0358 (0.0400) | -0.0512*** (0.0162) | 0.0941*** (0.0250) | -0.0556*** (0.0197) | -0.0314 (0.0413) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.1426*** (0.0106) | 0.1212*** (0.0294) | 0.1176*** (0.0142) | 0.1236*** (0.0361) | 0.1245*** (0.0088) | 0.1893*** (0.0256) | 0.1519*** (0.0116) | 0.1084*** (0.0350) |
| hedu3 | 0.4132*** (0.0131) | 0.3573*** (0.0310) | 0.3718*** (0.0178) | 0.3545*** (0.0381) | 0.4227*** (0.0101) | 0.4311*** (0.0260) | 0.3806*** (0.0143) | 0.3614*** (0.0355) |
| hedu4 | 0.9266*** (0.0198) | 0.7454*** (0.0370) | 0.8314*** (0.0314) | 0.7482*** (0.0521) | 1.0640*** (0.0146) | 0.8559*** (0.0294) | 1.0290*** (0.0269) | 0.8387*** (0.0492) |
| hnojob | 0.0460** (0.0186) | 0.1125*** (0.0249) | 0.0788*** (0.0206) | 0.0973*** (0.0320) | 0.0366** (0.0144) | 0.1017*** (0.0212) | 0.0633*** (0.0167) | 0.1476*** (0.0326) |
| urban | 0.1432*** (0.0098) | 0.1607*** (0.0235) | 0.1408*** (0.0129) | 0.1194*** (0.0345) | 0.1876*** (0.0081) | 0.1904*** (0.0191) | 0.1736*** (0.0106) | 0.1767*** (0.0279) |
| agri | -0.2606*** (0.0105) | -0.2875*** (0.0329) | -0.2102*** (0.0135) | -0.2130*** (0.0436) | -0.2562*** (0.0087) | -0.3009*** (0.0312) | -0.2153*** (0.0110) | -0.2753*** (0.0418) |
| llocos | -0.5495*** (0.0239) | -0.5004*** (0.0341) | -0.5480*** (0.0288) | -0.5558*** (0.0551) | -0.5112*** (0.0208) | -0.4012*** (0.0314) | -0.4233*** (0.0301) | -0.5010*** (0.0520) |
| Cagayan | -0.4336*** (0.0244) | -0.2614*** (0.0517) | -0.5146*** (0.0416) | -0.2268** (0.1020) | -0.3448*** (0.0199) | -0.3603*** (0.0402) | -0.3879*** (0.0345) | -0.4877*** (0.0798) |
| Cluzon | -0.2892*** (0.0192) | -0.2749*** (0.0298) | -0.2789*** (0.0233) | -0.2238*** (0.0340) | -0.3020*** (0.0167) | -0.2594*** (0.0271) | -0.2925*** (0.0230) | -0.3299*** (0.0439) |
| Sluzon | -0.2995*** (0.0172) | -0.2054*** (0.0301) | -0.3009*** (0.0232) | -0.2343*** (0.0403) | -0.2530*** (0.0148) | -0.1449*** (0.0261) | -0.3124*** (0.0230) | -0.1912*** (0.0444) |
| Bicol | -0.5509*** (0.0223) | -0.4038*** (0.0600) | -0.5984*** (0.0279) | -0.4876*** (0.0668) | -0.5335*** (0.0201) | -0.3872*** (0.0530) | -0.5819*** (0.0262) | -0.4832*** (0.0670) |
| Wvisayas | -0.4101*** (0.0196) | -0.2348*** (0.0417) | -0.4713*** (0.0253) | -0.4223*** (0.0519) | -0.4512*** (0.0190) | -0.2366*** (0.0349) | -0.4674*** (0.0249) | -0.3105*** (0.0540) |
| Cvisayas | -0.5872*** (0.0205) | -0.5179*** (0.0492) | -0.6882*** (0.0290) | -0.5016*** (0.0943) | -0.5844*** (0.0199) | -0.4008*** (0.0422) | -0.6297*** (0.0283) | -0.5292*** (0.0674) |
| Evisayas | -0.6223*** (0.0227) | -0.5888*** (0.0573) | -0.6593*** (0.0288) | -0.7663*** (0.0780) | -0.6251*** (0.0191) | -0.4808*** (0.0479) | -0.6430*** (0.0273) | -0.6696*** (0.0695) |
| Mindanao | -0.5018*** (0.0158) | -0.4500*** (0.0343) | -0.5737*** (0.0238) | -0.4622*** (0.0481) | -0.5714*** (0.0139) | -0.5377*** (0.0288) | -0.6144*** (0.0228) | -0.5454*** (0.0495) |
| (NCR omitted) | | | | | | | | |
| CAR | -0.3321*** (0.0285) | -0.4310*** (0.0627) | -0.4640*** (0.0585) | -0.4098*** (0.0817) | -0.3404*** (0.0208) | -0.3254*** (0.0336) | -0.4280*** (0.0335) | -0.2388*** (0.0626) |
| constant | 9.4947*** (0.0628) | 9.8851*** (0.1296) | 9.5751*** (0.0770) | 9.6604*** (0.1672) | 9.8065*** (0.0514) | 10.2350*** (0.1080) | 10.0854*** (0.0669) | 10.4790*** (0.1522) |
| R-squared | 0.5730 | 0.4790 | 0.5311 | 0.4513 | 0.5965 | 0.4664 | 0.5031 | 0.4685 |
| Number of Obs | 12732 | 3093 | 6620 | 1720 | 21439 | 5048 | 11021 | 2107 |

Note: Parentheses denote standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%

Chapter 6

Table A6. 1: Coefficient estimates of the Two-Part model on education expenditure share (%) with the absolute amount of remittances

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-----------------|------------------------|-------------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|
| | slection | level | slection | level | slection | level | slection | level |
| lpctotex | 0.2548*** (0.0245) | 0.0141*** (0.0009) | 0.2199*** (0.0219) | 0.0175*** (0.0008) | 0.1515*** (0.0161) | 0.0214*** (0.0007) | 0.1245*** (0.0168) | 0.0267*** (0.0009) |
| inrem | 0.0027** (0.0012) | .000195*** (0.00005) | 0.0016 (0.0012) | .000102*** (0.00004) | 0.0022*** (0.0008) | .0000842*** (0.00003) | 0.0024*** (0.0007) | .000149*** (0.00003) |
| exrem | 0.0017*** (0.0004) | .0000305** (0.00001) | 0.0015*** (0.0004) | .0000631*** (0.00001) | 0.0008*** (0.0002) | .0000393*** (0.00001) | 0.0022*** (0.0002) | .0000362*** (0.00001) |
| age7_14 | 2.2137*** (0.0312) | -0.0086*** (0.0013) | 2.1301*** (0.0293) | -0.0058*** (0.0011) | 2.1123*** (0.0230) | -0.0082*** (0.0010) | 2.2235*** (0.0238) | -0.0060*** (0.0010) |
| age15_24 | 0.7461*** (0.0266) | 0.0166*** (0.0009) | 0.8166*** (0.0242) | 0.0241*** (0.0008) | 0.7859*** (0.0188) | 0.0265*** (0.0007) | 0.7249*** (0.0188) | 0.0295*** (0.0007) |
| hfemale | 0.1523*** (0.0512) | 0.0039** (0.0019) | 0.0391 (0.0434) | 0.0021 (0.0018) | 0.1642*** (0.0333) | 0.0051*** (0.0018) | 0.1455*** (0.0315) | 0.0045*** (0.0017) |
| hage | 0.0113*** (0.0010) | 0.0004*** (0.00004) | 0.0020** (0.0009) | 0.0002*** (0.00004) | -0.0049*** (0.0007) | 0.0002*** (0.00003) | -0.0045*** (0.0007) | 0.0002*** (0.00003) |
| hmarried | 0.3059*** (0.0469) | 0.0055*** (0.0017) | 0.2153*** (0.0401) | 0.0068*** (0.0018) | 0.4128*** (0.0304) | 0.0077*** (0.0017) | 0.3700*** (0.0288) | 0.0097*** (0.0017) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.2519*** (0.0316) | 0.0048*** (0.0009) | 0.2244*** (0.0284) | 0.0053*** (0.0009) | 0.2350*** (0.0235) | 0.0035*** (0.0008) | 0.2261*** (0.0233) | 0.0033*** (0.0008) |
| hedu3 | 0.3545*** (0.0379) | 0.0089*** (0.0012) | 0.3139*** (0.0344) | 0.0104*** (0.0012) | 0.3848*** (0.0271) | 0.0099*** (0.0010) | 0.3942*** (0.0268) | 0.0116*** (0.0011) |
| hedu4 | 0.4346*** (0.0566) | 0.0137*** (0.0020) | 0.4443*** (0.0515) | 0.0203*** (0.0020) | 0.4799*** (0.0376) | 0.0185*** (0.0017) | 0.5433*** (0.0386) | 0.0170*** (0.0019) |
| hnojob | -0.3466*** (0.0435) | -0.0060*** (0.0016) | -0.2164*** (0.0341) | -0.0056*** (0.0015) | -0.1740*** (0.0254) | -0.0039*** (0.0013) | -0.1423*** (0.0261) | -0.0021 (0.0014) |
| urban | 0.0941*** (0.0304) | -0.0033*** (0.0010) | 0.1082*** (0.0256) | -0.0031*** (0.0009) | 0.0360* (0.0207) | -0.0061*** (0.0008) | 0.0111 (0.0210) | -0.0064*** (0.0009) |
| agri | -0.1886*** (0.0314) | 0.0003 (0.0010) | -0.2110*** (0.0286) | -0.0007 (0.0010) | -0.2382*** (0.0242) | 0.0007 (0.0009) | -0.1904*** (0.0230) | 0.0018** (0.0009) |
| llocos | 0.0292 (0.0635) | 0.0068*** (0.0021) | -0.1312** (0.0580) | 0.0206*** (0.0021) | 0.1083** (0.0480) | 0.0202*** (0.0022) | 0.3220*** (0.0451) | 0.0269*** (0.0019) |
| Cagayan | 0.0543 (0.0686) | 0.0157*** (0.0027) | -0.1635*** (0.0631) | 0.0286*** (0.0028) | 0.1555*** (0.0516) | 0.0267*** (0.0022) | 0.3521*** (0.0485) | 0.0406*** (0.0024) |
| Cluzon | -0.0670 (0.0522) | 0.0013 (0.0014) | -0.2000*** (0.0463) | 0.0092*** (0.0013) | -0.0146 (0.0385) | 0.0120*** (0.0014) | 0.2192*** (0.0415) | 0.0215*** (0.0016) |
| Sluzon | -0.0351 (0.0507) | 0.0077*** (0.0016) | -0.1554*** (0.0434) | 0.0214*** (0.0015) | 0.0554 (0.0344) | 0.0141*** (0.0013) | 0.3309*** (0.0371) | 0.0257*** (0.0015) |
| Bicol | 0.0022 (0.0650) | 0.0084*** (0.0019) | -0.0294 (0.0599) | 0.0200*** (0.0020) | 0.2758*** (0.0485) | 0.0162*** (0.0017) | 0.4128*** (0.0493) | 0.0272*** (0.0019) |
| Wvisayas | 0.1694*** (0.0574) | 0.0061*** (0.0018) | -0.0138 (0.0522) | 0.0127*** (0.0015) | 0.2779*** (0.0421) | 0.0151*** (0.0016) | 0.3940*** (0.0446) | 0.0267*** (0.0018) |
| Cvisayas | -0.0621 (0.0603) | 0.0068*** (0.0018) | -0.1620*** (0.0536) | 0.0170*** (0.0017) | 0.1370*** (0.0456) | 0.0198*** (0.0018) | 0.2916*** (0.0457) | 0.0314*** (0.0019) |
| Evisayas | -0.0628 (0.0710) | 0.0061*** (0.0021) | -0.2542*** (0.0641) | 0.0143*** (0.0020) | 0.1534*** (0.0480) | 0.0213*** (0.0020) | 0.3582*** (0.0517) | 0.0315*** (0.0021) |
| Mindanao | -0.0020 (0.0483) | 0.0074*** (0.0014) | -0.0705 (0.0436) | 0.0198*** (0.0014) | 0.0863** (0.0348) | 0.0210*** (0.0013) | 0.3033*** (0.0362) | 0.0314*** (0.0014) |
| (NCR omitted) | | | | | | | | |
| CAR | 0.0103 (0.0857) | 0.0223*** (0.0036) | 0.0943 (0.0853) | 0.0311*** (0.0036) | 0.2782*** (0.0521) | 0.0371*** (0.0024) | 0.4353*** (0.0525) | 0.0437*** (0.0026) |
| constant | -4.0793*** (0.2301) | -0.1271*** (0.0088) | -3.1078*** (0.2215) | -0.1744*** (0.0084) | -2.5188*** (0.1733) | -0.2153*** (0.0079) | -2.4752*** (0.1829) | -0.2885*** (0.0094) |
| R2 | 0.4105 | 0.1417 | 0.3978 | 0.1615 | 0.4177 | 0.1704 | 0.4254 | 0.1962 |
| Number of obs | 18429 | 12664 | 24165 | 17857 | 39615 | 28833 | 38480 | 27188 |

Note: (a) Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

(b) The selection equation was estimated using the probit model with all sample households, while the level equation was computed using OLS only with sample households with positive amount of remittances. The dependent variable of the selection equation is a dummy variable denoting whether households spend money on education or not, whereas the budget share of education expenditure (%) was used for the variable of the level equation.

Table A6. 2: Coefficient estimates of the Two-Part model on education expenditure (Philippine pesos, in real terms) with the absolute amount of remittances

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-----------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|----------------------------|------------------------|----------------------------|
| | selection | level | selection | level | selection | level | selection | level |
| lpctotex | 0.2548*** (0.0245) | 5808.86*** (280.37) | 0.2199*** (0.0219) | 7393.52*** (260.53) | 0.1515*** (0.0161) | 11891.56*** (485.76) | 0.1245*** (0.0168) | 11156.62*** (385.15) |
| inrem | 0.0027** (0.0012) | 42.41** (16.49) | 0.0016 (0.0012) | 45.27*** (12.77) | 0.0022*** (0.0008) | 50.22*** (17.02) | 0.0024*** (0.0007) | 66.42*** (20.79) |
| exrem | 0.0017*** (0.0004) | 19.11*** (4.81) | 0.0015*** (0.0004) | 31.59*** (4.35) | 0.0008*** (0.0002) | 27.68*** (4.67) | 0.0022*** (0.0002) | 32.99*** (7.14) |
| age7_14 | 2.2137*** (0.0312) | 292.26 (280.85) | 2.1301*** (0.0293) | 974.97*** (270.08) | 2.1123*** (0.0230) | 1426.53*** (317.46) | 2.2235*** (0.0238) | 1543.70*** (304.17) |
| age15_24 | 0.7461*** (0.0266) | 3126.56*** (203.79) | 0.8166*** (0.0242) | 5080.92*** (181.59) | 0.7859*** (0.0188) | 6615.40*** (223.81) | 0.7249*** (0.0188) | 7042.28*** (224.44) |
| hfemale | 0.1523*** (0.0512) | -613.84 (432.81) | 0.0391 (0.0434) | -670.04 (439.45) | 0.1642*** (0.0333) | -133.84 (590.95) | 0.1455*** (0.0315) | -282.91 (601.88) |
| hage | 0.0113*** (0.0010) | 72.77*** (9.87) | 0.0020** (0.0009) | 37.36*** (8.69) | -0.0049*** (0.0007) | 42.55*** (9.70) | -0.0045*** (0.0007) | 40.67*** (10.24) |
| hmarried | 0.3059*** (0.0469) | 1357.05*** (340.42) | 0.2153*** (0.0401) | 1585.01*** (407.94) | 0.4128*** (0.0304) | 3196.05*** (550.70) | 0.3700*** (0.0288) | 3509.62*** (562.29) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.2519*** (0.0316) | 467.68*** (147.66) | 0.2244*** (0.0284) | 344.86** (152.26) | 0.2350*** (0.0235) | -499.27*** (174.27) | 0.2261*** (0.0233) | -390.04** (176.85) |
| hedu3 | 0.3545*** (0.0379) | 1172.33*** (213.44) | 0.3139*** (0.0344) | 1375.22*** (223.75) | 0.3848*** (0.0271) | 446.80 (274.04) | 0.3942*** (0.0268) | 781.62*** (252.78) |
| hedu4 | 0.4346*** (0.0566) | 4684.13*** (534.58) | 0.4443*** (0.0515) | 7445.05*** (597.78) | 0.4799*** (0.0376) | 9076.11*** (567.27) | 0.5433*** (0.0386) | 8038.26*** (635.54) |
| hnojob | -0.3466*** (0.0435) | -1429.25*** (393.53) | -0.2164*** (0.0341) | -2047.98*** (356.10) | -0.1740*** (0.0254) | -1666.27*** (419.36) | -0.1423*** (0.0261) | -652.15 (498.08) |
| urban | 0.0941*** (0.0304) | -489.22** (207.70) | 0.1082*** (0.0256) | -392.22** (187.79) | 0.0360* (0.0207) | -1301.02*** (257.77) | 0.0111 (0.0210) | -685.47*** (262.39) |
| agri | -0.1886*** (0.0314) | 529.31*** (172.73) | -0.2110*** (0.0286) | 718.90*** (166.45) | -0.2382*** (0.0242) | 2417.75*** (242.20) | -0.1904*** (0.0230) | 2243.47*** (232.27) |
| llocos | 0.0292 (0.0635) | 119.32 (403.71) | -0.1312** (0.0580) | 2645.71*** (562.89) | 0.1083** (0.0480) | 141.79 (740.90) | 0.3220*** (0.0451) | 3953.97*** (640.28) |
| Cagayan | 0.0543 (0.0686) | 1282.81** (499.31) | -0.1635*** (0.0631) | 4110.27*** (696.07) | 0.1555*** (0.0516) | 1130.55 (778.53) | 0.3521*** (0.0485) | 5897.10*** (727.39) |
| Cluzon | -0.0670 (0.0522) | -626.39* (336.30) | -0.2000*** (0.0463) | 735.72* (396.16) | -0.0146 (0.0385) | -895.69 (622.17) | 0.2192*** (0.0415) | 4011.70*** (636.77) |
| Sluzon | -0.0351 (0.0507) | 1144.96** (482.97) | -0.1554*** (0.0434) | 2948.74*** (428.59) | 0.0554 (0.0344) | 412.08 (609.03) | 0.3309*** (0.0371) | 5015.87*** (564.43) |
| Bicol | 0.0022 (0.0650) | 1067.38** (424.66) | -0.0294 (0.0599) | 2663.48*** (448.02) | 0.2758*** (0.0485) | 1620.29* (873.01) | 0.4128*** (0.0493) | 5458.19*** (688.98) |
| Wvisayas | 0.1694*** (0.0574) | 569.26 (405.68) | -0.0138 (0.0522) | 1358.73*** (376.25) | 0.2779*** (0.0421) | 114.62 (642.58) | 0.3940*** (0.0446) | 4105.26*** (558.59) |
| Cvisayas | -0.0621 (0.0603) | 1190.06*** (427.16) | -0.1620*** (0.0536) | 2229.45*** (390.69) | 0.1370*** (0.0456) | 1105.41* (627.52) | 0.2916*** (0.0457) | 5680.22*** (591.18) |
| Evisayas | -0.0628 (0.0710) | 841.14* (444.96) | -0.2542*** (0.0641) | 1930.22*** (412.72) | 0.1534*** (0.0480) | 2025.14*** (697.82) | 0.3582*** (0.0517) | 5676.27*** (655.77) |
| Mindanao | -0.0020 (0.0483) | 665.17* (361.87) | -0.0705 (0.0436) | 2767.41*** (382.67) | 0.0863** (0.0348) | 1111.10* (569.25) | 0.3033*** (0.0362) | 5399.95*** (515.24) |
| (NCR omitted) | | | | | | | | |
| CAR | 0.0103 (0.0857) | 2027.82*** (615.39) | 0.0943 (0.0853) | 4000.25*** (908.15) | 0.2782*** (0.0521) | 4055.76*** (798.23) | 0.4353*** (0.0525) | 6635.30*** (752.88) |
| constant | -4.0793*** (0.2301) | -53056.22*** (2626.75) | -3.1078*** (0.2215) | -72502.00*** (2630.43) | -2.5188*** (0.1733) | -119119.01*** (4735.52) | -2.4752*** (0.1829) | -120533.88*** (4172.26) |
| R2 | 0.4105 | 0.2316 | 0.3978 | 0.2672 | 0.4177 | 0.2810 | 0.4254 | 0.2864 |
| Number of obs | 18429 | 12664 | 24165 | 17857 | 39615 | 28833 | 38480 | 27188 |

Note: (a) Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

(b) The selection equation was estimated using the probit model with all sample households, while the level equation was computed using OLS only with sample households with positive amount of remittances. The dependent variable of the selection equation is a dummy variable denoting whether households spend money on education or not, whereas the absolute amount of education expenditure (in real terms) was used for the variable of the level equation.

(c) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Table A6. 3: The Tobit estimation results of marginal effects on education expenditure share (%) with remittance dummy variables

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| lpctotex | 0.00622*** (0.00036) | | 0.00792*** (0.00034) | | 0.00874*** (0.00030) | | 0.01005*** (0.00032) | |
| Bottom 20% | | 0.00157** (0.00075) | | 0.00177** (0.00076) | | 0.00432*** (0.00066) | | 0.00318*** (0.00064) |
| Bottom 20-40% | | 0.00449*** (0.00150) | | 0.00724*** (0.00143) | | 0.00708*** (0.00125) | | 0.00701*** (0.00125) |
| Middle | | 0.00776*** (0.00183) | | 0.00896*** (0.00185) | | 0.00803*** (0.00153) | | 0.01056*** (0.00155) |
| Top 20-40% | | 0.01025*** (0.00178) | | 0.01454*** (0.00174) | | 0.01616*** (0.00137) | | 0.01730*** (0.00140) |
| Top 20% | | 0.00547*** (0.00124) | | 0.00573*** (0.00109) | | 0.00645*** (0.00086) | | 0.00867*** (0.00090) |
| dinrem | 0.00041 (0.00034) | 0.00046 (0.00034) | 0.00008 (0.00036) | 0.00013 (0.00036) | 0.00139*** (0.00032) | 0.00149*** (0.00032) | 0.00122*** (0.00032) | 0.00134*** (0.00032) |
| dexrem | 0.00432*** (0.00075) | 0.00412*** (0.00074) | 0.00424*** (0.00066) | 0.00400*** (0.00066) | 0.00513*** (0.00058) | 0.00488*** (0.00058) | 0.00559*** (0.00060) | 0.00534*** (0.00059) |
| dbothrem | 0.00167** (0.00077) | 0.00154** (0.00077) | 0.00283*** (0.00073) | 0.00270*** (0.00073) | 0.00457*** (0.00081) | 0.00449*** (0.00081) | 0.00505*** (0.00062) | 0.00495*** (0.00062) |
| age7_14 | 0.01620*** (0.00038) | 0.01622*** (0.00039) | 0.01659*** (0.00037) | 0.01663*** (0.00037) | 0.01790*** (0.00032) | 0.01790*** (0.00032) | 0.01959*** (0.00034) | 0.01952*** (0.00034) |
| age15_24 | 0.01117*** (0.00032) | 0.01122*** (0.00032) | 0.01558*** (0.00034) | 0.01560*** (0.00034) | 0.01783*** (0.00030) | 0.01781*** (0.00030) | 0.01800*** (0.00032) | 0.01801*** (0.00032) |
| hfemale | 0.00308*** (0.00074) | 0.00303*** (0.00074) | 0.00195*** (0.00075) | 0.00179** (0.00075) | 0.00416*** (0.00069) | 0.00407*** (0.00069) | 0.00388*** (0.00063) | 0.00376*** (0.00063) |
| hage | 0.00020*** (0.00002) | 0.00020*** (0.00002) | 0.00005*** (0.00001) | 0.00006*** (0.00001) | -0.00004*** (0.00001) | -0.00004*** (0.00001) | -0.00004*** (0.00001) | -0.00004*** (0.00001) |
| hmarried | 0.00418*** (0.00060) | 0.00417*** (0.00060) | 0.00476*** (0.00065) | 0.00469*** (0.00065) | 0.00747*** (0.00057) | 0.00744*** (0.00057) | 0.00759*** (0.00053) | 0.00757*** (0.00053) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.00332*** (0.00039) | 0.00346*** (0.00039) | 0.00361*** (0.00041) | 0.00364*** (0.00040) | 0.00312*** (0.00037) | 0.00328*** (0.00037) | 0.00272*** (0.00036) | 0.00302*** (0.00036) |
| hedu3 | 0.00553*** (0.00051) | 0.00549*** (0.00051) | 0.00617*** (0.00052) | 0.00602*** (0.00052) | 0.00688*** (0.00044) | 0.00685*** (0.00044) | 0.00725*** (0.00046) | 0.00731*** (0.00046) |
| hedu4 | 0.00832*** (0.00091) | 0.00780*** (0.00091) | 0.01228*** (0.00104) | 0.01168*** (0.00105) | 0.01232*** (0.00083) | 0.01183*** (0.00083) | 0.01195*** (0.00088) | 0.01115*** (0.00089) |
| hnojob | -0.00390*** (0.00057) | -0.00397*** (0.00057) | -0.00298*** (0.00056) | -0.00308*** (0.00056) | -0.00284*** (0.00047) | -0.00298*** (0.00047) | -0.00180*** (0.00050) | -0.00199*** (0.00050) |
| urban | -0.00028 (0.00038) | -0.00029 (0.00038) | -0.00028 (0.00039) | -0.00032 (0.00039) | -0.00164*** (0.00034) | -0.00164*** (0.00034) | -0.00187*** (0.00037) | -0.00198*** (0.00037) |
| agri | -0.00111*** (0.00039) | -0.00122*** (0.00039) | -0.00154*** (0.00040) | -0.00167*** (0.00040) | -0.00132*** (0.00036) | -0.00149*** (0.00037) | -0.00058*** (0.00035) | -0.00103*** (0.00036) |
| llocos | 0.00153* (0.00084) | 0.00200** (0.00086) | 0.00598*** (0.00094) | 0.00686*** (0.00097) | 0.00771*** (0.00101) | 0.00820*** (0.00103) | 0.01025*** (0.00093) | 0.01111*** (0.00095) |
| Cagayan | 0.00522*** (0.00117) | 0.00563*** (0.00118) | 0.00864*** (0.00131) | 0.00937*** (0.00133) | 0.01125*** (0.00113) | 0.01180*** (0.00115) | 0.01652*** (0.00123) | 0.01758*** (0.00126) |
| Cluzon | -0.00029 (0.00059) | -0.00007 (0.00059) | 0.00132** (0.00059) | 0.00183*** (0.00061) | 0.00347*** (0.00064) | 0.00382*** (0.00066) | 0.00786*** (0.00077) | 0.00838*** (0.00078) |
| Sluzon | 0.00197*** (0.00066) | 0.00217*** (0.00067) | 0.00606*** (0.00069) | 0.00654*** (0.00071) | 0.00483*** (0.00059) | 0.00504*** (0.00060) | 0.01071*** (0.00069) | 0.01100*** (0.00070) |
| Bicol | 0.00306*** (0.00081) | 0.00323*** (0.00082) | 0.00709*** (0.00096) | 0.00754*** (0.00097) | 0.00791*** (0.00084) | 0.00808*** (0.00084) | 0.01239*** (0.00094) | 0.01271*** (0.00095) |
| Wvisayas | 0.00309*** (0.00075) | 0.00343*** (0.00076) | 0.00429*** (0.00071) | 0.00490*** (0.00073) | 0.00736*** (0.00076) | 0.00772*** (0.00077) | 0.01216*** (0.00091) | 0.01279*** (0.00092) |
| Cvisayas | 0.00180** (0.00075) | 0.00166** (0.00074) | 0.00480*** (0.00080) | 0.00503*** (0.00081) | 0.00831*** (0.00089) | 0.00838*** (0.00089) | 0.01294*** (0.00093) | 0.01312*** (0.00094) |
| Evisayas | 0.00198** (0.00089) | 0.00206** (0.00089) | 0.00326*** (0.00089) | 0.00363*** (0.00090) | 0.00958*** (0.00095) | 0.00967*** (0.00095) | 0.01391*** (0.00105) | 0.01413*** (0.00106) |
| Mindanao | 0.00255*** (0.00060) | 0.00276*** (0.00060) | 0.00667*** (0.00065) | 0.00705*** (0.00066) | 0.00863*** (0.00060) | 0.00891*** (0.00060) | 0.01264*** (0.00065) | 0.01299*** (0.00066) |
| (NCR omitted) | | | | | | | | |
| CAR | 0.00649*** (0.00158) | 0.00676*** (0.00160) | 0.01326*** (0.00192) | 0.01404*** (0.00195) | 0.01676*** (0.00127) | 0.01702*** (0.00129) | 0.01953*** (0.00138) | 0.02021*** (0.00140) |
| Sigma | 0.04866 (0.00102) | 0.04861 (0.00102) | 0.05510 (0.00083) | 0.05501 (0.00083) | 0.06304 (0.00067) | 0.06295 (0.00067) | 0.06545 (0.00075) | 0.06532 (0.00075) |
| Log pseudolikelihood | 17175.27 | 17195.568 | 22684.387 | 22720.024 | 32483.624 | 32525.631 | 29252.572 | 29316.836 |
| Pseudo R2 | -0.1626 | -0.1640 | -0.1571 | -0.1589 | -0.1919 | -0.1934 | -0.2293 | -0.2320 |
| No. of Obs (uncensored) | 12664 | 12664 | 17857 | 17857 | 28833 | 28833 | 27188 | 27188 |
| No. of Obs (total) | 18429 | 18429 | 24165 | 24165 | 39615 | 39615 | 38480 | 38480 |

Note: Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

Table A6. 4: The Tobit estimation results of marginal effects on education expenditure (Philippine pesos, in real terms) with remittance dummy variables

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| lpctotex | 2085.01*** (94.44) | | 2866.07*** (94.46) | | 4228.88*** (148.08) | | 3914.31*** (114.46) | |
| Bottom 20% | | 182.12 (116.40) | | 116.96 (124.95) | | 746.07*** (139.24) | | 486.32*** (136.56) |
| Bottom 20-40% | | 706.78*** (210.30) | | 1531.75*** (215.98) | | 1673.61*** (230.76) | | 1267.08*** (229.97) |
| Middle | | 1784.29*** (293.56) | | 1807.89*** (299.57) | | 2216.11*** (343.97) | | 2297.13*** (290.76) |
| Top 20-40% | | 2671.05*** (455.31) | | 4788.41*** (379.57) | | 4538.49*** (563.37) | | 5008.86*** (366.64) |
| Top 20% | | 3717.53*** (485.33) | | 4597.93*** (383.25) | | 8469.53*** (689.59) | | 7024.02*** (415.05) |
| dinrem | -4.97 (62.20) | 27.32 (62.03) | -19.51 (69.01) | -0.90 (68.20) | 228.98** (96.45) | 212.75** (91.61) | 99.68 (73.68) | 138.50* (72.53) |
| dexrem | 875.00*** (173.35) | 798.51*** (170.89) | 838.05*** (152.30) | 726.41*** (149.75) | 1001.44*** (171.39) | 941.06*** (166.97) | 1423.32*** (170.83) | 1329.75*** (167.88) |
| dbothrem | 183.69 (139.44) | 187.49 (139.20) | 548.18*** (172.38) | 556.36*** (171.28) | 586.96*** (205.13) | 635.74*** (204.85) | 866.96*** (164.52) | 955.54*** (163.24) |
| age7_14 | 3440.16*** (129.27) | 3422.69*** (124.87) | 3949.55*** (107.80) | 3946.57*** (106.33) | 5710.87*** (176.92) | 5572.57*** (162.98) | 5650.68*** (143.44) | 5492.47*** (136.42) |
| age15_24 | 2028.66*** (63.04) | 2086.85*** (62.99) | 3138.73*** (79.84) | 3212.24*** (80.69) | 4410.47*** (97.38) | 4482.41*** (98.04) | 4231.05*** (94.97) | 4282.69*** (94.09) |
| hfemale | 369.27*** (133.92) | 302.61** (134.88) | 378.18** (176.77) | 270.77 (175.09) | 1182.47*** (203.66) | 1043.28*** (201.50) | 944.59*** (181.88) | 791.56*** (179.02) |
| hage | 33.38*** (3.08) | 35.38*** (3.18) | 6.13* (3.21) | 8.61*** (3.19) | -13.57*** (3.72) | -8.36** (3.59) | -11.26*** (3.39) | -7.03** (3.32) |
| hmarried | 986.18*** (108.54) | 994.40*** (109.44) | 1258.05*** (142.01) | 1279.22*** (141.99) | 2604.17*** (161.90) | 2581.59*** (161.45) | 2395.41*** (146.65) | 2334.08*** (145.48) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 434.64*** (62.81) | 535.87*** (64.12) | 407.26*** (68.13) | 488.13*** (67.85) | 265.85*** (75.31) | 528.98*** (74.85) | 209.42*** (73.04) | 471.09*** (72.82) |
| hedu3 | 820.66*** (86.09) | 914.66*** (87.06) | 932.80*** (95.04) | 1018.95*** (94.13) | 947.89*** (100.34) | 1320.06*** (94.78) | 944.39*** (97.89) | 1300.16*** (96.46) |
| hedu4 | 2238.24*** (227.04) | 1838.48*** (212.65) | 3823.24*** (295.04) | 3163.84*** (278.68) | 4596.54*** (262.58) | 3728.06*** (254.65) | 4059.65*** (277.24) | 3252.93*** (265.47) |
| hnojob | -651.74*** (114.04) | -700.34*** (114.07) | -636.45*** (118.69) | -701.30*** (118.15) | -650.29*** (137.52) | -698.03*** (135.17) | -163.24 (144.42) | -271.76* (141.71) |
| urban | -31.61 (73.47) | -15.84 (72.98) | 2.09 (73.71) | 57.29 (73.29) | -324.71*** (92.78) | -144.96* (84.57) | -175.47* (93.95) | -103.83 (92.00) |
| agri | -57.78 (62.13) | -225.49*** (59.84) | -19.23 (70.00) | -303.48*** (68.70) | 340.90*** (88.43) | -296.66*** (84.15) | 398.67*** (84.37) | -213.47*** (78.01) |
| llocos | -77.28 (145.07) | 115.45 (149.65) | 555.73** (217.10) | 1022.24*** (230.77) | 274.77 (267.04) | 935.52*** (279.33) | 1650.02*** (248.63) | 2241.58*** (259.69) |
| Cagayan | 353.51* (186.45) | 531.17*** (190.27) | 919.55*** (278.59) | 1292.89*** (285.71) | 604.19** (293.50) | 1385.60*** (305.79) | 2367.70*** (293.63) | 3129.95*** (309.05) |
| Cluzon | -295.91** (119.07) | -120.77 (122.56) | -156.16 (147.40) | 291.77* (158.23) | -390.05* (214.18) | 389.49* (220.64) | 1607.24*** (244.10) | 2226.47*** (254.51) |
| Sluzon | 246.13 (162.87) | 331.98** (163.37) | 574.63*** (163.13) | 916.03*** (170.97) | 90.47 (215.39) | 600.83*** (215.14) | 2176.08*** (220.85) | 2540.27*** (225.06) |
| Bicol | 369.14** (159.96) | 355.87** (156.82) | 748.60*** (185.11) | 915.92*** (187.60) | 1018.11*** (323.96) | 1216.34*** (324.37) | 2577.01*** (283.64) | 2732.55*** (285.06) |
| Wvisayas | 351.57** (149.26) | 452.96*** (151.22) | 313.39** (151.71) | 642.97*** (159.88) | 567.50** (236.30) | 944.29*** (241.12) | 2078.92*** (228.72) | 2480.24*** (235.45) |
| Cvisayas | 265.12* (152.27) | 114.95 (144.76) | 401.17** (158.95) | 486.26*** (159.24) | 649.44*** (239.97) | 842.85*** (239.97) | 2374.71*** (241.58) | 2562.34*** (243.65) |
| Evisayas | 242.81 (165.71) | 224.95 (163.13) | 233.75 (169.63) | 373.55** (171.19) | 1080.65*** (266.88) | 1194.81*** (264.94) | 2623.09*** (275.10) | 2756.01*** (274.54) |
| Mindanao | 187.10 (128.90) | 285.76** (130.24) | 728.07*** (151.14) | 936.87*** (153.95) | 608.70*** (205.46) | 913.56*** (205.93) | 2220.19*** (192.54) | 2466.85*** (194.30) |
| (NCR omitted) | | | | | | | | |
| CAR | 369.26 (232.85) | 499.66** (238.50) | 1461.10*** (383.89) | 1896.45*** (400.94) | 1828.23*** (326.65) | 2482.29*** (335.60) | 2944.00*** (320.46) | 3469.19*** (330.41) |
| Sigma | 10296.83 (538.69) | 10170.78 (520.46) | 12844.16 (385.06) | 12677.32 (375.99) | 19773.47 (752.12) | 19372.44 (708.11) | 18866.71 (460.87) | 18559 (445.29) |
| Log pseudolikelihood | -137827 | -137643 | -197673 | -197410 | -331770 | -331138 | -311964 | -311455 |
| Pseudo R2 | 0.0210 | 0.0223 | 0.0199 | 0.0212 | 0.0195 | 0.0214 | 0.0200 | 0.0216 |
| No. of Obs (uncensored) | 12664 | 12664 | 17857 | 17857 | 28833 | 28833 | 27188 | 27188 |
| No. of Obs (total) | 18429 | 18429 | 24165 | 24165 | 39615 | 39615 | 38480 | 38480 |

Note: (a) Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Table A6. 5: The Tobit estimation results of marginal effects on education expenditure share (%) with the absolute amount of remittances

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| lpctotex | 0.00601*** (0.00031) | | 0.00756*** (0.00031) | | 0.00847*** (0.00026) | | 0.00961*** (0.00028) | |
| Bottom 20% | | 0.00148 (0.00120) | | 0.00182 (0.00119) | | 0.00437*** (0.00104) | | 0.00319*** (0.00111) |
| Bottom 20-40% | | 0.00455** (0.00187) | | 0.00727*** (0.00176) | | 0.00724*** (0.00153) | | 0.00730*** (0.00162) |
| Middle | | 0.00782*** (0.00188) | | 0.00905*** (0.00186) | | 0.00797*** (0.00157) | | 0.01058*** (0.00158) |
| Top 20-40% | | 0.01026*** (0.00150) | | 0.01435*** (0.00150) | | 0.01643*** (0.00120) | | 0.01750*** (0.00120) |
| Top 20% | | 0.00463*** (0.00080) | | 0.00433*** (0.00084) | | 0.00508*** (0.00065) | | 0.00669*** (0.00067) |
| inrem | 0.000089*** (0.000014) | 0.000089*** (0.000014) | 0.000053*** (0.000011) | 0.000054*** (0.000011) | 0.000053*** (0.000007) | 0.000056*** (0.000007) | 0.000075*** (0.000008) | 0.000076*** (0.000008) |
| exrem | 0.000024*** (0.000004) | 0.000022*** (0.000004) | 0.000036*** (0.000004) | 0.000035*** (0.000004) | 0.000021*** (0.000002) | 0.000021*** (0.000002) | 0.000026*** (0.000002) | 0.000025*** (0.000002) |
| age7_14 | 0.01616*** (0.00033) | 0.01618*** (0.00033) | 0.01642*** (0.00034) | 0.01646*** (0.00034) | 0.01780*** (0.00031) | 0.01781*** (0.00031) | 0.01941*** (0.00032) | 0.01937*** (0.00032) |
| age15_24 | 0.01110*** (0.00031) | 0.01114*** (0.00031) | 0.01545*** (0.00032) | 0.01545*** (0.00032) | 0.01771*** (0.00029) | 0.01767*** (0.00029) | 0.01782*** (0.00030) | 0.01780*** (0.00030) |
| hfemale | 0.00252*** (0.00068) | 0.00252*** (0.00068) | 0.00105 (0.00066) | 0.00093 (0.00066) | 0.00372*** (0.00059) | 0.00362*** (0.00059) | 0.00336*** (0.00056) | 0.00328*** (0.00056) |
| hage | 0.00020*** (0.00001) | 0.00020*** (0.00001) | 0.00007*** (0.00001) | 0.00007*** (0.00001) | -0.00003** (0.00001) | -0.00003** (0.00001) | -0.00003** (0.00001) | -0.00002** (0.00001) |
| hmarried | 0.00396*** (0.00056) | 0.00398*** (0.00056) | 0.00429*** (0.00058) | 0.00421*** (0.00059) | 0.00720*** (0.00050) | 0.00715*** (0.00050) | 0.00737*** (0.00048) | 0.00737*** (0.00048) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 0.00338*** (0.00041) | 0.00350*** (0.00041) | 0.00371*** (0.00044) | 0.00371*** (0.00044) | 0.00326*** (0.00041) | 0.00338*** (0.00041) | 0.00288*** (0.00041) | 0.00310*** (0.00041) |
| hedu3 | 0.00563*** (0.00053) | 0.00555*** (0.00053) | 0.00632*** (0.00053) | 0.00610*** (0.00053) | 0.00708*** (0.00047) | 0.00696*** (0.00047) | 0.00761*** (0.00047) | 0.00752*** (0.00047) |
| hedu4 | 0.00864*** (0.00082) | 0.00818*** (0.00082) | 0.01238*** (0.00089) | 0.01196*** (0.00089) | 0.01234*** (0.00074) | 0.01198*** (0.00074) | 0.01220*** (0.00077) | 0.01160*** (0.00077) |
| hnojob | -0.00431*** (0.00049) | -0.00436*** (0.00049) | -0.00367*** (0.00049) | -0.00376*** (0.00049) | -0.00299*** (0.00043) | -0.00316*** (0.00043) | -0.00222*** (0.00045) | -0.00241*** (0.00045) |
| urban | -0.00025 (0.00038) | -0.00026 (0.00038) | -0.00025 (0.00037) | -0.00031 (0.00037) | -0.00161*** (0.00034) | -0.00165*** (0.00034) | -0.00183*** (0.00035) | -0.00198*** (0.00035) |
| agri | -0.00116*** (0.00039) | -0.00121*** (0.00039) | -0.00176*** (0.00041) | -0.00178*** (0.00042) | -0.00163*** (0.00039) | -0.00168*** (0.00039) | -0.00096** (0.00038) | -0.00121*** (0.00038) |
| llocos | 0.00181** (0.00082) | 0.00225*** (0.00083) | 0.00626*** (0.00094) | 0.00703*** (0.00096) | 0.00820*** (0.00093) | 0.00854*** (0.00094) | 0.01132*** (0.00093) | 0.01200*** (0.00095) |
| Cagayan | 0.00513*** (0.00101) | 0.00552*** (0.00102) | 0.00882*** (0.00112) | 0.00947*** (0.00113) | 0.01149*** (0.00105) | 0.01189*** (0.00106) | 0.01734*** (0.00109) | 0.01817*** (0.00110) |
| Cluzon | -0.00034 (0.00064) | -0.00014 (0.00064) | 0.00128* (0.00066) | 0.00168** (0.00067) | 0.00380*** (0.00068) | 0.00402*** (0.00069) | 0.00823*** (0.00077) | 0.00858*** (0.00078) |
| Sluzon | 0.00184*** (0.00064) | 0.00204*** (0.00064) | 0.00604*** (0.00066) | 0.00646*** (0.00067) | 0.00492*** (0.00062) | 0.00507*** (0.00062) | 0.01080*** (0.00070) | 0.01100*** (0.00070) |
| Bicol | 0.00270*** (0.00083) | 0.00291*** (0.00083) | 0.00677*** (0.00095) | 0.00722*** (0.00096) | 0.00788*** (0.00090) | 0.00804*** (0.00090) | 0.01231*** (0.00096) | 0.01265*** (0.00097) |
| Wvisayas | 0.00286*** (0.00074) | 0.00321*** (0.00075) | 0.00418*** (0.00079) | 0.00474*** (0.00080) | 0.00746*** (0.00079) | 0.00776*** (0.00080) | 0.01233*** (0.00090) | 0.01287*** (0.00091) |
| Cvisayas | 0.00152*** (0.00077) | 0.00143* (0.00077) | 0.00458*** (0.00084) | 0.00481*** (0.00084) | 0.00831*** (0.00088) | 0.00835*** (0.00088) | 0.01296*** (0.00092) | 0.01308*** (0.00092) |
| Evisayas | 0.00168* (0.00088) | 0.00178** (0.00089) | 0.00299*** (0.00098) | 0.00336*** (0.00099) | 0.00950*** (0.00091) | 0.00958*** (0.00092) | 0.01403*** (0.00104) | 0.01423*** (0.00105) |
| Mindanao | 0.00235*** (0.00060) | 0.00255*** (0.00060) | 0.00655*** (0.00064) | 0.00691*** (0.00065) | 0.00850*** (0.00061) | 0.00873*** (0.00061) | 0.01269*** (0.00065) | 0.01297*** (0.00065) |
| (NCR omitted) | | | | | | | | |
| CAR | 0.00671*** (0.00133) | 0.00696*** (0.00133) | 0.01338*** (0.00155) | 0.01406*** (0.00157) | 0.01709*** (0.00110) | 0.01721*** (0.00111) | 0.01983*** (0.00119) | 0.02033*** (0.00120) |
| Sigma | 0.04863 (0.00031) | 0.04858 (0.00031) | 0.05503 (0.00030) | 0.05494 (0.00030) | 0.06303 (0.00027) | 0.06293 (0.00027) | 0.06537 (0.00029) | 0.06523 (0.00029) |
| Log pseudolikelihood | 17185.71 | 17205.836 | 22707.593 | 22743.44 | 32484.837 | 32530.866 | 29281.082 | 29345.245 |
| Pseudo R2 | -0.1633 | -0.1647 | -0.1583 | -0.1601 | -0.1919 | -0.1936 | -0.2305 | -0.2331 |
| No. of Obs (uncensored) | 12664 | 12664 | 17857 | 17857 | 28833 | 28833 | 27188 | 27188 |
| No. of Obs (total) | 18429 | 18429 | 24165 | 24165 | 39615 | 39615 | 38480 | 38480 |

Note: Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

Table A6. 6: The Tobit estimation results of marginal effects on education expenditure (Philippine pesos, in real terms) with the absolute amount of remittances

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| lpctotex | 1977.39*** (60.51) | | 2663.77*** (68.66) | | 3960.88*** (75.91) | | 3525.02*** (72.81) | |
| Bottom 20% | | 162.53 (234.92) | | 122.08 (256.50) | | 738.63** (293.63) | | 474.67 (289.00) |
| Bottom 20-40% | | 717.46* (367.01) | | 1514.24*** (379.84) | | 1666.82*** (432.27) | | 1294.42*** (424.25) |
| Middle | | 1775.63*** (370.07) | | 1788.09*** (402.12) | | 2143.75*** (444.04) | | 2172.49*** (414.17) |
| Top 20-40% | | 2604.87*** (292.43) | | 4621.01*** (321.59) | | 4470.51*** (338.40) | | 4940.02*** (314.52) |
| Top 20% | | 3486.18*** (153.37) | | 4138.37*** (176.61) | | 7967.06*** (179.92) | | 6133.81*** (171.12) |
| inrem | 16.92*** (2.66) | 14.86*** (2.63) | 17.49*** (2.25) | 14.90*** (2.23) | 20.83*** (2.05) | 15.22*** (2.03) | 26.25*** (2.12) | 22.60*** (2.10) |
| exrem | 8.63*** (0.70) | 6.83*** (0.70) | 13.62*** (0.78) | 11.19*** (0.78) | 11.00*** (0.62) | 8.05*** (0.62) | 14.46*** (0.54) | 11.82*** (0.54) |
| age7_14 | 3398.09*** (65.06) | 3394.06*** (64.49) | 3853.32*** (74.18) | 3870.87*** (73.54) | 5601.79*** (87.85) | 5508.43*** (86.51) | 5449.74*** (83.93) | 5358.85*** (83.01) |
| age15_24 | 1999.61*** (61.63) | 2060.11*** (61.20) | 3075.53*** (70.24) | 3151.29*** (69.83) | 4323.67*** (81.71) | 4416.57*** (80.65) | 4104.27*** (77.64) | 4173.10*** (76.95) |
| hfemale | 63.22 (127.19) | 82.59 (126.25) | -108.35 (139.79) | -109.24 (138.52) | 611.87*** (165.91) | 677.47*** (164.24) | 391.17*** (144.31) | 386.11*** (142.74) |
| hage | 35.24*** (2.66) | 36.77*** (2.64) | 9.91*** (3.11) | 11.50*** (3.08) | -9.86*** (3.60) | -5.75 (3.55) | -6.54** (3.29) | -3.45 (3.25) |
| hmarried | 813.29*** (110.85) | 869.72*** (108.99) | 967.30*** (126.23) | 1042.89*** (124.38) | 2244.99*** (139.92) | 2346.36*** (137.08) | 2073.67*** (125.02) | 2097.57*** (123.39) |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 452.11*** (80.79) | 544.17*** (80.60) | 439.02*** (93.93) | 505.30*** (93.43) | 303.00*** (115.05) | 545.02*** (114.60) | 267.87** (105.79) | 492.08*** (105.88) |
| hedu3 | 844.08*** (101.79) | 926.31*** (101.82) | 956.96*** (113.06) | 1025.09*** (112.84) | 999.66*** (129.66) | 1338.13*** (129.68) | 1071.91*** (120.36) | 1356.86*** (120.92) |
| hedu4 | 2332.25*** (172.61) | 1936.78*** (166.17) | 3856.12*** (210.00) | 3251.10*** (202.06) | 4676.07*** (224.01) | 3826.73*** (214.14) | 4243.97*** (214.21) | 3488.03*** (205.57) |
| hnojob | -847.79*** (96.97) | -844.15*** (96.00) | -989.01*** (105.13) | -977.72*** (104.24) | -955.52*** (122.72) | -890.04*** (121.37) | -585.40*** (117.91) | -586.06*** (116.64) |
| urban | -11.01 (74.20) | -2.49 (73.52) | 20.23 (81.17) | 64.42 (80.48) | -287.79*** (95.92) | -134.43 (94.45) | -137.41 (91.68) | -90.74 (90.82) |
| agri | -63.92 (78.38) | -219.85*** (77.66) | -68.30 (90.77) | -314.87*** (90.00) | 266.60** (113.93) | -319.82*** (111.29) | 301.62*** (102.08) | -225.40** (100.84) |
| ilocos | -38.94 (152.79) | 147.91 (155.96) | 571.45*** (188.99) | 1006.28*** (196.93) | 235.00 (231.64) | 899.14*** (240.40) | 1676.35*** (226.51) | 2260.69*** (234.49) |
| Cagayan | 364.10** (184.47) | 526.15*** (187.36) | 983.87*** (223.43) | 1315.37*** (229.56) | 683.25*** (255.76) | 1400.55*** (266.18) | 2431.27*** (253.71) | 3138.62*** (264.48) |
| Cluzon | -314.88*** (121.05) | -145.68 (122.81) | -179.46 (136.18) | 230.92 (141.59) | -357.91** (176.42) | 376.96** (183.81) | 1479.20*** (194.15) | 2076.72*** (200.93) |
| Sluzon | 225.93* (123.59) | 308.17** (123.69) | 587.97*** (135.88) | 894.83*** (138.83) | 101.43 (163.18) | 578.87*** (165.68) | 2031.95*** (175.38) | 2393.82*** (177.68) |
| Bicol | 307.07* (159.03) | 303.75* (157.71) | 684.54*** (191.35) | 848.38*** (193.17) | 975.64*** (237.03) | 1174.43*** (237.16) | 2339.08*** (240.04) | 2544.35*** (241.31) |
| Wvisayas | 312.99** (141.61) | 414.90*** (142.50) | 300.18* (161.13) | 603.20*** (165.27) | 489.12** (204.06) | 878.94*** (207.03) | 1935.24*** (219.43) | 2344.41*** (223.92) |
| Cvisayas | 218.80 (150.02) | 82.39 (146.27) | 376.14** (172.34) | 452.63*** (172.28) | 609.26*** (224.43) | 803.80*** (224.26) | 2210.74*** (226.50) | 2422.45*** (227.58) |
| Evisayas | 194.89 (171.35) | 183.42 (169.55) | 171.69 (202.28) | 308.42 (203.75) | 1030.90*** (235.54) | 1151.64*** (234.37) | 2428.34*** (255.52) | 2609.71*** (256.41) |
| Mindanao | 187.78 (114.64) | 270.11** (114.51) | 740.99*** (133.49) | 923.53*** (134.25) | 579.99*** (162.37) | 869.78*** (162.16) | 2127.44*** (162.65) | 2376.39*** (162.88) |
| (NCR omitted) | | | | | | | | |
| CAR | 439.43* (234.03) | 550.09** (235.72) | 1508.48*** (299.69) | 1895.39*** (308.93) | 1885.97*** (267.17) | 2495.09*** (274.69) | 2906.72*** (277.21) | 3397.44*** (283.98) |
| Sigma | 10256.39 (65.60) | 10147.86 (64.82) | 12747.46 (68.42) | 12613.43 (67.64) | 19663.31 (83.09) | 19319.28 (81.54) | 18642.72 (81.14) | 18415.52 (80.06) |
| Log pseudolikelihood | -137770 | -137611 | -197529 | -197316 | -331598 | -331057 | -311622 | -311243 |
| Pseudo R2 | 0.0214 | 0.0225 | 0.0206 | 0.0217 | 0.0200 | 0.0216 | 0.0211 | 0.0223 |
| No. of Obs (uncensored) | 12664 | 12664 | 17857 | 17857 | 28833 | 28833 | 27188 | 27188 |
| No. of Obs (total) | 18429 | 18429 | 24165 | 24165 | 39615 | 39615 | 38480 | 38480 |

Note: (a) Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Table A6. 7: The CLAD estimation results on education expenditure (Philippine pesos, in real terms) with remittance dummy variables

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-------------------------|---------------------------|----------|---------------------------|----------|--------------------------|----------|----------------------------|----------|
| | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME |
| lpctotex | 4861.334*** (492.57) | 1737.302 | 8640.827*** (789.25) | 2961.088 | 14070.13*** (1336.59) | 4042.920 | 18661.45*** (2467.45) | 3508.236 |
| dinrem | -81.57275 (232.48) | -29.152 | -216.251 (377.75) | -74.106 | 595.6771 (509.92) | 171.162 | 1458.2** (985.46) | 274.133 |
| dexrem | 1567.397*** (274.90) | 560.143 | 1578.442*** (363.44) | 540.910 | 1982.116*** (663.57) | 569.543 | 3637.771*** (1093.30) | 683.878 |
| dbothrem | 1036.951*** (333.29) | 370.577 | 1865.123*** (470.11) | 639.151 | 1263.569 (1087.91) | 363.075 | 3931.692*** (1057.06) | 739.134 |
| age7_14 | 4771.594*** (338.04) | 1705.232 | 7603.892*** (706.10) | 2605.745 | 10966.64*** (763.94) | 3151.162 | 13889.35*** (1757.86) | 2611.111 |
| age15_24 | 6225.428*** (589.47) | 2224.791 | 9236.679*** (701.89) | 3165.278 | 16957.96*** (1512.06) | 4872.711 | 24411.49*** (3653.73) | 4589.208 |
| hfemale | 465.3332 (278.84) | 166.297 | 1500.875*** (420.88) | 514.328 | 2936.775*** (856.36) | 843.855 | 3068.342*** (994.18) | 576.829 |
| hage | 63.87226*** (11.98) | 22.826 | 50.3741*** (15.08) | 17.262 | 27.16871 (27.69) | 7.807 | 65.64162* (33.60) | 12.340 |
| hmarried | 2417.644*** (462.63) | 863.997 | 4815*** (777.88) | 1650.032 | 8799.169*** (1439.52) | 2528.359 | 11794.36*** (1463.43) | 2217.266 |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 1039.982*** (292.04) | 371.660 | 757.7817 (463.34) | 259.681 | 1096.767* (973.97) | 315.146 | 3224.648** (2211.86) | 606.214 |
| hedu3 | 2724.645*** (361.00) | 973.711 | 3016.166*** (410.52) | 1033.597 | 3952.317*** (1057.94) | 1135.661 | 7350.664*** (2190.28) | 1381.879 |
| hedu4 | 4141.34*** (518.38) | 1479.997 | 5861.418*** (685.52) | 2008.624 | 8855.355*** (1131.14) | 2544.503 | 13302.5*** (2167.14) | 2500.787 |
| hnojob | -1444.354*** (424.09) | -516.171 | -1196.446*** (452.56) | -410.005 | -1464.59*** (732.57) | -420.836 | -1307.828 (1055.10) | -245.864 |
| urban | 184.8969 (231.11) | 66.077 | -67.17163 (456.26) | -23.019 | -349.087 (554.50) | -100.307 | 791.4567 (1041.26) | 148.789 |
| agri | -222.2343 (254.51) | -79.420 | 583.7274* (535.24) | 200.035 | 3260.414*** (757.40) | 936.849 | 501.5383 (1539.20) | 94.286 |
| llocos | -866.6627* (652.47) | -309.721 | 1233.136 (947.91) | 422.578 | 1619.881** (1023.12) | 465.458 | 10882.39*** (1733.34) | 2045.821 |
| Cagayan | 1118.337*** (533.91) | 399.662 | 1122.423 (794.98) | 384.638 | 3737.734*** (1414.91) | 1074.003 | 14434.1*** (1882.20) | 2713.521 |
| Cluzon | 12.4438 (253.77) | 4.447 | 641.3446 (476.78) | 219.780 | 1203.915*** (835.11) | 345.934 | 9341.608*** (1762.63) | 1756.164 |
| Sluzon | -221.91 (310.74) | -79.304 | 1356.211*** (509.54) | 464.754 | 1690.4*** (676.30) | 485.721 | 10258.29*** (1439.62) | 1928.495 |
| Bicol | 1195.329*** (427.52) | 427.177 | 1884.464*** (771.09) | 645.779 | 1944.499 (1765.18) | 558.734 | 11757.54*** (1998.72) | 2210.344 |
| Wvisayas | 758.7936*** (366.99) | 271.171 | 892.1611 (590.53) | 305.731 | 3072.093*** (948.55) | 882.737 | 12353.99*** (1772.48) | 2322.473 |
| Cvisayas | -650.4806* (545.70) | -232.463 | 219.8643 (748.35) | 75.344 | 2538.68* (1458.14) | 729.466 | 10844.43*** (2119.36) | 2038.685 |
| Evisayas | -350.72 (542.51) | -125.337 | -1162.056 (1095.75) | -398.220 | 1622.194 (2198.35) | 466.122 | 12825.12*** (3490.92) | 2411.043 |
| Mindanao | 402.1553* (253.54) | 143.719 | 1691.723*** (630.41) | 579.729 | 2834.321*** (806.99) | 814.416 | 12876.2*** (1429.57) | 2420.645 |
| (NCR omitted) | | | | | | | | |
| CAR | 1387.585* (798.80) | 495.883 | 4482.355*** (784.52) | 1536.039 | 8223.374*** (1171.13) | 2362.910 | 14653.26*** (2294.68) | 2754.721 |
| constant | -56523.74*** (5775.56) | | -102740.1*** (9776.49) | | -175986*** (16563.09) | | -255383.8*** (32697.19) | |
| Scale factor | 0.357 | | 0.343 | | 0.287 | | 0.188 | |
| Pseudo R2 | 0.085 | | 0.086 | | 0.099 | | 0.100 | |
| No. of Obs (uncensored) | 6586 | | 8281 | | 11383 | | 7234 | |
| No. of Obs (total) | 18429 | | 24165 | | 39615 | | 38480 | |

Note: (a) Parentheses denote the standard errors. * p<0.10, ** p<0.05, *** p<0.01

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Table A6. 8: The CLAD estimation results on education expenditure (Philippine pesos, in real terms) with the absolute amount of remittances

| | 1988 FIES | | 1994 FIES | | 2000 FIES | | 2006 FIES | |
|-------------------------|---------------------------|----------|--------------------------|----------|----------------------------|----------|----------------------------|----------|
| | Coeff | ME | Coeff | ME | Coeff | ME | Coeff | ME |
| lpctotex | 4192.493*** (549.04) | 1650.244 | 8070.836*** (737.72) | 2804.169 | 12870.68*** (1562.70) | 3787.940 | 16178.74*** (2038.05) | 3329.507 |
| inrem | 26.89594*** (10.52) | 10.587 | 34.36305*** (11.40) | 11.939 | 46.12908* (17.00) | 13.576 | 50.8708* (25.71) | 10.469 |
| exrem | 15.45862*** (2.69) | 6.085 | 22.14917*** (4.58) | 7.696 | 23.54781*** (4.45) | 6.930 | 31.0494*** (7.58) | 6.390 |
| age7_14 | 4432.436*** (363.59) | 1744.690 | 6831.86*** (745.47) | 2373.693 | 10280.84*** (1264.42) | 3025.730 | 12355.67*** (1419.04) | 2542.738 |
| age15_24 | 5543.767*** (654.04) | 2182.131 | 9073.627*** (1184.33) | 3152.583 | 16291.3*** (1712.91) | 4794.655 | 22169.09*** (3603.73) | 4562.293 |
| hfemale | -193.4187 (430.91) | -76.133 | 189.7294 (581.96) | 65.920 | 1077.51 (618.97) | 317.120 | 881.3076 (1499.80) | 181.369 |
| hage | 51.68049*** (11.93) | 20.342 | 51.15223*** (14.45) | 17.773 | 32.933** (19.30) | 9.692 | 62.64341* (47.57) | 12.892 |
| hmarried | 1477.771*** (526.13) | 581.678 | 4084.87*** (798.05) | 1419.266 | 7070.255*** (1337.75) | 2080.831 | 9635.255*** (2131.19) | 1982.889 |
| (hedu1 omitted) | | | | | | | | |
| hedu2 | 915.4505*** (329.45) | 360.338 | 860.9355*** (519.16) | 299.127 | 914.8505* (1565.31) | 269.248 | 2464.492* (2070.45) | 507.181 |
| hedu3 | 2297.549*** (368.57) | 904.358 | 3048.631*** (486.44) | 1059.231 | 3536.338*** (1801.77) | 1040.772 | 6478.107*** (1833.59) | 1333.163 |
| hedu4 | 3593.144*** (542.52) | 1414.329 | 5935.336*** (841.97) | 2062.201 | 8751.035*** (1833.71) | 2575.497 | 11835.42*** (2037.85) | 2435.673 |
| hnojob | -1266.801*** (546.02) | -498.637 | -2191.917*** (496.24) | -761.570 | -2632.965 (1042.50) | -774.902 | -1231.068 (952.92) | -253.348 |
| urban | 290.4911** (188.37) | 114.343 | 39.78424 (393.87) | 13.823 | -257.1402 (627.08) | -75.678 | 518.8231 (750.20) | 106.771 |
| agri | -225.6832 (237.38) | -88.833 | 209.3231 (406.43) | 72.728 | 2816.659*** (1003.63) | 828.964 | 1733.755** (1141.59) | 356.798 |
| llocos | 80.80803 (487.70) | 31.808 | 1213.899*** (691.41) | 421.763 | 1308.554 (1622.46) | 385.118 | 9936.133*** (1435.12) | 2044.809 |
| Cagayan | 797.0111* (518.94) | 313.719 | 1065.997 (732.36) | 370.375 | 4055.066*** (1407.26) | 1193.437 | 12598.36*** (1621.39) | 2592.682 |
| Cluzon | -140.7937 (283.22) | -55.419 | 455.6004 (497.99) | 158.296 | 1815.991 (1043.48) | 534.460 | 8298.389*** (1699.82) | 1707.769 |
| Sluzon | -72.74641 (357.37) | -28.634 | 1412.881*** (478.26) | 490.898 | 1814.62*** (901.63) | 534.057 | 9506.358*** (1453.25) | 1956.363 |
| Bicol | 1275.023*** (392.49) | 501.873 | 1907.739* (720.70) | 662.834 | 1919.492 (1717.41) | 564.921 | 11077.9*** (1691.25) | 2279.779 |
| Wvisayas | 593.7508 (361.05) | 233.711 | 982.7861* (515.11) | 341.464 | 2724.773** (1084.93) | 801.922 | 10671.86*** (1485.52) | 2196.218 |
| Cvisayas | -314.7867 (557.27) | -123.906 | 752.2902* (457.84) | 261.379 | 3030.732** (1306.65) | 891.968 | 9285.466*** (1818.32) | 1910.905 |
| Evisayas | -485.3035 (414.20) | -191.025 | -1425.463 (958.11) | -495.269 | 1111.688 (2584.55) | 327.178 | 11416.76*** (2393.01) | 2349.515 |
| Mindanao | 357.0499 (226.29) | 140.542 | 1764.972*** (494.28) | 613.230 | 2779.985** (951.8984) | 818.171 | 11941.02*** (1358.10) | 2457.405 |
| (NCR omitted) | | | | | | | | |
| CAR | 1377.764*** (682.01) | 542.314 | 4369.714*** (706.46) | 1518.234 | 8352.308*** (1036.34) | 2458.149 | 15360.68*** (2435.97) | 3161.154 |
| constant | -48011.74*** (6387.67) | | -95812.7*** (9109.71) | | -160974.5*** (20130.31) | | -220829.7*** (28067.74) | |
| Scale factor | 0.394 | | 0.347 | | 0.294 | | 0.206 | |
| Pseudo R2 | 0.083 | | 0.090 | | 0.102 | | 0.102 | |
| No. of Obs (uncensored) | 7254 | | 8396 | | 11659 | | 7919 | |
| No. of Obs (total) | 18429 | | 24165 | | 39615 | | 38480 | |

Note: (a) Parentheses denote the standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(b) CPI=28.46 in 1988, =52.85 in 1994, =77.04 in 2000, and =106.24 in 2006 (=100 in 2005)

Appendix II Estimating marginal effects and impact effects of a bivariate probit model

The bivariate probit model can be written as follows:

$$(A-1) \quad \begin{aligned} y_1^* &= X_1' \beta_1 + u_1, & y_1 &= 1 \text{ if } y_1^* > 0 \\ & & &= 0 \text{ otherwise} \\ y_2^* &= X_2' \beta_2 + u_2, & y_2 &= 1 \text{ if } y_2^* > 0 \\ & & &= 0 \text{ otherwise} \end{aligned}$$

where $E(u_1) = E(u_2) = 0$, $Var(u_1) = Var(u_2) = 1$, and $Cov(u_1, u_2) = \rho \neq 0$. y_1 and y_2 are the dummy variables on whether households receive remittances from within the Philippines and abroad, respectively.

The joint probabilities to receive both internal and international remittances, only internal remittances, only international remittances, and no remittance are written as follows. For convenience, let $X_1' \beta_1 = c_1$ and $X_2' \beta_2 = c_2$.

$$(A-2) \quad \Phi_{11} = \text{Prob} [y_1 = 1, y_2 = 1] = BVN [c_1, c_2, \rho]$$

$$(A-3) \quad \Phi_{10} = \text{Prob} [y_1 = 1, y_2 = 0] = BVN [c_1, -c_2, -\rho]$$

$$(A-4) \quad \Phi_{01} = \text{Prob} [y_1 = 0, y_2 = 1] = BVN [-c_1, c_2, -\rho]$$

$$(A-5) \quad \Phi_{00} = \text{Prob} [y_1 = 0, y_2 = 0] = BVN [-c_1, -c_2, \rho]$$

where BVN denotes the cumulative distribution function of the bivariate normal distribution. The likelihood function for the bivariate probit is given by:

$$(A-6) \quad \mathcal{G}_{bip} = \prod \Phi_{11}^{y_1 y_2} \Phi_{10}^{y_1 (1-y_2)} \Phi_{01}^{(1-y_1) y_2} \Phi_{00}^{(1-y_1)(1-y_2)}$$

Taking natural logarithms where $L = \log_e(\theta)$ yields the log likelihood function for the bivariate probit model as:

$$(A-7) \quad L_{bip} = \sum_{i=1}^N y_{1i} y_{2i} \times \log_e \Phi_{11} + \sum_{i=1}^N y_{1i} (1 - y_{2i}) \times \log_e \Phi_{10} + \sum_{i=1}^N (1 - y_{1i}) y_{2i} \times \log_e \Phi_{01} + \sum_{i=1}^N (1 - y_{1i}) (1 - y_{2i}) \times \log_e \Phi_{00}$$

By maximising the above log likelihood function, the parameters we estimate (β_1 , β_2 and ρ) can be computed.

For a continuous variable, Z , which appears in X'_1 and X'_2 , the marginal effects of the bivariate probit model can be given by:

(A-8) Marginal Effects for internal remittances

$$= \frac{\partial \Phi_{11}}{\partial Z} + \frac{\partial \Phi_{10}}{\partial Z} = \frac{\partial BVN[c_1, c_2, \rho]}{\partial Z} + \frac{\partial BVN[c_1, -c_2, -\rho]}{\partial Z}$$

(A-9) Marginal Effects for international remittances

$$= \frac{\partial \Phi_{11}}{\partial Z} + \frac{\partial \Phi_{01}}{\partial Z} = \frac{\partial BVN[c_1, c_2, \rho]}{\partial Z} + \frac{\partial BVN[-c_1, c_2, -\rho]}{\partial Z}$$

For a dummy variable, D , which also appear in X'_1 and X'_2 , the impact effects of the bivariate probit model can be expressed as:

(A-10) Impact Effects for internal remittances

$$= BVN[c_1, c_2, \rho, D=1] - BVN[c_1, c_2, \rho, D=0] + BVN[c_1, -c_2, -\rho, D=1] - BVN[c_1, -c_2, -\rho, D=0]$$

(A-11) Impact Effects for international remittances

$$= BVN[c_1, c_2, \rho, D=1] - BVN[c_1, c_2, \rho, D=0] + BVN[-c_1, c_2, -\rho, D=1] - BVN[-c_1, c_2, -\rho, D=0]$$

Appendix III Measuring Regional differences

$$(A-12) \text{educ}_i = X_i' b + v_i = \alpha^* + X_i'^* \beta^* + d_i'^* \delta^* + v_i, \quad i = 1, 2, \dots, n$$

where d_i^* is a (10×1) vector of regional dummy variables. δ_i^* is a (10×1) vector of regional dummy coefficients. The parameters δ_i^* measure the regional differentials for the ten regions compared with NCR, omitted as a base category. Based on the estimated obtained by the equation (A-12), the location-weighted averages of regional dummy coefficients are defined as:

$$(A-13) \bar{\delta}^* = \sum_{j=1}^{11} \pi_j \hat{\delta}_j^*$$

where $\hat{\delta}^*$ is a (11×1) vector, including the estimated regional coefficients for ten regions and zero for the base region, NCR. π is a proportion of each region. The renormalized regional coefficients δ_i is a (11×1) vector, which measure the regional differentials for each of eleven regions compared with this overall mean impact on the budget share for education. They are given by:

$$(A-14) \hat{\delta}_i = \hat{\delta}_j^* - \bar{\delta}^*$$

This renormalized regional coefficients δ_i are also given by:

$$(A-15) \hat{\delta}_i = (Z - e\pi') \hat{\delta}_j^*$$

where e is a (11×1) vector of ones. Z is a (11×11) matrix constructed as a (11×11) identity matrix putting zero at the intersection of a NCR row and NCR column. This is defined as follows:

$$(A-16) Z = \begin{bmatrix} 1 & 0 & \dots & 0 & 0 \\ 0 & \ddots & & & \vdots \\ \vdots & & 1 & & \vdots \\ 0 & & & 0 & 0 \\ 0 & \dots & \dots & 0 & 1 \end{bmatrix}$$

Using the above expression, the variance-covariance submatrix of the normalized regional coefficients δ_i can be easily derived as:

$$(A-17) \text{Var} - \text{Cov}(\hat{\delta}) = (Z - e\pi') [\text{Var} - \text{Cov}(\hat{\delta}^*)] (Z - e\pi)'$$

To test the statistical significance of the regional parameters, we can derive the standard errors from the diagonal elements of the submatrices $\text{Var} - \text{Cov}(\hat{\delta})$.

Appendix IV Selection of instruments in the instrumental-variables (IV) probit and Tobit models

In order to possibly select more appropriate instrumental variables to control for a potential endogenous issue, we conducted the tests for the instrumental-variables (IV) probit and Tobit estimators: (1) Test for over-identifying restrictions; (2) Tests for weak instruments; (3) Test for regressor exogeneity. Using all possible combination of instrumental variables, the test results are reported in Table A4.9 and Table A4.10 for Chapter Four, while in Table A6.9 and Table A6.10 for Chapter Six.

(1) Test for over-identifying restrictions

The stata command *overid* after *ivprobit* or *ivtobit* with the *twostep* option tests the over-identifying restrictions. Amemiya-Lee-Newey minimum chi-square statistic (see Newey, 1987; Lee, 1992) is reported to test the joint null hypothesis that the excluded instruments are valid instruments, which are uncorrelated with the error term and correctly excluded from the estimated equation. If the null hypothesis is rejected, we need to cast doubt on the validity of the instruments. The following stata command was used after running *ivprobit* or *ivtobit*:

```
*for ivprobit*
overid, depvar(depvar)
*for ivtobit*
oderid
```

(2) Tests for weak instruments

When instruments are weak, point estimators derived from the *ivprobit* or *ivtobit* are biased and Wald tests become unreliable. The stata command *rivtest* after *ivprobit* or *ivtobit* tests whether the coefficient on the endogenous regressor is significant. This reports the minimum distance version of the Anderson-Rubin (AR) test statistic, which is a joint test of the structural parameter and the overidentification restrictions. In addition, for the models with more than one instrument, the AR test statistic can be decomposed into the Lagrange multiplier (LM) test and the J overidentification test. The former tests only the structural parameter, while the latter tests only the overidentification restrictions. This J statistic evaluated at the null hypotheses is

different from the Hansen J statistic evaluated at the parameter estimate. A combination of the LM and J tests (LM-J) are also reported. Similarly, the minimum distance versions of the conditional likelihood ratio (CLR) combines the LM and J tests and simultaneously tests both the structural parameter and the overidentification restrictions. All of these tests are robust to weak instruments as the instruments get weaker, the confidence interval around the parameter of interest gets wider. The *ci* option is used to estimate 95 per cent confidence intervals (or confidence sets). The term “confidence set” is used as it may comprise the union of two or more disjointed intervals. If the confidence intervals derived from weak-instrument robust tests get wider than the Wald test, instruments become weak and point estimates are biased. In order to conduct the test, the stata command used after *ivprobit* or *ivtobit* is as follows:

```
rivtest, ci points(#) gridmult(#)
```

The *points* (#) option specifies the number of equally spaced values over which to calculate the confidence sets, and the *gridmult* (#) option specifies that the grid is # times the size of the Wald confidence interval to calculate confidence sets. An increase in # will improve precision though it will also increase the time to compute the confidence sets.

(3) Test for regressor exogeneity

In order to test for regressor endogeneity, the Durbin-Wu-Hausman (DWH) test is conducted. The test was first proposed by Durbin (1954), and then independently by Wu (1973) and Hausman (1978). The test investigates whether a regressor is endogenous or exogenous. If the null hypothesis that a regressor is exogenous is rejected, we conclude that a regressor is potentially endogenous. We can obtain the DWH statistic using the following stata command:

```
quietly regress endogvar [indepvars] [instrumentvars], robust
quietly predict v1hat, resid
*for ivprobit*
quietly probit depvar [indepvars] v1hat, robust
test v1hat
*for ivtobit*
quietly tobit depvar [indepvars] v1hat, ll(0) robust
test v1hat
```

where *depvar* and *indepvars* are a dependent variable and independent variables used in the model equations, and *endogvar* and *instrumentvars* denote an endogenous regressor and the instrumental variables used in the analysis. *v1hat* is the error term from the first-stage equation of the instrumental variable (IV) models.

Table A4. 9: Selection of instruments in the *ivprobit* model in Chapter 4 ($y=dinrem$)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|--|--|--|--|---|--|---|---|--|
| Selection of instruments | | | | | | | | |
| Migrant's education level (=1 if completed tertiary; =0 otherwise) | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Length of stay abroad (months) | Yes | Yes | Yes | | Yes | Yes | | |
| Female Migrant (=1 if female; =0 if male) | Yes | Yes | | Yes | Yes | | Yes | |
| Migrant's age (years) | Yes | | Yes | Yes | Yes | | | Yes |
| Remittance coefficient | | | | | | | | |
| exrem | -0.0065 | -0.0061 | -0.0054 | -0.0068 | -0.0104 | -0.0047 | -0.0059 | -0.0054 |
| p-value | (0.0120) | (0.0240) | (0.0370) | (0.0200) | (0.0190) | (0.0760) | (0.0860) | (0.0620) |
| Testing for regressor endogeneity | | | | | | | | |
| Durbin-Wu-Hausman test | | | | | | | | |
| chi2 | 11.71 | 11.84 | 11.94 | 11.93 | 11.81 | 12.07 | 12.25 | 12.15 |
| Prob > chi2 | (0.0006) | (0.0006) | (0.0006) | (0.0006) | (0.0006) | (0.0005) | (0.0005) | (0.0005) |
| Testing for overidentifying restrictions | | | | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | | | | | |
| Chi-sq | 4.113 | 3.864 | 0.861 | 3.960 | 1.732 | 0.246 | 3.867 | 0.838 |
| p-value | (0.2496) | (0.1449) | (0.6502) | (0.1380) | (0.4206) | (0.6200) | (0.0492) | (0.3600) |
| Tests for weak instruments | | | | | | | | |
| Wald test | | | | | | | | |
| chi2 | 6.31 | 5.07 | 4.36 | 5.42 | 5.54 | 3.14 | 2.94 | 3.49 |
| p-value | (0.0120) | (0.0243) | (0.0368) | (0.0199) | (0.0186) | (0.0762) | (0.0863) | (0.0617) |
| 95% Confidence Set | [-.01164,-.001438] | [-.011328,-.000784] | [-.01046,-.000331] | [-.01256,-.001081] | [-.019073,-.001741] | [-.009992,.000501] | [-.012565,-.000837] | [-.01112,.000267] |
| Conditional Likelihood Ratio test | | | | | | | | |
| statistic | 8.10 | 6.31 | 4.85 | 7.28 | 9.40 | 3.35 | 3.87 | 3.91 |
| p-value | (0.0072) | (0.0161) | (0.0346) | (0.0101) | (0.0047) | (0.0736) | (0.0575) | (0.0541) |
| 95% Confidence Set | [-.015555,-.002103] | [-.015079,-.001471] | [-.012358,-.000422] | [-.018253,-.00215] | [-.034478,-.003842] | [-.011369,.000406] | [-.021845,-.000036] | [-.013573,-.000155] |
| Anderson-Rubin test | | | | | | | | |
| chi2 | 12.13 | 10.11 | 5.71 | 11.12 | 11.08 | 3.60 | 7.62 | 4.74 |
| p-value | (0.0164) | (0.0176) | (0.1268) | (0.0111) | (0.0113) | (0.1655) | (0.0221) | (0.0935) |
| 95% Confidence Set | [-.017272,-.00153] | [-.015079,-.001471] | [-.015484,.000999] | [-.017609,-.00215] | [-.051011,-.002383] | [-.01343,.001583] | [-.015828,-.001916] | [-.01517,.000803] |
| Lagrange Multiplier test | | | | | | | | |
| chi2 | 6.75 | 5.23 | 4.67 | 5.81 | 7.85 | 3.31 | 2.80 | 3.73 |
| p-value | (0.0094) | (0.0222) | (0.0306) | (0.0159) | (0.0051) | (0.0687) | (0.0941) | (0.0534) |
| 95% Confidence Set | [-.015841,-.002103] U [.016501,.037681] | [-.015966,-.001175] U [.017166,.046748] | [-.012074,-.000707] U [.027996,.046183] | [-.019219,-.001828] U [.01363,.038107] | [-.033991,-.003842] U [.009287,.019499] | [-.011075,.000112] U [.036908,.052805] | [-.027861,.001469] U [.010493,.087953] | [-.013253,-.000155] U [.025721,.05] |
| J overidentification test | | | | | | | | |
| chi2 | 5.39 | 4.88 | 1.03 | 5.31 | 3.23 | 0.28 | 4.82 | 1.01 |
| p-value | (0.1456) | (0.0870) | (0.5965) | (0.0704) | (0.1985) | (0.5936) | (0.0281) | (0.3151) |
| Lagrange Multiplier & J overidentification test | | | | | | | | |
| Is H_0 rejected at 5% level? | Yes | Yes | Yes | Yes | Yes | No | No | No |
| 95% Confidence Set | [-.016414,-.001817] | [-.016558,-.000879] | [-.012358,-.000422] | [-.020185,-.001506] | [-.037395,-.003842] | [-.011663,.000406] | [-.031621,.002221] | [-.013892,.000164] |

Note: The results of remittance coefficients are computed using the *twostep* option.

Table A4.9: Selection of instruments in the *ivprobit* model in Chapter 4 ($y=dinrem$) (continued)

| | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|--|--|---|---|---------------------|---------------------|--|---------------------|
| Selection of instruments | | | | | | | |
| Migrant's education level (=1 if completed tertiary; =0 otherwise) | | | | Yes | | | |
| Length of stay abroad (months) | Yes | Yes | | | Yes | | |
| Female Migrant (=1 if female; =0 if male) | Yes | | Yes | | | Yes | |
| Migrant's age (years) | | Yes | Yes | | | | Yes |
| Remittance coefficient | | | | | | | |
| exrem | -0.0099 | -0.0078 | -0.0135 | -0.0037 | -0.0066 | -0.0220 | -0.0100 |
| p-value | (0.0350) | (0.0780) | (0.0350) | (0.2850) | (0.1640) | (0.1800) | (0.1300) |
| Testing for regressor endogeneity | | | | | | | |
| Durbin-Wu-Hausman test | | | | | | | |
| chi2 | 11.93 | 12.09 | 12.01 | 12.47 | 12.20 | 12.29 | 12.28 |
| Prob > chi2 | (0.0006) | (0.0005) | (0.0005) | (0.0004) | (0.0005) | (0.0005) | (0.0005) |
| Testing for overidentifying restrictions | | | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | | | | |
| Chi-sq | 1.797 | 0.287 | 0.733 | | | | |
| p-value | (0.1801) | (0.5918) | (0.3920) | | | | |
| Tests for weak instruments | | | | | | | |
| Wald test | | | | | | | |
| chi2 | 4.45 | 3.10 | 4.44 | 1.14 | 1.94 | 1.79 | 2.29 |
| p-value | (0.0349) | (0.0785) | (0.0351) | (0.2855) | (0.1641) | (0.1804) | (0.1302) |
| 95% Confidence Set | [-.019115, -.000701] | [-.016525, .00089] | [-.026016, -.000942] | [-.010369, .003054] | [-.015815, .002682] | [-.054301, .010211] | [-.022931, .002949] |
| Conditional Likelihood Ratio test | | | | | | | |
| statistic | 7.46 | 3.94 | 9.43 | | | | |
| p-value | (0.0092) | (0.0600) | (0.0039) | | | | |
| 95% Confidence Set | [-.039613, -.00345] | [-.026628, .000244] | [-.07011, -.004685] | | | | |
| Anderson-Rubin test | | | | | | | |
| chi2 | 9.17 | 4.23 | 10.14 | 1.16 | 2.25 | 6.83 | 3.35 |
| p-value | (0.0102) | (0.1204) | (0.0063) | (0.2807) | (0.1338) | (0.0090) | (0.0671) |
| 95% Confidence Set | [-.041163, -.002934] | [-.036888, .00171] | [-.131314, -.003982] | [-.012508, .00331] | [-.02499, .001997] | [-.473628, -.00666] U [.054878, .429538] | [-.068443, .000537] |
| Lagrange Multiplier test | | | | | | | |
| chi2 | 5.98 | 3.81 | 8.27 | | | | |
| p-value | (0.0144) | (0.0508) | (0.0040) | | | | |
| 95% Confidence Set | [-.043229, -.002934] U [.008432, .02238] | [-.025162, -.000244] U [.017345, .028582] | [-.067296, -.005389] U [.007274, .012902] | | | | |
| J overidentification test | | | | | | | |
| chi2 | 3.18 | 0.42 | 1.86 | | | | |
| p-value | (0.0744) | (0.5175) | (0.1721) | | | | |
| Lagrange Multiplier & J overidentification test | | | | | | | |
| Is H_0 rejected at 5% level? | Yes | No | Yes | | | | |
| 95% Confidence Set | [-.049428, -.002417] | [-.027116, .000244] | [-.081366, -.004685] | | | | |

Note: The results of remittance coefficients are computed using the *twostep* option.

Table A4. 10: Selection of instruments in the *ivtobit* model in Chapter 4 ($y=inrem$)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|--|---|---|---------------------|--|----------------------|---------------------|----------------------|--|
| Selection of instruments | | | | | | | | |
| Migrant's education level (=1 if completed tertiary; =0 otherwise) | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Length of stay abroad (months) | Yes | Yes | Yes | | Yes | Yes | | |
| Female Migrant (=1 if female; =0 if male) | Yes | Yes | | Yes | Yes | | Yes | |
| Migrant's age (years) | Yes | | Yes | Yes | Yes | | | Yes |
| Remittance coefficient | | | | | | | | |
| exrem | -0.0958 | -0.0805 | -0.0609 | -0.1232 | -0.1757 | -0.0404 | -0.1094 | -0.0815 |
| p-value | (0.1410) | (0.2340) | (0.3550) | (0.0950) | (0.0900) | (0.5590) | (0.2140) | (0.2740) |
| Testing for regressor endogeneity | | | | | | | | |
| Durbin-Wu-Hausman test | | | | | | | | |
| F | 11.75 | 11.91 | 11.97 | 11.70 | 11.87 | 12.14 | 11.98 | 11.93 |
| Prob > F | (0.0006) | (0.0006) | (0.0006) | (0.0006) | (0.0006) | (0.0005) | (0.0005) | (0.0006) |
| Testing for overidentifying restrictions | | | | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | | | | | |
| Chi-sq | 6.136 | 5.682 | 0.922 | 5.251 | 4.271 | 0.004 | 5.237 | 0.565 |
| p-value | (0.1052) | (0.0584) | (0.6307) | (0.0724) | (0.1182) | (0.9507) | (0.0221) | (0.4523) |
| Tests for weak instruments | | | | | | | | |
| Wald test | | | | | | | | |
| chi2 | 2.17 | 1.42 | 0.85 | 2.79 | 2.88 | 0.34 | 1.55 | 1.20 |
| p-value | (0.1407) | (0.2341) | (0.3552) | (0.0950) | (0.0896) | (0.5593) | (0.2135) | (0.2735) |
| 95% Confidence Set | [-.223177, .031635] | [-.213175, .052115] | [-.190088, .068237] | [-.267796, .021433] | [-.378484, .027141] | [-.175941, .095174] | [-.281831, .062987] | [-.227476, .064408] |
| Conditional Likelihood Ratio test | | | | | | | | |
| statistic | 2.34 | 1.44 | 0.84 | 3.30 | 4.27 | 0.34 | 1.85 | 1.20 |
| p-value | (0.1503) | (0.2504) | (0.3810) | (0.0842) | (0.0591) | (0.5711) | (0.1894) | (0.2857) |
| 95% Confidence Set | [-.306668, .043635] | [-.292656, .072052] | [-.216749, .080402] | [-.395022, .018824] | [-1.01212, .000723] | [-.188709, .107942] | [-.530252, .079226] | [-.257601, .069965] |
| Anderson-Rubin test | | | | | | | | |
| chi2 | 8.45 | 7.12 | 1.76 | 8.47 | 8.33 | 0.34 | 7.01 | 1.77 |
| p-value | (0.0764) | (0.0683) | (0.6240) | (0.0372) | (0.0397) | (0.8437) | (0.0300) | (0.4133) |
| 95% Confidence Set | [-.278071, .022188] | [-.218226, .019951] | [-.27473, .131135] | [-.32199, -.021749] | [-.830037, -.022038] | [-.234347, .15358] | [-.259373, -.056213] | [-.306736, .102721] |
| Lagrange Multiplier test | | | | | | | | |
| chi2 | 1.78 | 1.09 | 0.80 | 2.44 | 2.68 | 0.34 | 1.17 | 1.17 |
| p-value | (0.1826) | (0.2958) | (0.3697) | (0.1184) | (0.1015) | (0.5622) | (0.2789) | (0.2799) |
| 95% Confidence Set | [-.335264, .057934] U [.60841, 1.68792] | [-.329871, .101824] U [.652606, 1.7765] | [-.209502, .080402] | [-.459939, .043168] U [.416441, 1.90142] | [-3.01505, 2.66371] | [-.188709, .107942] | [-2.52315, 2.30431] | [-.257601, .069965] U [1.47031, 1.96165] |
| J overidentification test | | | | | | | | |
| chi2 | 6.67 | 6.02 | 0.95 | 6.03 | 5.65 | 0.00 | 5.84 | 0.60 |
| p-value | (0.0830) | (0.0492) | (0.6206) | (0.0490) | (0.0594) | (0.9504) | (0.0157) | (0.4387) |
| Lagrange Multiplier & J overidentification test | | | | | | | | |
| Is H_0 rejected at 5% level? | No | No | No | No | No | No | No | No |
| 95% Confidence Set | [-.356711, .072232] | [-.3522, .109267] | [-.216749, .08765] | [-.492397, .059397] | [-3.01505, .137286] | [-.196315, .115548] | [-.481881, .059878] | [-.273979, .078154] |

Note: The results of remittance coefficients are computed using the *twostep* option.

Table A4.10: Selection of instruments in the *ivtobit* model in Chapter 4 ($y=inrem$) (continued)

| | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|--|----------------------|--|--|---------------------|---------------------|--|---------------------|
| Selection of instruments | | | | | | | |
| Migrant's education level (=1 if completed tertiary; =0 otherwise) | | | | Yes | | | |
| Length of stay abroad (months) | Yes | Yes | | | Yes | | |
| Female Migrant (=1 if female; =0 if male) | Yes | | Yes | | | Yes | |
| Migrant's age (years) | | Yes | Yes | | | | Yes |
| Remittance coefficient | | | | | | | |
| exrem | -0.1543 | -0.0831 | -0.2970 | -0.0439 | -0.0346 | -0.5933 | -0.1766 |
| p-value | (0.1580) | (0.4360) | (0.0560) | (0.6270) | (0.7660) | (0.1780) | (0.2610) |
| Testing for regressor endogeneity | | | | | | | |
| Durbin-Wu-Hausman test | | | | | | | |
| F | 12.02 | 12.16 | 11.83 | 12.20 | 12.30 | 12.08 | 12.11 |
| Prob > F | (0.0005) | (0.0005) | (0.0006) | (0.0005) | (0.0005) | (0.0005) | (0.0005) |
| Testing for overidentifying restrictions | | | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | | | | |
| Chi-sq | 4.334 | 0.842 | 1.506 | | | | |
| p-value | (0.0374) | (0.3588) | (0.2197) | | | | |
| Tests for weak instruments | | | | | | | |
| Wald test | | | | | | | |
| chi2 | 1.99 | 0.61 | 3.66 | 0.24 | 0.09 | 1.81 | 1.26 |
| p-value | (0.1584) | (0.4362) | (0.0556) | (0.6271) | (0.7664) | (0.1785) | (0.2611) |
| 95% Confidence Set | [-.368795, .06012] | [-.29233, .126096] | [-.601064, .007069] | [-.221246, .133351] | [-.263079, .193815] | [-1.45773, .271038] | [-.484666, .131432] |
| Conditional Likelihood Ratio test | | | | | | | |
| statistic | 2.96 | 0.61 | 6.94 | | | | |
| p-value | (0.1030) | (0.4617) | (0.0136) | | | | |
| 95% Confidence Set | [-1.39982, .056252] | [-.464648, .19276] | [-2.26764, -.083725] | | | | |
| Anderson-Rubin test | | | | | | | |
| chi2 | 7.04 | 1.45 | 8.35 | 0.23 | 0.09 | 6.94 | 1.46 |
| p-value | (0.0297) | (0.4837) | (0.0154) | (0.6295) | (0.7680) | (0.0084) | (0.2274) |
| 95% Confidence Set | [-.581533, -.052051] | [-.535084, .239717] | [-2.81362, -.083725] | [-.247894, .159999] | [-.335871, .279425] | [-12.6947, -.181075] U [1.46801, 11.508] | [-1.27423, .143161] |
| Lagrange Multiplier test | | | | | | | |
| chi2 | 1.66 | 0.56 | 5.32 | | | | |
| p-value | (0.1975) | (0.4562) | (0.0211) | | | | |
| 95% Confidence Set | [-3.15674, 2.84807] | [-3.0121, -2.74209] U [-.476387, .19276] U [.744512, 2.84587] | [-2.86481, -.083725] U [.155141, .547564] | | | | |
| J overidentification test | | | | | | | |
| chi2 | 5.38 | 0.90 | 3.03 | | | | |
| p-value | (0.0204) | (0.3434) | (0.0817) | | | | |
| Lagrange Multiplier & J overidentification test | | | | | | | |
| Is H_0 rejected at 5% level? | No | No | Yes | | | | |
| 95% Confidence Set | [-1.8932, .068286] | [-3.0121, -2.19034] U [-.535084, .227978] U [.685815, .850167] | [-4.55393, -.066663] | | | | |

Note: The results of remittance coefficients are computed using the *twostep* option.

Table A6. 9: Selection of instruments in the *ivtobit* model in Chapter 6 ($y=educsh$)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--|--|--|--|--------------------|--------------------|--------------------|--------------------|
| Selection of instruments | | | | | | | |
| Ownership of durable goods | | | | | | | |
| Refrigerator (number) | Yes | Yes | Yes | | Yes | | |
| Washing machine (number) | Yes | Yes | | Yes | | Yes | |
| Television set (number) | Yes | | Yes | Yes | | | Yes |
| Remittance coefficients | | | | | | | |
| exrem | 0.000717 | 0.000820 | 0.000831 | 0.000538 | 0.001054 | 0.000597 | 0.000427 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| inrem | 0.000335 | 0.000357 | 0.000360 | 0.000295 | 0.000409 | 0.000308 | 0.000270 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Testing for regressor endogeneity | | | | | | | |
| Durbin-Wu-Hausman test | | | | | | | |
| chi2 | 19.85 | 19.85 | 20.05 | 20.13 | 20.06 | 20.20 | 20.54 |
| Prob > chi2 | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Testing for overidentifying restrictions | | | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | | | | |
| Chi-sq | 25.311 | 13.222 | 17.476 | 1.466 | N.A. | N.A. | N.A. |
| p-value | (0.000) | (0.000) | (0.000) | (0.226) | | | |
| Tests for weak instruments | | | | | | | |
| Wald test | | | | | | | |
| chi2 | 82.03 | 85.00 | 73.52 | 44.22 | 74.05 | 37.71 | 13.41 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| 95% Confidence Set | [.000561, .000872] | [.000646, .000994] | [.000641, .001021] | [.000379, .000696] | [.000814, .001294] | [.000407, .000788] | [.000198, .000655] |
| Conditional Likelihood Ratio test | | | | | | | |
| statistic | 122.11 | 133.72 | 120.54 | 53.04 | | | |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | | | |
| 95% Confidence Set | [.000634, .000965] | [.000698, .001069] | [.000719, .001135] | [.000391, .000711] | | | |
| Anderson-Rubin test | | | | | | | |
| chi2 | 146.84 | 146.76 | 137.54 | 54.51 | 137.21 | 47.03 | 14.88 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| 95% Confidence Set | null set | null set | null set | [.000382, .00072] | [.000845, .001317] | [.000421, .000795] | [.000215, .000664] |
| Lagrange Multiplier test | | | | | | | |
| chi2 | 109.26 | 125.00 | 108.50 | 52.65 | | | |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | | | |
| 95% Confidence Set | [-.001454, -.001437] U [.000625, .000973] | [-.001425, -.001307] U [.000698, .001069] | [-.001381, -.001221] U [.000719, .001135] | [.000391, .000711] | | | |
| J overidentification test | | | | | | | |
| chi2 | 37.59 | 21.76 | 29.03 | 1.86 | | | |
| p-value | (0.000) | (0.000) | (0.000) | (0.172) | | | |
| Lagrange Multiplier & J overidentification test | | | | | | | |
| Is H ₀ rejected at 5% level? | Yes | Yes | Yes | Yes | | | |
| 95% Confidence Set | null set | null set | null set | [.000382, .00072] | | | |

Note: The results of remittance coefficients are computed using the *twostep* option.

Table A6. 10: Selection of instruments in the *ivtobit* model in Chapter 6 ($y=educ$)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--|----------------------------------|-----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Selection of instruments | | | | | | | |
| Ownership of durable goods | | | | | | | |
| Refrigerator (number) | Yes | Yes | Yes | | Yes | | |
| Washing machine (number) | Yes | Yes | | Yes | | Yes | |
| Television set (number) | Yes | | Yes | Yes | | | Yes |
| Remittance coefficients | | | | | | | |
| exrem | 333.73 | 330.17 | 340.27 | 329.58 | 336.87 | 320.82 | 342.13 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| inrem | 137.41 | 136.48 | 138.87 | 136.41 | 137.96 | 134.26 | 139.15 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Testing for regressor endogeneity | | | | | | | |
| Durbin-Wu-Hausman test | | | | | | | |
| chi2 | 29.89 | 29.97 | 30.17 | 29.94 | 30.29 | 30.06 | 30.36 |
| Prob > chi2 | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Testing for overidentifying restrictions | | | | | | | |
| Amemiya-Lee-Newey minimum chi-sq statistic | | | | | | | |
| Chi-sq | 0.212 | 0.138 | N.A. | N.A. | N.A. | N.A. | N.A. |
| p-value | (0.900) | (0.711) | | | | | |
| Tests for weak instruments | | | | | | | |
| Wald test | | | | | | | |
| chi2 | 154.93 | 132.63 | 115.80 | 127.78 | 88.11 | 89.74 | 59.26 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| 95% Confidence Set | [281.182, 386.282] | [273.98, 386.364] | [278.294, 402.243] | [272.437, 386.725] | [266.531, 407.21] | [254.446, 387.201] | [255.023, 429.238] |
| Conditional Likelihood Ratio test | | | | | | | |
| statistic | 293.87 | 249.13 | 223.62 | 239.86 | | | |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | | | |
| 95% Confidence Set | [288.027, 391.231] | [281.299, 391.656] | [286.366, 408.08] | [279.881, 392.108] | | | |
| Anderson-Rubin test | | | | | | | |
| chi2 | 294.06 | 249.26 | 223.63 | 240.01 | 168.69 | 164.34 | 115.14 |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| 95% Confidence Set | [270.335, 417.77] | [268.687, 407.422] | [272.456, 428.945] | [267.055, 408.14] | [275.693, 413.835] | [263.093, 393.453] | [266.37, 442.331] |
| Lagrange Multiplier test | | | | | | | |
| chi2 | 293.57 | 248.94 | 223.6 | 239.62 | | | |
| p-value | (0.000) | (0.000) | (0.000) | (0.000) | | | |
| 95% Confidence Set | -281.07 U [288.027, 391.231] | -283.098 U [281.299, 391.656] | [286.366, 408.08] | [279.881, 392.108] | | | |
| J overidentification test | | | | | | | |
| chi2 | 0.49 | 0.32 | 0.04 | 0.4 | | | |
| p-value | (0.781) | (0.571) | (0.851) | (0.529) | | | |
| Lagrange Multiplier & J overidentification test | | | | | | | |
| Is H_0 rejected at 5% level? | Yes | Yes | Yes | Yes | | | |
| 95% Confidence Set | [285.079, 394.18] | [278.146, 394.81] | [282.889, 411.558] | [276.674, 395.314] | | | |

Note: The results of remittance coefficients are computed using the *twostep* option.