



This is to certify that the
dissertation entitled

TWO ESSAYS ON THE ECONOMICS OF THE HOUSEHOLD
OF THE DEVELOPING COUNTRIES

presented by

FIRMAN WITOELAR

has been accepted towards fulfillment
of the requirements for the

DOCTORAL

degree in

ECONOMICS



Major Professor's Signature

August 3, 2004

Date

LIBRARY
Michigan State
University

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.
MAY BE RECALLED with earlier due date if requested.

DATE DUE	DATE DUE	DATE DUE
JUN 10 2006		

TWO ESSAYS ON THE ECONOMICS OF THE HOUSEHOLD
OF THE DEVELOPING COUNTRIES

By

Firman Witoelar

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Economics

2004

ABSTRACT

TWO ESSAYS ON THE ECONOMICS OF THE HOUSEHOLD OF THE DEVELOPING COUNTRIES

By

Firman Witoelar

This dissertation consists of two essays on the economics of the household of the developing countries. I use data from the Indonesia Family Life Survey to analyze household allocation decisions and to investigate the underlying factor determining household decision.

In Chapter 1, “Inter-household Allocations within Extended Families: Evidence from the Indonesia Family Life Survey”, I investigate whether households that belong to the same extended family pool their income to smooth their consumption. I use data from two waves of the IFLS (IFLS 2-1997 and IFLS 3-2000) to test the income-pooling hypothesis in both the static and the dynamic settings.

The findings suggest that in contradiction to the null hypothesis of income pooling, the distribution of income between households in an extended family does affect the distribution of their consumption. I also find that the distribution of income changes between them affects the distribution of consumption changes. The results stand even after correcting for potential measurement error and endogeneity of the income variables. However, the magnitudes of the coefficient on income changes are small.

While complete risk-sharing is rejected, the results suggest some evidence of risk-sharing within extended families. From a set of reduced form estimations, I also find that household consumption is affected by characteristics of other households in the same

extended families, highlighting the importance of inter-household ties in affecting household behavior. This essay contributes to the body of literature on inter-household risk sharing by shedding lights on the role that extended family play in household allocation decisions.

In Chapter 2, “The Determinants of Household Division: A Case of a Developing Country”, I investigate the underlying factors determining the probability of household division in Indonesia. I use data from three waves of the IFLS (IFLS 1 - 1993, IFLS2 - 1997, and IFLS 3- 2000). The longitudinal nature of the IFLS data allows us to study household division over the survey waves. Adopting the collective household model of household division and the empirical framework developed by Foster and Rosenzweig (2002), I estimate the probability of household division by the subsequent waves of the survey, using household variables from an earlier wave as the explanatory variables. The findings suggest that education variables play an important, although limited, role in determining household division. There is evidence that higher education of household head is associated with lower propensity of household to break up. On the other hand, higher maximum years of schooling of other members in the household are associated with higher probability of household division. These results, along with the finding showing that rural households are more likely to divide, indicate that household division in Indonesia may largely be associated with the mobility of young, more educated members. While the empirical framework is based on a collective household model, the results can be explained within the context of unitary household model. This essay contributes to our understanding of household division, which in most previous studies is treated as exogenous.

Copyright by
FIRMAN WITOELAR
2004

This dissertation is dedicated to my parents,
my wife, Nina, and our daughter, Lakshmi.

ACKNOWLEDGEMENTS

I would like to deeply thank my main advisor and dissertation chair, Prof. John A. Strauss, for his excellent guidance and constant support needed to complete this dissertation. I am extremely grateful to him for his sound advice and counsel, and for having his door always open for me throughout my graduate years at Michigan State University. I am very fortunate to have him as a teacher and a mentor.

I would like to express my sincere gratitude to the other members of my dissertation committee whose guidance has been indispensable: Prof. Jeff Biddle, for his constructive and thorough suggestions, Prof. John Giles, for the discussions and encouragement, and Prof. Richard Bernsten, for his insights and valuable comments.

I would also like to take this opportunity to thank those who helped shape my interest to do graduate work in this field: Prof. Mayling Oey-Gardiner of the University of Indonesia and Prof. Mark Pitt of Brown University.

To my colleagues and dear friends at Michigan State: Mu Ren, Pungpond Rukumnuaykit, Lebohang Lijane, and Elan Satriawan, thank you for all your help and friendship, and for making this journey much more enjoyable. I would also like to thank my long-time friends Rezal Kusumaatmadja and Sjamsu Rahardja for providing the necessary distractions to keep me sane.

I am very fortunate to enjoy the tremendous support of an extended family. I wish to thank my sister, Shanti Hasan, and her family, who always root for me in everything I do. I am very grateful to my mother-in-law, Koesmartanti Soesetio, for her support and encouragement. I would also like to thank my staunchest supporters: my uncle and my

late aunt, Wimar and Suvatchara Witoelar, who always treat me almost like their own son. A special thanks also goes to my late uncle, Toerki Witoelar, for his support and interest in my work.

I wish to dedicate this dissertation to my two loving parents, Luki and Augusta Witoelar, who always have faith in me and without whose support, none of this would have been possible. I am also dedicating this dissertation to my wife and my very best friend, Nina, for her continuous love, encouragement, and understanding, and to our daughter, Lakshmi, who brings such joy and happiness to our life.

TABLE OF CONTENTS

LIST OF TABLES.....	x
LIST OF FIGURES	xv
 CHAPTER 1	
INTER-HOUSEHOLD ALLOCATIONS WITHIN EXTENDED FAMILIES: EVIDENCE FROM THE INDONESIA FAMILY LIFE SURVEY	
1.1. Introduction.....	1
1.2. Background.....	7
1.2.1 Evidence on Interhousehold Allocations in Indonesia	7
1.2.2 Indonesia Family Life Survey	9
1.2.3 Tracking Respondents in IFLS.....	9
1.2.4 Household Structure of the IFLS Households.....	13
1.3 Model and Empirical Specification	19
1.3.1 Model.....	19
1.3.2 Empirical specification of the static model	21
1.3.3 Dynamic Specification	24
1.4 Data and Sample construction	27
1.4.1 Sample Construction	27
1.4.2 Data	30
1.4.3 Instrumenting Income.....	31
1.5. Empirical Results.....	34
1.5.1 Static Specifications	34
1.5.2 Dynamic Specification	38
1.5.3 Do Other Households' Resources Affect Own Household's Consumption? ...	40
1.6. Conclusions.....	41
TABLES	44
BIBLIOGRAPHY.....	79
 CHAPTER 2	
DETERMINANTS OF HOUSEHOLD DIVISION: A CASE FROM A DEVELOPING COUNTRY	
2. 1 Introduction.....	82

2.2 Previous Literature on Household Division.....	87
2.3 Model	90
2.3.1 A Model of Household Division	91
2.3.2 Parameterization of Preference and Some Comparative Static Results	94
2.3.3 Empirical Strategy.....	97
2.3.4 Discussion	98
2.4. The Indonesian Settings and Household Division in the IFLS.....	100
2.4.1 The Indonesian Settings	100
Postnuptial Residence	101
Inheritance.....	102
Marital Dissolution	102
2.4.2 Descriptive Analysis of Household Division in IFLS	103
2.5 Empirical Specification.....	107
Education Variables	109
2.6 Results.....	111
2.7 Conclusions.....	111
TABLES	118
BIBLIOGRAPHY	183

LIST OF TABLES

Table 1.2.1	
Household Re-Contact Rates	44
Table 1.2.2	
Number of Household Interviewed: Target vs. Split-off Households	45
Table 1.2.3	
Relationship to the Head of the Target Households, 2000	45
Table 1.2.4	
Descriptive Statistics: Target vs. Split-off Households, 2000	46
Table 1.2.5	
Number of Households and Extended Families.....	47
Table 1.2.6	
Current Marital Status of the Households Heads: 2000.....	48
Table 1.4.1	
Sample Sizes	49
Table 1.4.2	
Descriptive Statistics: All Extended Families, 2000.....	50
Table 1.4.3	
Descriptive Statistics: Parent-Child Extended Families, 2000	51
Table 1.5.1	
Estimates of the Effect of Household Own Income on Household Consumption.....	52
Table 1.5.2	
Estimates of the Effect of Changes in Household Own Income on Changes in Household Consumption.....	53
Appendix Table 1.4.1	
Descriptive Statistics: Parent-Son Extended Families, 2000.....	54
Appendix Table 1.4.2	
Descriptive Statistics: Parent-Daughter Extended Families, 2000	55
Appendix Table 1.5.1	
Coefficient on Income and Income Changes: No Instrumental Variables	56

Appendix Table 1.5.2	
Static Tests: All Extended Families and Parent-Child Extended Families, 2000.....	57
Appendix Table 1.5.3	
Static Tests, Two-Stage Least Squares, 2 nd Stage: All Extended Families and Parent-Child Extended Families, 2000.....	58
Appendix Table 1.5.4	
Static Tests, Two-Stage Least Squares, 1st Stage: All Extended Families and Parent-Child Extended Families, 2000.....	59
Appendix Table 1.5.5	
Static Tests: Parent-Son and Parent-Daughter Extended Families, 2000	60
Appendix Table 1.5.6	
Static Tests, Two-Stage Least Squares, 2nd Stage: Parent-Son and Parent-Daughter Extended Families, 2000.....	61
Appendix Table 1.5.7	
Static Tests, Two-Stage Least Squares, 1st Stage: Parent-Son and Parent-Daughter Extended Families, 2000.....	62
Appendix Table 1.5.8	
Static Tests, Two-Stage Least Squares with Community Dummy Variables, 2nd Stage: All Extended Families and Parent-Child Extended Families, 2000	63
Appendix Table 1.5.9	
Static Tests, Two-Stage Least Squares with Community Dummy Variables, 1st Stage: All Extended Families and Parent-Child Extended Families, 2000	64
Appendix Table 1.5.10	
Dynamic Tests: All Extended Families and Parent-Child Extended Families, 2000	65
Appendix Table 1.5.11	
Dynamic Tests, Two-Stage Least Squares, 2 nd Stage: All Extended Families	66
Appendix Table 1.5.12	
Dynamic Tests, Two-Stage Least Squares, 1 st Stage: All Extended Families.....	67
Appendix Table 1.5.13	
Dynamic Tests, Two-Stage Least Squares, 2 nd Stage: Parent-Child Extended Families ..	68
Appendix Table 1.5.14	
Dynamic Tests, Two-Stage Least Squares, 1 st Stage: Parent-Child Extended Families ..	69

Appendix Table 1.5.15	
Do Other Households' Resources Affect Own Household's Consumption ?	
Two Stage Least Squares, 2 nd Stage	72
Appendix Table 1.5.16	
Do Other Households' Resources Affect Own Household's Consumption ?	
Two Stage Least Squares, 1 st Stage	74
Appendix Table 1.5.17	
Do Other Households' Resources Affect Own Household's Consumption ?	
Reduced Form Regression	76
Table 2.4.1	
Number of Households Interviewed: 1993, 1997, and 2000	119
Table 2.4.2	
Household Division: 1997 and 2000.....	119
Table 2.4.3	
Percentage Household Interviewed by Types of Household Members:	
1993, 1997, and 2000.....	120
Table 2.4.4a	
Household Headship Status in 1997 of 1993 Household Member, by Sex	121
Table 2.4.4b	
Household Headship Status in 2000 of 1993 Household Member, by Sex	121
Table 2.4.4c	
Household Headship Status in 2000 of 1997 Household Member, by Sex	122
Table 2.4.5a	
Household Headship Status in 1997 of 1993 Household Member,	
by Sex and Age Group	124
Table 2.4.5b	
Household Headship Status in 1997 of 1993 Household Member,	
by Sex and Age Group	125
Table 2.4.5c	
Household Headship Status in 1997 of 1993 Household Member,	
by Sex and Age Group	126
Table 2.4.6a	
Reason for Leaving the Household of Household Members Not Found in the Target	
Households in 1997, by Sex	127

Table 2.4.6b	
Reason for Leaving the Household of Household Members Not Found in the Target	
Households in 2000, by Sex	127
Table 2.4.7	
Moves by Location:	
1993 Household Members Found in Any Split-off HH in 2000	128
Table 2.4.8	
1993 Household Demographic Variables by Household Status in 2000	129
Table 2.4.9	
1993 Household Assets Variables by Household Status in 2000	130
Table 2.5.1	
Sample Sizes	131
Table 2.5.2a	
Summary Statistics: Base Year 1993, Division by 1997,	
Claimant 1 and Claimant 2	132
Table 2.5.2a	
Summary Statistics: Base Year 1993, Division by 2000,	
Claimant 1 and Claimant 2	133
Table 2.5.2a	
Summary Statistics: Base Year 1997, Division by 2000,	
Claimant 1 and Claimant 2	134
Table 2.5.3a	
Means and Difference in Means of Key Variables of 1993 Households Between	
Households that Have Divided and Households that Have Not by 1997	135
Table 2.5.3a	
Means and Difference in Means of Key Variables of 1993 Households Between	
Households that Have Divided and Households that Have Not by 1997	136
Table 2.5.3a	
Means and Difference in Means of Key Variables of 1993 Households Between	
Households that Have Divided and Households that Have Not by 1997	137
Table 2.5.4	
Household Education Variables, by the Number of Adults in the Household,	
IFLS 1993	138

Table 2.6.1	
Determinant of Household Division between 1993 and 1997, Claimant 1	139
Table 2.6.2	
Determinant of Household Division between 1993 and 2000, Claimant 1	141
Table 2.6.3	
Determinant of Household Division between 1997 and 2000, Claimant 1	143
Table 2.6.4	
Determinant of Household Division between 1993 and 1997, Claimant 2	145
Table 2.6.5	
Determinant of Household Division between 1993 and 2000, Claimant 2	147
Table 2.6.6	
Determinant of Household Division between 1997 and 2000, Claimant 2	149
Table 2.6.7	
Probability of Household Division of Panel Households, LPM and LPM with HH Fixed Effects, Claimant 1	151
Table 2.6.7	
Probability of Household Division of Panel Households, LPM and LPM with HH Fixed Effects, Claimant 1	152
Appendix Table 2.6.1	
Determinant of Household Division between 1993 and 1997, Claimant 1: Urban	153
Appendix Table 2.6.2	
Determinant of Household Division between 1993 and 1997, Claimant 1: Rural	155
Appendix Table 2.6.3	
Determinant of Household Division between 1993 and 2000, Claimant 1: Urban	157
Appendix Table 2.4	
Determinant of Household Division between 1993 and 2000, Claimant 1: Rural	159
Appendix Table 2.6.5	
Determinant of Household Division between 1997 and 2000, Claimant 1: Urban	161
Appendix Table 2.6.6	
Determinant of Household Division between 1997 and 2000, Claimant 1: Rural	163
Appendix Table 2.6.7	
Determinant of Household Division between 1993 and 1997, Claimant 2: Urban	165
Appendix Table 2.6.8	
Determinant of Household Division between 1993 and 1997, Claimant 2: Rural	167
Appendix Table 2.6.9	
Determinant of Household Division between 1993 and 2000, Claimant 2: Urban	169

Appendix Table 2.6.10	
Determinant of Household Division between 1993 and 2000, Claimant 2: Rural	171
Appendix Table 2.6.11	
Determinant of Household Division between 1997 and 2000, Claimant 2: Urban	173
Appendix Table 2.6.12	
Determinant of Household Division between 1997 and 2000, Claimant 2: Rural	175
Appendix Table 2.6.13	
Determinant of Household Division between 1993 and 1997, Claimants are Household Heads, Their Sons, and Brothers Aged 15 or Above in 1993	177
Appendix Table 2.6.14	
Determinant of Household Division between 1993 and 2000, Claimants are Household Heads, Their Sons, and Brothers Aged 12 or Above in 1993	179
Appendix Table 2.6.15	
Determinant of Household Division between 1997 and 2000, Claimants are Household Heads, Their Sons, and Brothers Aged 16 or Above in 1997	181

LIST OF FIGURES

Figure 2.4.1	
Relationship to Household Head by Age, Male and Female, 1993 and 2000	123

CHAPTER 1

INTER-HOUSEHOLD ALLOCATIONS WITHIN EXTENDED FAMILY: EVIDENCE FROM THE INDONESIA FAMILY LIFE SURVEY

1.1. Introduction

Households break-up over time for several reasons such as members migrating to other villages or cities to find jobs, adult children leaving to form new households, or marriage dissolutions. However, households with familial links may still have economic ties with each other. For example, between these households there may be transfers of income, exchanges of gifts, or informal loans provided by one household to another. These inter-household transactions may be motivated by altruistic feelings of the households in the extended families toward each other. Parents may transfer income to their child's household because they derive utility from their child's consumption. But the transfers may also be motivated by self-interest: parents may provide transfers to their child in anticipation of receiving old age support from their child. In any case, one household's resource allocation decision may affect and be affected by allocation decisions of other households within the extended family.

While there have been many studies on intra-household allocations in developing countries, there are still few studies focusing on the role that an extended family plays in a household's allocation decisions. This essay focuses on this issue, and in particular asks whether or not extended family provide a means for households to smooth their consumption.

In the absence of complete financial and insurance markets, households may be

involved in informal arrangements with each other in order to smooth their consumptions.¹ Previous studies on inter-household allocations as consumption smoothing mechanism have focused on various links through which the mechanism works. Many studies on consumption smoothing focus on how households in a geographic location insure themselves against consumption risk face by the community. In a study on villages in southern India, Townsend (1994) argues that households within a village can make informal arrangements using local institutions to mitigate risks from uncertainty faced by an agricultural economy.² But geographical proximity may not be the only grounds for informal arrangements. Households may also be involved in inter-household allocation with relatives or members of the extended families living in different villages or regions. Indeed, pooling resources with members of the extended family living in a different village may protect the household from village-specific economic shocks. Rosenzweig and Stark (1989) study the practice in rural India of marrying daughters off to households living in different geographic locations. They find evidence that the marriage *cum* migration patterns plays a role in reducing household consumption variability. A study by Grimard (1997) on households in Cote d'Ivoire focuses on consumption smoothing between households with the same ethnicity, allowing for members of extended families to reside in different regions. The study shows some evidence of partial insurance performed by individual household with the

¹ There are of course mechanisms other than inter-household arrangement that households can use to limit their consumption risks in the absence of complete financial and insurance markets. For example, households may adjust their labor supply, deplete their non-financial assets, or withdraw their children from school.

² Using household data from the three villages sampled by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Townsend (1994) found that controlling for village consumption, household consumptions are not affected by contemporaneous changes in own income as well as other idiosyncratic shock. See also Ravallion and Chauduri (1997) for a very closely related work using data from the same ICRISAT villages.

members of the same ethnic group living across different geographic locations. However, the study can only identify the ethnic group, not the particular lineage that the households belong to.

In different social settings, using ethnic group as the “insurance group” may not be appropriate. Closer relationship such as family ties between members of an extended family rather than ethnicity or geographical proximity may be a more important factor on which households base their informal arrangements. Altonji, Hayashi, and Kotlikoff (1992) investigate whether or not households in an extended family in the United States smooth their consumption. Using data from several waves of Panel Study of Income Dynamics, they reject the null hypothesis of dynastic altruism among families in the sample. They find that at a point in time, the distribution of consumption between parents and children is affected by the distribution of their income. They also find that changes in distribution of income within extended family affect changes in the distribution of consumption.

It is important to note that Altonji et al (1992) are looking at extended families in the United States. There are several reasons why focusing on households in developing countries might produce different results. Households in these countries face very different risk environments from their counterparts in developed countries. The majority of the households depend on the agricultural sector, where variability in income is high. As has already been mentioned above, the absence of complete financial and insurance markets may cause households in these countries to rely on inter-household informal arrangements as a way to smooth their consumption. It is therefore reasonable to believe that extended families in developing countries may play a larger role than they do in the

developed countries.

However, focusing on extended family imposes a data requirement that is hard to meet with most household surveys. This is especially true for household surveys from developing countries. Many of the surveys do not purposely collect information on households that have familial links with each other. This essay takes advantage of a somewhat unique feature of the Indonesia Family Life Survey, namely the fact that this longitudinal household survey tracks a large fraction household members who have moved out of their original households and re-interviews them in their new households (the *split-off* households) in the follow-up surveys (I will discuss the tracking rules in more detail in the next section). By identifying the household from which the members originated, I can identify the households that have family ties and define the extended families.

Using the information on the linked households, I adopt the approach used by Altonji et al (1992). Specifically, I test whether households within an extended family pool their income to smooth their consumption, using data from two waves of the IFLS - IFLS2 (1997) and IFLS3 (2000). These two waves include an important period: Indonesia was hit by a financial crisis that started in 1997 and reached its peak in mid-1998. How the crisis has affected the welfare of Indonesian households has been and still is an important and interesting subject. This essay contributes towards our understanding of the dynamics of household behavior during a period of economic crisis.

This essay is also motivated by the question of how to take advantage of the longitudinal household surveys that interview original as well as split-off households. Collecting information from the split-off households in addition to the original

households helps to reduce sample attrition, a problem that is faced by all longitudinal surveys. However, defining what constitutes a household in a panel for the purpose of economic analysis then become a question, since analysis using panel households that consists of only the original households may be biased to the extent that households break-up non-randomly. In addition, using a panel of original household is also problematic because the rules used by surveys to define “original” and “split-off” households are often designed for ease in the fieldwork rather than being based on some analytical underpinnings.³ This, coupled with the concern that dropping split-off households may non-randomly exclude particular subgroups of the sample, make the option of creating a panel of only the original households unappealing. On the other hand, some economists choose to define the panel household by treating an original household and its split-off households as a single extended family. This approach, however, implies that the extended family acts as if it were a single household, or to put it differently, this approach assumes that household decisions are made at the extended family level.⁴

In this essay, I am particularly interested in studying household allocation decisions. Specifically, I am interested in looking at changes in household consumption over the period that was covered by the two waves of the survey. Analyzing household consumption and income while treating original and split-off households as extended families amounts to assuming that households within the extended family pool their income. A test for income pooling may then help us to judge whether household

³ I discuss briefly the rule established in IFLS2 to assign “origin” and “split-off” households in section two. The same rule was used in IFLS2+ and IFLS3. See Frankenberg and Thomas (2000) for full documentation of IFLS2.

⁴ In analyzing changes in household outcomes in Indonesia between 1997 and 1998, Frankenberg, Thomas,

allocation decisions are indeed made at the extended-family level and thus whether analysis of household consumption at the level of extended family is justified.

The findings show some evidence against income pooling within extended families among the IFLS households, both in 1997 and in 2000. To control for the potential measurement error and endogeneity of income, I estimate the models using instrument variables to instrument income. The distribution of income matters for the distribution of consumption within an extended family even after controlling for extended-family fixed-effects. I then estimate the first-difference version of the model to control for the possibility that there are household-specific fixed-effects that are correlated with income. As in the static tests, I use instrumental variables estimation to correct for the potential measurement error and endogeneity of income changes. The dynamic tests return estimates of coefficients on income changes that are statistically different from zero, even after controlling for extended-family fixed-effects. However, the magnitudes of these coefficients are small.

While the rejection of full risk sharing is in itself not a surprising finding, especially in the light of similar results found in studies in other developing countries, the small magnitude of the coefficients suggest that risk-sharing within extended families maybe important among Indonesian households, even though full risk-sharing do not occur. The results from estimating a set of reduced form regressions, using variables from other households in the same extended family to explain own household consumption, suggest that variables from other households in the same extended family do indeed play a role, although limited, in influencing household consumption.

and Beegle (1999) only look at the households that were interviewed in both waves.

The essay is organized as follows. The next section briefly reviews some evidence on inter-household transfers in Indonesia. The section also provides a brief background of the IFLS. I also discuss the composition of households that constitute the sample in this section. Section three discusses the model used in the estimation. The sample construction and the data used in the estimation are discussed in section four. Section five contains the estimation results, and I conclude the essay in section six.

1.2. Background

1.2.1 Evidence on Interhousehold Allocations in Indonesia

In the past years there have been numerous empirical studies that look at inter-household transfers in both developed and developing countries. Altonji, et al (1997) use data from the PSID to look at inter-generational transfers and test whether inter-vivos transfers from parents to child are motivated by altruism. In another study, Hayashi, Altonji, and Kotlikoff (1996) tests whether there is complete risk-sharing between and within the PSID families. They reject both inter- and intra-family full risk-sharing. Other studies that examine distribution of resources within extended families look at data on transfers explicitly. An example is the study by McGarry and Schoeni (1995) looking at how transfers are distributed within extended families. Using data from the Health and Retirement Survey they found that parents give more to their less well off children and elderly parents.

Empirically, there is evidence that interhousehold transfers are an important source of income for households in developing countries (Cox and Jimenez, 1990).⁵

⁵ The review by Cox and Jimenez (1990) of studies on transfers in developing countries reports the percentage of households receiving transfers as well as the average transfer amount as percentage of

While motives for transfers could vary (e.g. altruism, self-interest motivated), evidence have shown that transfers narrow inequality and serve as social insurance (Cox and Jiminez, 1990). Lillard and Willis (1997) find evidence that transfers from children to parents are an important source of old age support among Malaysian families. More recently Foster and Rosenzweig (2001) incorporate altruism into a model of risk sharing under imperfect commitment to study the inter-household transfers in rural India and Pakistan.

Interhousehold transfers are also important among Indonesian households. For example, around 31 percent of rural households and 44 percent in rural Java give transfers (Ravallion and Deardon, 1988), between 50 percent to 70 percent of elderly receive transfers (Cameron and Cobb-Clark, 2001), around 44 percent of couples transfer money to their noncoresident children and 55 percent of couples receive transfers from adult children (Frankenberg, Lillard, and Willis, 2002). The study by Ravallion and Deardon (1988) on interhousehold transfers in Java Indonesia suggests that transfers are targeted to disadvantaged households. Levine and Kevane (2000) look specifically at transfers from parents to daughters in Indonesia to see whether parents invest less in daughters who move away after marriage. Looking at schooling and health outcomes, they also find that there is no evidence that parents invest less in daughters who move away after marriage. There also transfers in the other direction. Studying old age support, Cameron and Cobb-Clark (2001) find that transfers from children to parents are not strongly related to parental need or ability of children to give to their parents. Another recent study by Frankenberg, et al (2002) find that inter-household transfers in Indonesia

average income. For example, 93 percent of households in rural South India receive transfers. Transfers account for 46 percent of the average income of the Malaysian households in the lowest income quintile.

are consistent with all three motives: insurance motive, exchange of money over time, as well as repayment of educational loans.

Regardless of the motives or the direction of transfers, it is evident that inter-household transfers play a role in household allocations in Indonesia. In this essay I do not attempt to look at transfers directly. Instead, drawing on the evidence, the study looks at what happens to household consumption, taking into account the inter-household ties. To the extent that inter-household transfers help households to smooth their consumption, I can examine whether extended families pool their resources.

1.2.2 Indonesia Family Life Survey

IFLS is a longitudinal household and community survey that collects a large amount of information from households, including information about their consumption, income, and assets. It also collects data from each individual on fertility, education, health, as well as migration, and labor market variables. In addition the survey collects information about the community and school and health facilities. The first wave of the sample was collected in 1993 and is representative of about 83 percent of the Indonesian population living in 13 of the 27 provinces in the country.⁶ Since then there have been two other full sample follow-ups (IFLS2 in 1997, and IFLS3 in 2000) and a follow-up of a 25 percent sub-sample in 1998 (IFLS2+). This essay focuses on consumption and consumption changes between 1997 and 2000, using the data from IFLS2 and IFLS3.

1.2.3 Tracking Respondents in IFLS

One of the main concerns faced by all longitudinal surveys is sample attrition.

When respondents drop out from a longitudinal survey, the survey may lose its population representativeness. Moreover, if the non-random attrition is related to the factor being analyzed, the sample will suffer from selectivity bias. At the survey design level, there are many ways to deal with the problems caused by sample attrition. One procedure is to re-weight the sample after each wave of survey to maintain the representativeness of the sample. One of the disadvantages of re-weighting the sample is that it requires a specific model for attrition. Some surveys “refresh” their sample after several waves by enrolling a new set of respondents. But perhaps one of the most important procedures is to reduce attrition from happening in the first place by following individuals and households when they move. Although tracking the movers will not prevent selection from attrition, it will help reduce it.

IFLS is one of the very few surveys conducted in developing countries that track its target respondents when they move.⁷ IFLS interviewers track certain respondents when they move from location where they were last found and even if they move to areas outside their own village. Respondent moving from the original survey location is one of the main causes of sample attrition in other household surveys. For the longitudinal surveys that are conducted in developed countries such as the Panel Study of Income Dynamics (PSID) and the Health and Retirement Survey (HRS) in the US, or the British Household Panel Surveys (BHPS) in the United Kingdom, finding and re-interviewing the movers does not pose such a big problem, since transportation and telecommunication

⁶ See Frankenberg and Karoly (1995) for full documentation of IFLS1.

⁷ See Frankenberg and Thomas (2000) for full documentation of IFLS2. Thomas, Smith, and Frankenberg (2001) study the sample attrition in IFLS.

infrastructures are already well-developed.⁸ Moreover, many of these surveys do not require face-to-face interviews with the respondents.⁹ Still, many surveys do not track their respondents when they move; the PSID, HRS, and BHPS are exceptions. In developing countries, the cost for finding and re-interviewing the movers often deemed to be prohibitive and the movers are dropped from the sample. IFLS is indeed one of the very few exceptions.

To determine whether a respondent has to be tracked when he moves, IFLS employs a set of tracking rules.¹⁰ In brief, the rules are as follow. Each individual listed in the household is assigned a status determining whether the individual has to be tracked or not. Any individual who has a tracking status will be tracked so long as he is in one of the 13 IFLS provinces and he can be found.^{11,12} These individuals are the “target” respondents that get tracked if they had moved from the location where they were last interviewed. In the split-off households where these respondents are found, the spouse and biological children were interviewed, and general information about the households was also collected.

The tracking rules were implemented by gathering much contact information in the previous wave, which was used together with current contacts to locate individuals.

⁸ The main cause for attrition in longitudinal surveys in developed countries is respondents' refusal. Some studies in survey response literature have tried to model survey non-response explicitly. For example, Hill and Willis (2001) developed a model of survey response decision process using data from the HRS and conclude: (1) length of interview does not affect refusal for the next wave, (2) assigning same interviewer reduce refusal rate.

⁹ Phone-based interviews account for the majority of interviews in PSID since 1973, and HRS since 1992. The BHPS administer questionnaires and self-completion surveys.

¹⁰ See Frankenberg and Thomas (2000) for full documentation of IFLS2.

¹¹ In IFLS2 and IFLS2+, the tracking status is given to: (1) all of the individuals who were interviewed in 1993, (2) all members of 1993 households who were born before 1967 (including those who were not interviewed in 1993). See Frankenberg and Thomas (2000) for details.

¹² In IFLS3, additional tracking rules were employed. In addition to rules (1) and (2) above, the following individuals were also given tracking status: (3) all children born after 1993 to the parents who were 1993 household members, and (4) a random sample of other 1993 household members who were born after

These tracking procedures in IFLS explain why the survey has a very low attrition rate, even compared to surveys conducted in developed countries.¹³ At the baseline in 1993, 7,224 households were interviewed. This number represents 93 percent of the total original target sample of 7,330 households. IFLS2, which was conducted in 1997 had a recontact rate of 93.4 percent (see Table 1.2.1) as 6,752 original households as well as 877 split-off households were recontacted.

The IFLS3 that was conducted in 2000 managed to recontact 94.7 percent of the target households that consisted of all of the original 1993 households plus split-off households formed in 1997 and 1998. Some of the households that were not found in 1997 (IFLS2) and 1998 (IFLS2+) were found and reinterviewed in 2000. In addition, 2,645 new split-off households were contacted in 2000. Compared to the surveys done in developing countries, the recontact rates are among the highest, if not the highest.¹⁴

In addition to reducing sample attrition, tracking the respondents proves to have additional scientific value. Thomas et al (2001), investigate the attrition and the follow-up in the IFLS, using IFLS1, IFLS2, and IFLS2+. Using household-level as well as community-level variables of the households in 1997, they estimate a multinomial logit model with the following outcomes: households that did not move from the baseline

1967. See Strauss, et al (2004) for full documentation of IFLS3.

¹³ Thomas, et al (2001) provides a comparison of attrition rate between IFLS and other longitudinal surveys. The PSID interviewed 78 percent of the target households at the baseline survey in 1968. The recontact rate in the following year was 88.1 percent, and the year after 86 percent. The HRS, interviewed 81.6 percent of the target households at the baseline, and by the second follow-up survey, the cumulative recontact rate was 83.7 percent.

¹⁴ Thomas, et al (2001) also discusses the recontact rates of some of the longitudinal household surveys conducted in developing countries. The Cebu Longitudinal Health Survey interviewed around 3,600 women between 1983-1984 in one province of the Philippines. In this two-year window, 17 percent respondents were lost because of out-migration. By the second follow-up survey in 1991-92, only around 67 percent of the original respondents were interviewed. The World Bank's Living Standard Measurement Survey in Peru collected information from 1,280 dwellings in Lima in 1985-86. The follow-up survey in 1990 collect information from respondents living in the same dwelling; less than 55 percent of the households in the first round were interviewed.

survey, households that move locally, as well as households that move to areas outside the original locality. They find that local movers are very similar to the households that stay at the baseline locations. Households that move considerably far from the original location are very similar in many observable characteristics to those not interviewed in the follow-up survey. This suggests that tracking these long-distance movers may provide valuable information about households that are not found. They argue that the information content of these movers is high and that tracking them is a very worthwhile investment.

1.2.4 Household Structure of the IFLS Households

This section discusses the structure and the characteristics of the households that constitute the sample. Who are the split-offs and how are their households different from the old households? This information is essential because it may tell us whether or not the test of income pooling within an extended family is plausible. In particular, it is important to know how big the fraction of all extended families actually represent inter-generational (i.e., parent-child relationships) linkages. Since the model is derived from a household model where a parent is altruistic towards his child, it is this inter-generational relationship that I am mostly interested in. Another concern is that a lot of the households that split might did so as a result of divorce, or marital separation.¹⁵ In this case, the altruistic linkage between households may not be a plausible assumption.

¹⁵ In this essay, family formation and dissolution are assumed to be exogenous. For a literature review on models that treat family formation and dissolution as results of individuals' decision making, see, for example Weiss (1997) and Bergstorm (1996). Foster and Rosenzweig (2002) formulate and estimate a structural model of household division. They look at how household size and intra-household allocation interact with exogenous income growth affect which households divide, division of assets among households, amount of household public goods consumed and evolution of incomes of the new

I define an *extended family* as the set of households that originate from the same 1993 households. These households can be identified by looking at the household identification numbers in the data set. A *target household* is a household that was interviewed in any prior wave of the survey. In 1997, the target households were the 1993 original households. Target households in 2000 include original 1993 households, 1997 split-off households, and 1998 split-off households. A *split-off household* consists of an individual or group of individuals who moved out from the one of the 1993 original households to form a new household.

Table 1.2.2 shows the number of households and extended family interviewed in IFLS1, IFLS2 and IFLS3. The number of households that were interviewed in 1993 is 7,224. In the follow-up surveys in 1997, a total number of 7,619 households were re-interviewed. This number includes both 1993 origin households as well as the households that split-off by 1997. The number of origin households interviewed in 1997 was actually 6,742 (93.3 percent of 1993 households). The other 877 households were split-off households spawned from 791 original households. In 2000, the number of households interviewed was 10,435, which came from 6,774 extended families (93.8 percent of 1993 households). Out of the 10,435 households interviewed, 7,790 were target households and 2,645 were new 2000 split-off households.

The rule used in the survey to assign which households are original and which are split-off households turns out to be somewhat arbitrary. At the first point of field contact with any 1993 household member, the household where the individual was found was assigned to be the original household.¹⁶ In practice, this will be the household living at

configurations of households.

¹⁶ See Frankenberg and Thomas (2000).

the same address as the previous wave. This “first-contact” rule has the advantage of ensuring at least some information on all target household members was gathered, and it also minimizes the risk of losing information of whereabouts of other 1993 household members. However, the rule also results in a great deal of arbitrariness, in that the split-off household may retain more of the household characteristics of the target household from the previous survey than the household that is defined in the current survey year as the target household. It is not clear how one can define whether a household is still the “same” household in different survey year. Table 1.2.3 may help illustrate this point. The table shows the relationship of the respondents to the head of household in the 2000 target households and whether or not the respondents were new members of the household. Note that there are 330 household heads that are new household members (note that they may or may not be respondents from earlier surveys, “new” refers to his/her membership in the household during the current survey). These cases may include instances where a respondent joined the household by marrying the head of the household and then became head of the household. They may also include instances where a child returned to her parents’ household to assume the responsibility of the household. Such examples increase the concern that the “target” household being observed is not the same household as the original target after all. Then the question that arises when one wants to restrict the analysis on only the panel of the original households is: are the ‘correct’ households being chosen?

While analysis using only the panel of original households may suffer from the fact that those households may not be the “same” households, a potentially more serious problem comes from the fact that split-off households may have very different

characteristics than target households. Table 1.2.4 shows the descriptive statistics of some of the economic and demographic variables of the 2000 target and 2000 new split-off households. Total real income and real expenditure of the main households are higher than those of split-off households. Household size of the split-off households tends to be smaller. Per capita expenditure, which is a very common measure of welfare, is higher for the split-off households than the target households. The same is true for per capita income. The proportions of adult members aged 15-59 years are very similar in each group, however the proportion of elderly is higher in the main households. On average, the heads of the split-off households are younger, better educated. The maximum years of education are also higher in the split-off households. The proportion of split-off households residing in urban areas is higher. In short, the split-off households have different characteristics from the target households, suggesting that household break-ups may have occurred non-randomly. Analysis excluding the split-off households will suffer from selection bias.

How many of the split-off households are really formed by children leaving their parents' household? Table 1.2.5 shows the number of extended families with multiple sub-households, parent-child extended families, parent-son extended families, and parent-daughter extended families. I define *parent-child extended family* as an extended family in which there is at least one parent-child relationship between individuals in different sub-households. By this definition it is possible that a sub-household can have someone identified as "parent" and "child. In fact in some cases, one individual is both a parent and a child. Using the similar approach I define the sample of parent-son household and parent-daughter household to see whether there are differences between these two

samples.¹⁷ A *parent-son (daughter) extended family* is an extended family in which there is at least one parent-son (daughter) relationship between individuals in different sub-households. By this definition a parent-son extended family can also be a parent-daughter extended family. I describe in more detail how these samples are constructed in section 4.

In 1997, there are 791 extended families with multiple sub-household of which 653 were parent-child extended families (82 percent). There are 287 extended families with parent-son relationships and 388 extended families with parent-daughter relationships. By 2000, there are 2,610 extended families with multiple sub-households. Around 83 percent of them (2,176 extended families) are parent-child extended families, 48 percent have parent-son relationships, and around 52 percent have parent-daughter relationships.

If a household split into two as a result of marriage dissolution, one may question whether it is still plausible to think that the households have any altruistic linkage. For cases of divorce where no children are present, altruistic behavior between the households may indeed seem to be unrealistic. On the other hand, with the presence of children, the divorced parents may still pool resources in order to improve their children's welfare. If this is the case, some pooling of resources can still be observed although it

¹⁷ Looking at parent-son and parent-daughter extended family separately may be of particular interest. Parents may behave differently towards their son's household and their daughter's household due to factors such as local norms, traditions, and other social institutions. For example, transfer behavior may depend on where the adult children reside after marriage. Levine and Kevane (2003) investigate, in the context of Indonesia the variations in residence after marriage based on the information on the local norms and traditional law that applied in each community. Using the 1993 and 1997 waves of the IFLS (IFLS1 and IFLS2), they find that there is a lot of variations between communities: daughters tend to reside with or near their parents in around 53 percent of the regions, with or near their husband's parents in 23 percent of the region, and in about 23 percent communities new couples tend to live with or near either set of parents.

might not necessarily be motivated by altruism.¹⁸

Table 1.2.6 shows the current marital status of the head of households in 2000 in the target households and the new split-off households. Only about 2 percent of head of the households in the split-off households were either divorced or separated. The percentages among the target households were similar (2.9 percent).¹⁹ The low percentage of the heads of split-off households that were divorced or separated help to support the case that marital break-ups do not seem to play a major role in the spawning of new split-off households in the data. However, it is important to note that the table only shows the current marital status of the respondents at the time of the survey. Therefore it does not tell us whether or not the household split because of a change in marital status. Also, split-off households headed by divorced people may still be economically related to origin households, for example if the origin household is the parents' household.

The discussion about the household structure above can be concluded as follows. Split-off households account for a large fraction of households in the sample and they are indeed different from the original households. There is also some degree of arbitrariness in defining which households are "original" and which are "split-off". These facts suggest that analyzing a panel of only the original households may not be appropriate and looking at panel of extended families seem to be preferable. Moreover, the data shows

¹⁸ In reality, parents with no custodial rights over the children often make inadequate transfers to the ones with custody. To explain this, Weiss and Willis (1985) modeled children as collective consumption goods within marriage, and they argued that altruism within marriage serves to overcome the "free-rider" problem of the provision of public goods. They showed that, after a divorce, the non-custodial parent may lose control over the allocation decisions of the custodial parent and therefore chooses to make inadequate payment or even to stop making payment at all. This suggests that we need to pay attention to the pervasiveness of divorces and marital separation among the households in the sample.

¹⁹ Indonesia used to have a very high rate of divorce: 13 per 1,000 population age 15 and above in 1960, compared to 1.8 in developed countries in the same period (Jones [1994]; p. 180). However, the rate has

that inter-generational relationships account for most of the relationships between the original and the split-off households. The data suggest about the fact that marital dissolutions are not an important factor in the sample. All these facts seem to work in the favor of treating the extended families as a unitary household. It seems plausible to hypothesize about altruism linkages within extended families in the data.

1.3 Model and Empirical Specification

1.3.1 Model

In this essay I do not look at transfers directly. Rather, I follow the strategy used by Altonji, et al (1992). Borrowing from the literatures on testing the dynastic nature of households and the closely related intra-household allocation literature, they look at parent-children dynasties in the PSID to test the hypothesis of extended family altruism. They investigate whether or not the distribution of consumption between parent and children households is affected by the distribution of their income. They argued that if parents and children were altruistically linked, then the distribution of consumption would be independent of the distribution of income.

The model is similar to that of intra-household allocations where parent's utility depends not only of his/her consumption but also on his/her child's consumption.²⁰ Parent and child behave as if their consumption is based on a unitary budget constraint. In the context of extended family, we can think of the model in terms of household of the head of the extended family (e.g., household of the parents) and other sub-households in

decline to 4.6 by 1975 and 1.1 by 1990

²⁰ For review on the subject of intra-household allocations, see for example, the volume edited by Haddad, Hoddinot, and Alderman (1997). Strauss, Mwabu, and Beegle (2000) review the theories and empirical evidence on the subject. See also Thomas (1990, 1993, 1994).

the extended family (e.g., households of their children) operating on a unitary, extended-household budget constraint.

The parent's utility maximization problem is given by:

$$(1) \quad U_h = \theta_h U(c_h) + \theta_k U(c_k)$$

$$(2) \quad s.t. \quad c_h \cdot p_h + c_k \cdot p_k = R_h + R_k$$

where c is quantity of good consumed, p is price, R is resources, and h, k stands for parent and child respectively. The parameter θ_h and θ_k is the weight attached by the parent to his utility and on the utility of his child. Parent and child may face different prices, for example, if they reside in different communities. The parent can transfer some resources T to the child so that $c_k \cdot p_k = R_k + T$ and $c_h \cdot p_h = R_h - T$. If the child takes T as given, then the parent will maximize his utility over his own consumption and transfer. The ability to make transfers is the key in this model; it is what results in a unified budget constraint. This is a typical model that can be found in intra-household allocation literature (e.g., Thomas 1990).

The first order condition of the maximization problem above is:

$$(3) \quad \frac{\theta_h \cdot U'(c_h)}{p_h} = \frac{\theta_k \cdot U'(c_k)}{p_k} = \lambda$$

where λ is the marginal utility of income. Suppose now that the utility function is of the form $U(c) = c^{1-\gamma} / (1-\gamma)$, then, from the first order conditions, the following can be obtained:

$$(4) \quad \log c_h = -\left(\frac{1}{\gamma}\right) \log \lambda + \left(\frac{1}{\gamma}\right) \log \theta_h - \left(\frac{1}{\gamma}\right) \log p_h \quad \text{for the parent, and}$$

$$(5) \quad \log c_k = -\left(\frac{1}{\gamma}\right) \log \lambda + \left(\frac{1}{\gamma}\right) \log \theta_k - \left(\frac{1}{\gamma}\right) \log p_k \quad \text{for the child.}$$

I add an index i to denote an extended family and error terms to have the statistical representations of these demand functions as:

$$(6) \quad \log c_{ih} = -\left(\frac{1}{\gamma_i}\right) \log \lambda_i + \left(\frac{1}{\gamma_i}\right) \log \theta_{ih} - \left(\frac{1}{\gamma_i}\right) \log p_h + u_{ih}, \quad \text{and}$$

$$(7) \quad \log c_{ik} = -\left(\frac{1}{\gamma_i}\right) \log \lambda_i + \left(\frac{1}{\gamma_i}\right) \log \theta_{ik} - \left(\frac{1}{\gamma_i}\right) \log p_{ik} + u_{ik}$$

The parameter λ_i can be interpreted as an extended family fixed-effect. Since λ_i is the marginal utility of income, this model assumes that in an altruistic extended family, the marginal utility of income is common among the extended family members. Note that members' own resources, R_k and R_h do not enter either of the consumption functions. Rather, it is the extended family unified resources R that enters the consumption equations through λ_i , the marginal utility of income.

It is clear how the test works: if extended family has altruistic linkages, the marginal utilities of income of the members are the same. In the empirical specification the marginal utility of income is represented by extended-household fixed effect. Controlling for this fixed effect, then the parent's income should not affect his consumption and child's income should not affect her consumption.

1.3.2 Empirical specification of the static model

The demand function resulting from the first order conditions can be written as:

$$(8) \quad c_{ikt} = c(\lambda_{it}, p_{ikt}, \mathbf{x}_{ikt}), \quad k = 0, 1, \dots, n_i \quad i = 1, 2, \dots, N$$

where c_{ikt} is logarithm of consumption at time t of household k , which is a member of extended family i , p_{ikt} is the price vector, and $\mathbf{x}_{ikt}$ represents household observable characteristics and other variables that might affect household weights θ_p and θ_k . The empirical specification of the demand function can be written as:

$$(9) \quad c_{ikt} = \beta' \mathbf{x}_{ikt} + \xi p_{ikt} + \alpha_{it} + u_{ikt}$$

where u_{ikt} is the error term that uncorrelated with $\mathbf{x}_{ikt}$. The altruistic linkage between households in an extended family is the common marginal utility of income (λ in the model), and it is represented by the extended families fixed effect, α_{it} in equation (9) - thus α_{it} represents $\log \lambda_t$. If all members of an extended family reside in the same community, it is likely that they will face the same price vector p_{ikt} . The extended family fixed effect α_{it} will then also capture the price vector. However, when some members of the extended family live in other community, this may no longer be true. In this case I need to add community prices as additional explanatory variables.

The income pooling test is performed by estimating the following equation.

$$(10) \quad c_{ikt} = \beta' \mathbf{x}_{ikt} + \psi Y_{ikt} + \xi p_{ikt} + \alpha_{it} + u_{ikt}$$

where Y_{ikt} is household k 's own income. The error term u_{ikt} contains unobserved household characteristics that may or may not be correlated with income.

I first assume that the error term u_{ikt} , which is uncorrelated with $\mathbf{x}_{ikt}$, is also uncorrelated with Y_{ikt} . Under the null hypothesis of the extended family altruism, the coefficient on Y_{ikt} should be zero. That is, after controlling for own household characteristics *and* the extended family fixed effect, household own income should not

affect its consumption.

However, the assumption that the error term u_{ikt} is uncorrelated with Y_{ikt} may not hold. Observable household characteristics $\mathbf{x}_{ikt}$ may not fully capture the factors that belong to θ_h and θ_k . These omitted variables will end up in the u_{ikt} and they may be correlated with Y_{ikt} . Extended family fixed effect estimation only sweeps away parts of the unobservables that are common across all sub-households, while parts that are household-specific and vary across the sub-households will remain. One way to deal with the problem is to find instrumental variables for income and use 2SLS estimation. In addition, 2SLS estimation could also help us deal with problem of measurement error in our income variable.

Even if one fails to accept the null that the coefficient on Y_{ikt} is zero, it is still interesting to see whether household consumption is affected by income of other household in the extended family. For example, one could directly estimate the following equation:

$$(11) \quad c_{ikt} = \beta' \mathbf{x}_{ikt} + \psi Y_{ikt} + \sum_j Y_{ijt} + \xi p_{ikt} + \alpha_{it} + u_{ikt}, \quad j \neq k$$

where $\sum Y_{ijt}$ is the sum of logarithm of income of other households in the extended family. Under the null hypothesis that households within an extended family do not pool their income at all, the coefficient on the other households' income variable, γ , is zero. Again, here one also needs to worry whether the error terms are correlated with Y_{ikt} or $\sum Y_{ijt}$.

1.3.3 Dynamic Specification

Consider an extended family i , with sub-households $k=1, \dots, n_i$, facing the state of nature $s=1, \dots, S$ with known probability of occurrence π_s . The discount factor is given by β , $0 < \beta < 1$. As before, θ_k denotes the household weight of sub-household k in the extended family i . When the sub-households pool their resources, the maximization program that is faced by the extended family is that of maximizing the sum of weighted utilities:

$$(12) \quad \max \sum_{k=1}^{n_i} \theta_k \sum_{t=1}^T \beta^t \sum_{s=1}^S \pi_s U(c_{kt})$$

subject to, assuming no borrowing:

$$(13) \quad \sum_{k=1}^{n_i} c_{kt} \cdot p_{kt} \leq \sum_{k=1}^{n_i} R_{kt}$$

For each household k in state s at time t , the first order conditions with respect to c_k , is:

$$(14) \quad \theta_k \cdot \beta^t \cdot \pi_s \cdot U'(c_{kt}) = \mu_t \cdot p_{kt}, \text{ or}$$

$$(15) \quad \frac{\theta_k \cdot U'(c_{kt})}{p_{kt}} = \lambda_t$$

where $\lambda_t = \mu_t / \beta^t \pi_s$ and μ_t is the Lagrange multiplier on the resource constraints at time

t .²¹ Note that λ_t is common across all sub-households $k \in i$. Note also that this first-order

²¹ This dynamic maximization problem is similar to the problem studied by Townsend (1994). The difference there is that the weighted sum of utilities is over all individuals and over all households in the village, resulting in common Lagrange multipliers across all individuals in the village. The maximization problem is also similar to that discussed by Mace (1991) and Cochrane (1991). Mace (1991) uses the data from the Consumer Expenditure Survey to test the hypothesis of full consumption insurance by regressing the change in consumption on aggregate consumption, changes in household income, and other explanatory variables. Similarly, using data from the PSID, Cochrane (1991) tests for consumption insurance by regressing changes in consumption growth on idiosyncratic variables that are argued to be exogenous to consumers.

condition should hold at any time t . Assuming that the utility function is $U(c) = c^{1-\gamma}/(1-\gamma)$, one can take logs and solve for consumption of sub-household k and add an index i denoting the extended family to obtain:

$$(16) \quad \log c_{ikt} = -\left(\frac{1}{\gamma_i}\right) \log \lambda_{it} + \left(\frac{1}{\gamma_i}\right) \log \theta_k - \left(\frac{1}{\gamma_i}\right) \log p_{ikt} + u_{ikt}$$

Focusing on the changes in consumption, I first-difference consumption over the two period t and $t-1$ to obtain:

$$(17) \quad \log c_{ikt} - \log c_{ikt-1} = -\left(\frac{1}{\gamma_i}\right) (\log \lambda_{it} - \log \lambda_{it-1}) - \left(\frac{1}{\gamma_i}\right) (\log p_{ikt} - \log p_{ikt-1}) + (u_{ikt} - u_{ikt-1})$$

Because I am assuming that the household weight θ_k is time-invariant, it disappears when I do the first-differencing. From equation (17), it is clear that household k 's own income change does not enter into determination of the household's consumption change. The extended family income change does, however, affect change in consumption through the change in marginal utility of income. The statistical representation of equation (18) can be written as follows:

$$(18) \quad \Delta c_{ikt} = \beta' \Delta \mathbf{x}_{ikt} + \xi \Delta p_{ikt} + \Delta \alpha_{it} + \Delta u_{ikt}$$

where $\Delta c_{ikt} = c_{ikt} - c_{ikt-1}$, $\Delta \mathbf{x}_{ikt} = \mathbf{x}_{ikt} - \mathbf{x}_{ikt-1}$, $\Delta \xi p_{ikt} = p_{ikt} - p_{ikt-1}$, $\Delta \alpha_{it} = \alpha_{it} - \alpha_{it-1}$ and $\Delta u_{ikt} = u_{ikt} - u_{ikt-1}$. The dynamic test is performed by including the change in sub-household k 's income, $\Delta Y_{ikt} = Y_{ikt} - Y_{ikt-1}$.

$$(19) \quad \Delta c_{ikt} = \beta' \Delta \mathbf{x}_{ikt} + \psi \Delta Y_{ikt} + \xi \Delta p_{ikt} + \Delta \alpha_{it} + \Delta u_{ikt}$$

Note that equation (19) is also the first-differenced version of the empirical specification given by equation (10). In the static specification, the extended-household

fixed effect α_i represent the log of marginal utility of income that is common across all sub-households in extended family i . Here, $\Delta\alpha_{it}$ represents the difference in the log of marginal utility of income across periods. Since $\Delta\alpha_{it}$ is independent of k , then it will be the same across all sub-households. Controlling for these fixed-effects, changes in household own income should not affect changes in household consumption.

Household-specific factors belonging to the household weights θ_k but that are not fully captured by Δx_{ikt} are swept away by the first-differencing, provided they are time-invariant. This means that the test allows for the possibility that the extended families have different – but time-invariant - preferences over the sub-households. Consider the case where the extended families consist of a parents' household, the son's household, and the daughter's household. Suppose that the parents prefer to invest more in human capital of the sons' household. Then the static version of this model at time t , would be:

$$(20) \quad c_{ikt} = \beta' x_{ikt} + \psi Y_{ikt} + \xi P_{ikt} + \alpha_{it} + \delta_{ik} + u_{ikt}, \quad k = 0, 1, \dots, n_i \quad i=1, 2, \dots, N$$

where δ_{ik} represents the household-specific time-invariant constant. In other words, δ_{ik} can be seen as sub-household fixed-effects that differ between the son's and the daughter's household and that may be correlated with the son's and daughter's income. Preferences towards the son's household imply that δ_{ik} is larger for his household than that for his sister's. Everything else the same, the son's household will have higher consumption and earnings. If the sub-household fixed effect is time-invariant, the first-differencing will sweep δ_{ik} away, and this is what is shown in equation (18). To correct for potential measurement error in income, I also employ 2SLS for the dynamic tests.

The assumption that the household weights, θ_k , are time-invariant may not be true.

In fact, it is in contrast with results in collective household models (e.g. Chiappori, 1988). In the collective household models, the sharing rule that governs how much each member can spend the remaining income after the household allocates its resources on household public goods is endogenous. Prices, total household income, and other time-varying factors such as assets of each individual may determine the sharing rule. On the contrary, in the example above that the extended family has an unequal but time-invariant sharing rule, which is in favor toward the son's household. Under our null above, θ_k are time-invariant. If θ_k include time-varying household specific factors, first differencing will not get rid of these factors, even with extended family fixed effect, and there may still be factors that determine θ_k that are correlated with ΔY_{ikt} . This is another reason why instrumenting changes in income would be helpful even after adding the extended-household fixed-effects.

1.4 Data and Sample construction

1.4.1 Sample Construction

Since the tests involve estimating extended families fixed effect I need to restrict the sample to the extended families that have more than one member households. The identification comes from these extended families. There may be concerns that constructing the sample in this way would induce a selection bias. For example, there may be unobserved variables among households that affect the decision to split and that also affect consumption. Adding the extended-household fixed effects take care of this problem.

In addition I also create a sample of extended families consisting only of parent-

child households, parent-son households, as well as parent-daughter households. Below I define the samples and describe how I generate them.²²

I start with household roster in IFLS1 (1993). From this roster, I can identify parent-child relationship within each household. In the following survey (1997), if the household split, and provided that the 1993 members were found, I can observe these individuals, the households they were in, the households their parents/children were in, as well as the extended families they belong to. Therefore I can link the 1997 households of the individuals with the 1997 households that their parents/children are in, and I can identify the linkage between these households as a parent-child linkage. In 1997 (and also in 1998), there were new entrants to the survey: new household members whose household memberships and relationships with other members will also be followed and identified. By 2000, there are more split-off households, spawned not only by individuals who were members of the 1993 roster but also by individuals who were new members in 1997 (or 1998). Using similar procedure, I identify parent-child as well as parent-son and parent-daughter linkages among the individuals in the different households within the extended families.

Since I define a parent-child extended family as an extended family in which there is at least one parent-child relationship between individuals in different households, it is possible that in some cases, a household has members identified as a parent and another member as a son/daughter. In some cases, an individual can be a parent and a child (for example, the individual may have a parent residing in another household and a

²² At this point, it is appropriate to note the problem that we can never observe a “complete” extended family in our sample. For example, one may observe the extended family consisting of a parent’s household and a married son’s household in our sample, but it is unlikely that the household of son’s parent-in-law is also interviewed in the survey. Pooling of resources may occur within the larger extended

son in yet another household in the extended families).

For the first-difference version of the test, I need households that appeared in both survey years, 1997 and 2000. The number of households that were interviewed in 1997 and re-interviewed in 2000 is 7,107. By definition, the new 2000 split-off households did not exist in 1997. Since including the split-off household is essential to the test, I try to match each of the new split-off household to the household where the split-off member was in during the 1997 interview. I first match the split-off to the 1997 household of origin for the panel individual who was tracked. If I cannot make a match, I then try to match it to the 1997 household of origin of the spouse of the tracked member. If a match still cannot be found, I try to match the child of the tracked member, and so on. For the cases that I am able to match, I use the 1997 household variables as the 1997 household variables for the 2000 split-off households.

After restricting the sample to those households in multiple member extended families and also parent-child, parent-son, parent-daughter extended families, and restricting further by households that can be matched with 1997 households, I end up with samples that are shown in Table 1.4.1. The samples used to test the static version of the model are shown in column (2) and (5) for 1997 and 2000, respectively.²³ For the dynamic test, I use the sample shown in column (5), and match the households with 1997 households as described above.

family that include the parent-in-law's household. While I acknowledge this problem, I do not attempt to solve it in this essay.

²³ For the static test using 2000 households, I also estimate the model using a larger sample, namely by not only restricting that extended families have multiple households. The results are similar. I report the results of the sample of 2000 households that can be matched with 1997 households so that comparison with the dynamic results can be made.

1.4.2 Data

Monthly household consumption is calculated using all consumption expenditures including durable goods. For housing expenditures, I use rental value of housing (actual if available, imputed otherwise). The household composition variables used as explanatory variables are household size, proportion of children age 0-5, 6-14, adult 15-59 (male, female), 60 or above (male, female), age of the head of household. I also use a dummy variable whether a household is a male-headed household, and whether the household is a farm household. For the education of the household I use the maximum years of education of adults in the household. I also use dummy variables for province and urban residence. Community median wages for males and females were calculated from earnings and hours worked of those who earned labor income including those who were self-employed. I use community median prices of sugar and oil since these were the only two prices for which data were available for the majority of the households both in 1997 and 2000. The prices were prices that the household paid for the last purchases in the past month.

Monthly household income was calculated using labor earnings of individuals in the household, earnings from self-employment, net sales of farm and non-farm assets, rental income from household assets, gross sales of individual assets, and other non-labor income excluding transfers. I exclude transfer income since what I want to test is whether the extended family's resources matter to household consumption after controlling for household income, without explicitly accounting for transfers. All monetary values are in December 2000 prices. The descriptive statistics for each of the sample are shown in

Table 1.4.2-1.4.3.

1.4.3 Instrumenting Income

Income variables are notoriously hard to measure without error.²⁴ In particular, the income variables may be measured with errors in the sense of classical errors-in-variables. If they are, then the estimates of income coefficients may be biased towards zero. Failure to take into account possible measurement error will result in underestimating the coefficient on income, which I expect to be positive.

The concern seems to be well-substantiated by looking at the value of monthly household expenditure with the value of monthly household income in the data set shown in Table 1.4.2. For the 2000 main households, the mean value of household income is roughly 70 percent of household expenditure, and for the split-off households the corresponding number is about 65 percent. The numbers seem to indicate there may be under-reporting of income in the IFLS. Under-reporting of income is certainly not unique to the IFLS; indeed, as noted by Deaton (1997), it is the case in many surveys, including those in industrialized countries.²⁵

To correct for this potential problem, I use instrumental variables that are predictive of income but that can reasonably be excluded from the consumption regressions. Note, however, that while the instrument variables may help correct for random measurement errors, they may not help in solving the systematic measurement errors. For example, it may be possible that household with higher income underreport

²⁴ As noted by Deaton (1997: p.29), "...All of the difficulties of measuring consumption – imputations, recall bias, seasonality, long questionnaires- apply with a greater force to the measurement of income..."

²⁵ Another problem associated with data on household income is that collecting them often affects response rate. This problem is not shared by the IFLS: collecting data on components of household income does not

more than poorer households.

The first set of IVs used consists of the log of value of land, farm business assets, and non-farm business assets (all in real values).²⁶ Farm business assets include plants, house or building used for farm business, livestock/poultry/fish pond, vehicles, tractor, heavy farm equipment, and other assets used in the farm business. Non-farm business assets include building, vehicles, and other equipment used in the non-farm business. By using these variables as identifying IVs, I claim that these assets are predictive of income but they are not correlated with the error term in the consumption regressions.

In addition, in some of the static specifications I use community infrastructure variables as additional instrumental variables. In order to obtain these variables, I use data from the Village Potential Statistics (the PODES) collected by the Central Bureau of Statistics. The PODES contains a rich set of information of village characteristics in Indonesia. I can link most of the villages in the IFLS with the villages in PODES. Several variables such percent of land that is irrigated, percent of households with electricity, and percent of households with telephone seems to be suitable candidates for instrumental variables. These variables may indicate the availability of infrastructure at the village level that may be correlated with household income but not with consumption, conditional on household income. In addition, I use population density, existence of manufacturing industry, and existence of a bank in the village as measures of the level of development of a market economy in the villages. However, none of the IVs that I obtain

affect the response rate (Deaton, 1997: p.30).

²⁶ In place of log of the value of land owned, I also estimate the models using log of the area of land owned but the first stage regression results show that land area is only marginally significant in predicting household income. Moreover, the specification using land area along with other business assets as instruments variables does not pass the overidentification test. The results of adding the interaction terms between land area owned and a dummy variable indicating a farm household are similar.

from the PODES contribute significantly to explaining variation in household income in the first stage regressions.

I also employ instrumental variables in the dynamic tests. In addition to allowing the possibility of household specific fixed-effects, the dynamic test may help us solve the systematic measurement error problem. For example, if richer households under-report more than poorer households, and if the measurement errors are unchanged between survey waves, then, these errors will be differenced out. However, there is still a potential problem of random measurement error. In addition, changes in income may also be endogenous. To correct for these I use lagged value of land owned as well as lagged value of non-land business assets as instrument variables. Using changes in business assets to instrument changes in income may potentially induce additional endogeneity into the model. Changes in income may affect investment in business assets which in turn may be correlated with consumption changes. The lagged value of assets used as instruments are 1997 value of land owned and 1997 values of non-land business assets of the households. I argue that these lagged values of assets are not correlated with the error terms in the first-differenced consumption equation.

In addition to the 1997 lagged value of land owned, I include the change in log value of land. My claim is that the potential problem of endogeneity resulting from using the change in land value is substantially less than if I were to use changes in value of other business assets. The data shows that between 1997 and 2000 there were very few incidence of land sales, only 1.5 percent out of all land ownerships. The total value of those sales was only about 0.5 percent out of total values of land owned. The change in land value might be the result of investment in land such as improvement in irrigation

system. However, during the three-year period there was no large irrigation project that was being carried out, at least none that I am aware of. The variation of real land values owned between the periods is likely driven by the change in prices that occur between 1997 and 2000.

In other specifications I add interaction of changes in the median wage of males and females with the 1997 household maximum years of education. Changes in wages between the periods may affect households differently depending on the level of education in the households. I also tried to add interactions of price changes with 1997 household maximum years of education. The use of the latter set of IVs turns out not to be fruitful since they do not pass the over-identification tests.

1.5. Empirical Results

1.5.1 Static Specifications

I begin by estimating the static model with and without extended-household fixed-effects for all households in 1997 and 2000. For each sample, I estimate the consumption regressions with and without the extended families fixed effect. First, I estimate the models without instrumental variables. Next, I estimate the models using 2SLS.

Table 1.5.1 summarizes the result of our static tests. The table reports only the coefficient on log of household income from the various specifications. Regression results showing coefficients on the other covariates are reported in Appendix Table 1.5.2-1.5.7.

The first panel of Table 1.5.1 shows the result from estimating equation (5) using

the sample of 1997 households. The second panel shows the result for the 2000 households. While the results are similar qualitatively, I focus the attention to 2000 households since split-off households consists a much larger fraction of households in 2000 than in 1997.²⁷

The first thing to note is that estimations without using any instrumental variables return coefficients on income that are although small in magnitude, statistically significant. The coefficient ranges from 0.015 (parent-daughter extended families, with fixed effect) to 0.026 (parent-son extended families, without fixed effect). The small magnitudes of the coefficients translate into income elasticity of consumption of 0.015 to 0.026. This goes in line with the suspicion that the income variables suffer from measurement error.²⁸

Looking closely at the regression results in Appendix Table 1.5.2 it is clear that most of the explanatory variables appear to be statistically significant when I estimate the consumption equation without extended family fixed effect. Column (1) shows that the coefficient on income for the sample of household in multi-member extended families is 0.022 and it is statistically significant at 1 percent level. Having fixed effect in the

²⁷ The estimates of the coefficients on household income under 2SLS using the sample of parent-daughter extended families for 1997 stood out as much greater those of other samples; 1.509 (standard error 0.494) and 1.205 (0.646) without and with fixed effect, respectively. However, the identifying instrumental variables fail the over-identification tests miserably; the null hypothesis that the equation is properly specified and the instruments are valid instruments (p -values is 0.000 in each case) is rejected. The same is also true for the sample of parent-son extended families in 1997, although the estimates are not as high as those for parent-daughter extended families

²⁸ I also estimate a bivariate regression using only household income as the explanatory variables (see Appendix Table 1.5.1 for the results). As shown in the tables, the coefficient on household income or its changes gets smaller as more explanatory variables are added. One explanation is that household income is capturing effects of other, valid, explanatory variables such as household composition and education variables. Another explanation is that the small coefficients are the results of the measurement error problem in income that gets worse as more explanatory variables are added. The intuition is that as more explanatory variables are added, there are less variations available in the data to explain the variation in household consumption. The contribution of measurement error to the remaining variation becomes proportionally larger, and so the attenuation bias becomes worse.

estimation does not seem to change this coefficient by any significant magnitude. Note however that some of the community-level variable became statistically insignificant after using the fixed effect. Large fraction of the households reside in the same community as the other households in their extended families, so the extended household fixed-effects sweep away some of the community level variables. Similar results are obtained using the sample of parent-child extended families (column 3 and 4 in Appendix Table 1.5.2), as well as parent-son, parent-daughter extended families (Appendix Table 1.5.5).

The summary of the results of the 2SLS estimation is also presented in Table 1.5.1. The second stage regressions for the sample of extended families with multiple sub-households and parent-child extended families are reported in Appendix Table 1.5.3. For 1997, only the estimates of the coefficients on household income are presented in Table 1.5.1. The regression results are not reported but are available upon request. The corresponding first stage regressions are reported in Appendix Table 1.5.4.

The first thing to note is that the coefficients on household income in the 2SLS estimations are greater than in the OLS estimations by as much as ten-fold. For the sample of 2000 extended families, the coefficient on household income under 2SLS is 0.216 (with standard error 0.031).²⁹ Controlling for fixed effect, the coefficient drops to 0.135 (with standard error 0.028) – lower than without controlling for fixed effect- but much higher than in the specification without instrumental variables (0.021). Our IVs pass the over-identification tests for this sample. The p -values for our Hausman tests with the null that the variable log of household real income is exogenous are 0.000 (column 1-

²⁹ Altonji et al (1992) reports income elasticities of food consumption of around 0.240-0.286 for US households. However, this is arguably not comparable to the results above since one would expect that food

4, Appendix Table 5.3) suggesting that instrumental variables estimations are required.

Since the model is derived from a model of parental altruism, I am particularly interested in whether using the sample of only parent-child extended families would produce different results. It turns out that the results are very similar (column 3 and 4 in Appendix Table 5.3). For the parent-child extended families the coefficient on income under 2SLS but without fixed effect is 0.218 (standard error 0.035) and after fixed effect it drops to 0.128 (standard error 0.044). Coefficient on income before fixed effect is highest using the sample of parent-son extended families; it is 0.284 (standard error 0.062), but after fixed effect it became virtually the same as from the sample of parent-daughter extended families. Except for the 2SLS estimate with fixed effect for the sample of parent-daughter extended families, the IVs pass the over-identification tests. As noted above, the Hausman tests suggest that income is indeed endogenous.

The results thus far seem to suggest that the household's own income matters even after controlling for the extended-household fixed-effects. The estimations without instrumental variables show that the coefficients on income are small in magnitude and almost the same with and without the fixed effect. 2SLS estimations provide us with more reasonable estimates of the coefficients on income. Under 2SLS, controlling for extended family fixed effect does decrease the coefficients on income significantly (around 40 to 60 percent decrease for 2000 households) but the coefficients on income after accounting for fixed effect are still statistically significant.³⁰

in the US would be far less sensitive than all consumption in a developing country.

³⁰ I also estimate the static regressions using community dummy variables in place of prices and wages. The results are shown in Appendix Table 5.8 and 5.9. Identification comes from extended families with members living in different communities. Around 60 percent of the extended families do span across different communities. The coefficient on own income is 20 percent lower (0.203 compared to 0.256) after controlling for extended-family fixed-effects and it is statistically significant.

1.5.2 Dynamic Specification

Table 1.5.3 presents the summary of results from the dynamic tests. First I first-difference the variables and estimate the model by OLS. The coefficient on changes in log (household real income) is positive and statistically significant, although the magnitude, 0.017 is very small. When I add extended family fixed effect, the income coefficient is slightly greater (0.020), and it is still statistically significant. As in the static version, 2SLS would provide a better estimate about the effects of the changes in household income on changes in consumption, provided the instrumental variables are valid. The second stage regression results for all extended families and for parent-child extended families are reported in Appendix Table 1.5.11 and 1.5.13, respectively. The first stage regression results for the corresponding samples are reported in Appendix Table 1.5.12 and 1.5.14, respectively.

The F-tests for the identifying instrumental variables reported in Appendix Table 1.5.12 and 1.5.14 seem to suggest that the instrumental variables contribute considerably well in predicting changes in income. The first 2SLS specification use lagged land value 1997 as well as changes in land value between the 1997 and 2000. Using the sample of all extended families, the coefficient on income changes is 0.132 (standard error 0.049) before adding the fixed effects. After accounting for extended family fixed effect, the coefficient drops to 0.059 (standard error 0.033). Similar results were obtained using the sample of parent-child extended families. Note that while the test can reject the null that the change in household income is endogenous in the specification without the extended-household fixed effects, the test fail to reject the null when the fixed-effects are

controlled for. This seems to suggest that there is no need to treat the change in income as an endogenous variable when I include the fixed-effects. Nonetheless, the estimations appear to be well identified and the coefficient after controlling for fixed-effects under 2SLS (0.059), and under OLS (0.020) are both significantly lower than the estimates under 2SLS before controlling for fixed effects. It is reasonable to conclude that controlling for extended family fixed-effects, the effects of a change in household own income on the change in household own consumption are small.

When I add lagged value of business assets as an additional instruments, the results do not change much, although now the coefficient on income changes after accounting for fixed effect are slightly higher. However the instrumental variables did not pass the over-identification test, especially after accounting for extended family fixed effect. Using changes in median wage of male and female interacted with the household education variable in 1997 to capture different effects of wage changes on household income depending on education level of the household, the coefficient on income before accounting for fixed effects are much lower than in previous specifications. But again, the instrumental variables perform very poorly in over-identification tests.

The results from the dynamic specifications show that changes in distribution of resources does affect changes in distribution of consumption among households in extended families, suggesting that households may not fully pool their resources to cope with economic shock they were facing. However, the coefficients on the change of own income after controlling for extended family fixed-effects become small.

1.5.3 Do Other Households' Resources Affect Own Household's Consumption?

Including income of other sub-households from the same extended family directly in consumption regression may provide some insight about the role of other households' income in household consumption. Note that this is not a formal test of consumption-smoothing hypothesis. The estimation will tell us whether the coefficient on other households' income is statistically significant. If it is, then it indicates that resources of other households do play a role in determining household consumption.

As instruments, I use own household's as well as other households' log of land value, farm and non-farm business assets. However, the instrumental variables failed the over-identification tests (p -values = 0.039 and 0.0524 for the sample of extended families with multiple sub-households and parent-child extended families, respectively). The Hausman tests seem to suggest that other households' income is not endogenous in household consumption equation. Overall, the results seems to show, at least in the static context, that income of other households does not play any role in determining own household consumption (see Appendix Table 1.5.15 and 1.5.16).

In addition, I also estimate reduced form regression of household consumption by regressing log of household consumption not on income variables but on all of the exogenous explanatory variables included in other specifications belonging to own household as well as other households, and also on log value of land, farm, and non-farm business assets of own and other households (see Appendix Table 1.5.17). The F-test of other household variables in these regressions are 2.09 (p -value=0.001) and 2.02 (p -value=0.001) for the sample of extended families with multiple sub-households and parent-child extended families, respectively. This suggests that other households'

variables have some effects, if only small, on households' own consumption.

This result is related to the body of literature that looks at the outcome of linked households. For example, Foster (1993) looked at the effects of household partition in rural Bangladesh on child's schooling. In particular the study asks whether decision on child's schooling depend on resources available to a particular household or to resources available to all the linked-households as a whole. The study rejects the null hypothesis of no effects of linked-household, although controlling for linked households' resources, own household resources still affect child's schooling.

1.6. Conclusions

In this essay I have shown that there is evidence against income pooling in extended families, both in the static and dynamic settings. The findings show that household own income and income changes affect consumption and consumption changes even after adding the extended family fixed-effects. In terms of the magnitudes of the income (and income changes) coefficients, the results are mixed. The static tests return estimates that range from 0.127 to 0.135 after controlling for fixed effect. These magnitudes are economically significant and suggest that I can strongly reject the income-pooling hypothesis. This in itself is perhaps not surprising: even *within* households, income-pooling hypothesis is almost always rejected in most empirical studies.

The more interesting results come from the dynamic tests that show that controlling for extended family fixed effects, the magnitudes of the coefficient on income change seem to be small (0.067 to 0.09), although they are statistically significant. This

suggests that at least to some degree, households within an extended family do pool their resources. The findings also suggest that although households do not fully act as a unitary (extended) household, allocation decisions may be made at the extended-household level. This implies that, under some conditions, looking at a panel of extended families may be preferable to using only panel of "original" household when one wants to analyze household consumption or income changes.

It is also important to note that pooling resources is by far not the only mechanism available to the households to cope with economic crisis. Frankenberg, Smith, and Thomas (2003), using data from IFLS2 (1997) and IFLS2+ (1998) - a shorter period of observation- shows how households in Indonesia use a type of asset that was least affected by the crisis, namely gold, as a way to cope with the crisis. Yet another mechanism that may have been used by the households is to change living arrangement (i.e., moving out of households in some cases, or joining households in other), a household decision that I assume to be exogenous in this essay.

Perhaps one of the more important lesson to be learned from this research is the fact that inter-household ties may be influential in shaping household allocation decisions. Rejection against extended family income pooling does not mean that extended families do not behave as a single-household in other dimension of household behavior. One possible extension of this study is then to look whether and how inter-household ties affect other household behavior such as labor market supply, home production, and investment in human capital. The study by Foster (1993) on the effects of household partition in rural Bangladesh on child schooling is one of the few studies that looks at the effects of linked household resources on household outcome.

The analysis has also raised some interesting questions. The results suggest that extended-household does not fully act as a unitary household. The next obvious question would be whether inter-household allocation decisions across households within an extended family are consistent with the collective (extended-) household model. Another important question concerns the determinants of household break-ups and formation. In this essay I treat them as exogenous, although family formation and dissolution are themselves results of economic decisions. One could further the study by incorporating the endogeneity of household division into the analysis of interhousehold ties and household outcomes.

Table 1.2.1 Household Re-contact Rates

Number of Households	IFLS1	All Members Died	IFLS2 Households Contacted	Re-contact Rate (%)	IFLS3 Target Households	All Members Died	IFLS3 Households Contacted	Re-contact Rates (%)
IFLS1 households	7,224	69	6,752	94.3	7,152	32	6,768	95.1
IFLS2 split-off households	-	-	877	-	877	2	817	93.4
IFLS2+ split-off households	-	-	-	-	338	0	311	92.0
IFLS3 target households	-	-	-	-	8,370	34	7,896	94.7
IFLS3 split-off households	-	-	-	-	-	-	2,645	-
Total households contacted	7,224	69	7,629			34	10,541	

Source: IFLS1, IFLS2, IFLS3.

Re-contact rates are conditional on at least some household members living. Households that recombined into other households are included in the number of households contacted. IFLS3 target households are IFLS1 households, IFLS2 split-off households and IFLS2+ split-off households.

Table 1.2.2 Number of Households Interviewed: Target vs. Split-off Households

	1993	1997	2000
Households interviewed	7,224	7,619	10,435
Target households interviewed	7,224	6,742	7,790
Split-off households interviewed	-	877	2,645

Source: IFLS1, IFLS2, IFLS3

Target households are households that were interviewed in any prior wave of the survey. IFLS2 target households are IFLS1 original households. IFLS3 target households are IFLS1 original households, IFLS2 split-off households and IFLS2+ split-off households.

Table 1.2.3 Relationship to the Head of the 2000 Target Households

Relationship to household head	HH members re-interviewed	New HH members	Total
Head	7,460	330	7,790
Spouse	5,708	277	5,985
Child,S/D-in-law	13,075	2,675	15,750
Parent,F/M-in-law	812	174	986
Sibs.,B/S-in-law	378	140	518
Other relative	1,537	1,289	2,826
Non-relative	95	174	269
Total	29,065	5,059	34,124

Source: IFLS3

Table 1.2.4. Household Characteristics Target vs. Split-off Households, 2000

	2000 Target households		2000 Split-off Households	
Number of households	7,505		2,517	
	Mean	Std. Dev	Mean	Std. Dev
HH real expenditure (000 Rp)	1,031	(1,169)	979	(1,101)
HH real income (000 Rp)	727	(1,169)	641	(1,120)
Per capita real expenditure (000 Rp)	261	(301)	329	(378)
Per capita real income (000 Rp)	179	(328)	202	(363)
Household size	4.39	(2.01)	3.62	(2.10)
Number of hh members:				
0-5 years	0.47	(0.68)	0.63	(0.72)
6-14 years	0.85	(0.99)	0.36	(0.73)
15-59 years, male	1.26	(0.96)	1.22	(0.94)
15-59 years, female	1.37	(0.89)	1.23	(0.90)
60+ years, male	0.19	(0.40)	0.07	(0.27)
60+ years, female	0.24	(0.45)	0.10	(0.31)
Male household head (=1)	0.82	(0.39)	0.85	(0.36)
Age of hh head	49.41	(14.10)	34.72	(13.94)
Maximum years of education	9.04	(4.24)	10.19	(3.93)
Farm households (=1)	0.41	(0.49)	0.24	(0.43)
Urban	0.46	(0.50)	0.54	(0.50)

Source: IFLS3

* After dropping observations with missing values

Table 1.2.5 Number of Households and Extended Families

	1993	1997	2000
All extended families	-	6,742	6,774
Households	7,224	7,619	10,435
Extended families with multiple households	-	791	2,610
Households	-	1,668	6,271
Parent-child extended families	-	653	2,176
Households	-	1,343	5,075
Parent-son extended families	-	287	1,256
Households	-	578	2,730
Parent-daughter extended families	-	388	1,361
Households	-	787	2,952

Source: IFLS1, IFLS2, and IFLS3

See text for discussion on different definitions of extended families.

Table 1.2.6 Current Marital Status of the Household Heads, 2000

	2000 "Target" Households			Split-off households		
	Male	Female	Total	Male	Female	Total
% has never married	1.5	6.5	2.4	11.3	49.4	17.4
% married	95.0	15.7	80.7	87.6	18.2	76.5
% separated	0.2	3.3	0.7	0.0	3.5	0.6
% divorced	0.5	10.0	2.2	0.3	7.3	1.4
% widow/er	2.8	64.5	13.9	0.8	21.5	4.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households	6384	1406	7790	2222	423	2645

Source: IFLS3

Table 1.4.1. Sample Sizes

	1997		2000		
	(1)	(2)	(3)	(4)	(5)
All extended families	6,742	6,382	6,774	6,698	6,175
Households	7,619	7,152	10,435	10,022	8,351
Extended families with multiple households	791	703	2,610	2,450	1,723
Households	1,668	1,473	6,271	5,774	3,899
Parent-child extended families	653	562	2,176	2,070	1,510
Households	1,343	1,172	5,075	4,785	3,377
Parent-son extended families	287	240	1,256	1,172	834
Households	578	495	2,730	2,546	1,785
Parent-daughter extended families	388	339	1,361	1,275	907
Households	787	696	2,952	2,771	1,933

See text for discussion on different definitions of extended families.

1) All 1997 households

2) After dropping households with missing observations

3) All 2000 households

4) After dropping households with missing observations

5) After dropping households that cannot be matched with 1997 households

Table 1.4.2 Descriptive Statistics: All Extended Families with Multiple Households, 2000

Number of extended families	1,723	
Number of households	3,889	
	Mean	Std. Dev
HH real expenditure (000 Rp)	983	(1,000)
HH real income (000 Rp)	672	(1,086)
Per capita real expenditure (000 Rp)	295	(332)
Per capita real income (000 Rp)	190	(330)
Household size	3.93	(2.07)
Number of hh members:		
0-5 years	0.49	(0.68)
6-14 years	0.56	(0.87)
15-59 years, male	1.24	(0.97)
15-59 years, female	1.30	(0.89)
60+ years, male	0.15	(0.36)
60+ years, female	0.18	(0.40)
Male household head (=1)	0.82	(0.39)
Age of hh head	43.54	(16.23)
Maximum years of education	9.56	(4.06)
Farm households (=1)	0.32	(0.47)
Urban (=1)	0.50	(0.50)
Median wage, male (Rp)	1,888	(2,221)
Median wage, female (Rp)	1,098	(2,608)
Median prices of sugar (Rp)	3,692	(451)
Median prices of oil (Rp)	3,510	(241)
Real land value (000 Rp)	8,412	(39,100)
Real value of farm bus. assets (000 Rp)	1,302	(8,585)
Real value of non-farm bus. assets (000 Rp)	4,149	(32,500)

Table 1.4.3 Descriptive Statistics: Parent-Child Extended Families, 2000

Number of extended families	1,510					
Number of households	3,377					
	Parent households (n=1,451)		Child households (n=1672)		Parent, child households (n=254)	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
HH real expenditure (000 Rp)	982	(947)	983	(1,038)	883	(786)
HH real income (000 Rp)	727	(1000)	618	(1,109)	630	(1,352)
Per capita real expenditure (000 Rp)	265	(288)	329	(379)	242	(244)
Per capita real income (000 Rp)	194	(288)	190	(364)	167	(388)
Household size	4.22	(2.06)	3.64	(2.04)	4.13	(2.02)
Number of hh members:						
0-5 years	0.34	(0.64)	0.60	(0.69)	0.54	(0.68)
6-14 years	0.66	(0.95)	0.44	(0.79)	0.84	(0.95)
15-59 years, male	1.28	(0.97)	1.23	(0.94)	1.07	(1.16)
15-59 years, female	1.40	(0.89)	1.24	(0.89)	1.30	(0.79)
60+ years, male	0.27	(0.44)	0.06	(0.24)	0.13	(0.34)
60+ years, female	0.28	(0.46)	0.07	(0.27)	0.24	(0.43)
Male household head (=1)	0.82	(0.39)	0.86	(0.35)	0.59	(0.49)
Age of hh head	54.41	(11.80)	33.29	(13.23)	46.87	(14.13)
Maximum years of education	8.95	(4.28)	10.30	(3.69)	8.62	(3.92)
Farm households (=1)	0.42	(0.49)	0.24	(0.42)	0.36	(0.48)
Urban (=1)	0.47	(0.50)	0.54	(0.50)	0.46	(0.50)
Median wage, male (Rp)	1,602	(1,090)	2,178	(2,966)	1,687	(1,934)
Median wage, female (Rp)	855	(1,383)	1,266	(2,401)	1,320	(6,835)
Median prices of sugar (Rp)	3,680	(466)	3,705	(450)	3,721	(402)
Median prices of oil (Rp)	3,499	(243)	3,521	(240)	3,502	(238)
Real land value (000 Rp)	13,100	(48,100)	4,844	(28,900)	7,188	(40,700)
Real value of farm bus. assets (000 Rp)	1,974	(11,900)	769	(3,918)	1,504	(9,487)
Real value of non-farm bus. assets (000 Rp)	3,805	(22,100)	4,273	(40,300)	3,151	(20,40)

Table 1.5.1 Estimates of the Effect of Household Own Income on Household Consumption

	OLS			2SLS		
	No Fixed Effects	Extended-Family Effects		No Fixed Effects	Extended-Family Effects	# Extended Families Households
1997 households						
Extended families w/ multiple households	0.026 (0.006)	0.024 (0.006)	***	0.230 (0.050)	0.187 (0.048)	703 ***
Parent-child extended families	0.023 (0.006)	0.026 (0.007)	***	0.214 (0.057)	0.151 (0.043)	562 ***
Parent-son extended families	0.032 (0.009)	0.031 (0.011)	***	0.306 (0.539)	0.283 (0.729)	240
Parent-daughter extended families	0.022 (0.009)	0.025 (0.010)	**	1.509 (0.494)	1.205 (0.646)	339 *
2000 households that can be matched with 1997 households						
Extended families w/ multiple households	0.022 (0.004)	0.021 (0.004)	***	0.216 (0.031)	0.135 (0.028)	1,723 ***
Parent-child extended families	0.020 (0.004)	0.019 (0.004)	***	0.218 (0.035)	0.128 (0.031)	1,510 ***
Parent-son extended families	0.026 (0.006)	0.025 (0.006)	***	0.284 (0.062)	0.126 (0.044)	834 ***
Parent-daughter extended families	0.016 (0.005)	0.015 (0.006)	***	0.173 (0.040)	0.127 (0.042)	907 ***

Robust standard errors in parentheses. Regression results showing the coefficients on other covariates for the sample of 2000 households are reported in Appendix Table 1.5.2 - 1.5.9

Table 1.5.2 Regression Estimates of the Effect of Changes in Household Own Income on the Changes in Household Consumption

First Differenced Estimation		First Differenced Estimation, 2SLS									
		1		2		3		# Extended Families	# Households		
		No Fixed Effects	Extended-Family Fixed-Effects	No Fixed Effects	Extended-Family Fixed-Effects	No Fixed Effects	Extended-Family Fixed-Effects				
Extended families with multiple households		0.017 (0.003) ***	0.020 (0.004) ***	0.132 (0.049) ***	0.059 (0.033) *	0.136 (0.047) ***	0.072 (0.031) **	0.084 (0.032) ***	0.049 (0.028) *	1,723	3,899
Parent-child extended families		0.019 (0.004) ***	0.019 (0.004) ***	0.133 (0.053) **	0.067 (0.031) **	0.157 (0.053) ***	0.090 (0.031) ***	0.085 (0.033) ***	0.073 (0.028) ***	1,510	3,377

Robust standard errors in parentheses. Regression results showing coefficients on other covariates are reported in Appendix Table 1.5.10- 1.5.14
(1) Instrumental variables not included in the second stage regressions are: log of land value 1997 and changes in land value.

(2) Instrumental variables not included in the second stage regressions are: log of land value 1997, log of business assets 1997, changes in real land value.

(3) Instrumental variables not included in the second stage regressions are: log of land value 1997, log of business assets 1997, changes in real land value, interactions of changes in median real wages (male, female) with maximum years of education 1997.

Appendix Table 1.4.1 Descriptive Statistics: Parent-Son Extended Families, 2000

Number of extended families	834					
Number of households	1,785					
	Parent households(n=780)		Son households (n=812)		Parent, son households (n=193)	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
HH real expenditure (000 Rp)	973	(978)	1,003	(1,033)	914	(832)
HH real income (000 Rp)	706	(957)	629	(1,127)	611	(1,071)
Per capita real expenditure (000 Rp)	273	(315)	343	(418)	248	(266)
Per capita real income (000 Rp)	197	(289)	192	(380)	156	(232)
Household size	4.11	(2.10)	3.75	(2.22)	4.23	(2.15)
Number of hh members:						
0-5 years	0.36	(0.64)	0.58	(0.70)	0.52	(0.69)
6-14 years	0.61	(0.91)	0.45	(0.79)	0.87	(0.98)
15-59 years, male	1.22	(0.94)	1.51	(1.04)	1.15	(1.25)
15-59 years, female	1.34	(0.91)	1.08	(0.90)	1.28	(0.82)
60+ years, male	0.28	(0.45)	0.05	(0.23)	0.15	(0.35)
60+ years, female	0.30	(0.48)	0.07	(0.26)	0.26	(0.44)
Male household head (=1)	0.80	(0.40)	0.94	(0.23)	0.59	(0.49)
Age of hh head	55.05	(12.01)	33.12	(13.04)	48.08	(14.39)
Maximum years of education	8.93	(4.30)	10.29	(3.60)	8.84	(3.81)
Urban (=1)	0.48	(0.50)	0.54	(0.50)	0.48	(0.50)
Farm households (=1)	0.39	(0.49)	0.23	(0.42)	0.35	(0.48)
Median wage, male (Rp)	1,646	(1,078)	2,062	(2,356)	1,736	(2,158)
Median wage, female (Rp)	936	(1,718)	1,226	(1,938)	1,508	(7,829)
Median prices of sugar (Rp)	3,670	(413)	3,709	(426)	3,721	(349)
Median prices of oil (Rp)	3,500	(248)	3,526	(242)	3,504	(247)
Real land value (000 Rp)	12,600	(48,100)	3,908	(25,600)	8,774	(46,500)
Real value of farm bus. assets (000 Rp)	2,370	(14,900)	812	(3,956)	1,861	(10,900)
Real value of non-farm bus. assets (000 Rp)	4,624	(27,000)	3,554	(26,200)	2,985	(17,800)

Appendix Table 1.4.2 Parent-Daughter Extended Families, 2000

Number of extended families	907					
Number of households	1,933					
	Parent households(n=853)		Daughter households (n=893)		Parent, daughter households (n=187)	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
HH real expenditure (000 Rp)	961	(867)	963	(1,023)	866	(784)
HH real income (000 Rp)	734	(1,014)	610	(1,072)	691	(1,522)
Per capita real expenditure (000 Rp)	256	(243)	310	(337)	232	(204)
Per capita real income (000 Rp)	194	(282)	187	(345)	180	(437)
Household size	4.27	(2.12)	3.60	(1.88)	4.13	(2.03)
Number of hh members:						
0-5 years	0.33	(0.64)	0.62	(0.68)	0.55	(0.70)
6-14 years	0.69	(0.99)	0.46	(0.80)	0.86	(0.96)
15-59 years, male	1.31	(0.99)	0.98	(0.77)	1.06	(1.20)
15-59 years, female	1.42	(0.89)	1.40	(0.87)	1.30	(0.74)
60+ years, male	0.26	(0.44)	0.06	(0.25)	0.14	(0.35)
60+ years, female	0.26	(0.45)	0.08	(0.28)	0.22	(0.41)
Male household head (=1)	0.83	(0.37)	0.78	(0.41)	0.60	(0.49)
Age of hh head	53.98	(11.49)	33.74	(13.58)	46.27	(13.37)
Maximum years of education	8.92	(4.23)	10.30	(3.76)	8.56	(4.08)
Farm households (=1)	0.45	(0.50)	0.24	(0.43)	0.35	(0.48)
Urban (=1)	0.47	(0.50)	0.54	(0.50)	0.45	(0.50)
Median wage, male (Rp)	1,584	(1,157)	2,268	(3,391)	1,730	(2,111)
Median wage, female (Rp)	883	(1,678)	1,280	(2,720)	1,462	(7,947)
Median prices of sugar (Rp)	3,690	(503)	3,706	(473)	3,732	(438)
Median prices of oil (Rp)	3,511	(243)	3,521	(242)	3,508	(241)
Real land value (000 Rp)	13,400	(47,200)	5,631	(31,200)	4,781	(14,000)
Real value of farm bus. assets (000 Rp)	1,956	(11,600,)	722	(3,820)	1,157	(5,145)
Real value of non-farm bus. assets (000 Rp)	2,631	(13,300)	4,813	(49,200)	3,633	(23,600)

Appendix Table 1.5.1
Coefficient on Income and Income Changes, No Instrumental Variables

Explanatory variables:	Static	Dynamic
	Coefficient on log(household income)	Coefficient on changes in log(household income)
Household income variable ^{a)}	0.070 (0.004) ***	0.044 (0.003) ***
+ Education variable ^{b)}	0.048 (0.004) ***	0.036 (0.003) ***
+ Household composition variables ^{c)}	0.032 (0.004) ***	0.020 (0.003) ***
Full specification ^{d)}	0.022 (0.003) ***	0.017 (0.003) ***
Number of households	3,899	3,899

The sample consists of households in extended household with multiple sub-households. The dependent variable for the static specification is log(household expenditure) and for the dynamic specification the change in log(household expenditure) between 1997 and 2000. Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %.

a) Household income (static) or changes in household income (dynamic) is the only explanatory variable in the bivariate regression.

b) Maximum education of adult (for the static specification) or its change (for the dynamic specification is added) as an additional explanatory variable.

c) Household composition variables (or their changes) are added as additional explanatory variables. These variables include: log(household size), proportion of household members aged 6-14, 15-59 male and female, 60+ male and female.

d) The full specifications corresponds to the result shown in Table 1.5.1 (for the static specification) and Table 1.5.2 (for the dynamic specification). See Appendix Table 1.5.2 (static) and Appendix Table 1.5.10 (dynamic) for the complete sets of explanatory variables.

Appendix Table 1.5.2
Static Tests: All Extended Families and Parent-Child Extended Families, 2000

Dependent variable: log (household real expenditure)	All Extended Families with Multiple Households		Parent-child Extended Families	
	No Fixed-Effects	Extended-Family Fixed-Effects	No Fixed- Effects	Extended-Family Fixed-Effects
log(hh real income)	0.022 (0.004)***	0.021 (0.004)***	0.020 (0.004)***	0.019 (0.004)***
log(hh size)	0.408 (0.035)***	0.521 (0.042)***	0.410 (0.037)***	0.556 (0.045)***
<u>Proportion of hh members:</u>				
6-14 years	0.564 (0.077)***	0.303 (0.098)***	0.594 (0.082)***	0.307 (0.105)***
15-59 years, male	0.424 (0.078)***	0.299 (0.094)***	0.483 (0.085)***	0.377 (0.101)***
15-59 years, female	0.498 (0.080)***	0.320 (0.102)***	0.513 (0.086)***	0.355 (0.110)***
60+ years, male	0.548 (0.110)***	0.276 (0.133)**	0.536 (0.122)***	0.257 (0.148)*
60+ years, female	0.258 (0.140)*	0.102 (0.158)	0.245 (0.155)	0.205 (0.172)
Male household head (=1)	0.147 (0.032)***	0.138 (0.042)***	0.146 (0.034)***	0.123 (0.045)***
Age of hh head	0.019 (0.004)***	0.014 (0.004)***	0.021 (0.004)***	0.017 (0.005)***
Age of hh head (squared)	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***
Max. years of education	0.068 (0.003)***	0.042 (0.005)***	0.068 (0.003)***	0.040 (0.005)***
Farm households (=1)	-0.036 (0.024)	-0.040 (0.033)	-0.036 (0.026)	-0.048 (0.035)
log (median wage), male	0.092 (0.018)***	0.043 (0.022)*	0.089 (0.019)***	0.040 (0.024)*
log (median wage), female	0.032 (0.012)***	0.025 (0.017)	0.032 (0.013)**	0.011 (0.018)
log (median prices of sugar)	-0.414 (0.170)**	0.313 (0.321)	-0.336 (0.178)*	0.310 (0.342)
log (median prices of oil)	0.268 (0.109)**	0.017 (0.196)	0.281 (0.117)**	-0.137 (0.207)
Constant	11.623 (1.605)***	8.505 (3.034)***	10.871 (1.700)***	9.840 (3.248)***
Number of households	3899	3899	3377	3377
R-squared	0.42	0.33	0.42	0.33
Number of extended families		1723		1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions.

Appendix Table 1.5.3				
Static Tests, 2SLS, 2 nd Stage: All Extended Families and Parent-Child Extended families, 2000				
Dependent variable: log (household real expenditure)	All Extended Families with Multiple Households		Parent-child Extended Families	
	No Fixed Effects	Extended-Family Fixed-Effects	No Fixed Effects	Extended-Family Fixed-Effects
Log(hh real income)	0.216 (0.031)***	0.135 (0.028)***	0.218 (0.035)***	0.128 (0.031)***
Log(hh size)	0.086 (0.069)	0.361 (0.063)***	0.109 (0.073)	0.429 (0.063)***
<u>Proportion of hh members:</u>				
6-14 years	1.099 (0.141)***	0.585 (0.135)***	1.200 (0.162)***	0.604 (0.149)***
15-59 years, male	0.528 (0.109)***	0.381 (0.113)***	0.638 (0.121)***	0.471 (0.121)***
15-59 years, female	0.569 (0.115)***	0.353 (0.120)***	0.643 (0.127)***	0.427 (0.130)***
60+ years, male	0.775 (0.156)***	0.336 (0.157)**	0.695 (0.173)***	0.257 (0.172)
60+ years, female	0.471 (0.186)**	0.237 (0.189)	0.489 (0.207)**	0.334 (0.204)
Male household head (=1)	-0.202 (0.072)***	-0.086 (0.074)	-0.211 (0.080)***	-0.091 (0.080)
Age of hh head	-0.038 (0.010)***	-0.020 (0.010)**	-0.042 (0.012)***	-0.020 (0.012)*
Age of hh head (squared)	0.000 (0.000)***	0.000 (0.000)**	0.000 (0.000)***	0.000 (0.000)
Maximum years of education	0.052 (0.005)***	0.029 (0.006)***	0.053 (0.005)***	0.027 (0.007)***
Farm households (=1)	-0.092 (0.035)***	-0.105 (0.042)**	-0.074 (0.037)**	-0.100 (0.044)**
log (median wage), male	0.053 (0.023)**	0.017 (0.027)	0.055 (0.025)**	0.026 (0.028)
log (median wage), female	0.014 (0.016)	0.008 (0.020)	0.005 (0.018)	-0.009 (0.022)
log (median prices of sugar)	-0.383 (0.232)*	0.289 (0.379)	-0.298 (0.251)	0.289 (0.399)
log (median prices of oil)	0.149 (0.160)	0.176 (0.234)	0.236 (0.173)	0.096 (0.250)
Constant	12.411 (2.220)***	7.488 (3.585)**	11.021 (2.417)***	8.111 (3.821)**
<u>p-values for null hypothesis that:</u>				
- IVs are valid	0.89	0.21	0.93	0.22
- log (hh income) is exogenous	0.00	0.00	0.00	0.00
Number of households	3899	3899	3377	3377
Number of extended-families		1723		1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions. For the 2SLS estimations, instrumental variables not included in the first stage regressions are: log of real value of land owned, farm business assets, and non-farm business assets.

Appendix Table 1.5.4
Static Test, 2SLS, 1st Stage: All Extended Families and Parent-Child Extended Families, 2000

Dependent variable: log (household real income)	All Extended Families with Multiple Households		Parent-child Extended Families	
	No Fixed Effects	Extended-Family Fixed-Effects	No Fixed Effects	Extended-Family Fixed-Effects
log(household size)	1.487 (0.146)***	1.196 (0.177)***	1.418 (0.207)***	1.011 (0.242)***
<u>Proportion of hh members:</u>				
6-14 years	-2.717 (0.332)***	-2.324 (0.403)***	-3.116 (0.440)***	-2.863 (0.568)***
15-59 years, male	-0.388 (0.338)	-0.441 (0.386)	-0.767 (0.455)*	-0.982 (0.548)*
15-59 years, female	-0.227 (0.368)	0.057 (0.418)	-0.738 (0.493)	-0.878 (0.596)
60+ years, male	-1.107 (0.516)**	-0.458 (0.566)	-0.859 (0.689)	-0.165 (0.799)
60+ years, female	-0.854 (0.627)	-1.347 (0.685)**	-1.181 (0.802)	-1.368 (0.933)
Male household head (=1)	1.771 (0.155)***	1.906 (0.176)***	1.672 (0.196)***	1.821 (0.240)***
Age of hh head	0.255 (0.022)***	0.262 (0.018)***	0.296 (0.028)***	0.305 (0.024)***
Age of hh head (squared)	-0.002 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***
Maximum years of education	0.056 (0.013)***	0.081 (0.019)***	0.065 (0.017)***	0.106 (0.027)***
Farm households (=1)	-0.160 (0.151)	-0.324 (0.254)	-0.213 (0.187)	-0.438 (0.344)
log (median wage), male	0.300 (0.072)***	0.288 (0.091)***	0.185 (0.102)*	0.140 (0.130)
log (median wage), female	0.131 (0.048)***	0.132 (0.070)*	0.157 (0.063)**	0.203 (0.097)**
log (median prices of sugar)	-0.415 (0.724)	-1.002 (1.327)	-0.092 (0.975)	0.490 (1.855)
log (median prices of oil)	0.460 (0.466)	0.121 (0.811)	0.271 (0.640)	-1.857 (1.121)*
log (real land value)	0.011 (0.005)**	0.039 (0.011)***	0.009 (0.007)	0.048 (0.016)***
log (real value of farm bus. assets)	0.037 (0.012)***	0.047 (0.021)**	0.036 (0.015)**	0.047 (0.028)*
log (real value of non-farm bus. assets)	0.065 (0.005)***	0.070 (0.008)***	0.062 (0.006)***	0.060 (0.011)***
Constant	-0.685 (6.775)	7.120 (12.412)	-1.605 (9.255)	11.754 (17.601)

(continued)

				(continued)
F-test of exclusionary restrictions	42.28	19.43	32.41	15.82
(p-values)	(0.000)	(0.000)	(0.000)	(0.000)
Number of households	3899	3899	3377	3377
R-squared	0.30	0.33	0.29	0.34
Number of extended-families		1723		1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Instrumental variables not included in the first stage regressions are: log of real value of land owned, farm business assets, and non-farm business assets. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions.

Appendix Table 1.5.5
Static Tests: 2000 Parent-Son and Parent-Daughter Extended Families

Dependent variable: log (household real expenditure)	Parent-Son Extended Families		Parent-Daughter Extended Families		
	Extended-Family		Extended-Family		
	No Fixed Effects	Fixed-Effects	No Fixed Effects	Fixed-Effects	
log(household real income)	0.026 (0.006)***	0.025 (0.006)***	0.016 (0.005) ***		0.015 (0.006)**
log(household size)	0.389 (0.051)***	0.541 (0.059)***	0.420 (0.047) ***		0.577 (0.062)***
<u>Proportion of hh members:</u>					
6-14 years	0.515 (0.112)***	0.210 (0.149)	0.674 (0.110) ***		0.425 (0.141)***
15-59 years, male	0.439 (0.115)***	0.352 (0.138)**	0.453 (0.122) ***		0.440 (0.152)***
15-59 years, female	0.407 (0.131)***	0.172 (0.163)	0.616 (0.107) ***		0.517 (0.147)***
60+ years, male	0.351 (0.165)**	0.001 (0.195)	0.697 (0.163) ***		0.493 (0.205)**
60+ years, female	-0.004 (0.185)	-0.012 (0.224)	0.260 (0.216)		0.398 (0.236)*
Male household head (=1)	0.089 (0.044)**	0.021 (0.058)	0.231 (0.047) ***		0.188 (0.063)***
Age of hh head	0.019 (0.005)***	0.012 (0.006)**	0.021 (0.006) ***		0.019 (0.007)***
Age of hh head (squared)	-0.000 (0.000)***	-0.000 (0.000)*	-0.000 (0.000) ***		-0.000 (0.000)***
Maximum years of education	0.067 (0.004)***	0.036 (0.007)***	0.068 (0.004) ***		0.039 (0.007)***
Farm households (=1)	-0.016 (0.037)	0.021 (0.051)	-0.065 (0.034) *		-0.099 (0.046)**
log (median wage), male	0.066 (0.025)***	-0.034 (0.034)	0.116 (0.027) ***		0.111 (0.033)***
log (median wage), female	0.040 (0.016)**	0.049 (0.023)**	0.021 (0.017)		-0.016 (0.024)
log (median prices of sugar)	-0.597 (0.245)**	-0.230 (0.432)	-0.165 (0.226)		0.632 (0.505)
log (median prices of oil)	0.246 (0.172)	-0.622 (0.311)**	0.325 (0.148) **		-0.044 (0.263)
Constant	13.515 (2.363)***	18.798 (4.378)***	8.873 (2.167) ***		5.854 (4.559)
Number of households	1785	1785	1933		1933
R-squared	0.42	0.36	0.43		0.34
Number of extended-households		834	907		

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions.

Appendix Table 1.5.6
Static Tests, Two-State Least Squares 2nd Stage:
Parent-Son and Parent-Daughter Extended Families, 2000

Dependent variable: log (household real expenditure)	Parent-Son Extended Families		Parent-Daughter Extended Families	
	No Fixed Effects	Extended-Family Fixed -Effects	No Fixed Effects	Extended-Family Fixed -Effects
log(household real income)	0.284 (0.062)***	0.126 (0.044)***	0.173 (0.040)**	0.127 (0.042)***
log(household size)	-0.052 (0.130)	0.401 (0.090)***	0.248 (0.074)**	0.493 (0.079)***
<u>Proportion of hh members:</u>				
6-14 years	1.283 (0.272)***	0.484 (0.208)**	0.975 (0.159)**	0.659 (0.185)***
15-59 years, male	0.635 (0.192)***	0.433 (0.163)***	0.237 (0.162)	0.383 (0.179)**
15-59 years, female	0.245 (0.225)	0.172 (0.188)	0.800 (0.147)**	0.673 (0.181)***
60+ years, male	0.555 (0.276)**	0.025 (0.226)	0.688 (0.199)**	0.407 (0.241)*
60+ years, female	-0.077 (0.317)	-0.004 (0.259)	0.373 (0.236)	0.532 (0.280)*
Male household head (=1)	-0.299 (0.121)**	-0.158 (0.102)	-0.043 (0.090)	-0.037 (0.111)
Age of hh head	-0.050 (0.018)***	-0.019 (0.015)	-0.023 (0.013)*	-0.015 (0.015)
Age of hh head (squared)	0.000 (0.000)***	0.000 (0.000)	0.000 (0.000)*	0.000 (0.000)
Maximum years of education	0.046 (0.009)***	0.025 (0.009)***	0.054 (0.006)**	0.024 (0.009)***
Farm households (=1)	-0.087 (0.062)	-0.045 (0.065)	-0.083 (0.042)**	-0.118 (0.054)**
log (median wage), male	0.057 (0.040)	-0.023 (0.039)	0.075 (0.030)**	0.081 (0.040)**
log (median wage), female	0.039 (0.028)	0.049 (0.027)*	-0.015 (0.022)	-0.053 (0.031)*
log (median prices of sugar)	-0.439 (0.399)	-0.320 (0.500)	-0.247 (0.292)	0.507 (0.592)
log (median prices of oil)	0.104 (0.298)	-0.443 (0.366)	0.277 (0.192)	0.144 (0.315)
Constant	12.840 (3.935)***	17.724 (5.068)***	10.102 (2.782)**	5.518 (5.327)
<u>p-values for null hypothesis that:</u>				
- IVs are valid (over-identification)	0.90	0.47	0.56	0.01
- log (hh income) is exogenous	0.00	0.01	0.00	0.01
Number of households	1785	1785	1933	1933
Number of extended- families		834		907

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions. For the 2SLS estimations, instrumental variables not included in the first stage regressions are: log of real value of land owned, farm business assets, and non-farm business assets.

Appendix Table 1.5.7
Static Tests, Two-State Least Squares 1st Stage:
Parent-Son and Parent-Daughter Extended Families, 2000

Dependent variable: log (household real income)	Parent-Son Extended Families		Parent-Daughter Extended Families	
	No Fixed Effects	Extended -Family Fixed-Effects	No Fixed Effects	Extended -Family Fixed-Effects
log(household size)	1.612 (0.264)***	1.200 (0.329)***	0.971 (0.272)***	0.642 (0.327)*
<u>Proportion of hh members:</u>				
6-14 years	-3.114 (0.630)***	-2.840 (0.831)***	-1.924 (0.578)***	-2.243 (0.741)***
15-59 years, male	-0.763 (0.556)	-0.890 (0.774)	1.307 (0.613)**	0.340 (0.804)
15-59 years, female	0.521 (0.651)	-0.175 (0.914)	-1.230 (0.632)*	-1.602 (0.776)**
60+ years, male	-0.870 (0.878)	-0.374 (1.094)	0.053 (0.882)	0.720 (1.084)
60+ years, female	0.302 (0.867)	-0.157 (1.257)	-0.791 (1.087)	-1.512 (1.250)
Male household head (=1)	1.374 (0.256)***	1.619 (0.324)***	1.628 (0.248)***	1.889 (0.329)***
Age of hh head	0.248 (0.037)***	0.287 (0.034)***	0.267 (0.034)***	0.277 (0.034)***
Age of hh head (squared)	-0.002 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***
Maximum years of education	0.070 (0.022)***	0.095 (0.038)**	0.071 (0.021)***	0.112 (0.036)***
Farm households (=1)	-0.043 (0.227)	0.075 (0.475)	-0.301 (0.270)	-0.824 (0.458)*
log (median wage), male	0.061 (0.143)	-0.054 (0.189)	0.258 (0.135)*	0.249 (0.174)
log (median wage), female	0.020 (0.087)	0.006 (0.130)	0.256 (0.078)***	0.371 (0.129)***
log (median prices of sugar)	-0.239 (1.386)	1.649 (2.425)	0.380 (1.228)	1.043 (2.673)
log (median prices of oil)	0.436 (0.928)	-1.790 (1.739)	0.489 (0.793)	-1.195 (1.398)
log (real land value)	0.014 (0.010)	0.039 (0.023)*	0.012 (0.009)	0.062 (0.019)***
log (real value of farm bus. assets)	0.025 (0.017)	0.026 (0.039)	0.036 (0.021)*	0.044 (0.037)
log (real value of non-farm bus. assets)	0.057 (0.009)***	0.066 (0.016)***	0.062 (0.008)***	0.051 (0.015)***
Constant	0.751 (12.841)	5.050 (24.532)	-7.753 (11.549)	0.218 (24.114)
F-test of exclusionary restrictions (p-values)	14.26 (0.000)	7.45 (0.000)	21.3 (0.000)	9.23 (0.000)
Number of households	1785	1785	1933	1933
R-squared	0.27	0.35	0.33	0.37
Number of extended- families		834		907

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Instrumental variables not included in the first stage regressions are: log of real value of land owned, farm business assets, and non-farm business assets. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions.

Appendix Table 1.5.8
Static Tests, Two-Stage Least Squares with Community Dummy Variables, 2nd Stage:
All Extended Families and Parent-Child Extended Families, 2000

Dependent variable: log (household real expenditure)	All Extended Families with Multiple Households		Parent-Child Extended Families	
	No Fixed Effects	Extended Family Fixed Effects	No Fixed Effects	Extended Family Fixed Effects
log (household real income)	0.256 (0.040)***	0.203 (0.065)***	0.263 (0.048)***	0.212 (0.082)***
log(household size)	-0.023 (0.080)	0.163 (0.135)	-0.009 (0.091)	0.206 (0.145)
Proportion of hh members:				
6-14 years	0.871 (0.131)***	0.561 (0.184)***	0.995 (0.155)***	0.569 (0.215)***
15-59 years, male	0.210 (0.115)*	0.187 (0.168)	0.333 (0.125)***	0.223 (0.185)
15-59 years, female	0.330 (0.117)***	0.214 (0.173)	0.454 (0.128)***	0.323 (0.197)
60+ years, male	0.572 (0.156)***	0.152 (0.225)	0.576 (0.173)***	0.280 (0.259)
60+ years, female	0.149 (0.185)	-0.181 (0.283)	0.161 (0.205)	-0.184 (0.319)
Male household head (=1)	-0.187 (0.073)**	-0.179 (0.117)	-0.170 (0.080)**	-0.127 (0.128)
Age of hh head	-0.023 (0.010)**	-0.023 (0.016)	-0.028 (0.013)**	-0.020 (0.019)
Maximum years of education	0.036 (0.007)***	0.022 (0.011)**	0.035 (0.008)***	0.019 (0.013)
Farm households (=1)	-0.125 (0.039)***	-0.136 (0.067)**	-0.090 (0.041)**	-0.146 (0.074)**
Constant	10.140 (0.769)***	12.010 (1.275)***	10.057 (0.787)***	9.287 (1.810)***
p-values for null hypothesis that:				
- IVs are valid (over-identification test)	0.515	0.577	0.867	0.471
- log (hh real income) is exogenous	0.000	0.000	0.000	0.000
Number of households	3899	3899	3377	3377
Number of extended families		1723		1510
Number of extended families with households in different communities		1124		985

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Instrumental variables not included in the second stage regressions are: log of real value of land owned, farm business assets, and non-farm business assets. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interaction, and community dummy variables

Appendix Table 1.5.9
Static Tests, Two-Stage Least Squares with Community Dummy Variables, 1st Stage:
All Extended Families and Parent-Child Extended Families, 2000

Dependent variable: log (household real income)	All Extended Families with Multiple Households		Households in Parent-child Extended Families	
	No Fixed Effects	Extended-Family Fixed-Effects	No Fixed Effects	Extended-Family Fixed-Effects
log(household size)	1.513 (0.198)***	1.601 (0.286)***	1.471 (0.215)***	1.279 (0.316)***
Proportion of hh members:				
6-14 years	-1.613 (0.483)***	-1.338 (0.614)**	-1.956 (0.528)***	-1.435 (0.660)**
15-59 years, male	0.330 (0.493)	0.336 (0.611)	0.115 (0.525)	0.139 (0.655)
15-59 years, female	-0.119 (0.515)	-0.095 (0.639)	-0.419 (0.553)	-0.473 (0.694)
60+ years, male	-0.976 (0.714)	-0.635 (0.821)	-0.739 (0.771)	-0.826 (0.896)
60+ years, female	0.238 (0.876)	1.238 (0.993)	0.220 (0.869)	0.999 (1.080)
Male household head (=1)	1.330 (0.206)***	1.382 (0.274)***	1.217 (0.216)***	1.181 (0.298)***
Age of hh head	0.211 (0.028)***	0.190 (0.029)***	0.229 (0.030)***	0.192 (0.031)***
Maximum years of education	0.121 (0.018)***	0.093 (0.031)***	0.113 (0.021)***	0.099 (0.033)***
Farm households (=1)	-0.017 (0.206)	0.002 (0.377)	-0.177 (0.194)	-0.187 (0.394)
log (real value of land)	0.006 (0.009)	0.030 (0.017)*	0.008 (0.009)	0.020 (0.018)
log(real value of farm assets)	0.033 (0.017)*	0.023 (0.031)	0.031 (0.016)*	0.043 (0.032)
log(real value of non-farm assets)	0.051 (0.008)***	0.042 (0.013)***	0.046 (0.008)***	0.035 (0.013)***
F-test of exclusionary restrictions (p-values)	17.36 0.000	5.74 0.0007	12.28 0.000	3.88 0.009
Number of households	3,899	3,899	3,377	3,377
Number of extended families		1,723		1,510
Number of extended families with households in different communities		1,124		985
R-squared	0.57	0.71	0.58	0.74

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Instrumental variables not included in the second stage regressions are: log of real value of land owned, farm business assets, and non-farm business assets. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interaction, and community dummy variables.

Appendix Table 1.5.10
Dynamic tests: First Difference Estimation without IVs

Dependent variable: $\Delta \log$ (household expenditure)	All Extended Families with Multiple Households		Parent-child Extended Families	
	No Fixed Effects	Extended-Family Fixed Effects	No Fixed Effects	Extended Family Fixed Effects
	1	2	3	4
$\Delta \log(\text{household income})$	0.017 (0.003)***	0.020 (0.004)***	0.019 (0.004)***	0.019 (0.004)***
$\Delta \log(\text{household size})$	0.030 (0.005)***	0.035 (0.005)***	0.030 (0.005)***	0.034 (0.005)***
Δ proportion of hh members:				
6-14 years	0.542 (0.036)***	0.507 (0.045)***	0.552 (0.039)***	0.529 (0.049)***
15-59 years, male	0.345 (0.086)***	0.316 (0.104)***	0.330 (0.091)***	0.352 (0.112)***
15-59 years, female	0.440 (0.088)***	0.348 (0.105)***	0.480 (0.093)***	0.405 (0.112)***
60+ years, male	0.404 (0.093)***	0.321 (0.111)***	0.442 (0.099)***	0.377 (0.120)***
60+ years, female	-0.079 (0.152)	-0.127 (0.163)	-0.226 (0.167)	-0.129 (0.178)
Δ Male household head (=1)	0.216 (0.130)*	0.094 (0.145)	0.379 (0.143)***	0.129 (0.160)
Δ Age of hh head	0.103 (0.035)***	0.102 (0.044)**	0.128 (0.037)***	0.123 (0.049)**
Δ Maximum years of education	0.083 (0.041)**	0.180 (0.045)***	0.075 (0.044)*	0.162 (0.048)***
Δ Farm households (=1)	-0.018 (0.025)	-0.077 (0.033)**	-0.010 (0.026)	-0.059 (0.036)
$\Delta \log(\text{median wage}), \text{male}$	0.038 (0.018)**	0.069 (0.023)***	0.040 (0.020)**	0.078 (0.025)***
$\Delta \log(\text{median wage}), \text{female}$	0.032 (0.012)***	0.042 (0.016)***	0.036 (0.013)***	0.037 (0.018)**
$\Delta \log(\text{median prices of sugar})$	0.230 (0.075)***	0.117 (0.153)	0.176 (0.082)**	-0.026 (0.168)
$\Delta \log(\text{median prices of oil})$	0.319 (0.115)***	0.351 (0.276)	0.344 (0.123)***	0.302 (0.302)
Constant	-0.107 (0.045)**	0.257 (0.226)	-0.072 (0.049)	0.140 (0.262)
Number of households	3899	3899	3377	3377
R-squared	0.22	0.26	0.22	0.26
Number of extended- families		1723		1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Variables included in the estimations but not reported on the table are 1997 province and 1997 urban dummy variables and province-urban dummy interactions.

Appendix Table 1.5.11
Dynamic tests, 2SLS, 2nd Stage, Households in Extended Families with Multiple Households

Dependent variable: $\Delta \log$ (household expenditure)	No Fixed Effects	Extended- Family FE	No Fixed Effects	Extended- Family FE	No Fixed Effects	Extended- Family FE
	1	2	3	4	5	6
$\Delta \log(\text{household income})$	0.132 (0.049)***	0.059 (0.033)*	0.136 (0.047)***	0.072 (0.031)**	0.084 (0.032)***	0.049 (0.028)*
$\Delta \log(\text{household size})$	0.023 (0.006)***	0.032 (0.006)***	0.023 (0.006)***	0.031 (0.006)***	0.026 (0.005)***	0.033 (0.006)***
<u>Δ proportion of hh members:</u>						
6-14 years	0.316 (0.104)***	0.443 (0.071)***	0.309 (0.101)***	0.421 (0.070)***	0.410 (0.072)***	0.459 (0.064)***
15-59 years, male	0.508 (0.123)***	0.394 (0.125)***	0.513 (0.122)***	0.421 (0.125)***	0.440 (0.102)***	0.375 (0.119)***
15-59 years, female	0.410 (0.104)***	0.366 (0.109)***	0.409 (0.105)***	0.372 (0.111)***	0.423 (0.093)***	0.362 (0.108)***
60+ years, male	0.441 (0.110)***	0.342 (0.115)***	0.442 (0.111)***	0.349 (0.117)***	0.426 (0.098)***	0.337 (0.114)***
60+ years, female	0.215 (0.208)	0.031 (0.213)	0.223 (0.206)	0.086 (0.212)	0.092 (0.170)	-0.008 (0.200)
Δ Male household head (=1)	0.463 (0.180)**	0.196 (0.172)	0.471 (0.179)***	0.231 (0.172)	0.360 (0.148)**	0.171 (0.164)
Δ Age of hh head	-0.095 (0.092)	0.024 (0.080)	-0.101 (0.089)	-0.004 (0.078)	-0.013 (0.064)	0.043 (0.072)
Δ Maximum years of education	-0.094 (0.087)	0.100 (0.081)	-0.099 (0.085)	0.073 (0.079)	-0.020 (0.063)	0.120 (0.072)*
Δ Farm households (=1)	-0.081 (0.039)**	-0.109 (0.043)**	-0.083 (0.039)**	-0.12 (0.043)***	-0.055 (0.031)*	-0.101 (0.040)**
$\Delta \log(\text{median wage}), \text{male}$	-0.001 (0.026)	0.057 (0.025)**	-0.002 (0.026)	0.052 (0.026)**	0.016 (0.021)	0.060 (0.025)**
$\Delta \log(\text{median wage}), \text{female}$	0.022 (0.014)	0.040 (0.017)**	0.022 (0.014)	0.039 (0.017)**	0.026 (0.012)**	0.040 (0.016)**
$\Delta \log(\text{median prices of sugar})$	0.319 (0.089)***	0.116 (0.156)	0.321 (0.089)***	0.116 (0.159)	0.282 (0.077)***	0.116 (0.155)
$\Delta \log(\text{median prices of oil})$	0.144 (0.156)	0.240 (0.298)	0.138 (0.155)	0.201 (0.302)	0.217 (0.132)	0.267 (0.291)
Constant	-0.051 (0.060)	0.163 (0.245)	-0.05 (0.060)	0.13 (0.248)	-0.074 (0.052)	0.186 (0.239)
<u>p-values for null hypothesis that:</u>						
- IVs are valid (overidentification test)	0.32	0.41	0.60	0.21	0.19	0.00
$\sim \log(\text{hh real income})$ is exogenous	0.00	0.12	0.00	0.08	0.02	0.28
Number of households	3899	3899	3899	3899	3899	3899
Number of extended- families		1723		1723		1723

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. In columns (1) and (2), the instrumental variables not included in the second regressions are: log of land value 1997, changes in land value. In columns (3) and (4), the instrumental variables not included in the second regressions are: log of land value 1997, log of business assets 1997, changes in real land value. In columns (5) and (6) Instrumental variables not included in the second regressions are: log of land value 1997, log of business assets 1997, changes in real land value, interactions of changes in median real wages (male, female) with maximum years of education 1997.

Appendix Table 1.5.12
Dynamic tests, 2SLS, 1st Stage, Households in Extended Families with Multiple Households

Dependent variable: $\Delta \log(\text{household real income})$	No Fixed Effects	Extended Family FE	No Fixed Effects	Extended Family FE	No Fixed Effects	Extended Family FE
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \log(\text{household size})$	1.944 (0.206)***	1.653 (0.253)***	1.922 (0.208)***	1.622 (0.254)***	1.907 (0.208)***	1.624 (0.253)***
<u>Δ proportion of hh members:</u>						
6-14 years	-1.493 (0.468)***	-2.194 (0.596)***	-1.513 (0.469)***	-2.241 (0.596)***	-1.555 (0.471)***	-2.201 (0.595)***
15-59 years, male	0.237 (0.530)	-0.585 (0.604)	0.220 (0.531)	-0.636 (0.604)	0.201 (0.531)	-0.576 (0.605)
15-59 years, female	-0.333 (0.509)	-0.635 (0.638)	-0.366 (0.511)	-0.693 (0.638)	-0.428 (0.510)	-0.679 (0.638)
60+ years, male	-2.630 (0.924)***	-4.275 (0.928)***	-2.617 (0.923)***	-4.338 (0.928)***	-2.641 (0.925)***	-4.288 (0.928)***
60+ years, female	-2.151 (0.748)***	-2.701 (0.831)***	-2.188 (0.751)***	-2.768 (0.831)***	-2.265 (0.751)***	-2.732 (0.830)***
Δ Male household head (=1)	1.721 (0.218)***	2.052 (0.250)***	1.716 (0.218)***	2.038 (0.250)***	1.725 (0.218)***	2.054 (0.249)***
Δ Age of hh head	1.437 (0.247)***	1.874 (0.254)***	1.432 (0.247)***	1.887 (0.254)***	1.439 (0.247)***	1.884 (0.254)***
Δ Maximum years of education	0.059 (0.027)**	0.086 (0.029)***	0.059 (0.027)**	0.086 (0.029)***	0.055 (0.027)**	0.084 (0.029)***
Δ Farm households (=1)	0.267 (0.164)	0.070 (0.232)	0.245 (0.164)	0.049 (0.232)	0.236 (0.165)	0.059 (0.232)

(continued)

(continued)

Δ log (median wage), male	0.334	0.314	0.332	0.304	1.053	0.756
	(0.105)***	(0.130)**	(0.106)***	(0.130)**	(0.301)***	(0.387)*
Δ log (median wage), female	0.102	0.079	0.103	0.083	-0.304	-0.496
	(0.060)*	(0.092)	(0.060)*	(0.092)	(0.158)*	(0.249)**
Δ log (median prices of sugar)	-0.817	-0.046	-0.810	-0.022	-0.825	-0.020
	(0.379)**	(0.878)	(0.378)**	(0.877)	(0.378)**	(0.881)
Δ log (median prices of oil)	1.675	2.890	1.686	3.037	1.683	2.991
	(0.625)***	(1.588)*	(0.625)***	(1.588)*	(0.628)***	(1.589)*
<u>Instrumental variables excluded from the second stage:</u>						
log (real land value) 1997	0.032	-0.033	0.039	-0.008	0.039	-0.004
	(0.011)***	(0.025)	(0.012)***	(0.028)	(0.012)***	(0.028)
Δ log (real land value)	0.050	0.075	0.052	0.076	0.052	0.076
	(0.011)***	(0.015)***	(0.011)***	(0.015)***	(0.011)***	(0.015)***
log (real value of bus. assets) 1997			-0.016	-0.050	-0.017	-0.053
			(0.012)	(0.025)**	(0.012)	(0.025)**
Δ log (median wage, male) x max. educ 1997					-0.077	-0.044
					(0.029)***	(0.035)
Δ log (median wage, male) x max. educ 1997					0.044	0.059
					(0.016)***	(0.024)**
Constant	-0.561	2.591	-0.483	2.992	-0.498	3.045
	(0.239)**	(1.298)**	(0.248)*	(1.312)**	(0.249)**	(1.314)**
F-test of identifying IVs	12.45	15.09	8.95	11.40	7.64	8.24
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of households	3899	3899	3899	3899	3899	3899
R-squared	0.18	0.23	0.18	0.23	0.18	0.23
Number of extended families		1723		1723		1723

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %.

Appendix Table 5.13
Dynamic tests, 2SLS, 2nd Stage, Parent-Child Extended Families

Dependent variable: $\Delta \log$ (household expenditure)	No Fixed Effects	Extended Family FE	No Fixed Effects	Extended Family FE	No Fixed Effects	Extended Family FE
	1	2	3	4	5	6
$\Delta \log(\text{household income})$ (0.053)**	0.133 (0.031)**	0.067 (0.053)***	0.157 (0.031)***	0.090 (0.033)***	0.085 (0.028)***	0.073 (0.028)*
$\Delta \log(\text{household size})$	0.021 (0.007)***	0.030 (0.006)***	0.020 (0.007)***	0.028 (0.007)***	0.025 (0.005)***	0.029 (0.006)***
<u>Δ proportion of hh members:</u>						
6-14 years	0.346 (0.105)***	0.456 (0.069)***	0.304 (0.106)***	0.421 (0.071)***	0.433 (0.070)***	0.447 (0.066)***
15-59 years, male	0.510 (0.137)***	0.444 (0.131)***	0.547 (0.142)***	0.489 (0.135)***	0.434 (0.110)***	0.456 (0.129)***
15-59 years, female	0.476 (0.110)***	0.437 (0.118)***	0.475 (0.116)***	0.452 (0.123)***	0.477 (0.099)***	0.441 (0.119)***
60+ years, male	0.504 (0.120)***	0.410 (0.126)***	0.517 (0.127)***	0.427 (0.131)***	0.478 (0.106)***	0.415 (0.127)***
60+ years, female	0.061 (0.224)	0.079 (0.229)	0.119 (0.233)	0.179 (0.235)	-0.061 (0.182)	0.105 (0.221)
Δ Male household head (=1)	0.636 (0.201)***	0.250 (0.184)	0.689 (0.208)***	0.308 (0.189)	0.527 (0.163)***	0.265 (0.181)
Δ Age of hh head	-0.083 (0.107)	0.015 (0.087)	-0.127 (0.107)	-0.037 (0.088)	0.006 (0.071)	0.002 (0.080)
Δ Maximum years of education	-0.127 (0.106)	0.057 (0.085)	-0.169 (0.106)	0.006 (0.086)	-0.042 (0.072)	0.044 (0.078)
Δ Farm households (=1)	-0.052 (0.036)	-0.086 (0.041)**	-0.061 (0.038)	-0.098 (0.042)**	-0.034 (0.030)	-0.089 (0.040)**
$\Delta \log(\text{median wage}), \text{male}$	-0.004 (0.029)	0.067 (0.026)**	-0.013 (0.030)	0.062 (0.027)**	0.015 (0.023)	0.066 (0.026)**
$\Delta \log(\text{median wage}), \text{female}$	0.018 (0.016)	0.030 (0.019)	0.014 (0.017)	0.027 (0.020)	0.025 (0.014)*	0.030 (0.019)
$\Delta \log(\text{median prices of sugar})$	0.255 (0.094)***	-0.037 (0.175)	0.272 (0.099)***	-0.042 (0.182)	0.222 (0.081)***	-0.038 (0.176)
$\Delta \log(\text{median prices of oil})$	0.180 (0.164)	0.179 (0.323)	0.146 (0.171)	0.120 (0.335)	0.249 (0.139)*	0.164 (0.324)
Constant	-0.011 (0.066)	-0.021 (0.291)	0.002 (0.069)	-0.099 (0.301)	-0.037 (0.056)	-0.041 (0.289)
<u>p-values for null hypothesis that:</u>						
- IVs are valid (overidentification test)	0.61	0.59	0.47	0.00	0.09	0.00
$\sim \log(\text{hh real income})$ is exogenous	0.01	0.12	0.00	0.01	0.03	0.04
Number of households	3377	3377	3377	3377	3377	3377
Number of extended-families		1510		1510		1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. In columns (1) and (2), the instrumental variables not included in the second regressions are: log of land value 1997, changes in land value. In columns (3) and (4), the instrumental variables not included in the second regressions are: log of land value 1997, log of business assets 1997, changes in real land value. In columns (5) and (6), the instrumental variables not included in the second regressions are: log of land value 1997, log of business assets 1997, changes in real land value, interactions of changes in median real wages (male, female) with maximum years of education 1997.

Appendix Table 1.5.14
Dynamic tests, 2SLS, 1st Stage, Parent-Child Extended Families

Dependent variable: $\Delta \log$ (household real income)	No Fixed Effects		Extended Family Fixed Effects		No Fixed Effects		Extended Family Fixed Effects		No Fixed Effects		Extended Family Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\Delta \log(\text{household size})$	1.780 (0.223)***	1.526 (0.272)***	1.757 (0.225)***	1.506 (0.272)***	1.735 (0.225)***	1.511 (0.272)***						
<u>Δ proportion of hh members:</u>												
6-14 years	-1.660 (0.507)***	-2.132 (0.632)***	-1.685 (0.508)***	-2.185 (0.632)***	-1.713 (0.509)***	-2.165 (0.631)***						
15-59 years, male	0.020 (0.565)	-0.807 (0.635)	-0.003 (0.566)	-0.850 (0.635)	-0.022 (0.565)	-0.782 (0.635)						
15-59 years, female	-0.553 (0.546)	-0.818 (0.678)	-0.602 (0.547)	-0.879 (0.679)	-0.669 (0.545)	-0.890 (0.678)						
60+ years, male	-2.583 (0.973)***	-4.564 (0.999)***	-2.559 (0.971)***	-4.608 (0.999)***	-2.571 (0.973)***	-4.552 (0.998)***						
60+ years, female	-2.257 (0.799)***	-2.645 (0.901)***	-2.319 (0.803)***	-2.710 (0.901)***	-2.418 (0.802)***	-2.700 (0.900)***						
Δ Male household head (=1)	1.849 (0.238)***	2.288 (0.269)***	1.840 (0.238)***	2.273 (0.269)***	1.835 (0.237)***	2.261 (0.269)***						
Δ Age of hh head	1.668 (0.264)***	2.005 (0.267)***	1.661 (0.264)***	2.016 (0.266)***	1.665 (0.264)***	2.013 (0.266)***						
Δ Maximum years of education	0.073 (0.030)**	0.084 (0.031)***	0.073 (0.030)**	0.083 (0.031)***	0.068 (0.030)**	0.080 (0.031)***						
Δ Farm households (=1)	0.076 (0.166)	-0.270 (0.247)	0.046 (0.166)	-0.293 (0.248)	0.042 (0.166)	-0.269 (0.247)						

(continued)

(continued)

$\Delta \log (\text{median wage}), \text{male}$	0.378 (0.115)***	0.232 (0.139)*	0.376 (0.115)***	0.227 (0.139)	1.247 (0.341)***	0.895 [0.434]**
$\Delta \log (\text{median wage}), \text{female}$	0.165 (0.065)**	0.164 (0.100)*	0.166 (0.065)**	0.165 (0.100)*	-0.215 (0.170)	-0.490 [0.272]*
$\Delta \log (\text{median prices of sugar})$	-0.732 (0.406)*	0.323 (0.953)	-0.720 (0.406)*	0.324 (0.953)	-0.740 (0.404)*	0.280 [0.953]
$\Delta \log (\text{median prices of oil})$	1.586 (0.656)**	2.320 (1.716)	1.593 (0.657)**	2.492 (1.718)	1.580 (0.660)**	2.427 [1.716]
<u>Instrumental variables excluded from the second stage:</u>						
$\log (\text{real land value}) 1997$	0.029 (0.012)**	-0.050 (0.028)*	0.036 (0.012)***	-0.025 (0.031)	0.038 (0.012)***	-0.019 [0.031]
$\Delta \log (\text{real land value})$	0.050 (0.011)***	0.082 (0.016)***	0.052 (0.011)***	0.083 (0.016)***	0.052 (0.011)***	0.083 [0.016]***
$\log (\text{real value of bus. assets}) 1997$			-0.020 (0.013)	-0.050 (0.029)*	-0.020 (0.013)	-0.053 [0.029]*
$\Delta \log (\text{median wage, male}) \times \text{max. educ } 1997$					-0.092 (0.033)***	-0.064 [0.040]
$\Delta \log (\text{median wage, male}) \times \text{max. educ } 1997$					0.042 (0.018)**	0.067 [0.026]**
Constant	-0.613 (0.264)**	3.721 (1.478)**	-0.516 (0.272)*	4.070 (1.491)***	-0.541 (0.275)**	4.183 [1.490]***
F-test of identifying IVs (p-value)	10.74 (0.000)	16.98 (0.000)	8.26 (0.000)	12.34 (0.000)	6.98 (0.000)	9.02 (0.000)
Number of households	3377	3377	3377	3377	3377	3377
R-squared	0.18	0.24	0.18	0.24	0.18	0.24
Number of extended-families		1510		1510		1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %.

Appendix Table 1.5.15
Do other households' resources affect own household's consumption?
2SLS: Second Stage Regressions

Dependent variable: log (household real expenditure)	All extended families with multiple sub-households	Parent-child extended families
log (hh's income)	0.181 (0.027)***	0.180 (0.029)***
log (other hh's income)	0.032 (0.031)	0.030 (0.032)
<u>Own hh's variables</u>		
log(household size)	0.167 (0.061)***	0.188 (0.065)***
<u>Proportion of hh members:</u>		
6-14 years	0.929 (0.282)***	0.992 (0.309)***
15-59 years, male	0.253 (0.219)	0.313 (0.234)
15-59 years, female	0.765 (0.221)***	0.781 (0.245)***
60+ years, male	0.636 (0.348)*	0.597 (0.407)
60+ years, female	0.076 (0.405)	-0.047 (0.461)
Male household head (=1)	-0.131 (0.065)**	-0.139 (0.070)**
Age of hh head	-0.028 (0.009)***	-0.031 (0.010)***
Maximum years of education	0.038 (0.008)***	0.037 (0.009)***
Farm households (=1)	-0.100 (0.047)**	-0.081 (0.051)
log (median wage), male	0.046 (0.022)**	0.049 (0.024)**
log (median wage), female	0.008 (0.016)	-0.002 (0.017)
log (median prices of sugar)	0.012 (0.403)	0.172 (0.434)
log (median prices of oil)	0.056 (0.307)	0.021 (0.335)
<u>Other hh's variables</u>		
log(household size)	0.010 (0.021)	0.015 (0.023)
<u>Proportion of hh members:</u>		
6-14 years	0.061 (0.303)	0.069 (0.325)
15-59 years, male	0.276 (0.226)	0.311 (0.238)
15-59 years, female	-0.275 (0.230)	-0.223 (0.247)
60+ years, male	0.381 (0.430)	0.536 (0.482)
60+ years, female	0.110 (0.372)	0.096 (0.433)

(continued)

(continued)

Other hh's variables

Male household head (=1)	-0.088 (0.069)	-0.081 (0.071)
Age of hh head	-0.010 (0.011)	-0.011 (0.012)
Maximum years of education	0.013 (0.006)**	0.014 (0.006)**
Farm households (=1)	0.021 (0.033)	0.018 (0.035)
log (median wage), male	0.035 (0.024)	0.034 (0.025)
log (median wage), female	0.009 (0.017)	0.021 (0.018)
log (median prices of sugar)	-0.099 (0.171)	-0.005 (0.184)
log (median prices of oil)	-0.271 (0.235)	-0.241 (0.252)
Constant	12.653 (2.344)***	10.639 (2.532)***

p-value : significance of other hh's variables 61.61 (0.012) 59.18 (0.020)

p-values of null hypothesis that:

- IVs are valid (overidentification test)	0.039	0.052
- Own hh income exogenous	0.000	0.000
- Other hh income exogenous	0.221	0.258

Number of households	3899	3377
Number of extended families	1723	1510

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions. For the 2SLS estimations, instrumental variables not included in the first stage regressions are: own household's and other households' log of real value of land owned, farm business assets, non-farm business assets.

Appendix Table 1.5.16
Do other households' resources affect own household's consumption?
2SLS: First Stage Regressions

	All extended families with multiple households		Parent-child extended families	
	Dependent variable: log (other hh's real income)			
<u>Own hh's variables</u>				
log(household size)	1.504 (0.191)***	0.194 (0.162)	1.388 (0.208)***	0.301 (0.176)*
<u>Proportion of hh members:</u>				
6-14 years	-2.599 (0.984)***	4.263 (0.554)***	-2.570 (1.092)**	4.176 (0.635)***
15-59 years, male	0.520 (0.800)	4.718 (0.452)***	0.615 (0.858)	4.782 (0.509)***
15-59 years, female	-1.485 (0.907)	4.250 (0.492)***	-1.659 (1.013)	4.484 (0.579)***
60+ years, male	-1.021 (1.888)	3.214 (0.850)***	-0.100 (2.058)	2.936 (1.038)***
60+ years, female	-2.191 (1.971)	1.327 (1.232)	-2.153 (1.890)	1.437 (1.330)
Male household head (=1)	1.694 (0.185)***	-0.273 (0.142)*	1.667 (0.197)***	-0.275 (0.162)*
Age of hh head	0.263 (0.027)***	-0.001 (0.016)	0.285 (0.029)***	-0.003 (0.016)
Maximum years of education	0.081 (0.025)***	-0.151 (0.023)***	0.079 (0.026)***	-0.142 (0.025)***
Farm households (=1)	-0.001 (0.268)	0.290 (0.235)	-0.298 (0.292)	0.489 (0.282)*
log (median wage), male	0.218 (0.094)**	-0.002 (0.065)	0.170 (0.106)	-0.004 (0.073)
log (median wage), female	0.128 (0.062)**	0.007 (0.049)	0.167 (0.067)**	0.008 (0.053)
log (median prices of sugar)	1.177 (1.785)	-0.113 (1.464)	0.804 (1.820)	-0.920 (1.709)
log (median prices of oil)	-1.113 (1.291)	0.842 (1.095)	-1.504 (1.344)	1.447 (1.214)
<u>Other hh's variables</u>				
log(household size)	-0.091 (0.077)	0.156 (0.058)***	-0.115 (0.085)	0.185 (0.067)***
<u>Proportion of hh members:</u>				
6-14 years	-0.296 (1.068)	-5.035 (0.705)***	-0.580 (1.183)	-4.691 (0.779)***
15-59 years, male	-1.347 (0.827)	-5.167 (0.419)***	-1.556 (0.896)*	-5.114 (0.459)***
15-59 years, female	1.235 (0.917)	-4.912 (0.443)***	1.189 (1.015)	-4.897 (0.496)***

(continued)

(continued)

<u>Other hh's variables</u>				
60+ years, male	1.233 (2.129)	-1.291 (1.475)	1.174 (2.055)	-1.105 (1.617)
60+ years, female	-0.333 (1.999)	-4.494 (0.944)***	-0.854 (2.149)	-4.296 (1.130)***
Male household head (=1)	-0.087 (0.134)	1.842 (0.181)***	-0.098 (0.143)	1.785 (0.193)***
Age of hh head	0.009 (0.017)	0.298 (0.027)***	0.008 (0.017)	0.311 (0.030)***
Maximum years of education	-0.009 (0.015)	0.131 (0.015)***	-0.011 (0.016)	0.117 (0.017)***
Farm households (=1)	-0.095 (0.215)	-0.157 (0.141)	0.093 (0.249)	-0.198 (0.157)
log (median wage), male	-0.029 (0.082)	0.200 (0.096)**	0.016 (0.088)	0.179 (0.107)*
log (median wage), female	-0.046 (0.062)	0.067 (0.058)	-0.043 (0.065)	0.099 (0.063)
log (median prices of sugar)	1.348 (0.708)*	0.018 (0.645)	1.479 (0.750)**	-0.180 (0.705)
log (median prices of oil)	-0.078 (1.045)	0.145 (0.918)	0.081 (1.090)	0.144 (1.082)
<u>IVs Excluded from 2nd Stage</u>				
log(own land)	0.014 (0.007)**	-0.028 (0.009)***	0.013 (0.007)*	-0.028 (0.011)***
log (own farm prod. assets)	0.032 (0.014)**	0.007 (0.018)	0.036 (0.015)**	-0.010 (0.022)
log (own non-farm prod. assets)	0.063 (0.006)***	-0.000 (0.007)	0.061 (0.006)***	0.000 (0.008)
log (other's land)	-0.040 (0.011)***	0.002 (0.007)	-0.039 (0.012)***	0.001 (0.008)
log (other's farm bus. assets)	0.024 (0.020)	0.041 (0.013)***	0.006 (0.022)	0.044 (0.014)***
log (other's non-farm bus. assets)	-0.000 (0.008)	0.054 (0.005)***	0.003 (0.008)	0.056 (0.006)***
Constant	-10.523 (9.133)	-6.461 (8.383)	-7.146 (9.920)	-3.898 (9.224)
<u>F-test of identifying IVs (p-values)</u>				
Land and bus. assets (own hh)	40.97 (0.000)	3.710 (0.011)	32.35 (0.000)	3.60 (0.013)
Land and bus assets (other hh)	4.72 (0.003)	41.62 (0.000)	4.15 (0.006)	35.43 (0.006)
Land and bus assets (own, other hh)	22.47(0.000)	22.22 (0.000)	18.07 (0.000)	19.00 (0.000)
Number of households	3899	3899	3377	3377
Number of extended families	1723	1723	1510	1510
R-squared	0.31	0.32	0.31	0.32

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Instrumental variables not included in the first stage regressions are: own hh's and other hh's log of real value of land owned, farm business assets, and non-farm business assets. Variables included in the estimations but not reported on the table are province and urban dummy variables and their interactions.

Appendix Table 1.5.17
Do other households' resources affect own household's consumption?
Reduced Form Regressions

Dependent variable: log (household real expenditure)	OLS: All extended families with multiple sub-households	OLS: Parent-child extended families
<u>Own hh's variables</u>		
log(household size)	0.447 (0.034)***	0.448 (0.037)***
<u>Proportion of hh members:</u>		
6-14 years	0.563 (0.182)***	0.615 (0.196)***
15-59 years, male	0.475 (0.134)***	0.548 (0.149)***
15-59 years, female	0.612 (0.134)***	0.598 (0.143)***
60+ years, male	0.542 (0.280)*	0.657 (0.341)*
60+ years, female	-0.318 (0.301)	-0.443 (0.318)
Male household head (=1)	0.162 (0.031)***	0.149 (0.034)***
Age of hh head	0.020 (0.004)***	0.021 (0.004)***
Maximum years of education	0.048 (0.005)***	0.047 (0.005)***
Farm households (=1)	-0.081 (0.062)	-0.092 (0.066)
log (median wage), male	0.087 (0.018)***	0.081 (0.019)***
log (median wage), female	0.032 (0.012)***	0.030 (0.013)**
log (median prices of sugar)	0.182 (0.312)	0.242 (0.343)
log (median prices of oil)	-0.084 (0.233)	-0.168 (0.251)
log(own land) x 10 ⁻²	0.318 (0.211)	0.274 (0.002)
log (own farm prod. assets) x 10 ⁻²	0.611 (0.424)	0.669 (0.004)
log (own non-farm prod. assets) x	1.328 (0.154)***	1.296 (0.166)***
<u>Other hh's variables</u>		
log(household size)	-0.003 (0.016)	-0.002 (0.017)
<u>Proportion of hh members:</u>		
6-14 years	-0.118 (0.195)	-0.134 (0.210)
15-59 years, male	-0.099 (0.129)	-0.092 (0.144)

(continued)

(continued)

15-59 years, female	-0.181 (0.126)	-0.128 (0.133)
60+ years, male	0.632 (0.330)*	0.796 (0.352)**
60+ years, female	-0.085 (0.293)	-0.178 (0.359)
Male household head (=1)	-0.043 (0.027)	-0.044 (0.029)
Age of hh head	0.001 (0.004)	-0.001 (0.004)
Maximum years of education	0.015 (0.003)***	0.014 (0.003)***
Farm households (=1)	-0.026 (0.038)	-0.021 (0.041)
log (median wage), male	0.039 (0.017)**	0.044 (0.019)**
log (median wage), female	0.006 (0.013)	0.019 (0.014)
log (median prices of sugar)	0.135 (0.125)	0.251 (0.131)*
log (median prices of oil)	-0.253 (0.182)	-0.188 (0.200)
log (other's land) x 10 ⁻²	0.099 (0.189)	0.126 (0.207)
log (other's farm bus. assets) x 10 ⁻²	0.160 (0.309)	0.077 (0.339)
log (other's non-farm bus. assets) x 10 ⁻²	0.190 (0.144)	0.211 (0.157)
F-test		
Land and bus. assets (own)	28.36 (0.000)	22.80 (0.000)
Land and bus. assets (other)	0.96 (0.409)	0.86 (0.462)
All own hh's variables	27.01 (0.000)	22.99 (0.000)
All other hh's variables	2.09 (0.001)	2.02 (0.0001)
Constant	10.417 (1.860)***	9.040 (1.985)***
Number of households	3899	3377

Standard errors (in parentheses) are robust to serial correlation and heteroskedasticity. *** indicates statistical significance at 1%, ** at 5%, and * at 10 %. Omitted variables are proportion of hh members age 0-4, female hh head, and non-farm household. Variables included in the estimations but not reported on the table are province and urban dummy variables and province-urban dummy interactions.

BIBLIOGRAPHY

- Altonji, Joseph G., Fumio Hayashi, and Laurence J. Kotlikoff (1997), "Parental Altruism and Inter Vivos Transfers: Theory and Evidence", *Journal of Political Economy* 105:6, p.1121-66.
- Altonji, Joseph G., Fumio Hayashi, and Laurence J. Kotlikoff (1992), "Is the Extended Family Altruistically Linked? Direct Tests Using Micro Data", *American Economic Review*, 82:5, p.1177-98.
- Bergstorm, Theodore C. (1996), "Economics in a Family Way", *Journal of Economic Literature*, 34:4, p.1903-34.
- Cameron, Lisa and Deborah Cobb-Clark (2001), "Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements" *Working Paper No.773*, Department of Economics, University of Melbourne, Australia.
- Chiappori, Pierre-Andre (1988), "Nash-Bargained Household Decision". *International Economic Review*, 29:4, p. 791-96.
- Cochrane, John (1991), "A Simple Test of Consumption Insurance", *Journal of Political Economy*, 99, p.857-76.
- Cox, Donald and Emmanuel Jimenez (1990), "Achieving Social Objectives through Private Transfers", *World Bank Research Observer*, 5:2, p.205-18.
- Foster, Andrew, and Mark R. Rosenzweig (2002), "Household Division and Rural Economic Growth" *Review of Economic Studies*, 69, p.839-69.
- Foster, Andrew, and Mark R. Rosenzweig (2001), "Imperfect Commitment, Altruism, and the Family: Evidence from Transfer Behavior in Low-Income Rural Areas", *The Review of Economics and Statistics*, 83:3 p.389-407.
- Foster, Andrew (1993), "Household Partition in Rural Bangladesh", *Population Studies*, 47, p.97-114
- Frankenberg, E., J.P. Smith, and D.Thomas (2003), "Economic Shocks, Wealth and Welfare", *The Journal of Human Resources*, 38:2, p. 280-321.
- Frankenberg, Elizabeth, Lee Lillard, and Robert J. Willis (2002), "Patterns of Intergenerational Transfers in Southeast Asia", *Journal of Marriage and Family*, 64, p. 627-41.
- Frankenberg, Elizabeth and Lynn Karoly (1995). *The 1993 Indonesian Family Life*

Survey: Overview and field report, Publication No. DRU-1195/1-NICHD/AID, RAND, Santa Monica, CA.

Frankenberg, Elizabeth and Duncan Thomas, (2000), "The Indonesia Family Life Survey (IFLS): Study Design and Results from Waves 1 and 2." RAND, Santa Monica, CA. DRU-2238/1-NIA/NICHD.

Frankenberg, Elizabeth, Duncan Thomas, and Kathleen Beegle (1999) "The Real Costs of Indonesia's Economic Crisis: Preliminary Findings from the Indonesia Family Life Surveys" *RAND DRU 2064*. Santa Monica: RAND.

Grimard, Franque (1997), "Household Consumption Smoothing through Ethnic Ties: Evidence from Cote d'Ivoire", *Journal of Development Economics*, 53, p.391-422.

Haddad, L., J. Hoddinott, and H. Alderman (1997) eds. *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*, Baltimore: John Hopkins University Press.

Hayashi, Fumio, Joseph Altonji, and Laurence Kotlikoff (1996), "Risk-Sharing between and within Families" *Econometrica*, 62:2, p.261-94.

Hill, Daniel, and Robert J. Willis (2001), "Reducing Panel Attrition" *The Journal of Human Resources*, 36:3 p.416-38.

Jones, Gavin (1994), *Marriage and Divorce in Islamic Southeast Asia*, Kuala Lumpur: Oxford University Press.

Levine, David and Michael Kevane (2003), "Are Investments in Daughters Lower when Daughters Move Away? Evidence from Indonesia", *World Development*, 31:6, p. 1065-1084.

Lillard, Lee and Robert J. Willis (1997), "Motives for Intergenerational Transfers: Evidence from Malaysia", *Demography* 34, p.115-34.

Mace, Barbara (1991), "Full Insurance in the Presence of Aggregate Uncertainty", *The Journal of Political Economy*, 99:5, p.928-956.

McGarry, Kathleen, Robert F. Schoeni, (1995), "Transfer Behavior in the Health and Retirement Study: Measurement and Redistribution of Resources within the Family", *The Journal of Human Resources*, 30, p. S184-S226.

Ravallion, Martin and Loraine Dearden (1988), "Social Security in a "Moral Economy": An Empirical Analysis of Java", *The Review of Economics and Statistics*, 70: 1, p.36-44.

- Rosenzweig, Mark R., Oded Stark (1989), "Consumption Smoothing, Migration, and Marriage: Evidence from Rural India", *The Journal of Political Economy*, 97:4 p. 905-926.
- Strauss, John, Kathleen Beegle, Bondan Sikoki, and Agus Dwiyanto, Yulia Herawati and Firman Witoelar, *The Third Wave of the Indonesia Family Life Survey (IFLS3): Overveiw and Field Report*. RAND, Santa Monica, California.
- Strauss, John, Germano Mwabu and Kathleen Beegle (2000), "Intrahousehold Allocations: a Review of Theories and Empirical Evidence", *Journal of African Economies*, 9, p.83-143.
- Thomas, Duncan, James P. Smith, and Elizabeth Frankenberg (2001), "Lost but Not Forgotten", *Journal of Human Resources*, 36:3, p. 556-92.
- Thomas, Duncan (1994), "Like Father, Like Son; Like Mother Like Daughter: Parental Resources and Child Height" *The Journal of Human Resources*, 29:4 p.951-88
- Thomas, Duncan (1993), "The Distribution of Income and Expenditure within the Household", *Annales d'Economie et de Statistique* 29, p. 110-35.
- Thomas, Duncan (1990), "Intra-household Resource Allocations: An Inferential Approach", *Journal of Human Resources*, 25:4, p. 635-64.
- Townsend, Robert (1994), "Risk and Insurance in Village India", *Econometrica*, 62, p.539-92.
- Weiss, Yoram (1997) "The Formation and Dissolution of Families: Why Marry? Who Marries Whom? And What Happens Upon Divorce", in M.Rosenzweig and O. Stark (eds). *Handbook of Population and Family Economics*, vol, Amsterdam: North-Holland.
- Weiss, Yoram and Robert J. Willis (1985), "Children as Collective Goods and Divorce Settlements", *Journal of Labor Economics* 3:3, p. 268-92.

CHAPTER 2

DETERMINANTS OF HOUSEHOLD DIVISION:

A CASE FROM A DEVELOPING COUNTRY

2. 1 Introduction

When a daughter leaves her parents to set up a new household with her husband, or a son sets out to other villages to find employment opportunity outside his village, the parents as well as the child may lose some of the benefits associated with living in a joint household. For instance, the ability to pool resources and to share consumption may diminish as the child ceases to contribute directly to the household economy. When the departing child also has some claims on the parents' assets, for instance through inheritance, the household may lose not only a potential source of family labor, but also some of the capital used in household production. On the other hand, departure of adult children may ease parents of the responsibility to provide for their children (and perhaps for their children's young children), and relieve the children from the obligation to take care of their aging parents. In many cases, there will still be economic ties between the children and the parents, for instance through transfers. In this case, having family members residing in different region may in fact increase insurance possibilities for the household against local risks, such as weather risks for agricultural households.

This essay looks at factors underlying household division in Indonesia. As argued by Foster (1993), if household division in a society occurs solely because of marriage, one could study the age of first marriage to be able to predict household division.¹ But studies have shown that the process of household division does seem to vary between and

even within societies. For instance, it is common in some parts of Indonesia for a young married couple to live with either sets of parents "...until they are considered to be able to manage their own affairs..." (Koentjaraningrat, 1985: p.133). Anthropological studies on Indonesia have long concluded that there is no strong cultural preference regarding with whom a newly married couple resides (Geertz, 1961, p.76, Jay 1969: p, 40-41, Koentjaraningrat, 1985: p.133. See also Jones, 1994: 113). Indeed, the choice of postnuptial residence and thus the timing of household division may depend more on economic reasoning.²

"Economic considerations appear most important in the choice of residence [of the newlyweds]: the financial advantages to be gained, the number of single children remaining in the two families, the parents' need for extra help, or the availability of land rights...." (Jay, 1969: p, 40-41)

Economic considerations also can explain the practice in rural India of parents marrying daughters to families residing in other regions. Rosenzweig and Stark (1989) find evidence that these marriages also serve as a way to reduce consumption variability. The economic motive is the primary motive of young male adults in Malaysia who leave the household (Smith and Thomas [1998], Johnson and DaVanzo [1998]), while moves of young women are more related to fertility and family considerations (Smith and Thomas, 1998).³ Household division may also be induced by other, non-economic events. Death of the head of household may cause households to split. Foster and Rosenzweig (2002), looking at household division in rural India, find that most

¹ A similar point is also argued by Johnson and DaVanzo (1998) who study nest-leaving in peninsular Malaysia.

² There is a slight preference towards *uxorilocality* (residence with the bride's family) as opposed to *virilocality* (residence with the groom's family) (See, for example Jones [1994], Levine and Kevane [2003]).

³ See also Lucas (1997) for a review on models and empirical findings on internal migration in developing

household splits occur after the death of the head. Negative economic shocks may also cause household structure and composition to change. For instance, Frankenberg, Smith, and Thomas (2003) find that households in Indonesia reorganize their composition and living arrangement to cope with economic crisis. In short, household division is likely to be responsive to economic incentives. This implies that decisions underlying household division are likely to be endogenous with a number of household economic outcomes.

There is a potentially high value in understanding the process of household division with regards to the increasing availability of longitudinal household surveys in developing countries. Some longitudinal surveys based their selection of respondents conditional on the residence in the previous wave or the baseline year (Thomas et al [2001], Foster and Rosenzweig [2002], Rosenzweig [2003]). When a household interviewed in the baseline survey has divided, inattention to this fact may cause inference based only on the characteristics of the remaining household members to be biased.⁴

It is therefore unfortunate that the overwhelming majority of the analyses of households in the development literature treat household composition as fixed and exogenous (see Strauss and Thomas [1995] for a review on empirical modeling of household decisions). While the importance of understanding the underlying process of how household composition changes seems obvious, there are still very few studies that

countries.

⁴ For example, Rosenzweig (2003) demonstrates how the estimates of economic mobility among adult males in Bangladesh are affected by household division. He estimates the wage of adult male in 2000 based on household income, assets, and the maximum years of schooling in 1982. He finds that since less able male are more likely to leave the joint households, the relationship between schooling in the household in the initial year (1982) with the status of young males in the household in 2000 is significantly understated.

try to explicitly model how households divide.⁵ One notable exception is the study by Foster and Rosenzweig (2002) in the context of Indian rural households. They model household division explicitly and investigate how exogenous income growth interacts with household structure and intrahousehold inequality to influence decisions on joint residence.

This essay is an attempt to apply the model developed by Foster and Rosenzweig (2002) to the Indonesian context. It is very appealing to choose Indonesia as a case to study household division. First, Indonesia is a very diverse society with different traditions and norms influencing decisions on household structure and living arrangement. It is interesting to see whether we can uncover the underlying process of household division by focusing on some of the key economic and demographic variables. The availability of a longitudinal household survey of a high quality, namely the Indonesia Family Life Survey, also makes it very appealing to look at household division in Indonesia.

Using three waves of the Indonesia Family Life Survey (1993, 1997, and 2000), I first present a descriptive analysis of household division. I then estimate the determinants of household division by using origin-household variables as explanatory variables in a probit regression framework. Using 1993 as the initial period, I estimate the probability that a household divides by 1997 and by 2000. I also estimate the probability that a household divide by 2000, using 1997 as the initial period.

⁵ More have been written on the closely related literature on coresidency in developed as well as in developing countries. The subject of household division is also naturally related to the literature on household formation.

The findings suggest that, consistent with the model, the probability of household division increases with the number of claimants in the household (household size). Higher education of the head seems to be associated with lower probability of household break-up. On the other hand, higher maximum years of education of non-head members seems to be associated with higher probability of household division. While one could explain this finding in terms of the collective household model, one could also interpret the finding to be largely related to the migration of young household members, which can very well be explained within the context of unitary household model.

The result shows that standard deviation of the household members education, used as a measure for the intra-household inequality, does not explain the probability of household division. High correlation between different measures of education makes it difficult to estimate and interpret the effects of education variables effectively.

Allowing for the values of land and business assets to be interacted with dummy variable for urban region, it seems that land and assets are not important in determining household division. Controlling for household head's education and age, as well as the age composition of household members, households with female heads tend to have higher propensity to divide, especially in rural areas.

In addition, I also estimate the probability of household division of the panel households (i.e., households appearing in all three waves of the survey). Estimating the model using a pooled Linear Probability Model (LPM), the results also show the positive association between household division and maximum years of education of the non-head members. The results are similar when I estimate the model using LPM with origin-household fixed effects.

The essay is organized as follows. The next section will briefly discuss previous literature related to household division. The third section discusses the model developed by Foster and Rosenzweig (2002). The fourth section briefly discusses the Indonesian setting and provides some description analysis of household structure and composition in Indonesia using the IFLS data. Section five will describe the empirical strategy for the multivariate analysis and discuss how the samples are constructed. The findings are discussed in section six and I conclude the essay in section seven.

2.2 Previous Literature on Household Division

With the increasing availability of longitudinal household surveys, it is now more than ever, possible to study what happens to household structure over time. While the advantages of having longitudinal data are obvious, the question of how one defines a household – not unambiguous even in cross-sectional setting - becomes increasingly important. First, there is the question of whether it is more appropriate to focus on household as the decision-making unit or to treat household as a collection of individual decision makers, a question that is at the center of the literature on intra-household allocations.⁶ As discussed by Strauss and Thomas (1995), the question of appropriateness is an empirical one and the answer really depends on the issue at hand. Although in some cases it may be more appropriate to put the locus of decision making on individuals, in other cases household decisions may be made at the household level, or even at a higher

⁶ See Strauss and Thomas (1995) for an extensive discussion on this issue. For review on the subject of intra-household allocations including collective household models, see for example, the volume edited by Haddad, Hoddinot, and Alderman (1997). Strauss, Mwabu, and Beegle (2000) review the theories and empirical evidence on the subject. For a review of testing among interhousehold models, see Doss (1996). See also Thomas (1990, 1993, 1994).

level such as the extended family.⁷ Secondly, as discussed above, the household itself is a dynamic concept: household structure and composition changes over time.

One of the few studies that focuses on household division is a study by Foster (1993) in Bangladesh. The study focuses on the institution of *bari*, a collection of related households living in large compound. Foster uses the data on the characteristics of households in 1974 and match them with the data from 1982 to identify households that are partitioned and to see whether there are effects of household partition on household outcomes such as child's schooling. While the study does provide some evidence of the effects of household partition on household outcome, it does not model household partition explicitly.

A more recent study by Foster and Rosenzweig (2002) does explicitly model household division. In the context of rural Indian households at the beginning of the "Green Revolution", they develop a model of household division to study how exogenous income growth interacts with household structure and intrahousehold inequality to affect household division. They find that estimates of the extent to which households are better off due to technical change in agriculture are overestimated when household division is treated as exogenous.⁸ More recently, Rosenzweig (2003) adopt a similar approach to study economic mobility in Bangladesh, taking into account the selection problem caused by nonrandom household division. He finds that the effects of maximum education of adults in the origin-household when the individuals were young on individuals' educational attainment and earnings in later years are understated, and the effects of

⁷ In the first essay of this dissertation (Witoelar, 2004) I investigate whether resource allocation decisions are made at the extended family level.

⁸ Foster and Roszenzweig (2002) find that technical change in agriculture not only affect household income growth, but also affect the probability of household division. In particular, technical change, interacting

origin-households income are overstated, when one only looks at adult males in households that were undivided compared to using sample of all adult males. The patterns of bias in the estimates of economic mobility are consistent with the facts that household division occurred nonrandomly.⁹

To date, at least to the author's knowledge, there have been no economic studies that attempt to look at household division in Indonesia. There have been, however, some related studies on living arrangement and co-residence in Indonesia, focusing primarily on the elderly. Cameron (2000) studies the residence decision of elderly Indonesian, using the 1993 wave of the IFLS. She found that children's and parent's demographic characteristics play an important role in the residency decision. Cameron and Cobb-Clark (2001) look at determinants of coresidency, financial transfers, and the labor-supply of the elderly in Indonesia. They find that the characteristics of the elderly parents' children play a more important role than the characteristics of the parents themselves. A more recent study by Frankenberg, Chan, and Ofstedal (2002) focuses on the stability and change in living arrangement using longitudinal household data from Indonesia, Singapore, and Taiwan. The study shows that characteristics found to be associated with co-residence at the initial period (baseline interview) exhibit an even stronger association with continued co-residence over time, suggesting some stability of living arrangements over time. Note however that this study, as in other studies looking at co-residence mentioned above also focuses only on elderly.

Finally, another closely related study of Indonesian households is the study by

with intra-household inequality and household size, reduce the probability of household division of households with more land resources per capita.

⁹ Rosenzweig (2003) finds that household income in 1982 is positively associated, and maximum years of education in 1982 negatively associated, with household division between 1982 and 2000.

Frankenberg, et al (2003) looking at household coping strategies in the face of economic crisis. Using two waves of the IFLS (IFLS2 1997 and IFLS2+ 1998) they investigate various ways by which households in Indonesia cope with the economic crisis that hit Asia in 1997-1998. They find that household dependents tend to move into households residing in locations with lower costs of consumption (i.e., places less severely affected by the crisis), while working age family members tend to move into households that are able to absorb more workers. While this study does not model household division explicitly, the findings illuminate the need to look at household division as an endogenous decision.

2.3 Model

This essay adopts the model of household division developed by Foster and Rosenzweig (2002). The model is a collective household model in which conflicts among the household members over the level of household public good provided in the household may lead to household division. As with the collective household models developed by Chiappori (1988, 1992), the model assumes that intrahousehold allocations are efficient. However, unlike most of the previous collective household models where household composition is assumed to be fixed and exogenous, here household division is explicitly modeled as an outcome of household members' decision making.

The model was developed in the context of rural Indian farm households.¹⁰ Foster and Rosenzweig specifically look at the period of the Indian "Green Revolution" between 1960 and 1980s – the period during which new agricultural technologies were introduced

in India - to study the effects of technical change on household division. Focusing on this particular period, they investigate how exogenous income growth interacts with household size and intrahousehold inequality to affect household division.

In the following section I briefly review the model, illuminating some key assumptions and comparative static results that will be relevant to this essay. The readers are referred to the original paper to see the complete exposition of the model.

2.3.1 A Model of Household Division

According to the model, household members may benefit from residing in a joint household by sharing the cost of household public goods, taking advantage of economies of scale in production, and by sharing information on the best-practice farming technique.¹¹ On the other hand, gains from joint household may be offset by a direct preference to live separately (i.e., desire for privacy)¹², the possibility of diseconomies of scale in production, and also by the increased insurance possibilities associated with interhousehold transfers from departed members.¹³

A joint household j consists of N individuals ($i = 1, \dots, N$). These individuals are *claimants*, who have property rights over a divisible asset that produces income stream to

¹⁰ This implies that the households allocate time and resources in both production and consumption activities. See Singh, Squire, and Strauss (1986) for a review of the literature on agricultural household models.

¹¹ A study by Foster and Rosenzweig (1995) models the learning spillover among rural Indian households during the Green Revolution.

¹² Preference to live in private has long been acknowledged in the literature on co-residency and does not seem to apply only to younger individuals seeking independence from the parents. A study by Costa (1997) on retired Union Army veterans in the U.S. shows that rising incomes of the elderly were the most important factor for the elderly to live alone. Frankenberg et al (2003) find that in Indonesia privacy may be substitutable with consumption from joint household, as shown by the finding that sub-households recombine to minimize the impact of the economic crisis.

¹³ This is an important consideration since there is evidence that households in rural India take advantage of marital ties between family residing in different regions to deal with variability of income (Rosenzweig and Stark, 1988).

the household.¹⁴

Each claimant i in a joint household j , has his own nuclear family, described by the vector $\mathbf{n}_i$ and has the utility of:

$$u_{ij} = u(x_{ij}, z_j, r_{ij}; \mathbf{n}_{ij}) \quad (1)$$

where x_{ij} denotes private good, z_j represents household public goods, and r_{ij} the household structure. The presence of r_{ij} allows for direct preference for residing separately from the joint household. The vector $\mathbf{n}_{ij}$ represents the characteristics of claimant i 's nuclear family in the joint household j .

The budget for the joint household is given by:

$$\sum_{i=1}^N x_{ij} + z_j = y_j^N \quad (2)$$

where y_j^N is the joint household income. If an individual i lives separately (possibly with his own nuclear family), he will earn “autarchic income” y_i . The joint household income y_j^N is not the same as the sum of each claimant's autarchic income, $\sum y_i$.¹⁵ Indeed, the expected gains from the joint household depend on the expected value of the difference between the two.

The time sequence of household decisions is as follows. Household members make decisions about joint residence based on the expected utility maximization problem

¹⁴ Each claimant has a share κ_{ij} of the household production asset A_j .

¹⁵ The autarchic income y_i is a function of claimant i wages W_i , his claim of asset $\kappa_{ij}A_j$ times the individual specific productivity factor θ_i , income shock e_i , and transfer, τ_i : $y_i = \theta_i \kappa_{ij} A_j + W_i + e_i + \tau_i$. Joint household income is $y_j^N = \theta_j^N A_j + N W_i + e_j^N + \tau_j^N$. Note that this implies that each claimant earns the same labor income W_i , even though there is an individual-specific productivity factor θ_i . This productivity factor is assumed to affect joint household income through household assets A_j .

above, before income shocks are revealed. After income shocks are realized, they make decisions about consumption of private and public goods. It is also assumed that, conditional on residence and income realizations, intrahousehold consumption is *ex ante* efficient, i.e., it is not possible for any claimant to have higher expected utility without decreasing the expected utility of some other claimants. As noted by Foster and Rosenzweig (2003), this timing sequence amounts to assuming *ex post* efficiency in the sense that for each pair of residential choice and income realization, no claimant can obtain higher utility without decreasing the utility of some other claimants. The last restriction is that each claimant has to obtain an *ex ante* expected utility that is at least equal to his reservation utility. The household will divide whenever this last condition cannot be satisfied.

The gain from living in the joint household to each claimant is the difference between expected utility achieved by the claimant in the joint household and his reservation utility subject to the conditions that each other claimants receive his respective reservation utility. In other words, for claimant 1, the expected gain from joint household is:

$$E(u(x_1, z, r_1; \mathbf{n}_1)) - Ev(y_1, r_1; \mathbf{n}_1) \quad (3)$$

where $v(y_1, r_1, \mathbf{n}_1)$ is the utility that claimant 1 would have received had he lived separately. Claimant 1 maximizes (3) with respect to private good x_1 and public good z and subject to:

$$E(u(x_i, z, r_i; \mathbf{n}_i)) \geq Ev(y_i, r_i; \mathbf{n}_i) \quad \text{for } i = 2, \dots, N, \quad (4)$$

and the joint household budget: $\sum_{i=1}^N x_{ij} + z_{ij} = y_j$.

As long as the gains from joint residence given by equation (3) is positive, the

joint household remains intact.

2.3.2 Parameterization of Preference and Some Comparative Static Results

Foster and Rosenzweig (2002) then assume a parametric utility function for each claimant of the form:

$$u(x, z; n) = \ln((x - \beta'n - \alpha z)(z + \gamma)) + \delta r_i \quad (5)$$

where r_i is one for autharchic households and zero otherwise.¹⁶ This utility function exhibits transferable utility, which, as discussed in Bergstrom (1996), implies that distribution of assets within the household does not affect public good consumption.¹⁷ This is a key assumption since this implies that distribution of assets does not affect the decision to break up from the household, or at least not through the disagreement over household public goods.

From the first order conditions, Foster and Rosenzweig (2002) show that claimants with differing characteristics or incomes will demand different levels for public and private goods when they co-reside than the levels they demand when they live separately.¹⁸ In particular the consumption of public goods in an autarchic household is given by:

$$z = \frac{1}{2(1 + \alpha)}(y - \beta'n - \gamma(1 + \alpha)) \quad (6)$$

while the consumption of public goods in a joint households is given by:

¹⁶ Thus δ represents direct preference for living separately.

¹⁷ The necessary and sufficient condition for a utility function with one private good and n public goods is that the preferences for each household member can be written as $U_i = f(z)x_i + g_i(z)$ (Bergstrom, 1996).

¹⁸ The reader is referred to Foster and Rosenzweig (2002) for the complete derivation of the first order conditions and comparative statics.

$$z = \frac{1}{2(1 + N\alpha)} \left(y^N - \sum_{i=1}^N \beta' n - \gamma(1 + \alpha) \right) \quad (7)$$

It is then assumed that there only two states of the world; a good state, and a bad state, with the corresponding income shock $+\Delta$ and $-\Delta$. These shocks along with a multiplicative factor ζ affect income additively. In addition, in a bad state of the world, claimant i will receive a net transfer τ_i and in good state of the world, he will send a net transfer of τ_i (see footnote 15). Thus, in a good state the autarchic income is $\bar{y}_i + \zeta\Delta - \tau_i$, while in a bad state it is $\bar{y}_i - \zeta\Delta + \tau_i$. The joint household incomes in good and bad state of the world are $\bar{y}^N + \zeta\Delta^N - \tau^N$ and $\bar{y}^N - \zeta\Delta^N + \tau^N$, respectively.

Assuming first that the claimants are homogenous, by solving the maximization problem above, one can obtain an expression for the gains from the joint household as:

$$\begin{aligned} \Psi^*(\theta, N, A, W, \beta' \mathbf{n}) = & \frac{1}{4(1 + N\alpha)} [\theta A + NW - N\beta' \mathbf{n} + \gamma(1 + N\alpha)]^2 \\ & - \frac{1}{4(1 + \alpha)} N \left[\theta \frac{A}{N} + W - N\beta' \mathbf{n} + \gamma(1 + \alpha) \right]^2 \end{aligned} \quad (8)$$

Some comparative static results, as discussed in Foster and Rosenzweig (2002) are as follows:

$$1. \frac{\partial \Psi^*}{\partial N} < 0. \text{ An increase in the number of claimants given the amount of}$$

household asset will reduce the gains from joint household, and thus increase the propensity of the household to break up.¹⁹ An increase in the number of claimants, given the same amount of household assets decreases per capita income and thus decreases the

¹⁹ This will be true as long as the demand for private good is high relative the wage, and public good consumption is at an interior solution (see Foster and Rosenzweig 2002).

gains from the joint household. A larger number of claimants may also mean a lower average cost of household public goods, but under the specified conditions, the increased saving is not enough to offset the decrease in per capita income.

$$2. \text{sign } \frac{\partial \Psi^*}{\partial n_k} = \text{sign } \frac{\partial z}{\partial n_k}. \text{ The effect of any element in } \mathbf{n} \text{ (characteristics of the}$$

nuclear family) on household division depends on whether the element increases or decreases consumption of household public goods. The increase in the number of children of a claimant, for example, will decrease the demand for public goods relative to private goods (e.g., children's clothing), and thus the effects on the joint household surplus will be negative.

$$3. \frac{\partial \Psi^*}{\partial A} > 0. \text{ An increase in household assets will increase the joint household}$$

surplus and thus decrease the propensity of household division.

$$4. \frac{\partial \Psi^*}{\partial \theta} > 0. \text{ An increase in productivity will increase the gains from joint}$$

household and discourage household division.

When claimants are allowed to be heterogeneous, the gains from the joint household can be written as:

$$\begin{aligned} \Psi = & \frac{1}{4(1+N\alpha)} \left(\left[\bar{y}^N - \sum_{i=1}^N \beta' \mathbf{n}_i + \gamma(1+N\alpha) \right]^2 - (\xi \Delta^N - \tau N)^2 \right) \\ & - \frac{Ne^\delta}{4(1+\alpha)} \left(\text{var}(\bar{y}^N - \beta' \mathbf{n}) + \text{mean}(\bar{y}^N - \beta' \mathbf{n} \gamma(1+\alpha))^2 - \text{mean}(\xi \Delta^N - \tau N)^2 \right) \end{aligned}$$

(9)

Higher intrahousehold variance of income implies a greater difference among the claimants over the demand for public goods. In particular equation (9) shows that for a given mean of $y_i - \beta' \mathbf{n}_i$ and $y^N - \Sigma \beta' \mathbf{n}_i$, and increase in the variance of $y_i - \beta' \mathbf{n}_i$ will

reduce gains from joint households ψ and increase the propensity of household division. Higher intrahousehold variance of $y_i - \beta' \mathbf{n}_i$ implies greater disagreement over the level of household public goods demanded. Since the consumption of public good must be equal among claimants in a joint household, the higher variance increases the probability of household break up.

2.3.3 Empirical Strategy

In the empirical part of the study Foster and Rosenzweig (2002) estimate the probability of household division using a probit model with dependent variable equal to 1 if a household split by 1982. They used characteristics of the same households from 1971 survey as explanatory variables.²⁰ The claimant is defined as the head of household, sons, and brothers of the head; claimants are male. The base specification includes the number of claimants, the number of claimants' wives, age of head, means of schooling of claimants, the number of children by sex, and household landholdings. The results show that the number of claimants (and claimants' wives) is positively associated with household division. The number of boys (future claimants) is also positively associated with household division while the number of girls does not have a statistically significant effect.

In the next specification, in addition to means of schooling of the claimants, they add other education variables, namely the maximum years of schooling of the claimants and the variance of the claimants' schooling. They argue that these variables are

²⁰ By using 1971 characteristics to summarize the initial conditions, they implicitly assumed that 1971 household characteristics are given. To some degree, they deal with the problem by adding as explanatory variables the number of previously departed children in one of their specifications.

measures of intra-household inequality.²¹ According to the model, variance of schooling is positively associated with the probability of household division. On the other hand, higher maximum education is associated with higher household surplus and thus lower probability of household division. Their empirical results show that indeed the variance of schooling appears to be associated positively and maximum of schooling negatively with household division.

2.3.4 Discussion

The model provides a framework in which household division is seen as a process that is associated with conflicts over household public goods. As with Chiappori's model, household members are assumed to make Pareto efficient decisions.²² The model is also in line with some other models of intra-household allocations. For example, public goods also play a central role in cooperative bargaining models developed by McElroy and Horney (1981), McElroy (1990), and Lundberg and Pollak (1993).²³ However, neither Chiappori's collective household model nor the cooperative bargaining models mentioned above explicitly model household division. Household composition is assumed to be fixed and exogenous. In contrast, the model developed by Foster and

²¹ It is not clear, however, how one should interpret the coefficients of the education variables when the mean, the maximum, and the variance are included together as explanatory variables. Furthermore, controlling for two of the education variables, there is not much variation in the third education variable in the data, especially when the number of claimants is small. Consider a sample where all households have only two claimants. For any given pair of mean and maximum years of education, there is no variation in the variance of schooling.

²² In a typical Chiappori's collective household model, household allocation decisions are first made to decide the level of household public goods. Decisions on the expenditure of private goods are then made according to a sharing rule, using what is left of the household income.

²³ In McElroy and Horney's cooperative bargaining model, individuals in marriage receive utility from a household public good in addition to consumption and leisure. They solve a Nash-bargained game in which the threat point is the utility outside the marriage. McElroy (1990) introduces the concept of EEP (extra-household environmental parameters), parameters that shift the threat points. Lundberg and Pollak (1993)

Rosenzweig above enables us to derive and sign the effects of changes in household characteristics and income, as well as intrahousehold inequality, on household division, providing the basis for the empirical work.

Unfortunately, some of the assumptions made in the Foster and Rosenzweig model above are unquestionably strong. While the use of the utility function with transferable utility helps to make the model tractable, it is inconsistent with some assumptions of previous models of collective household. The assumption of transferable utility assumes away the importance of distribution of assets in intrahousehold allocations. The assumption is also not in agreement with some recent empirical findings. As an example to the contrary, a study by Thomas, Contreras and Frankenberg (2002) find some evidence that assets brought into marriage by husbands and wives affects child health differentially.²⁴

The model also assumes that the magnitude and the sign of the gains from living in a joint household are independent of the particular identity of the maximizer and they are also independent of the decision of how the gains are distributed. This is somewhat in contrast with findings showing that intrahousehold allocations are affected by individuals' exogenous income, such as non-labor income (Schultz [1990], Thomas [1994]), or transfers (Lundberg, Pollak, and Wales [1993])

While the model above allows for a special role of the head of the household (by allowing some elements of $\mathbf{n}$ to be characteristics of household head), the empirical specification does not differentiate the education of the household head from that of the

introduce the notion of "separate sphere" in which the threat point is not divorce, but the traditional gender roles inside marriage.

²⁴ A review by Quisumbing (2003) discusses the recent development in the literature with regards to the role of resources and power in the household.

other claimants. It is true that the role of household head's education in intrahousehold allocations is somewhat controversial.²⁵ There have been some discussions on whose education matters the most in the household and some authors suggest it is the maximum years of education that matters the most (Jolliffe [1997], Foster and Rosenzweig [1996]).²⁶

One the other hand, with regards to decisions of the joint household on public goods allocation, one could argue for a case where the head is altruistic towards household members (an assumption dating back to Becker's "rotten kid theorem" [1974]). As acknowledged by Foster and Rosenzweig (2002) the head of household may identify more with the joint household, and thus will tend to allocate more resources towards household public goods, discouraging household dissolution. In addition, younger, non-head adults in the households with higher education may have employment opportunities with higher earning outside the joint households.

2.4. The Indonesian Settings and Household Division in the IFLS

2.4.1 The Indonesian Settings

In adopting the model to the case of Indonesia, it is important to acknowledge some important differences from the rural Indian context. In particular, it is not clear how one should define a "claimant" in the Indonesian context. The law and norms influencing household behavior in Indonesia and in particular with regards to claims on inheritance,

²⁵ It is also true that the definition of the head in household surveys is sometimes arbitrary

²⁶ Jolliffe (1997) uses data on households in Ghana to tests which of the following education variables matter most in determining household income: household head's schooling, maximum schooling of adults, or average schooling of adult. The results show that either maximum or average schooling of adults is a better measure than schooling of the household head. Foster and Rosenzweig (1996) find that maximum years of education is a better predictor of the adoption of the new agricultural technology during the Indian "Green Revolution".

distribution of resources within households, as well as co-residency are vastly different from that in rural India, as will be discussed below. Furthermore, since the IFLS includes households from 13 provinces in Indonesia, it is not clear what local norms and traditional law operate in each community.

To better define the appropriate set of claimants, I will discuss briefly some of the institutional settings that are most relevant, namely the norms on postnuptial residence, inheritance, and the incidence of marital dissolution.

Postnuptial Residence

If one practice dominates the pattern of postnuptial residence, for example, if most marriages are virilocal, then for the purpose of the empirical work, one may need to treat households with adult sons differently from households with no adult sons. As discussed above, postnuptial residence varies among Indonesians and sometimes depends more on economic considerations than some strict traditional law or local norms.

Anthropologists usually classify the Javanese (which constitute the majority of Indonesian population) as *ambilocal* (reside with either set of parents) with some preference toward *uxorilocality* (Geertz [1961], Jay [1969], Koentjaraningrat [1985], Jones [1994]). Levine and Kevane (2003) study the variations in residence after marriage based on the information on the local norms and traditional law. Using a special module on *adat* (traditions) from 1997 IFLS they find that there is a lot of variation between communities and ethnic groups: daughters tend to reside with or near their parents in around 53 percent of the regions, with or near their husband's parents in 23 percent of the region, and in about 23 percent communities new couples tend to live with or near either

set of parents.²⁷

Inheritance

In the context of rural India, inheritance customs determine adult males as heirs (Foster and Rosenzweig 2002). It is less clear how the inheritance system operates in Indonesia, although generally sons and daughters have some claims on their parents' estates.²⁸ The kinship is *bilateral*, in the sense that one is equally related to father's side of the family as to the mother's side (Jones, 1994). For the majority of the Indonesian moslem population, inheritance is governed by Islamic law, which states that sons should inherit two-thirds of their parents' estates. But at the same time, Javanese traditional law states that sons and daughters should have equal shares. In practice, some follow each while others pay no attention to either (Geertz [1961], Jones [1994]). While these findings do not offer any guide on how the inheritance is shared, what is unambiguous is that both men and women have some claims on the parents' assets.

Marital Dissolution

How assets are distributed when a household is divided may differ between the case where a child leaves the household and the case where the division is due to marital dissolution. Among some ethnic groups in Indonesia such as the Bataks and the Makassarese, the husband will lose the payment made to the wife at the time of marriage, while among the Javanese and the Minangs, the husband and the wife keep what they

²⁷ Balinese and Sasaks reported 94 percent and 83 percent of the marriages as virilocal, respectively, while Javanese, Bugis, and Minangs reported 53 percent, 71 percent, and 77 percent of the marriages as uxoriocal.

brought into marriage (Jones [1994]: p. 220).

If the incidence of divorce is high, it may be necessary incorporate marital dissolution into the model or the empirical specification. As a matter of fact, Indonesia used to have a very high rate of divorce: 13 per 1,000 population age 15 and above in 1960, compared to 1.8 in developed countries in the same period (Jones [1994]; p. 180). However, the rate has decline to 4.6 by 1975 and 1.1 by 1990. A study by Heaton, Cammack, and Young (2001) uses data from IFLS 1993 and the Indonesian Fertility Study (IFS) to study the dramatic decline. They find that education variables are becoming important in predicting marital dissolution while age at marriage and marital duration are becoming less so.²⁹

The discussion above provides some insights on how the set of claimants should be defined. In contrast to the rural Indian context, in the Indonesian context one should consider female household members as potential claimants. With regards to the widespread practice of virilocality and uxorilocality, one possibility is to include not only sons and daughter as potential claimants, but also sons- and daughter-in-laws.

2.4.2 Descriptive Analysis of Household Division in IFLS

The IFLS provides an excellent opportunity to look at the incidence of household

²⁸ According to Jones (1994; p. 114), it is typical for the parents to inherit their home to the youngest daughter, with the expectation that the daughter will care for the parents.

²⁹ Previous authors (for example Jones [1994]) have identified some key factors explaining the decline in the past decades: the increase in the age of marriage, the decrease in arranged marriage, and the passing of the 1974 Marriage Law that makes it more difficult for a husband to divorce a wife (this law also sets the minimum age of marriage of 19 for male, and 16 for female).

division among Indonesian households.³⁰ Since the survey tracks and interviews some respondents when they leave the households and set up a new household in the subsequent wave, I can identify households that have divided from the baseline interview by the subsequent wave. In the first wave, which was conducted in 1993, 7,224 households were interviewed. In 1997 the number of households interviewed was 7,619, and more than 11 percent of those households are split-off households. When the IFLS3 was conducted in 2000, the number of splitoff households (including those that split in 1997 and 1998) accounts for around 35 percent of all households interviewed (see Table 2.4.1). In 1997, around 11 percent of the 1993 original households have divided. By 2000, the percentage is around 36 percent (Table 2.4.2). Using 1997 as the base year, the table shows that of 7,619 households that were interviewed in 1997, around 21 percent have divided by 2000.

Does the household composition differ between the original and the split-off households? The fraction of nuclear households, households that consists of at most the head, spouse, and their children, is similar between the original households and the split-offs, with around 62-66 percent households in either category. From Table 2.4.3, it is clear that one would more likely find intergenerational coresidency in original households than in splitoff households.

Table 2.4.4.a-4.b shows the status of 1993 non-head household members in their respective 1997, 2000 households. While most of them were still non-household members in 1997, some of the individuals have moved on to form new households, and

³⁰ See the first chapter of this dissertation (Witoelar, 2004) for a brief description on IFLS and the tracking rules used by the IFLS. For a full documentation of IFLS1 see Frankenberg and Karoly (1995). See Frankenberg and Thomas (2000) for a full documentation of IFLS2, and Strauss, et al (2004) for a full documentation of IFLS3.

some others become heads of the original households. Of the 1993 female non-heads who became heads of the original household by 1997, most were spouses of the head. This is consistent with the case where the woman (possibly the spouse of the head) became the household head when the head died. On the other hand, of the 1993 male non-heads who became head of the splitoff households, most were sons of the heads of the original households. Table 2.4.4c similarly shows the number for the 1997 non-household members in their respective 2000 households.

Figure 2.4.1 shows the relationship to the household head by age and sex in 1993 and 2000. Even though the figure only provides a snapshot of a cross section of the population in a given year, one can infer some life cycle pattern with regards to household living arrangement. Until they are 17 years old, most children are sons and daughter of the household head (the other significant portion is 'other', which also includes grandchildren, nieces, and nephews). A small fraction of men age 18-23 are the head of households, while a bigger fraction of women at that age are married to the head of household. By the age of 23-29 these fractions increase for both sexes. The fraction of men residing as son-in-law of the head and women as daughter-in-law are also the highest in this age group, suggesting that in this age group, many of the individuals are residing with their parents-in-law. The fraction of men and women living as sons- and daughters-in-law is smaller among the 30-35 years old, and virtually disappear for the older age groups, suggesting that the married children who reside with either set of parents eventually leave the household or take over the headship themselves (or became spouses of the heads). This seems to conform the previous anthropological findings of the practice of coresidency after marriage.

Table 2.4.5a and 2.4.5b show the household headship status of 1993 individuals in 1997 and 2000 by age (and similarly, Table 2.4.5c for 1997 individuals in 2000). The top panel of Table 2.4.5b shows that most of the males who became heads of the 2000 split-off households were 25-29 in 1993. It is also shown that some of those who were 12-13 in 1993 have already become head of the splitoff households by 2000, or when they are 19-20 years old.

As noted before, if marriage is the only reason why young adults decide to leave their household, then the study on household division is just a study of age of first marriage. The IFLS asks a question of what was the reason why a household member left the household. The question is answered by a household member who remains (usually the head). Table 2.4.6a tabulates the answers from the 1997 interview of why 1993 household members left their original household. Among men, finding work seems to be the most important reason, while among women, to follow spouse or parent and marriage seems to be the primary reason. Table 2.4.6b tabulates the answers given in the 2000 interview. In both years note also the numbers of individuals leaving due to marital dissolution are relatively small.

How far did the individuals move? Table 2.4.7 shows the number and percentage of 1993 respondents who are found in split-off households in 2000 by the location of the split-off households relative to their 1993 households. Around 60 percent of 1993 male respondents who were found in split-off households have moved out from their original village. The number is somewhat similar with females.

Are there differences in the 1993 demographic and education characteristics between households that remain intact by and the households that eventually split by?

Table 2.4.8 summarizes some of the key household-level demographic and education variables of the 1993 households by the status of the household in 2000. One thing to note is that the mean of household head's education is slightly higher in the households that remain intact by 1997. The maximum education of both male and female are higher in households that eventually split. The standard deviations of age and of education are also higher in households that eventually split.

Differences in household assets are shown in Table 2.4.9. It seems that households that eventually split have higher initial value of landholdings as well as other household business assets. In per capita terms, households that remain intact seem to have higher per capita landholdings. Households with more non-business household assets in 1993 seem to be more likely to eventually split by 2000.

2.5 Empirical Specification

Following Foster and Rosenzweig (2002), I estimate the probability of household division by using a probit model with characteristics of the households at the base year as explanatory variables. Specifically I estimate the probability of household division between 1993 and 1997 using 1993 household variables, between 1993 and 2000 using 1993 household variables, and the division between 1997 and 2000 using 1997 household variables.³¹

Based on the discussions above, I define two sets of samples according to different definitions of claimants. The first set of claimants, '**Claimant 1**', include the head, child of the head or sibling of the head who would have been 19 years old by the

³¹ Specifically, the dependent variable equals one if household have split by 1997 (or 2000), and zero otherwise. I am ignoring household that were not found in the subsequent surveys, and I also do not take

time the household was next observed. The second definition of claimants, ‘**Claimant 2**’, includes not only the head, head’s child or sibling, but also any household members who would be 19 by the year the household is next observed. The latter definition is broader and may include in-laws as well as other members of the household.³²

The choice of 19 as the cutoff age is somewhat arbitrary, although the descriptive analysis above suggests that it is at the age of 19-20 that the fraction of males who become heads of the splitoff households starts to increase.³³ The restriction of age 19 or more implies that when I estimate the probability of household division by 1997 for the 1993 households using Claimant 1, the claimants are the head’s children or siblings who were at least 15 years old in 1993. Similarly they have to be at least 12 years old in 1993 to be defined as a potential claimant when I estimate the probability of household division between 1993 and 2000, and 16 years old when I do the estimation for household division between 1997 and 2000. Note that if I use the same definition of claimants as Foster and Rosenzweig (i.e., sons or brother of the head), I would miss a significant fraction of households that divided due to other members leaving.³⁴

The sample sizes, after dropping a small fraction of households who have missing values in the key variables, are shown in Table 2.5.1. Note that there are 6 sets of samples: three for each definition of claimants.

into account the possibility of households that have divided to join back together.

³² Around 45 percent of males who were sons-in-law of the household heads in 1993 became the heads of the same households by 2000.

³³ Age 19 is also the legal minimum age for marriage for males, although the limit seems to be non-binding. Using data from the Indonesian *Population Census*, Jones (1994) estimate the mean age at first marriage for Indonesian males to be 24.1 in 1980 and 25.4 in 1990.

³⁴ I estimate the model using the set of claimants defined similarly to that in Foster and Rosenzweig (2002). Namely, the claimants are defined as the household head, the head’s sons and brothers. Among those, similar to the other definitions of claimants in this essay, I choose those who would have been 19 by the time the household is observed as potential claimants. The results are presented in Appendix Table 2.6.14 and 2.6.15.

Table 2.5.2a – 2.5.2c shows the summary statistics of the key variables used in the estimation. Table 2.5.3a – 2.5.3c shows means and the difference in the means of the key variables for the households used in the estimation. It is worth noting that the difference between the means of the claimant's standard deviation of schooling is significant for Claimant 2 in the sample used to estimate the probability of household division between 1993 and 2000 (Table 2.5.3b).

In the base regression specification I include the number of claimants, and the proportion of claimants by age, the number of claimants, the number of young children by sex. These account for the household demographic composition and household size. Furthermore, young children represent future claimants. I also include the age and age squared of the head, and a dummy variable identifying male-headed household. I include the log of the value of the land owned as well as the log of the value of the business assets for farm and non-farm businesses.³⁵

Education Variables

In addition to household size and composition variables, age and age squared of the head, value of land and other business assets owned by the households, and dummy variables indicating urban location and male headed households, the base specification includes two education variables: education of the head, and maximum education of non-head claimants.³⁶

In the other specifications I add the standard deviation of education among the

³⁵ Farm and non-farm business assets include house or buildings, vehicles, other equipment, and other. For farm businesses, hard stem plans, livestock/poultry/fishpond are also included, and for non-farm businesses the assets also include supplies/merchandise, office equipment, and other.

claimants (including the head) as an additional explanatory variable. As previously discussed, this variable provides some measure of inequality among the claimants. In another specification I also include the means of education of the non-head claimants.

There is a problem associated with using all of these measures of household education at the same time: these values are highly correlated. In particular maximum years of education of non-head claimants is highly correlated with the mean years of education especially when the number of non-head claimants is small. Table 2.5.4 shows the comparison of the various measure of household education using all households in IFLS1, by the number of adult in the household.³⁷ Note that the number of households with only two adults is 2,905, or 43 percent of all households with multiple adults. Column (6) shows the correlation between the maximum years of education of non-head adults with the mean years of education of non-head adults. Even among households with more than 6 adults, the correlation is 0.832. The correlations between other measures of education are also high. While the table reports the comparison for all 1993 households, the same is true for the households in the estimation sample.³⁸

Because of this problem, in most specifications I only include at most three measures of education: household head's education, maximum education of non-head claimants, and the standard deviation of education among the claimants, including the head.

In addition to the education variables I also estimate the model with various sets

³⁶ Information in schooling is collected on the highest education level attended and the highest grade completed at the level. The information is then converted into a variable on completed years of schooling. The value ranges from 0 (no schooling or not completed first grade) to 17 (university graduate).

³⁷ The total number of observations is 7,223 instead of 7,224 since one household does not have any adult. (The head of household is 14 years old).

³⁸ In fact, the correlation between the maximum education of non-head claimants and the mean is above 0.90 in each sample.

of interaction variables. Most importantly, I include the interaction of the dummy variable of urban/rural residence with the log value of land and log value of business assets, to control for region effects.³⁹ The nature of the business that the households are involved in may be different depending on where the households reside (e.g, rural households are more likely to be engaged in farm business), and consequently land and other business assets can affect household division differentially. In addition I also estimate the full model using dummy variables for province, urban, and their interactions. Finally, I estimate the model using dummy variables for community in place of the province-urban interaction variables.⁴⁰

2.6 Results

Table 2.6.1-2.6.3 show the results of the probit regression of household division between 1993 and 1997, between 1993 and 2000, and between 1997 and 2000, respectively, using the Claimant 1 sample. Table 2.6.4-2.6.6 report the result using the sample of Claimant 2. The results from separating the urban and rural households for each sample are reported in Appendix Table 2.6.1-2.6.12. The marginal effects of a change in explanatory variables are reported in these tables. The standard errors are corrected for clustering at the base year community level and heteroskedasticity.

I am primarily interested in looking at the probability of household division between 1993 and 2000 (Table 2.6.2 and 2.6.5) since the longer period allows for more variation in the sample. As expected, the probability of household division is positively

³⁹ For the interaction terms, I use the demeaned value as opposed to the original value of the variable.

⁴⁰ I also estimate separating the sample between urban and rural. For the rural sample I add a dummy variable equals to one for farm household, zero otherwise. I also interact this dummy variable with the education variables.

associated with household size (the number of claimants and the number of non-claimants) across all specifications, using either Claimant 1 or Claimant 2 as the sample. For the sample of Claimant 1, assets variables seem to be associated positively with household division (Table 2.6.2), in contrast to the model's prediction. However, as shown in the third column of Table 2.6.2, when the business assets variable is interacted with the dummy variable indicating urban residence, the coefficient on business assets become not statistically significant with $z\text{-statistics} = 0.514$ (the $p\text{-value}$ of the F-test of joint significance of the land variables is 0.07). This suggests that most of the assets impacts were actually capturing urban – rural differences. Business assets does not significantly affect household division when I use Claimant 2 as the sample (Table 2.6.5). The value of land owned does not appear to be significant in determining household division in either sample.

The dummy for urban is negative and statistically significant throughout the results (see Table 2.6.2 and Table 2.6.5), suggesting that households in rural areas are more likely to split than their urban counterpart.

Presence of children seems to be positively associated with the possibility of household division. One explanation could be that these children are future claimants, and as is with the number of claimants, the number of future claimants increases the propensity of household to break up. Another explanation that is consistent with the model is that the presence of children in the household implies that there is an increase in demand for private goods (e.g. children's food and clothing) relative to public goods, thus encouraging household division.

Moving on to the education variables, the results show that the maximum years of

education of the non-head claimant to be positive and statistically significant in most of the specifications. Table 2.6.5 shows that the coefficients on the maximum years of education are close to 0.010 and statistically significant, while the coefficients on education of the head are for the most part negative at around -0.004. The negative sign on the coefficient on head's education is somewhat consistent with the story that heads with higher education have more control over household resources and may be able to increase the gains from joint household. It is interesting that for the most part, standard deviation of education does not appear to be statistically significant. In fact in some of the specifications the coefficients are negative, contrary to the prediction of the model.

The positive sign on the coefficient on maximum years of education of the non-head claimants implies that the higher is the maximum years of education of claimants, controlling for household heads' education, the more likely it is for the household to break up. The results somewhat differ from previous findings in India (Foster and Rosenzweig, 2002) or Bangladesh (Rosenzweig 2003) where the maximum years of education is associated *negatively* with household division.⁴¹ Note however that in each of these previous studies, head's education is not separately controlled for, and the maximum years of education include education of all claimants including the head.

One possible interpretation of the positive relationship between maximum years of education and the probability of household division in Indonesia is that household division may be primarily driven by the migration of the young, more educated, adult males from the household.⁴² It is most likely that household members with the maximum

⁴¹ In Foster and Rosenzweig (2002) and Rosenzweig (2003) maximum years of education is positively associated with surplus of joint household.

⁴² This is in contrast to the study by Rosenzweig (2003). He argues that among the households in rural Bangladesh, education lower than the maximum is redundant in the households, so members with lower

years of education in the household are the young adult males. This, coupled with the findings that rural households are more likely to divide, is consistent with the migration interpretation. As has been shown in Table 2.4.7, around 60 percent of the 1993 male respondents who are found in split-off households in 2000, reside outside their original village.

In the context of the collective model used in this essay, the results indicate that the higher is the education of non-claimant members, the higher is their autarchic incomes, and the more likely that these members will leave the joint household. On the other hand, and perhaps more interestingly, the results are not necessarily inconsistent with the unitary household model. Indeed, the departure of highly educated members can be well explained within the context of unitary household. Households may send their most educated sons to find better opportunities elsewhere, and have them transfer remittances back to the household, for example.

To interpret the results with respect to what happens with the female members is more complicated. In particular it is not very clear how marriage of daughters would affect household division in Indonesia. On one hand, as with males, higher educated females may leave the household to earn higher earnings elsewhere and thus increase the probability of household division. On the other hand, higher educated females marry later in life than their lower educated counterparts, and thus lower the propensity for household division.

Another interesting finding is that, in some specifications, male-headed households tend to have lower probability of splitting up. This is interesting since this is

education are the ones more likely to leave the household.

saying that controlling for age and education of the head of households –thus controlling for human capital of the head – and controlling for other household variables, households headed by women have higher probability of breaking up. This is something that needs to be investigated much further.

Panel Households

I also investigate what happens to the panel households –households appearing in the three waves of the IFLS- by using a pooled Linear Probability Model (LPM) and LPM with origin household fixed effects.

The setup for the pooled LPM estimation is as follows. I first restrict the sample only to include households appearing in all three waves of the IFLS. For each household, there are two observations: one representing the household in 1993, the other representing the household in 1997. The dependent variable for the observations with 1993 values is 1 if the household split by 1997, 0 otherwise. The explanatory variables for these households are their 1993 characteristics. Likewise, the dependent variable for the observations with 1997 values is 1 if the household split by 2000, 0 otherwise; and the explanatory variables for these households are their 1997 characteristics.⁴³ The idea is to estimate the linear probability model of household division conditional on the household variables in the base year. Included as explanatory variables are household composition, education variables, dummy for urban region, and a year dummy equals 1 if the base year is 1997. The results are presented in the first four columns of Table 2.6.7

⁴³ This implies that for the observations with 1997 as the base year, I did not take into account whether the households have divided before 1997.

(for Claimant 1) and Table 2.6.8 (for Claimant 2).

The results seem to show that as before, maximum years education is positively associated with the probability of household division. For the Claimant 2 specification, the coefficient on the standard deviation of education is positive and significant (Table 2.6.8, column (2)). When head's education is added along with the maximum years and the standard deviation, the result in (column (4)) shows that head's education and maximum education are negative, and positive, respectively. For Claimant 1, maximum education is positive, and significant, while standard deviation is not significant when head's education is excluded (Table 2.6.7, column (2)). When head's education is included, the coefficient on standard deviation becomes *negative* and statistically significant. Standard deviation becomes not significant, while coefficients on maximum education are positive and statistically significant.

The last three columns in Table 2.6.7 and Table 2.6.8 report the results from estimating the model using OLS, controlling for 1993 household fixed effects. The rest of the setup is similar to the LPM estimation above. For both Claimant 1 and Claimant 2, the maximum years of education is positive and significant while standard deviation, when included, does not seem to help explain the probability of household division.

2.7 Conclusions

In this essay, I have investigated the factors underlying household division. The descriptive analysis suggests that household division is indeed a non-random process. The data shows that age and sex of household members is an important factors determining individuals' decision to leave the household. Men in Indonesia leaves

household for different reasons than women, and on average they leave at different age in life. Households with higher assets seem to be more likely to break up. This is somewhat in contrast with the prediction of the theoretical model.

The multivariate analysis provides a better picture about this process. The probit estimates show that assets, after controlling for urban/rural dummy variable, do not seem to affect the probability of household division. On the other hand, education variables seem to play an important role in determining which households are more likely to break up. Positive association between maximum years of schooling of non-claimant members with the probability of household division is consistent with the idea that household members may have different preferences, and that this may lead to conflicts with regards to household allocation decisions. The finding does not necessarily imply that the collective household model holds – the model is not a test of collective household model.

Indeed, one interpretation of the findings, namely that household division in Indonesia is very much related to migration of household members can be very well explained in the context of unitary household model.

This essay is but a first attempt to uncover a very important aspect in household and individual behavior. Household division is a much more complex issue than that can be explained with the current model. One of the problems related to the empirical strategy that has not been dealt with satisfactorily in the previous or in this essay is the question of initial condition assumption.

A potential improvement that can be made is to make use of the information available in the split-off households. Longitudinal household surveys such as the IFLS collect information not only from the original households but also from the split-off

households. By using the information on the “destination household” as well as the origin-household, one could perhaps better understand this process, although the existing models are not appropriate for this.

Table 2.4.1
Number of Households Interviewed: 1993, 1997, and 2000

	1993	1997	2000
Households interviewed	7,224	7,619	10,435
Target households interviewed	7,224	6,742	7,789
Split-off households interviewed	-	877	2,646

Source: IFLS1, IFLS2, IFLS3

Target households are households that were interviewed in any prior wave of the survey. IFLS2 target households are IFLS1 original households. IFLS3 target households are IFLS1 original households, IFLS2 split-off households and IFLS2+ split-off households

Table 2.4.2
Household Division: 1997 and 2000

	1997		2000	
	# HH	%	# HH	%
1993 Households (N =7, 224)				
Household not found/all members died	482	6.7	450	6.2
Household undivided	5,951	82.4	4,165	57.7
Household has divided	791	10.9	2,609	36.1
1997 Households (N=7,619) *				
Household not found/all members died	-	-	305	4.0
Household undivided	-	-	5,744	75.4
Household has divided	-	-	1,570	20.6

Source: IFLS1, IFLS2, IFLS3

* 1997 Households includes 1997 splitoff households as well as the 1993 original households

Table 2.4.3
Percentage of Household Interviewed by Types of Household Members,
1993, 1997, and 2000

	1993	1997			2000		
	HH interviewed	All 1997 HH	Target Household	Split-off HH	All 2000 HH	Target Household	Split-off HH
Nuclear households ^{a)}	65	63	63	63	63	63	62
Vertical households ^{b)}	21	24	25	15	23	26	15
Other ^{c)}	14	12	11	23	14	11	23
Total	100	100	100	100	100	100	100

Source: IFLS1, IFLS2, IFLS3

^{a)} Nuclear households include at most head, spouse, and their children

^{b)} Vertical households include also grandchildren, fathers, mothers, sons-in-law or daughters-in-law

^{c)} Other households are households with other types of members

Table 2.4.4a
Household Headship Status in 1997 of 1993 Household Member, by Sex

Relationship to HH Head in 1997							
Relationship to Household Head in 1993	Found in 1993 Origin HH			Found in 1997 Split-off HH			Total
	Head	Spouse	Other	Head	Spouse	Other	
Male							
Head	5,229	11	43	59	0	11	5,353
Spouse	1	6	1	0	0	0	8
Sons	70	0	5,891	197	0	101	6,259
Brothers	4	0	107	5	0	4	120
Other	52	1	1,034	153	0	166	1,406
Total	5,356	18	7,076	414	0	282	13,146
Female							
Head	838	62	70	3	2	6	981
Spouse	281	4,890	69	15	38	6	5,299
Daughters	29	43	5,455	56	172	124	5,879
Sisters	0	4	102	0	7	5	118
Other	29	51	1,427	18	99	189	1,813
Total	1,177	5,050	7,123	92	318	330	14,090

Source: IFLS1, IFLS2

Table 2.4.4b
Household Headship Status in 2000 of 1993 Household Member, by Sex

Relationship to Household Head in 1993		Relationship to HH Head in 2000						Total
		Found in 1993 Origin HH			Found in Any Split-off HH*			
		Head	Spouse	Other	Head	Spouse	Other	
Male								
	Head	4,855	7	65	166	0	32	5,125
	Spouse	6	2	0	0	0	0	8
	Sons	131	0	4,758	824	3	407	6,123
	Brothers	2	0	83	29	0	6	120
	Other	101	0	646	376	0	348	1,471
	Total	5,095	9	5,552	1,395	3	793	12,847
Female								
	Head	648	108	129	12	12	11	920
	Spouse	438	4,463	133	43	101	27	5,205
	Daughters	44	102	4,338	241	732	357	5,814
	Sisters	1	6	74	3	22	9	115
	Other	47	88	943	84	263	346	1,771
	Total	1,178	4,767	5,617	383	1,130	750	13,825

Source: IFLS1, IFLS2, IFLS3

* Includes 1997, 1998, 2000 split-off households.

Table 2.4.4c
Household Headship Status in 2000 of 1997 Household Member, by Sex

Household Headship Status in 2000 of 1997 Household Member, by Sex

Relationship to Household Head in 1993	Relationship to HH Head in 2000						Total
	Found in Origin HH*			Found in 2000 Split-off HH			
	Head	Spouse	Other	Head	Spouse	Other	
Male							
Head	5,512	7	108	110	0	25	5,762
Spouse	26	3	0	1	0	0	30
Sons	130	0	6,072	441	0	293	6,936
Brothers	0	0	87	12	0	6	105
Other	139	0	1,270	190	0	225	1,824
Total	5,807	10	7,537	754	0	549	14,657
Female							
Head	918	112	143	9	10	5	1,197
Spouse	275	5,105	113	17	64	20	5,594
Daughters	44	112	5,601	163	367	225	6,512
Sisters	2	5	88	0	7	7	109
Other	73	120	1,699	44	150	255	2,341
Total	1,312	5,454	7,644	233	598	512	15,753

Source: IFLS1, IFLS2, IFLS3

* Includes 1993 original households as well as 1997 split-off households

Figure 1. Relationship to Household Head by Age, Male and Female, 1993 and 2000

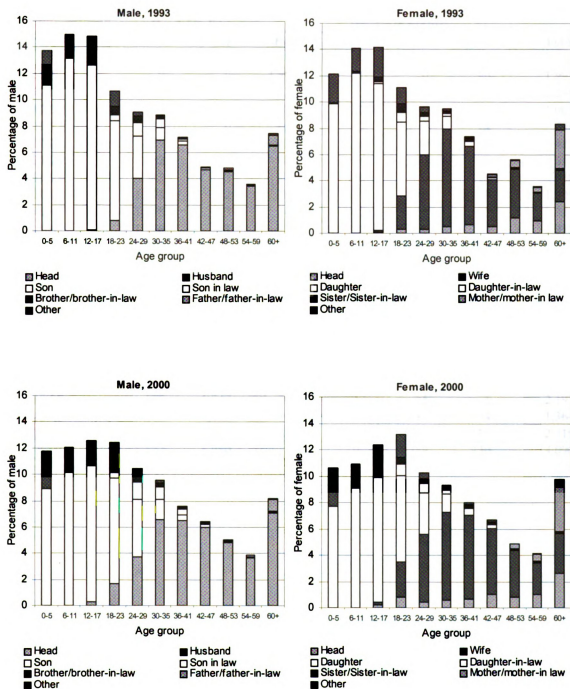


Table 2.4.5a
1997 Headship Status of 1993 HH Members, by Sex and Age Group

Age in 1993	Found in 1993 Origin HH, Headship Status:			Found in 1997 Split-off HH, Headship Status:			Total
	Head	Spouse	Other	Head	Spouse	Other	
Male							
0-5	0	0	1,895	0	0	96	1,991
6-11	1	0	2,132	11	0	75	2,219
12-13	1	0	921	32	0	53	1,007
15-17	11	0	659	12	0	14	696
18-20	19	0	439	16	0	8	482
21-24	152	0	420	36	0	6	614
25-29	543	2	272	139	0	14	970
30-39	1,605	2	183	107	0	9	1,906
40-49	1,248	3	40	32	0	3	1,326
50+	1,776	11	115	29	0	4	1,935
Total	5,356	18	7,076	414	0	282	13,146
Female							
0-5	0	0	1,784	0	0	104	1,888
6-11	1	2	2,065	11	2	88	2,169
12-13	2	2	826	31	36	72	969
15-17	11	28	566	8	23	9	645
18-20	17	114	376	4	46	6	563
21-24	24	383	322	3	61	13	806
25-29	52	769	259	9	68	13	1,170
30-39	175	1,742	207	13	55	5	2,197
40-49	219	1,020	103	6	12	4	1,364
50+	676	990	615	7	15	16	2,319
Total	1,177	5,050	7,123	92	318	330	14,090

Source: IFLS1, IFLS2

Table 2.4.5b
2000 Headship Status of 1993 HH Members, by Sex and Age Group

2000 Headship Status of 1993 HH Members, by Sex and Age Group							
Age in 1993	Found in 1993 Origin HH, Headship Status:			Found in Any Split-off HH*, Headship Status:			Total
	Head	Spouse	Other	Head	Spouse	Other	
Male							
0-5	0	0	1,753	4	0	213	1,970
6-11	2	0	1,820	91	0	207	2,120
12-13	8	0	643	136	0	114	901
15-17	9	0	454	126	0	82	671
18-20	29	0	256	144	1	62	492
21-24	150	0	246	276	2	56	730
25-29	542	1	154	308	0	24	1,029
30-39	1,593	1	109	182	0	12	1,897
40-49	1,208	1	25	57	0	6	1,297
50+	1,554	6	92	71	0	17	1,740
Total	5,095	9	5,552	1,395	3	793	12,847
Female							
0-5	0	0	1,650	3	0	213	1,866
6-11	3	5	1,716	77	60	226	2,087
12-13	0	8	529	105	158	114	914
15-17	8	31	356	31	176	55	657
18-20	11	126	214	29	190	30	600
21-24	24	390	187	27	239	26	893
25-29	57	762	165	36	152	18	1,190
30-39	226	1,700	133	26	104	17	2,206
40-49	248	935	94	18	25	7	1,327
50+	601	810	573	31	26	44	2,085
Total	1,178	4,767	5,617	383	1,130	750	13,825

Source: IFLS1, IFLS2, IFLS3

* Includes 1997, 1998, 2000 split-off households.

Table 2.4.5c
2000 Headship Status of 1997 HH Members, by Sex and Age Group

Age in 1997	Found in 1997 Origin HH*, Headship Status:			Found in 2000 Split-off HH, Headship Status:			Total
	Head	Spouse	Other	Head	Spouse	Other	
Male							
0-5	0	0	1,706	0	0	138	1,844
6-11	2	0	2,025	11	0	89	2,127
12-13	6	0	1,052	40	0	80	1,178
15-17	22	0	815	89	0	86	1,012
18-20	33	0	590	95	0	42	760
21-24	73	0	493	134	0	54	754
25-29	401	1	391	170	0	29	992
30-39	1,699	1	276	142	0	10	2,128
40-49	1,532	2	46	25	0	5	1,610
50+	2,039	6	143	48	0	16	2,252
Total	5,807	10	7,537	754	0	549	14,657
Female							
0-5	0	0	1,638	0	0	153	1,791
6-11	0	0	1,936	8	3	91	2,038
12-13	10	4	1,020	35	28	62	1,159
15-17	12	45	691	70	88	75	981
18-20	16	72	509	37	115	51	800
21-24	29	254	409	17	152	25	886
25-29	55	723	299	11	106	10	1,204
30-39	199	1,906	280	24	71	10	2,490
40-49	262	1,315	120	9	19	5	1,730
50+	729	1,135	742	22	16	30	2,674
Total	1,312	5,454	7,644	233	598	512	15,753

Source: IFLS1, IFLS2, IFLS3

* Includes 1993 original households as well as 1997 split-off households

Table 2.4.6a
Reason for Leaving the Household of Household Members Not Found in the
Target Households in 1997, by Sex ^{*)}

Reason not in HH	Male		Female	
	Freq.	Percent	Freq.	Percent
Find work	896	36.5	484	19.7
School	275	11.2	263	10.7
Follow spouse/parent	377	15.4	655	26.7
Marriage	446	18.2	561	22.8
Divorce	44	1.8	39	1.6
Help family	24	1.0	51	2.1
Need place to stay	151	6.1	122	5.0
Other	243	9.9	256	10.5
Total	2,456	100.0	2,431	100.0

Source: IFLS1 and IFLS2

*)Target households are households that were interviewed in any prior wave of the survey. IFLS2 target households are IFLS1 original households.

Table 2.4.6b
Reason for Leaving the Household of Household Members Not Found in the
Target Households in 2000, by Sex ^{*)}

Reason not in HH	Male		Female	
	Freq.	Percent	Freq.	Percent
Find work	1426	29.7	870	17.3
School	417	8.7	351	7.0
Follow spouse/parent	918	19.1	1,833	36.4
Marriage	798	16.6	880	17.5
Divorce	108	2.3	90	1.8
Help family	42	0.9	94	1.9
Need place to stay	553	11.5	390	7.8
Other	534	11.1	524	10.4
Total	4,796	100.0	5,032	100.0

Source: IFLS1, IFLS2, and IFLS3

*)Target households are households that were interviewed in any prior wave of the survey. IFLS3 target households are IFLS1 original households, IFLS2 split-off households and IFLS2+ split-off households.

Table 2.4.7
Moves by Location: 1993 Household Members
Found in Any Split-off HH in 2000

	Male		Female	
	#	%	#	%
Not moved/moved within village	916	41.8	959	42.4
Moved within sub-district	225	10.3	232	10.3
Moved within district	307	14.0	267	11.8
Moved within province	388	17.7	462	20.4
Moved outside province	355	16.2	343	15.2
Total	2,191	100.0	2,263	100.0

Source: IFLS1, IFLS2, and IFLS3

Table 2.4.8
1993 Household Demographic and Education Variables by Household Status in 2000

1993 HH Variables	HH not found in 200 (N=450)		HH found undivided in 2000 (N=4,165)		HH have divided by 2000N=(2,609)	
	Mean	Sd. Dev	Mean	Sd. Dev	Mean	Sd. Dev
<i>Mean</i>						
Age	35.62	20.07	29.76	15.1	27.2	8.73
Age male	32.35	19.34	29.7	16.14	27.84	11.85
Age female	36.07	19.65	30.73	16.16	28.9	11.78
Educ (yrs)	6.86	4.77	5.28	3.77	5.93	3.36
Educ of male (yrs)	6.06	5.55	5.48	4.48	6.36	4.15
Educ of female (yrs)	4.98	4.85	4.44	3.95	5.01	3.71
Educ of head (yrs)	7.18	5.4	5.33	4.52	5.36	4.41
<i>Standard deviation</i>						
Age	9.4	9.27	15.74	7.91	18.27	5.77
Age male	6.58	9.87	11.99	11.31	15.93	10.38
Age female	7.14	9.81	12.04	10.63	16.17	9.15
Educ (yrs)	1.76	2.10	2.18	1.98	2.87	1.73
Educ of male (yrs)	0.42	1.19	0.59	1.56	1.41	1.98
Educ of female (yrs)	0.86	2.04	0.92	1.97	1.92	2.35
<i>Maximum</i>						
Educ of male (yrs)	6.4	5.75	5.93	4.76	7.48	4.61
Educ of female (yrs)	5.66	5.42	5.14	4.44	6.53	4.53
Educ (yrs)	8.37	5.30	7.20	4.49	8.76	4.06
HH size	3.1	2.23	4.04	1.85	5.7	2.19
0-5 yrs	0.35	0.69	0.61	0.78	0.60	0.80
6 -14 yrs (boys)	0.22	0.59	0.43	0.71	0.66	0.81
6 -14 yrs (girls)	0.27	0.65	0.42	0.68	0.67	0.83
15- 24 yrs male	0.32	0.66	0.28	0.57	0.68	0.88
15- 24 yrs female	0.37	0.79	0.34	0.66	0.66	0.82
25 -49 yrs male	0.48	0.6	0.63	0.52	0.76	0.63
25 -49 yrs female	0.54	0.62	0.68	0.53	0.83	0.59
50 - 64 yrs male	0.09	0.28	0.18	0.38	0.3	0.46
50 - 64 yrs female	0.16	0.37	0.23	0.43	0.32	0.48
65+ male	0.12	0.33	0.10	0.31	0.11	0.31
65+ female	0.19	0.4	0.12	0.33	0.11	0.32
Male headed hh	0.70	0.46	0.84	0.36	0.86	0.35
Urban	0.70	0.46	0.46	0.50	0.47	0.50

Table 2.4.9
1993 Household Assets Variables by Household Status in 2000

1993 HH Variables	HH not found in 2000		HH found undivided in 2000		HH have divided by 2000	
	Mean	Sd. Dev	Mean	Sd. Dev	Mean	Sd. Dev
HH has farm business	0.19	0.39	0.39	0.49	0.42	0.49
HH has nonfarm business	0.25	0.44	0.32	0.47	0.38	0.48
Household business assets						
Landed	0.18	0.38	0.34	0.47	0.38	0.49
Farm land value (1000 Rp)	565	4,945	4	1,817	2,469	11,200
Non-farm land value (1000 Rp)	528	8,676	153	2,847	407	7,902
Land value (1000 Rp)	1,072	10,100	1,933	10,700	2,837	13,700
Other business assets (1000 Rp)	954	6,876	852	5,656	1,982	23,800
Household business assets per capita						
Landed	373	3,172	513	2,438	462	1,893
Non-farm land value (1000 Rp)	167	2,877	35	562	77	1,523
Land value (1000 Rp)	530	4,381	537	2,523	531	2,425
Other business assets (1000 Rp)	325	2,717	233	1,650	306	2,267
Household assets						
House occupied	10,600	45,300	5,617	21,100	8,279	30,300
Other house	2,141	13,700	744	5,145	1,643	19,000
Other land	1,567	10,900	1,451	9,813	2,084	12,400
Livestock	30	263	60	445	89	556
Vehicle	2,734	23,100	444	2,643	847	8,380
House appliances	763	2,105	401	1,995	473	1,785
Savings	638	3,849	193	1,283	197	1,047
Stock	23	475	6	188	9	336
Receivables	113	674	134	2,481	219	2,844
Jewelry	240	560	191	2,244	197	803
Other	103	732	53	404	141	2,257
Total	17,700	60,900	8,928	28,500	13,600	52,000
Household assets per capita						
House occupied	2,985	12,700	1,503	5,728	1,521	7,016
Other house	488	2,523	220	1,733	300	4,006
Other land	569	2,574	437	3,440	373	2,276
Livestock	11	76	17	93	17	108
Vehicle	588	3,897	118	804	147	1,594
House appliances	230	735	104	509	85	315
Savings	164	802	53	319	38	253
Stock	4	79	1	36	1	56
Receivables	36	185	34	483	39	480
Jewelry	89	206	51	464	36	119
Other	41	306	15	127	24	341
Total	4,855	14,300	2,454	8,170	2,473	11,300

Source: IFLS1, IFLS2, IFLS3

Table 2.5.1 Sample Sizes

[illegible]

Table 2.5.2a
Summary Statistics : Base Year 1993, Division by 1997, Claimant 1 and Claimant 2

1993 HH variables	Claimant 1 (N=3,270) ^{a)}		Claimant 2 (N=6,627) ^{b)}	
	Means	Std. Dev.	Means	Std. Dev.
# Claimants	2.97	1.17	3.18	1.43
<u>Proportion of claimants:</u>				
15-19 years, male	0.16	0.21	0.07	0.14
20-29 years, male	0.15	0.21	0.11	0.18
30-49 years, male	0.18	0.22	0.20	0.21
50 years or older, male	0.15	0.19	0.11	0.17
15-19 years, female	0.14	0.20	0.07	0.14
20-29 years, female	0.11	0.18	0.14	0.20
30-49 years, female	0.06	0.15	0.20	0.20
50 years or older, female	0.05	0.14	0.12	0.18
# Nonclaimant age 15 and above	1.07	0.78	0.00	0.00
# Boys 0-11	0.59	0.81	0.68	0.85
# Girls 0-11	0.57	0.80	0.66	0.84
# Boys 12-14	0.23	0.46	0.18	0.42
# Girls 12-14	0.22	0.45	0.18	0.42
Age of household head	50.78	11.88	45.64	13.71
Male head (=1)	0.82	0.38	0.89	0.31
Head of hh's schooling	5.14	4.40	5.41	4.43
Max. of non-head claimants' schooling	8.77	3.79	7.13	4.44
Sd. dev. of claimants' schooling	2.78	1.86	2.62	1.85
Mean of non-head claimants' schooling	7.89	3.50	5.62	3.70
Land owned (000 Rp)	2,616	10,600	2,280	9,885
Farm/Non-farm business assets (000 Rp)	1,097	4,929	1,070	5,339
Urban (=1)	0.51	0.50	0.46	0.50
HH farm (=1)	0.41	0.49	0.42	0.49

a) Claimant 1 consists of households with multiple claimants where claimants include household head, head's children and head's siblings who would be at least 19 years old in 1997.

b) Claimant 2 consists of households with multiple claimants where claimants include household head and other household members who would be at least 19 years old in 1997.

Table 2.5.2b
Summary Statistics: Base Year 1993, Division by 2000, Claimant 1 and Claimant 2

	Claimant 1 (N=3,951) ^{a)}		Claimant 2 (N=6,330) ^{b)}	
	Means	Std. Dev.	Means	Std. Dev.
# Claimants	3.15	1.26	3.536	1.62
Proportion of claimants:				
12-14 years, male	0.12	0.14	0.05	0.12
15-19 years, male	0.11	0.18	0.06	0.12
20-29 years, male	0.12	0.19	0.10	0.17
30-49 years, male	0.19	0.21	0.18	0.19
50 years or older, male	0.13	0.18	0.10	0.15
12-14 years, female	0.06	0.14	0.04	0.12
15-19 years, female	0.10	0.17	0.06	0.12
20-29 years, female	0.09	0.16	0.13	0.19
30-49 years, female	0.05	0.13	0.17	0.18
50 years or older, female	0.04	0.13	0.11	0.17
# Nonclaimant age 12 and above	0.57	0.95	-0.37	0.59
# Boys 0-5	0.27	0.53	0.33	0.57
# Girls 0-5	0.25	0.52	0.31	0.55
# Boys 6-11	0.37	0.61	0.36	0.60
# Girls 6-11	0.37	0.61	0.36	0.60
Age of household head	49.17	11.90	45.54	13.71
Male head (=1)	0.84	0.36	0.88	0.32
Head of hh's schooling	5.22	4.35	5.42	4.43
Max. of non-head claimants' schooling	8.28	3.64	7.39	4.18
Sd. dev. of claimants' schooling	2.68	1.75	2.64	1.74
Mean of non-head claimants' schooling	7.22	3.21	5.65	3.45
Land owned (000 Rp)	2,480	9,916	2,247	9,577
Farm/Non-farm business assets (000 Rp)	1,129	5,141	1,056	5,290
Urban	0.48	0.50	0.46	0.50
HH farm	0.42	0.49	0.41	0.49

a) Claimant 1 consists of households with multiple claimants where claimants include household head, head's children and head's siblings who would be at least 19 years old in 2000.

b) Claimant 2 consists of households with multiple claimants where claimants include household head and other household members who would be at least 19 years old in 2000.

Table 2.5.2c
Descriptive Statistics: Base Year 1997, Division by 2000 Claimant 1 and Claimant 2

	Claimant 1 (N=3,417) ^{a)}		Claimant 2 (N=6,664) ^{b)}	
	Means	Std. Dev.	Means	Std. Dev.
# Claimants	2.91	1.09	3.12	1.36
Proportion of claimants:				
16-19 years, male	0.13	0.04	0.05	0.12
20-29 years, male	0.16	0.21	0.09	0.16
30-49 years, male	0.19	0.22	0.21	0.21
50 years or older, male	0.16	0.20	0.12	0.17
16-19 years, female	0.12	0.19	0.06	0.13
20-29 years, female	0.12	0.18	0.12	0.19
30-49 years, female	0.07	0.16	0.22	0.20
50 years or older, female	0.05	0.14	0.13	0.18
# Nonclaimant age 16 and above	1.03	0.77		
# Boys 0-11	0.49	0.75	0.59	0.80
# Girls 0-11	0.48	0.73	0.57	0.77
# Boys 12-15	0.26	0.49	0.23	0.48
# Girls 12-15	0.27	0.51	0.23	0.48
Male head (=1)	0.81	0.40	0.88	0.33
Age of household head	52.40	11.72	47.49	13.71
Head of hh's schooling	5.45	4.50	5.87	4.59
Max. of non-head claimants' schooling	9.36	3.80	7.73	4.53
Sd. dev. of claimants' schooling	2.91	1.94	2.70	1.96
Mean of non-head claimants' schooling	8.50	3.61	6.21	3.89
Land owned (000 Rp)	4,211	21,000	3,639	17,700
Farm/Non-farm business assets (000 Rp)	2,372	14,700	2,195	13,800
Urban	0.50	0.50	0.46	0.50
HH farm	0.36	0.48	0.36	0.48

a) Claimant 1 consists of households with multiple claimants where claimants include household head, head's children and head's siblings who would be at least 19 years old in 2000.

b) Claimant 2 consists of households with multiple claimants where claimants include household head and other household members who would be at least 19 years old in 2000.

Table 2.5.3a
Means and Difference in Means of Key Variables of 1993 Households between Households that Have Divided and Households that Have Not Divided by 1997

1993 HH Characteristics	Households have not divided by 1997	Household have divided by 1997	Diff.	p-value
Claimant 1 ^{a)} N= 3,270				
# Claimants	2.9	3.4	0.5	0.000
Household size	5.5	6.5	1.0	0.000
Age, mean	29.2	28.8	-0.4	0.296
Age, sd. dev.	18.6	19.0	0.4	0.081
Head's age	50.6	51.7	1.1	0.043
Head's educ. (yrs.)	5.2	4.9	-0.4	0.086
Non-head claimants' mean educ (yrs).	7.9	7.9	0.0	0.833
Non-head claimants' max. educ. (yrs)	8.7	9.1	0.4	0.032
Claimants' sd. dev. of educ. (yrs)	2.8	2.8	0.0	0.622
Household sd. dev. of education (yrs)	3.4	3.6	0.1	0.021
Value of land owned (1000 Rp)	2,530	2,939	409	0.465
Value of other bus. assets (1000 Rp)	1,027	1,389	362	0.157
Claimant 2 ^{b)} N= 6,227				
# Claimants	2.4	2.7	0.3	0.000
Household size	5.7	6.6	0.9	0.000
Age, mean	29.4	29.0	-0.4	0.302
Age, sd. dev.	18.9	19.1	0.2	0.434
Head's age	50.3	51.9	1.6	0.011
Head's educ. (yrs.)	5.3	4.8	-0.4	0.051
Non-head claimants' mean educ (yrs).	7.9	7.9	0.1	0.785
Non-head claimants' max. educ. (yrs)	8.4	8.8	0.4	0.047
Claimants' sd. dev. of educ. (yrs)	3.0	3.0	0.0	0.713
Household sd. dev. of education (yrs)	3.5	3.6	0.1	0.122
Value of land owned (1000 Rp)	2,724	3,065	341	0.608
Value of other bus. assets (1000 Rp)	1,074	1,228	154	0.535

a) Claimant 1 consists of households with multiple claimants where claimants include household head, head's children and head's siblings who would be at least 19 years old in 1997.

b) Claimant 2 consists of households with multiple claimants where claimants include household head and other household members who would be at least 19 years old in 1997.

Table 2.5.3b
Means and Difference in Means of Key Variables of 1993 Households between Households that Have Divided and Households that Have Not Divided by 2000

1993 HH Characteristics	Households have not divided by 2000	Household have divided by 2000	Diff.	p-value
Claimant 1 ^{a)} N= 3,951				
# Claimants	2.8	3.5	0.7	0.000
Household size	5.0	6.0	1.1	0.000
Age, mean	29.0	27.3	-1.7	0.000
Age, sd. dev.	18.9	18.3	-0.6	0.000
Head's age	49.1	49.3	0.2	0.590
Head's educ. (yrs.)	5.1	5.3	0.2	0.275
Non-head claimants' mean educ (yrs).	6.9	7.5	0.5	0.000
Non-head claimants' max. educ. (yrs)	7.8	8.7	0.9	0.000
Claimants' sd. dev. of educ. (yrs)	2.7	2.7	0.0	0.638
Household sd. dev. of education (yrs)	3.3	3.4	0.1	0.011
Value of land owned (1000 Rp)	2,040	2,826	786	0.009
Value of other bus. assets (1000 Rp)	725	1,460	734	0.000
Claimant 2 ^{b)} N=6,330				
# Claimants	3.0	4.3	1.3	0.000
Household size	4.3	5.7	1.4	0.000
Age, mean	28.3	27.2	-1.1	0.000
Age, sd. dev.	16.8	18.3	1.5	0.000
Head's age	43.9	48.0	4.1	0.000
Head's educ. (yrs.)	5.5	5.4	-0.1	0.392
Non-head claimants' mean educ (yrs).	5.3	6.1	0.8	0.000
Non-head claimants' max. educ. (yrs)	6.6	8.5	1.9	0.000
Claimants' sd. dev. of educ. (yrs)	2.5	2.9	0.5	0.000
Household sd. dev. of education (yrs)	3.2	3.4	0.1	0.004
Value of land owned (1000 Rp)	1,947	2,661	714	0.004
Value of other bus. assets (1000 Rp)	824	1,384	560	0.000

a) Claimant 1 consists of households with multiple claimants where claimants include household head, head's children and head's siblings who would be at least 19 years old in 2000.

b) Claimant 2 consists of households with multiple claimants where claimants include household head and other household members who would be at least 19 years old in 2000.

Table 2.5.3c
Means and Difference in Means of Key Variables of 1997 Households between Households that
Have Divided and Households that Have Not Divided by 2000

1997 HH Characteristics	Households have not divided by 2000	Household have divided by 2000	Diff.	p-value
Claimant 1 ^{a)} N= 3,417				
# Claimants	2.7	3.2	0.45	0.000
Household size	5.1	6	0.91	0.000
Age, mean	31.6	29.3	-2.27	0.000
Age, sd. dev.	19.3	18.9	-0.45	0.012
Head's age	52.5	52.2	-0.28	0.494
Head's educ. (yrs.)	5.4	5.5	0.2	0.372
Non-head claimants' mean educ (yrs).	8.4	8.8	0.37	0.005
Non-head claimants' max. educ. (yrs)	9.1	9.8	0.67	0.000
Claimants' sd. dev. of educ. (yrs)	2.9	2.9	0.00	0.951
Household sd. dev. of education (yrs)	3.5	3.7	0.12	0.030
Value of land owned (1000 Rp)	3,704	5,119	1,414	0.051
Value of other bus. assets (1000 Rp)	2,202	2,669	467	0.361
Claimant 2 ^{b)} N=6,664				
# Claimants	2.9	3.9	1.07	0.000
Household size	4.4	5.8	1.34	0.000
Age, mean	30.3	29	-1.38	0.000
Age, sd. dev.	17.4	18.9	1.53	0.000
Head's age	46.6	50.5	3.93	0.000
Head's educ. (yrs.)	5.9	5.6	-0.29	0.030
Non-head claimants' mean educ (yrs).	6	6.8	0.81	0.000
Non-head claimants' max. educ. (yrs)	7.3	9.2	1.84	0.000
Claimants' sd. dev. of educ. (yrs)	2.6	3.1	0.56	0.000
Household sd. dev. of education (yrs)	3.4	3.6	0.15	0.004
Value of land owned (1000 Rp)	3,247	4,931	1,684	0.003
Value of other bus. assets (1000 Rp)	2,083	2,556	473	0.185

a) Claimant 1 consists of households with multiple claimants where claimants include household head, head's children and head's siblings who would be at least 19 years old in 2000.

b) Claimant 2 consists of households with multiple claimants where claimants include household head and other household members who would be at least 19 years old in 2000.

Table 2.5.4
Household Education Variables, by the Number of Adults in the Household, IFLS 1993

Number of adult in the household	Heads' education (yrs)	Non-head adults' max. education (yrs)	Non-head adults' mean education (yrs)	Standard deviation of adult's education	Correlation (head, max) (1) and (2)	Correlation (max, mean) (2) and (3)	Correlation (max, sd) (3) and (4)	# Households
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(10)
1	4.4	-	-					612
2	5.5	4.9	4.9	1.9	0.601	1.000	0.652	2905
3	5.3	7.7	5.6	3.0	0.499	0.903	0.713	1587
4	5.7	9.3	6.4	3.2	0.515	0.865	0.688	1090
5	5.6	9.8	6.7	3.2	0.559	0.873	0.666	562
6	6.1	11	7.6	3.4	0.559	0.859	0.562	237
>6	6.9	11.9	8.1	3.4	0.483	0.832	0.607	230
>2	5.5	7.2	5.9	2.6	0.496	0.908	0.640	6611

Source: IFLS1

Adult is defined as 15 years old or older. The total number of household reported in the table is 7223 (612+6611), since no household with no adult member is excluded. (The head of the household is 14 years old).

Table 2.6.1
Determinant of Household Division between 1993 and 1997, Claimant 1

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.060 [8.247] ***	0.058 [7.862] ***	0.058 [7.866] ***	0.058 [7.870] ***	0.059 [8.187] ***	0.023 [8.245] ***
Proportion of claimants:						
20-29 years, male	0.291 [6.163] ***	0.292 [6.196] ***	0.291 [6.161] ***	0.291 [6.161] ***	0.304 [6.452] ***	0.102 [6.213] ***
30-49 years, male	0.386 [5.989] ***	0.393 [6.068] ***	0.392 [6.058] ***	0.390 [6.040] ***	0.4 [6.283] ***	0.144 [6.112] ***
50 years or older, male	0.386 [4.456] ***	0.394 [4.553] ***	0.392 [4.538] ***	0.392 [4.528] ***	0.389 [4.544] ***	0.14 [4.425] ***
15-19 years, female	0.032 [0.673]	0.033 [0.685]	0.033 [0.696]	0.032 [0.673]	0.04 [0.874]	0.022 [1.391]
20-29 years, female	0.231 [4.640] ***	0.232 [4.675] ***	0.232 [4.675] ***	0.233 [4.683] ***	0.248 [4.994] ***	0.101 [5.737] ***
30-49 years, female	0.335 [5.017] ***	0.339 [5.083] ***	0.339 [5.072] ***	0.339 [5.081] ***	0.35 [5.347] ***	0.127 [5.445] ***
50 years or older, female	0.218 [2.593] ***	0.228 [2.717] ***	0.229 [2.713] ***	0.225 [2.688] ***	0.234 [2.844] ***	0.083 [2.817] ***
# Non-claimant members 15+	0.019 [2.256] **	0.020 [2.354] **	0.020 [2.333] **	0.020 [2.294] **	0.019 [2.200] **	0.007 [2.000] **
Age of head	-0.011 [2.533] **	-0.011 [2.554] **	-0.011 [2.539] **	-0.011 [2.555] **	-0.011 [2.617] **	-0.003 [2.140] **
Age of head squared x 10 ⁻³	0.086 [2.315] **	0.087 [2.328] **	0.086 [2.318] **	0.087 [2.342] **	0.087 [2.347] **	0.024 [1.781] *
Head of hh's educ.	-0.003 [1.364]	-0.005 [1.926] *	-0.005 [1.924] *	-0.004 [1.664] *	-0.004 [1.760] *	-0.002 [1.526]
Max. schooling, non-head claimants	0.003 [1.632]	0.006 [2.182] **	0.006 [2.168] **	0.006 [2.150] **	0.006 [2.207] **	-0.002 [1.297]
Sd. dev. of claimants' schooling		-0.007 [1.397]	-0.007 [1.396]	-0.007 [1.366]	-0.007 [1.396]	0.045 [3.733] ***
# Boys 0-11	0.018 [2.249] **	0.018 [2.238] **	0.018 [2.254] **	0.018 [2.251] **	0.018 [2.314] **	0.006 [2.159] **
# Girls 0-11	0.016 [1.957] *	0.016 [1.932] *	0.016 [1.931] *	0.016 [1.951] *	0.017 [2.057] *	0.005 [1.667] *
# Boys 12-14	0.004 [0.285]	0.004 [0.279]	0.004 [0.273]	0.004 [0.233]	0.003 [0.229]	0.004 [0.727]
# Girls 12-14	0.091 [6.497] ***	0.090 [6.462] ***	0.090 [6.447] ***	0.089 [6.449] ***	0.088 [6.399] ***	0.032 [6.192] ***
Male head (=1)	-0.053 [1.430]	-0.054 [1.443]	-0.053 [1.424]	-0.051 [1.382]	-0.055 [1.521]	-0.019 [1.371]
log(land owned) (Rp x 10 ⁻³)	1.736 [1.518]	1.764 [1.541]	2.338 [1.517]	2.573 [1.700] *	2.414 [1.655] *	0.002 [1.955] *
log(bus. assets) (Rp x 10 ⁻³)	-1.449 [1.211]	-1.467 [1.225]	-1.756 [0.839]	-1.414 [0.678]	-1.796 [0.842]	0.675 [1.123]
Urban (=1)	-0.055 [3.090] ***	-0.054 [3.081] ***	-0.055 [3.081] ***	-0.055 [3.065] ***	-0.078 [1.386]	-0.186 [0.222]

(continued)

(continued)

Interactions						
Urban x $\log(\text{land owned}) \times 10^{-3}$				-1.589	-1.989	-1.881
				[0.660]	[0.830]	[0.802]
Urban x $\log(\text{bus. assets}) \times 10^{-3}$				0.537	-0.297	-0.366
				[0.214]	[0.113]	[0.139]
$\log(\text{land owned})$ (Rp x 10^{-3})						
x household head's schooling					0.150	0.033
					[0.479]	[0.104]
x max. of non-head claimants' schooling					-0.011	0.025
					[0.029]	[0.070]
$\log(\text{bus. assets})$ (Rp x 10^{-3})						
x household head's schooling					0.138	0.175
					[0.454]	[0.576]
x max. of non-head claimants' schooling					0.139	0.119
					[0.364]	[0.315]
Observations	3,270	3,270	3,270	3,270	3,270	3,270
Province, urban, interaction dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education					0.167	0.200
Non-head claimants' max. educ.					0.193	0.176
Education variables	0.177	0.138	0.054	0.349	0.407	0.641
Land variables			0.294	0.531	0.564	0.858
Other assets variables			0.494	0.726	0.535	0.945
Land and assets variables	0.270	0.260	0.554	0.711	0.535	0.968

Claimants include head of household and children or siblings who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the 1993 community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Table 2.6.2
Determinant of Household Division between 1993 and 2000, Claimant 1

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.113 [10.374] ***	0.111 [10.074] ***	0.111 [10.103] ***	0.111 [10.048] ***	0.117 [10.726] ***	0.129 [10.278] ***
<u>Proportion of claimants:</u>						
15-19 years, male	-0.157 [2.097] **	-0.163 [2.169] **	-0.161 [2.137] **	-0.160 [2.121] **	-0.169 [2.267] **	-0.243 [2.908] ***
20-29 years, male	0.104 [1.369]	0.101 [1.318]	0.101 [1.324]	0.102 [1.337]	0.117 [1.512]	0.065 [0.749]
30-49 years, male	-0.215 [2.270] **	-0.214 [2.256] **	-0.211 [2.220] **	-0.214 [2.247] **	-0.192 [2.014] **	-0.31 [2.808] ***
50 years or older, male	-0.171 [1.501]	-0.172 [1.519]	-0.172 [1.507]	-0.170 [1.480]	-0.142 [1.227]	-0.323 [2.391]
12-14 years, female	0.036 [0.518]	0.033 [0.475]	0.032 [0.471]	0.031 [0.456]	0.041 [0.595]	0.051 [0.644]
15-19 years, female	-0.133 [1.837] *	-0.141 [1.945] *	-0.141 [1.941] *	-0.138 [1.899] *	-0.130 [1.790] *	-0.2 [2.460] **
20-29 years, female	-0.058 [0.750]	-0.065 [0.831]	-0.063 [0.811]	-0.061 [0.785]	-0.047 [0.592]	-0.083 [0.973]
30-49 years, female	-0.151 [1.480]	-0.154 [1.498]	-0.153 [1.492]	-0.153 [1.495]	-0.132 [1.267]	-0.176 [1.487]
50 years or older, female	-0.170 [1.315]	-0.162 [1.246]	-0.163 [1.251]	-0.164 [1.260]	-0.135 [1.025]	-0.181 [1.290]
# Non-claimant members 12+	0.069 [5.304] ***	0.069 [5.301] ***	0.069 [5.307] ***	0.069 [5.273] ***	0.069 [5.332] ***	0.086 [5.998] ***
Age of head	-0.006 [1.136]	-0.006 [1.101]	-0.006 [1.106]	-0.006 [1.215]	-0.007 [1.349]	-0.005 [0.899]
Age of head squared x 10 ⁻³	0.047 [0.984]	0.046 [0.966]	0.046 [0.966]	0.051 [1.064]	0.056 [1.151]	0.053 [0.973]
Head of hh's educ.	0.000 [0.048]	-0.002 [0.667]	-0.002 [0.634]	-0.001 [0.423]	-0.001 [0.213]	0.003 [0.912]
Max. schooling, non-head claimants	0.007 [2.404] **	0.011 [3.040] ***	0.011 [3.071] ***	0.011 [3.173] ***	0.011 [3.259] ***	0.014 [3.678] ***
Sd. dev. of claimants' schooling		-0.011 [1.831] *	-0.011 [1.840] *	-0.009 [1.609]	-0.009 [1.585]	-0.009 [1.326]
# Boys 0-5	0.027 [1.715] *	0.027 [1.737] *	0.027 [1.752] *	0.028 [1.773] *	0.029 [1.930] *	0.034 [1.909] *
# Girls 0-5	0.033 [2.112] **	0.032 [2.117] **	0.032 [2.109] **	0.033 [2.151] **	0.031 [1.978] **	0.051 [2.738] ***
# Boys 6-11	0.056 [4.127] ***	0.056 [4.093] ***	0.056 [4.122] ***	0.055 [4.079] ***	0.055 [3.974] ***	0.062 [3.850] ***
# Girls 6-11	0.039 [2.746] ***	0.038 [2.675] ***	0.037 [2.676] ***	0.037 [2.656] ***	0.039 [2.864] ***	0.044 [2.842] ***
Male head (=1)	-0.010 [0.220]	-0.011 [0.230]	-0.009 [0.201]	-0.005 [0.107]	-0.012 [0.259]	0.001 [0.025]

(continued)

(continued)

<i>log(land owned)</i> (Rp x 10 ⁻³)	0.477 [0.311]	0.559 [0.365]	1.040 [0.535]	1.021 [0.500]	1.025 [0.497]	1.522 [0.634]
<i>log(bus. assets)</i> (Rp x 10 ⁻³)	3.654 [2.172] **	3.589 [2.138] **	1.428 [0.514]	2.197 [0.773]	1.799 [0.606]	2.832 [0.898]
Urban (=1)	-0.070 [3.138] ***	-0.069 [3.096] ***	-0.071 [3.122] ***	-0.070 [3.099] ***	-0.097 [1.568]	0.953 [23.364] ***
Interactions						
Urban x <i>log(land owned)</i> x 10 ⁻³			-0.100 [0.031]	0.990 [0.284]	0.470 [0.135]	-1.59 [0.391]
Urban x <i>log(bus. assets)</i> x 10 ⁻³			3.337 [0.954]	1.758 [0.460]	1.429 [0.368]	2.46 [0.567]
<i>log(land owned)</i> (Rp x 10 ⁻³) x household head's schooling				0.231 [0.511]	0.073 [0.162]	0.174 [0.350]
x max. of non-head claimants' schooling				-0.613 [1.182]	-0.527 [1.032]	-0.63 [1.093]
<i>log(bus. assets)</i> (Rp x 10 ⁻³) x household head's schooling				0.703 [1.817] *	0.728 [1.867] *	0.83 [1.888] *
x max. of non-head claimants' schooling				-0.193 [0.378]	-0.135 [0.266]	-0.203 [0.362]
Observations	3,951	3,951	3,951	3,951	3,951	3,951
Province, urban, interaction dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.077	0.138	0.073
Non-head claimants' max. educ.				0.005	0.005	0.001
Education variables	0.045	0.020	0.018	0.019	0.020	0.001
Land variables			0.814	0.755	0.790	0.750
Other assets variables			0.070	0.076	0.114	0.042
Land and assets variables	0.028	0.028	0.069	0.029	0.107	0.035

Claimants include head of household and children or siblings who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Table 2.6.3
Determinant of Household Division between 1997 and 2000, Claimant 1

1997 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.069 [6.656] ***	0.068 [6.471] ***	0.068 [6.473] ***	0.067 [6.366] ***	0.07 [6.741] ***	0.07 [6.440] ***
Proportion of claimants:						
20-29 years, male	0.101 [1.838] *	0.101 [1.846] *	0.101 [1.861] *	0.103 [1.884] *	0.107 [1.964] **	0.097 [1.803] *
30-49 years, male	0.001 [0.016]	0.004 [0.052]	0.005 [0.066]	0.002 [0.029]	0.012 [0.150]	-0.014 [0.178]
50 years or older, male	-0.083 [0.812]	-0.080 [0.777]	-0.080 [0.782]	-0.088 [0.863]	-0.071 [0.675]	-0.081 [0.762]
16-19 years, female	0.118 [2.106] **	0.117 [2.096] **	0.117 [2.097] **	0.118 [2.110] **	0.125 [2.218] **	0.098 [1.641]
20-29 years, female	0.134 [2.119] **	0.135 [2.126] **	0.136 [2.144] **	0.135 [2.125] **	0.137 [2.181] **	0.127 [2.020] **
30-49 years, female	-0.187 [2.400] **	-0.185 [2.383] **	-0.186 [2.387] **	-0.192 [2.470] **	-0.196 [2.441] **	-0.129 [1.530]
50 years or older, female	-0.227 [1.879] *	-0.222 [1.849] *	-0.221 [1.845] *	-0.232 [1.944] *	-0.224 [1.875] *	-0.149 [1.248]
# Non-claimant members 16+	0.031 [2.452] **	0.031 [2.463] **	0.031 [2.400] **	0.031 [2.444] **	0.03 [2.311] **	0.055 [3.813] ***
Age of head	0.006 [1.065]	0.006 [1.028]	0.006 [1.030]	0.006 [1.034]	0.005 [0.960]	0.006 [0.933]
Age of head squared x 10 ⁻³	-0.040 [0.802]	-0.038 [0.769]	-0.038 [0.774]	-0.039 [0.770]	-0.035 [0.701]	-0.041 [0.728]
Head of hh's educ.	0.000 [0.115]	-0.001 [0.426]	-0.001 [0.418]	-0.002 [0.488]	-0.001 [0.306]	-0.001 [0.182]
Max. schooling, non-head claimants	0.005 [1.645]	0.006 [1.623]	0.006 [1.641]	0.006 [1.660] *	0.007 [1.815] *	0.009 [2.291] **
Sd. dev. of claimants' schooling		-0.003 [0.504]	-0.003 [0.509]	-0.003 [0.424]	-0.004 [0.516]	-0.007 [0.985]
# Boys 0-11	0.023 [1.973] **	0.023 [1.969] **	0.023 [1.977] **	0.023 [1.946] *	0.023 [1.988] **	0.027 [2.224] **
# Girls 0-11	0.021 [1.724] *	0.021 [1.712] *	0.020 [1.707] *	0.021 [1.757] *	0.021 [1.713] *	0.023 [1.699] *
# Boys 12-15	0.057 [3.105] ***	0.057 [3.109] ***	0.057 [3.104] ***	0.058 [3.122] ***	0.062 [3.373] ***	0.062 [3.279] ***
# Girls 12-15	0.106 [6.438] ***	0.106 [6.438] ***	0.106 [6.478] ***	0.106 [6.448] ***	0.111 [6.692] ***	0.125 [7.257] ***
Male head (=1)	-0.078 [1.775] *	-0.078 [1.770] *	-0.076 [1.720] *	-0.079 [1.775] *	-0.085 [1.887] *	-0.07 [1.480]
log(land owned) (Rp x 10 ⁻³)	2.456 [1.748] *	2.466 [1.756] *	2.553 [1.488]	2.370 [1.318]	2.153 [1.163]	1.502 [0.812]
log(bus. assets) (Rp x 10 ⁻³)	4.190 [2.758] ***	4.188 [2.755] ***	2.995 [1.167]	2.423 [0.915]	2.379 [0.872]	2.652 [0.962]
Urban (=1)	-0.013 [0.622]	-0.013 [0.615]	-0.014 [0.641]	-0.014 [0.658]	-0.032 [0.422]	0.145 [0.479]

(continued)

(continued)

Interactions						
Urban x $\log(\text{land owned}) \times 10^{-3}$			0.485	1.063	0.222	0.472
			[0.160]	[0.338]	[0.070]	[0.148]
Urban x $\log(\text{bus. assets}) \times 10^{-3}$			1.841	3.493	3.306	1.076
			[0.570]	[1.008]	[0.930]	[0.304]
$\log(\text{land owned})$ (Rp x 10^{-3})						
x household head's schooling				-0.115	-0.068	-0.126
				[0.289]	[0.170]	[0.326]
x max. of non-head claimants' schooling				-0.001	-0.089	-0.099
				[0.003]	[0.200]	[0.227]
$\log(\text{bus. assets})$ (Rp x 10^{-3})						
x household head's schooling				0.020	0.013	0.122
				[0.050]	[0.032]	[0.299]
x max. of non-head claimants' schooling				-0.65	-0.607	-0.231
				[1.351]	[1.259]	[0.479]
Observations	3,417	3,417	3,417	3,417	3,417	3,417
Province, urban, interaction dummies	No	No	No	No	No	Yes
Community dummies	No	No	No	No	No	No
F-test (<i>p-values</i>)						
Head's education				0.962	0.991	0.987
Non-head claimants' max. educ.				0.197	0.159	0.139
Education variables	0.217	0.340	0.329	0.493	0.411	0.336
Land variables			0.165	0.392	0.696	0.748
Other assets variables			0.020	0.032	0.054	0.351
Land and assets variables	0.000	0.000	0.001	0.005	0.022	0.349

Claimants include head of household and children or siblings who were 16 or over in 1997. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Table 2.6.4
Determinant of Household Division between 1993 and 1997, Claimant 2

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.043 [12.524] ***	0.043 [12.531] ***	0.043 [12.530] ***	0.043 [12.556] ***	0.044 [12.559] ***	0.018 [12.004] ***
<u>Proportion of claimants:</u>						
20-29 years, male	0.204 [4.656] ***	0.203 [4.618] ***	0.202 [4.592] ***	0.200 [4.563] ***	0.204 [4.697] ***	0.078 [4.617] ***
30-49 years, male	0.244 [5.348] ***	0.243 [5.285] ***	0.242 [5.280] ***	0.240 [5.274] ***	0.242 [5.326] ***	0.097 [5.231] ***
50 years or older, male	0.209 [3.627] ***	0.208 [3.599] ***	0.207 [3.590] ***	0.204 [3.545] ***	0.207 [3.584] ***	0.088 [3.697] ***
15-19 years, female	0.019 [0.424]	0.018 [0.406]	0.018 [0.404]	0.018 [0.395]	0.021 [0.480]	0.02 [1.170]
20-29 years, female	0.078 [1.683] *	0.077 [1.647] *	0.076 [1.636]	0.076 [1.641]	0.074 [1.616]	0.038 [2.171] **
30-49 years, female	0.127 [2.551] **	0.122 [2.464] **	0.121 [2.448] **	0.122 [2.468]	0.115 [2.390] **	0.045 [2.451] **
50 years or older, female	0.167 [3.705] ***	0.154 [3.423] ***	0.154 [3.403] ***	0.155 [3.433] ***	0.151 [3.327] ***	0.066 [3.721] ***
Age of head	-0.001 [0.248]	-0.001 [0.236]	-0.001 [0.235]	-0.001 [0.235]	0 [0.207]	0 [0.108]
Age of head squared x 10 ⁻³	0.008 [0.361]	0.008 [0.349]	0.008 [0.347]	0.008 [0.359]	0.007 [0.314]	-0.001 [0.087]
Head of hh's schooling	-0.002 [1.753] *	-0.002 [1.568]	-0.002 [1.560]	-0.002 [1.361]	-0.002 [1.468]	-0.001 [0.972]
Max. schooling, non-head claimants	0.004 [2.910] ***	0.003 [1.980] **	0.003 [1.979]	0.003 [2.040]	0.003 [2.201] **	0.001 [1.393]
Sd. dev. of claimants' schooling		0.004 [1.681] *	0.004 [1.693]	0.004 [1.421]	0.004 [1.498]	0.033 [4.849] ***
# Boys 0-11	0.003 [0.682]	0.003 [0.660]	0.003 [0.674]	0.003 [0.639]	0.004 [0.820]	0.002 [1.125]
# Girls 0-11	0.012 [2.442] **	0.012 [2.363] **	0.012 [2.362] **	0.012 [2.338] **	0.013 [2.562] **	0.006 [2.911] ***
# Boys 12-14	0.026 [2.892] ***	0.026 [2.877] ***	0.026 [2.873] ***	0.025 [2.786] ***	0.025 [2.901] ***	0.012 [3.271] ***
# Girls 12-14	0.071 [7.886] ***	0.072 [7.918] ***	0.072 [7.917] ***	0.072 [7.965] ***	0.071 [8.020] ***	0.03 [8.122] ***
Male head (=1)	-0.089 [4.444] ***	-0.089 [4.467] ***	-0.089 [4.462] ***	-0.087 [4.390] ***	-0.095 [4.814] ***	-0.042 [4.411] ***
log(land owned) (Rp x 10 ⁻³)	0.779 [1.122]	0.750 [1.083]	1.008 [1.144]	1.147 [1.251]	1.063 [1.199]	0.001 [2.379]
log(bus. assets) (Rp x 10 ⁻³)	-0.192 [0.277]	-0.233 [0.333]	-0.604 [0.539]	-0.840 [0.736]	-0.871 [0.737]	0.441 [1.146]
Urban (=1)	-0.035 [3.183] ***	-0.035 [3.185] ***	-0.035 [3.201] ***	-0.035 [3.205] ***	-0.032 [1.039]	-0.43 [0.851]

(continued)

(continued)

Interactions						
Urban x $\log(\text{land owned}) \times 10^{-3}$			-0.606	-1.900	-1.901	-0.966
			[0.397]	[1.200]	[1.215]	[1.366]
Urban x $\log(\text{bus. assets}) \times 10^{-3}$			0.626	1.465	1.427	1.06
			[0.442]	[0.927]	[0.886]	[1.540]
$\log(\text{land owned})$ (Rp x 10^{-3})						
x household head's schooling				0.101	0.062	0.06
				[0.521]	[0.318]	[0.730]
x max. of non-head claimants' schooling				0.326	0.356	0.156
				[1.574]	[1.731]*	[1.786]*
$\log(\text{bus. assets})$ (Rp x 10^{-3})						
x household head's schooling				0.050	0.055	-0.049
				[0.283]	[0.317]	[0.651]
x max. of non-head claimants' schooling				-0.302	-0.311	-0.164
				[1.485]	[1.523]	[1.969]
Observations	6,227	6,227	6,227	6,227	6,227	6,227
Province, urban, interaction dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.336	0.349	0.498
Non-head claimants' max. educ.				0.077	0.049	0.023
Education variables	0.013	0.008	0.007	0.008	0.005	0.002
Land variables			0.498	0.089	0.087	0.050
Other assets variables			0.865	0.612	0.563	0.152
Land and assets variables	0.515	0.549	0.838	0.302	0.306	0.196

Claimants include head of household and any member who were 15 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the 1993 community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Table 2.6.5
Determinant of Household Division between 1993 and 2000, Claimant 2

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.118 [9.633] ***	0.118 [9.643] ***	0.118 [9.660] ***	0.118 [9.656] ***	0.120 [9.823] ***	0.131 [9.282] ***
Proportion of claimants:						
15-19 years, male	-0.601 [3.383] ***	-0.596 [3.353] ***	-0.597 [3.361] ***	-0.599 [3.369] ***	-0.596 [3.347] ***	-0.691 [3.544] ***
20-29 years, male	-0.504 [2.907] ***	-0.500 [2.882] ***	-0.501 [2.890] ***	-0.505 [2.909] ***	-0.489 [2.808] ***	-0.591 [3.056] ***
30-49 years, male	-0.742 [4.536] ***	-0.739 [4.510] ***	-0.739 [4.517] ***	-0.743 [4.527] ***	-0.722 [4.375] ***	-0.816 [4.491] ***
50 years or older, male	-0.861 [5.096] ***	-0.857 [5.063] ***	-0.857 [5.072] ***	-0.858 [5.066] ***	-0.828 [4.853] ***	-0.972 [5.202] ***
12-14 years, female	-0.001 [0.012]	0.000 [0.004]	0.000 [0.002]	-0.002 [0.036]	0 [0.006]	0.022 [0.310]
15-19 years, female	-0.650 [3.869] ***	-0.646 [3.839] ***	-0.647 [3.852] ***	-0.648 [3.850] ***	-0.636 [3.782] ***	-0.71 [3.843] ***
20-29 years, female	-0.700 [4.122] ***	-0.696 [4.099] ***	-0.697 [4.111] ***	-0.697 [4.107] ***	-0.679 [4.004] ***	-0.791 [4.237] ***
30-49 years, female	-0.740 [4.422] ***	-0.739 [4.422] ***	-0.740 [4.436] ***	-0.740 [4.432] ***	-0.716 [4.273] ***	-0.856 [4.590] ***
50 years or older, female	-0.782 [4.560] ***	-0.789 [4.637] ***	-0.791 [4.652] ***	-0.792 [4.661] ***	-0.765 [4.491] ***	-0.869 [4.613] ***
# Non-claimant members 12+	0.135 [2.872] ***	0.134 [2.846] ***	0.134 [2.855] ***	0.135 [2.869] ***	0.131 [2.791] ***	0.15 [2.875] ***
Age of head	0.014 [3.098] ***	0.014 [3.108] ***	0.014 [3.113] ***	0.014 [3.104] ***	0.014 [3.071] ***	0.015 [3.108] ***
Age of head squared x 10 ⁻³	-0.103 [2.460] **	-0.103 [2.470] **	-0.103 [2.475] **	-0.103 [2.460] **	-0.103 [2.440] **	-0.107 [2.322] **
Head of hh's schooling	-0.004 [1.916] *	-0.004 [1.812] *	-0.004 [1.792] *	-0.003 [1.339]	-0.003 [1.477]	0 [0.205]
Max. schooling, non-head claimants	0.011 [4.440] ***	0.010 [3.851] ***	0.010 [3.883] ***	0.010 [3.948] ***	0.011 [4.309] ***	0.013 [4.763] ***
Sd. dev. of claimants' schooling		0.005 [0.949]	0.005 [0.938]	0.004 [0.846]	0.004 [0.885]	0.005 [0.971]
# Boys 0-5	0.000 [0.001]	0.000 [0.002]	0.000 [0.008]	0.000 [0.010]	0.001 [0.059]	0.007 [0.522]
# Girls 0-5	0.007 [0.552]	0.006 [0.523]	0.006 [0.533]	0.007 [0.546]	0.006 [0.507]	0.016 [1.175]
# Boys 6-11	0.065 [5.930] ***	0.065 [5.919] ***	0.065 [5.938] ***	0.065 [5.889] ***	0.065 [5.785] ***	0.072 [5.840] ***
# Girls 6-11	0.059 [4.847] ***	0.059 [4.837] ***	0.059 [4.846] ***	0.060 [4.870] ***	0.061 [5.024] ***	0.071 [5.407] ***
Male head (=1)	-0.059 [1.638]	-0.059 [1.639]	-0.059 [1.629]	-0.056 [1.538]	-0.067 [1.859]	-0.083 [2.038]

(continued)

(continued)

<i>log(land owned)</i> (Rp x 10 ⁻³)	-0.209 [0.168]	-0.237 [0.189]	-0.344 [0.232]	0.056 [0.037]	-0.178 [0.116]	-0.21 [0.121]
<i>log(bus. assets)</i> (Rp x 10 ⁻³)	3.695 [2.692]	3.678 [2.677]	3.087 [1.433]	3.325 [1.511]	3.379 [1.469]	3.013 [1.216]
Urban (=1)	-0.064 [3.562]	-0.064 [3.558]	-0.063 [3.411]	-0.063 [3.381]	-0.018 [0.397]	-0.994 [36.958]
Interactions						
Urban x <i>log(land owned)</i> x 10 ⁻³			0.885 [0.327]	0.247 [0.085]	0.873 [0.301]	-0.371 [0.117]
Urban x <i>log(bus. assets)</i> x 10 ⁻³			0.920 [0.328]	0.124 [0.040]	-0.12 [0.038]	2.048 [0.583]
<i>log(land owned)</i> (Rp x 10 ⁻³) x household head's schooling				0.318 [0.899]	0.197 [0.551]	0.329 [0.854]
x max. of non-head claimants' schooling				-0.053 [0.129]	0.06 [0.144]	-0.013 [0.029]
<i>log(bus. assets)</i> (Rp x 10 ⁻³) x household head's schooling				0.239 [0.755]	0.241 [0.764]	0.13 [0.381]
x max. of non-head claimants' schooling				0 [0.001]	0.054 [0.145]	0.108 [0.273]
Observations	6,330	6,330	6,330	6,330	6,330	6,330
Province, urban, interaction dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.109	0.178	0.578
Non-head claimants' max. educ.				0.001	0.000	0.000
Education variables	0.000	0.000	0.000	0.001	0.000	0.000
Land variables			0.946	0.883	0.914	0.880
Other assets variables			0.029	0.106	0.118	0.057
Land and assets variables	0.012	0.014	0.055	0.087	0.095	0.081

Claimants include head of household and any member who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Table 2.6.6
Determinant of Household Division between 1997 and 2000, Claimant 2

1997 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.063 [11.900] ***	0.062 [11.908] ***	0.062 [11.866] ***	0.062 [11.881] ***	0.063 [11.936] ***	0.051 [12.758] ***
Proportion of claimants:						
20-29 years, male	0.038 [0.739]	0.038 [0.750]	0.040 [0.773]	0.041 [0.791]	0.042 [0.832]	0.006 [0.171]
30-49 years, male	-0.193 [3.347] ***	-0.192 [3.343] ***	-0.191 [3.329] ***	-0.190 [3.309] ***	-0.19 [3.321] ***	-0.141 [3.446] ***
50 years or older, male	-0.213 [3.124] ***	-0.213 [3.122] ***	-0.214 [3.135] ***	-0.214 [3.131] ***	-0.212 [3.118] ***	-0.152 [3.199] ***
15-19 years, female	0.121 [2.193] **	0.121 [2.189] **	0.121 [2.183] **	0.122 [2.207] **	0.13 [2.340] **	0.070 [1.728] *
20-29 years, female	-0.006 [0.109]	-0.006 [0.116]	-0.006 [0.106]	-0.005 [0.098]	-0.006 [0.111]	-0.037 [0.944]
30-49 years, female	-0.054 [0.953]	-0.056 [0.985]	-0.056 [0.991]	-0.055 [0.973]	-0.056 [1.004]	-0.042 [1.015]
50 years or older, female	-0.154 [2.618] ***	-0.162 [2.719] ***	-0.164 [2.735] ***	-0.163 [2.730] ***	-0.163 [2.695] ***	-0.106 [2.489] **
Age of head	0.012 [4.019] ***	0.012 [4.037] ***	0.012 [4.074] ***	0.012 [4.111] ***	0.012 [4.145] ***	0.007 [3.208] ***
Age of head squared x 10 ⁻³	-0.084 [3.020] ***	-0.084 [3.034] ***	-0.085 [3.064] ***	-0.086 [3.095] ***	-0.087 [3.107] ***	-0.048 [2.334] **
Head of hh's schooling	-0.002 [1.754] *	-0.002 [1.551]	-0.002 [1.523]	-0.002 [1.493]	-0.002 [1.475]	0.000 [0.116]
Max. schooling, non-head claimants	0.005 [3.150] ***	0.005 [2.690] ***	0.005 [2.736] ***	0.004 [2.530] **	0.005 [2.722] ***	0.004 [3.425]
Sd. dev. of claimants' schooling		0.003 [0.954]	0.003 [0.923]	0.003 [0.947]	0.003 [0.872]	0.000 [0.009]
# Boys 0-11	0.019 [2.617] ***	0.019 [2.602] ***	0.019 [2.620] ***	0.019 [2.602] ***	0.02 [2.853] ***	0.012 [2.432]
# Girls 0-11	0.004 [0.586]	0.004 [0.582]	0.004 [0.580]	0.004 [0.583]	0.005 [0.649]	0.002 [0.309]
# Boys 12-15	0.074 [6.589] ***	0.074 [6.569] ***	0.074 [6.551] ***	0.074 [6.536] ***	0.077 [6.812] ***	0.055 [6.720] ***
# Girls 12-15	0.105 [10.465] ***	0.105 [10.438] ***	0.105 [10.509] ***	0.105 [10.523] ***	0.108 [10.728] ***	0.080 [11.121] ***
Male head (=1)	-0.041 [1.801] *	-0.042 [1.822] *	-0.041 [1.781] *	-0.042 [1.813] *	-0.046 [1.978] **	-0.034 [1.958] *
log(land owned) (Rp x 10 ⁻³)	1.997 [2.263] **	1.968 [2.225] **	2.585 [2.359]	2.396 [2.123]	2.502 [2.142] **	1.179 [1.487]
log(bus. assets) (Rp x 10 ⁻³)	1.575 [1.592]	1.550 [1.564]	0.095 [0.062]	-0.045 [0.030]	-0.031 [0.020]	-0.112 [0.098]
Urban (=1)	-0.027 [2.066] **	-0.027 [2.058] **	-0.028 [2.137] **	-0.028 [2.168] **	-0.017 [0.411]	-0.026 [0.327]

(continued)

(continued)

Interactions						
Urban x $\log(\text{land owned}) \times 10^{-3}$	-1.023	-1.185	-1.841	-0.640		
	[0.537]	[0.613]	[0.950]	[0.460]		
Urban x $\log(\text{bus. assets}) \times 10^{-3}$	2.455	2.884	2.716	1.900		
	[1.231]	[1.362]	[1.273]	[1.233]		
$\log(\text{land owned})$ (Rp x 10^{-3})						
x household head's schooling		-0.126	-0.129	-0.078		
		[0.533]	[0.549]	[0.483]		
x max. of non-head claimants' schooling		0.145	0.131	0.089		
		[0.557]	[0.503]	[0.529]		
$\log(\text{bus. assets})$ (Rp x 10^{-3})						
x household head's schooling		-0.184	-0.189	-0.188		
		[0.784]	[0.800]	[1.120]		
x max. of non-head claimants' schooling		0.018	0.054	0.032		
		[0.073]	[0.218]	[0.183]		
Observations	6,664	6,664	6,664	6,664	6,664	6,664
Province, urban, interaction dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.194	0.189	0.345
Non-head claimants' max. educ.				0.007	0.034	0.004
Education variables	0.007	0.016	0.002	0.065	0.042	0.005
Land variables			0.004	0.154	0.187	0.493
Other assets variables			0.143	0.343	0.382	0.381
Land and assets variables	0.001	0.001	0.004	0.030	0.062	0.167

Claimants include head of household and any member who were 16 or over in 1997. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Table 2.6.6
Probability of Household Division of Panel Households, LPM and
LPM with HH Fixed Effects, Claimant 1

Base year characteristics	LPM			LPM with 1993 HH Fixed Effects	
	(1)	(2)	(3)	(4)	(5)
# Claimants	0.072 [11.255] ***	0.072 [11.104] ***	0.07 [10.656] ***	0.135 [10.228] ***	0.135 [10.216] ***
<u>Proportion of claimants</u>					
20-29 years, male	0.137 [3.578] ***	0.139 [3.665] ***	0.137 [3.594] ***	0.306 [5.254] ***	0.306 [5.254] ***
30-49 years, male	0.115 [2.204] **	0.12 [2.324] **	0.122 [2.372] **	0.711 [7.421] ***	0.71 [7.394] ***
50 years or older, male	0.034 [0.699]	0.041 [0.853]	0.038 [0.772]	0.86 [7.629] ***	0.859 [7.613] ***
15-19 years, female	0.03 [0.888]	0.03 [0.867]	0.029 [0.840]	0.045 [0.646]	0.045 [0.650]
20-29 years, female	0.121 [3.123] ***	0.122 [3.152]	0.122 [3.132]	0.463 [5.703] ***	0.463 [5.698]
30-49 years, female	0.059 [1.288]	0.062 [1.380]	0.061 [1.350]	0.594 [5.449] ***	0.593 [5.419] ***
50 years or older, female	-0.009 [0.189]	0.003 [0.052]	-0.003 [0.069]	0.517 [3.841] ***	0.514 [3.785] ***
# Non-claimant members	0.022 [2.649] ***	0.021 [2.577]	0.024 [2.871] ***	0.013 [0.706]	0.014 [0.708]
Head's schooling			-0.003 [1.681] *		
Max. schooling, non-head claimants	0.004 [1.844] *	0.004 [2.161] **	0.007 [2.855] ***	0.018 [3.880] ***	0.017 [3.487] ***
Sd. dev. of claimants' schooling		-0.004 [1.163]	-0.009 [1.933] *		0.001 [0.194]
# Boys 0-11	0.01 [0.910]	0.01 [0.930]	0.01 [0.887]	-0.051 [2.835] ***	-0.051 [2.830] ***
# Girls 0-11	0.023 [1.853] *	0.023 [1.834] *	0.023 [1.791] *	0.174 [6.770] ***	0.174 [6.771] ***
# Boys 12-14	0.028 [2.231] **	0.028 [2.236] **	0.028 [2.233] **	0.107 [4.676] ***	0.107 [4.679] ***
# Girls 12-14	0.043 [4.002] ***	0.043 [4.005] ***	0.043 [3.975] ***	0.213 [7.789] ***	0.213 [7.788] ***
Year (1997=1)	0.217 [16.063] ***	0.217 [16.063] ***	0.217 [16.081] ***		
Urban	-0.106 [2.290] **	-0.107 [2.317] **	-0.103 [2.200] **	-0.041 [0.265]	-0.042 [0.274]
Constant	-0.219 [4.090] ***	-0.217 [4.073] ***	-0.204 [3.707] ***	-1.021 [6.143] ***	-0.9 [4.889] ***
F-test (<i>p</i> values) for education variables	-	0.092	0.071	-	0.001
Number of observations	5076	5076	5076	5076	5076
R-squared	0.1425	0.1427	0.1242	0.1624	0.1624
Number of unique households	2538	2538	2538	2538	2538

Panel households are households appearing in 1993, 1997, and 2000. The estimation uses household variables in 1993 and 1997 to estimate the probability of household division by 1997, and 2000, respectively (i.e., for each household there are two observations). The dependent variable is 1 for 1993 household if the household split by 1997, and 0 otherwise. The dependent variable is 1 for households that have split by 2000, and 0 otherwise. The explanatory variables are the base year household variables, namely 1993 household variables for 1993 households, and 1997 household variables for households observed in 1997. Claimant 2 consists of households with multiple claimants where claimants include household head, and other household members who would be at least 19 years old in 1997 for 1993 households, or 19 years old in 2000 for 1997 households.

Table 2.6.7
Probability of Household Division of Panel Households, LPM and
LPM with HH Fixed Effects, Claimant 1

Base year characteristics	LPM		LPM with 1993 HH Fixed Effects		
	(1)	(2)	(3)	(4)	(5)
# Claimants	0.074 [19.690] ***	0.074 [19.434] ***	0.072 [18.984] ***	0.096 [13.563] ***	0.096 [13.520] ***
<u>Proportion of claimants</u>					
20-29 years, male	0.121 [3.435] ***	0.121 [3.448] ***	0.126 [3.563] ***	0.339 [6.492] ***	0.34 [6.499] ***
30-49 years, male	-0.013 [0.352]	-0.012 [0.318]	0.004 [0.116]	0.278 [4.556] ***	0.279 [4.577] ***
50 years or older, male	0.023 [0.621]	0.024 [0.656]	0.033 [0.896]	0.412 [5.603] ***	0.414 [5.627] ***
15-19 years, female	0.052 [1.291]	0.052 [1.289]	0.056 [1.380]	0.076 [1.266]	0.075 [1.247]
20-29 years, female	0.019 [0.518]	0.019 [0.529]	0.029 [0.784]	0.342 [5.340] ***	0.34 [5.306] ***
30-49 years, female	0.05 [1.294]	0.048 [1.258]	0.057 [1.475]	0.31 [4.473] ***	0.307 [4.432] ***
50 years or older, female	0.043 [1.165]	0.034 [0.925]	0.034 [0.923]	0.3 [3.956] ***	0.294 [3.843] ***
Head's schooling			-0.004 [4.085] ***		
Max. schooling, non-head claimants	0.004 [3.613] ***	0.003 [3.048] ***	0.005 [4.843] ***	0.016 [6.831] ***	0.016 [6.102] ***
Sd. dev. of claimants' schooling		0.004 [1.908] *	0.003 [1.486]		0.004 [0.844]
# Boys 0-11	-0.012 [1.921] *	-0.012 [1.934] *	-0.011 [1.879] *	-0.04 [4.047] ***	-0.04 [4.059] ***
# Girls 0-11	0.039 [5.368] ***	0.039 [5.366] ***	0.039 [5.274] ***	0.108 [8.441] ***	0.108 [8.449] ***
# Boys 12-14	0.007 [1.166]	0.007 [1.158]	0.008 [1.232]	0.073 [5.424] ***	0.073 [5.436] ***
# Girls 12-14	0.036 [5.938] ***	0.036 [5.888] ***	0.036 [5.943] ***	0.155 [10.299] ***	0.155 [10.311] ***
Year (1997=1)	0.109 [13.844] ***	0.11 [13.864] ***	0.109 [13.876] ***		
Urban	-0.047 [1.787] *	-0.047 [1.816] *	-0.044 [1.655] *	0.084 [0.904]	0.081 [0.871]
Constant	-0.22 [5.341] ***	-0.222 [5.382] ***	-0.215 [5.149] ***	-0.704 [3.644] ***	-0.705 [3.653] ***
F-test (<i>p</i> values) for education variables	0.124	0.124	0.126	0.111	0.111
Number of observations	11,774	11,774	11,774	11,774	11,774
R-squared	0.124	0.124	0.125	0.107	0.108
Number of unique households	5887	5887	5887	5887	5887

Panel households are households appearing in 1993, 1997, and 2000. The estimation uses household variables in 1993 and 1997 to estimate the probability of household division by 1997, and 2000, respectively (i.e., for each household there are two observations). The dependent variable is 1 for 1993 household if the household split by 1997, and 0 otherwise. The dependent variable is 1 for households that have split by 2000, and 0 otherwise. The explanatory variables are the base year household variables, namely 1993 household variables for 1993 households, and 1997 household variables for households observed in 1997. Claimant 2 consists of households with multiple claimants where claimants include household head, and other household members who would be at least 19 years old in 1997 for 1993 households, or 19 years old in 2000 for 1997 households.

Appendix Table 2.6.1
Determinant of Household Division between 1993 and 1997, Claimant 1: Urban

1993 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.056 [6.642] ***	0.053 [6.255] ***	0.052 [6.163] ***	0.054 [6.456] ***	0.011 [6.341] ***
Proportion of claimants:					
20-29 years, male	0.280 [3.953] ***	0.282 [4.028] ***	0.284 [4.054] ***	0.297 [4.153] ***	0.058 [4.351] ***
30-49 years, male	0.368 [4.323] ***	0.381 [4.520] ***	0.380 [4.519] ***	0.387 [4.680] ***	0.078 [4.594] ***
50 years or older, male	0.389 [3.234] ***	0.395 [3.321] ***	0.395 [3.320] ***	0.391 [3.299] ***	0.073 [2.961] ***
15-19 years, female	0.016 [0.249]	0.022 [0.346]	0.024 [0.374]	0.038 [0.601]	0.011 [0.891]
20-29 years, female	0.177 [2.589] ***	0.182 [2.677] ***	0.187 [2.754] ***	0.186 [2.672] ***	0.045 [3.289] ***
30-49 years, female	0.342 [3.723] ***	0.355 [3.908] ***	0.358 [3.972] ***	0.348 [3.941] ***	0.064 [3.688] ***
50 years or older, female	0.214 [1.790] *	0.238 [1.992] **	0.232 [1.955] *	0.233 [2.024] **	0.041 [1.779] *
# Non-claimant members 15 +	0.021 [2.218] **	0.022 [2.338] **	0.021 [2.259] **	0.02 [2.080] **	0.004 [2.121] **
Age of head	-0.011 [1.899] *	-0.010 [1.845] *	-0.011 [1.879] *	-0.011 [1.890] *	-0.001 [1.324]
Age of head squared x 10 ⁻³	0.081 [1.508]	0.078 [1.458]	0.080 [1.506]	0.08 [1.508]	0.009 [0.875]
Head of hh's schooling	-0.003 [1.464]	-0.007 [2.370]	-0.005 [1.446]	-0.005 [1.336]	-0.001 [1.035]
Max. schooling, non-head claimants	0.006 [2.338] **	0.010 [3.146] ***	0.010 [3.072] ***	0.011 [3.274] ***	0.002 [2.976] ***
Sd. dev. of claimants' schooling		-0.013 [2.031] **	-0.013 [1.967] **	-0.013 [1.991] **	-0.002 [1.910] *
# Boys 0-11	0.028 [2.388] **	0.027 [2.290] **	0.026 [2.255] **	0.026 [2.228] **	0.003 [1.458]
# Girls 0-11	0.019 [1.618]	0.019 [1.612]	0.019 [1.614]	0.021 [1.854] *	0.002 [0.926]
# Boys 12-14	0.001 [0.049]	0.001 [0.033]	0.001 [0.031]	0.002 [0.092]	0.002 [0.546]
# Girls 12-14	0.054 [2.900] ***	0.053 [2.854] ***	0.052 [2.834] ***	0.051 [2.825] ***	0.01 [2.595] ***
Male head (=1)	-0.092 [1.807] *	-0.090 [1.793] *	-0.087 [1.745] *	-0.095 [2.004] **	-0.025 [2.175] **
log(land owned) (Rp x 10 ⁻³)	0.809 [0.455]	0.891 [0.506]	0.535 [0.275]	0.588 [0.302]	-0.026 [0.064]
log(bus. assets) (Rp x 10 ⁻³)	-1.077 [0.801]	-1.041 [0.776]	-1.998 [1.402]	-2.468 [1.701] *	-0.344 [1.155]

(continued)

(continued)

Interactions*log(land owned) (Rp x 10⁻³)*

x household head's schooling	0.310	0.253	0.073
	[0.639]	[0.521]	[0.769]
x max. of non-head claimants' schooling	-0.027	-0.066	-0.019
	[0.048]	[0.119]	[0.178]

log(bus. assets) (Rp x 10⁻³)

x household head's schooling	0.146	0.16	0.012
	[0.420]	[0.463]	[0.179]
x max. of non-head claimants' schooling	0.357	0.364	0.063
	[0.809]	[0.827]	[0.701]

Observations	1,652	1,652	1,652	1,652	1,652
Province dummies	No	No	No	Yes	No
Community dummies	No	No	No	No	Yes

F-test (*p-values*)

Head's education			0.095	0.130	0.230
Non-head claimants' max. educ.			0.022	0.011	0.029
Education variables	0.045	0.014	0.063	0.052	0.129
Land variables			0.851	0.920	0.884
Other assets variables			0.482	0.353	0.675
Land and assets variables	0.714	0.717	0.640	0.628	0.797

Claimants include head of household and children or siblings who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the 1993 community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.2
Determinant of Household Division between 1993 and 1997, Claimant 1: Rural

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.062 [4.506] ***	0.063 [4.447] ***	0.063 [4.462] ***	0.063 [4.420] ***	0.063 [4.572] ***	0.041 [4.960] ***
Proportion of claimants:						
20-29 years, male	0.281 [4.600] ***	0.281 [4.577] ***	0.282 [4.584] ***	0.281 [4.570] ***	0.29 [4.830] ***	0.149 [4.186] ***
30-49 years, male	0.358 [3.670] ***	0.356 [3.618] ***	0.357 [3.615] ***	0.357 [3.617] ***	0.364 [3.742] ***	0.209 [3.765] ***
50 years or older, male	0.341 [2.629] ***	0.337 [2.606] ***	0.338 [2.609] ***	0.337 [2.588] ***	0.329 [2.580] ***	0.2 [2.778] ***
15-19 years, female	0.059 [0.843]	0.060 [0.852]	0.057 [0.821]	0.057 [0.830]	0.059 [0.908]	0.054 [1.511]
20-29 years, female	0.283 [3.915] ***	0.282 [3.906] ***	0.280 [3.859] ***	0.279 [3.853] ***	0.309 [4.370] ***	0.201 [4.971] ***
30-49 years, female	0.319 [3.124] ***	0.319 [3.105] ***	0.321 [3.119] ***	0.321 [3.141] ***	0.357 [3.519] ***	0.23 [3.993] ***
50 years or older, female	0.229 [1.848] *	0.226 [1.824] *	0.227 [1.815] *	0.228 [1.855] *	0.246 [2.020] **	0.162 [2.262] **
# Non-claimant members 15+	0.011 [0.678]	0.011 [0.649]	0.010 [0.568]	0.010 [0.565]	0.009 [0.530]	0.007 [0.690]
Age of head	-0.010 [1.497]	-0.010 [1.487]	-0.010 [1.539]	-0.010 [1.507]	-0.011 [1.649]	-0.006 [1.508]
Age of head squared x 10 ⁻³	0.085 [1.534]	0.084 [1.525]	0.087 [1.582]	0.086 [1.550]	0.091 [1.645] *	0.047 [1.438]
Head of hh's schooling	-0.002 [0.501]	-0.001 [0.190]	-0.001 [0.175]	-0.001 [0.158]	-0.002 [0.512]	-0.001 [0.306]
Max. schooling, non-head claimants	0.000 [0.105]	-0.001 [0.174]	-0.001 [0.198]	-0.001 [0.185]	-0.001 [0.131]	0.002 [0.387]
Sd. dev. of claimants' schooling		0.003 [0.358]	0.003 [0.359]	0.002 [0.305]	0.001 [0.157]	-0.981 [0.515]
# Boys 0-11	0.011 [1.020]	0.011 [1.010]	0.011 [1.001]	0.011 [0.994]	0.012 [1.098]	0.01 [1.589]
# Girls 0-11	0.012 [1.030]	0.013 [1.046]	0.012 [1.007]	0.012 [1.000]	0.011 [0.940]	0.009 [1.281]
# Boys 12-14	0.012 [0.509]	0.012 [0.511]	0.011 [0.490]	0.011 [0.465]	0.011 [0.462]	0.011 [0.807]
# Girls 12-14	0.129 [6.173] ***	0.129 [6.188] ***	0.129 [6.216] ***	0.130 [6.319] ***	0.128 [6.212] ***	0.079 [6.267] ***
Male head (=1)	0.012 [0.226]	0.013 [0.234]	0.012 [0.226]	0.012 [0.225]	0.016 [0.297]	0.013 [0.429]
log(land owned) (Rp x 10 ⁻³)	3.496 [1.773] *	3.498 [1.778] *	10.123 [1.359]	10.499 [1.419]	12.223 [1.731] *	-0.001 [0.202]
log(bus. assets) (Rp x 10 ⁻³)	-0.851 [0.338]	-0.827 [0.329]	-2.762 [0.938]	-3.144 [1.049]	-3.57 [1.202]	6.34 [1.578]
Farm household (=1)	-0.035 [0.890]	-0.035 [0.892]	-0.067 [1.284]	-0.069 [1.303]	-0.088 [1.633]	-0.043 [1.338]

(continued)

Interactions						
Farm hh (=1) x $\log(\text{land owned})$ (Rp x 10^{-3})	-7.386	-7.300	-8.899	-4.323		
	[0.968]	[0.953]	[1.203]	[1.004]		
Farm hh (=1) x $\log(\text{bus. assets})$ (Rp x 10^{-3})	4.755	4.688	5.76	1.07		
	[0.782]	[0.761]	[0.903]	[0.290]		
$\log(\text{land owned})$ (Rp x 10^{-3}) x head's schooling		0.156	0.017	0.183		
		[0.291]	[0.032]	[0.635]		
x max. of non-head claimants' schooling		0.084	0.199	0.018		
		[0.147]	[0.349]	[0.052]		
$\log(\text{bus. assets})$ (Rp x 10^{-3}) x head's schooling		-0.233	-0.125	-0.352		
		[0.383]	[0.206]	[1.014]		
x max. of non-head claimants' schooling		-0.05	-0.16	-0.112		
		[0.064]	[0.204]	[0.238]		
Observations	1,618	1,618	1,618	1,618	1,618	1,618
Province dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.976	0.931	0.663
Non-head claimants' max. educ.				0.996	0.984	0.976
Education variables	0.879	0.941	0.942	0.998	0.990	0.804
Land variables			0.169	0.333	0.182	0.215
Other assets variables			0.604	0.867	0.811	0.753
Land and assets variables	0.208	0.206	0.366	0.702	0.487	0.606

Claimants include head of household and children or siblings who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the 1993 community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.3
Determinant of Household Division between 1993 and 2000, Claimant 1: Urban

1993 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.102 [7.324] ***	0.101 [7.149] ***	0.101 [7.093] ***	0.108 [7.609] ***	0.101 [7.093] ***
Proportion of claimants:					
15-19 years, male	-0.210 [1.845] *	-0.215 [1.877] *	-0.212 [1.845] *	-0.227 [1.995] **	-0.212 [1.845] *
20-29 years, male	0.099 [0.903]	0.096 [0.880]	0.101 [0.918]	0.111 [0.996]	0.101 [0.918]
30-49 years, male	-0.280 [2.071] **	-0.280 [2.072] **	-0.274 [2.020] **	-0.253 [1.884] *	-0.274 [2.020] **
50 years or older, male	-0.215 [1.370]	-0.221 [1.404]	-0.213 [1.351]	-0.178 [1.152]	-0.213 [1.351]
12-14 years, female	-0.038 [0.354]	-0.039 [0.362]	-0.037 [0.338]	-0.016 [0.146]	-0.037 [0.338]
15-19 years, female	-0.110 [1.005]	-0.115 [1.046]	-0.109 [0.978]	-0.093 [0.838]	-0.109 [0.978]
20-29 years, female	-0.037 [0.324]	-0.042 [0.366]	-0.034 [0.296]	-0.034 [0.295]	-0.034 [0.296]
30-49 years, female	-0.073 [0.487]	-0.074 [0.496]	-0.067 [0.451]	-0.059 [0.388]	-0.067 [0.451]
50 years or older, female	-0.044 [0.238]	-0.036 [0.197]	-0.027 [0.145]	0.008 [0.042]	-0.027 [0.145]
# Non-claimant members 12+	0.078 [4.337] ***	0.078 [4.319] ***	0.077 [4.292] ***	0.076 [4.271] ***	0.077 [4.292] ***
Age of head	-0.011 [1.468]	-0.011 [1.426]	-0.011 [1.476]	-0.012 [1.660] *	-0.011 [1.476]
Age of head squared x 10 ⁻³	0.081 [1.102]	0.080 [1.084]	0.083 [1.129]	0.092 [1.259]	0.083 [1.129]
Head of hh's schooling	-0.003 [0.732]	-0.003 [0.905]	0.001 [0.206]	0.002 [0.327]	0.001 [0.206]
Max. schooling, non-head claimants	0.011 [2.671] ***	0.013 [2.737] ***	0.011 [2.423] **	0.012 [2.704] ***	0.011 [2.423] **
Sd. dev. of claimants' schooling		-0.006 [0.729]	-0.005 [0.589]	-0.007 [0.797]	-0.005 [0.589]
# Boys 0-5	0.049 [2.189] **	0.050 [2.210] **	0.049 [2.198] **	0.056 [2.466] **	0.049 [2.198] **
# Girls 0-5	0.003 [0.110]	0.003 [0.130]	0.004 [0.156]	-0.001 [0.057]	0.004 [0.156]
# Boys 6-11	0.048 [2.347] **	0.047 [2.315] **	0.047 [2.297] **	0.046 [2.126] **	0.047 [2.297] **
# Girls 6-11	0.020 [0.993]	0.019 [0.969]	0.019 [0.969]	0.02 [1.017]	0.019 [0.969]
Male head (=1)	0.048 [0.790]	0.049 [0.797]	0.053 [0.852]	0.051 [0.817]	0.053 [0.852]

<i>(continued)</i>					
<i>log</i> (land owned) (Rp x 10 ⁻³)	0.611 [0.229]	0.719 [0.271]	1.043 [0.343]	0.608 [0.201]	1.043 [0.343]
<i>log</i> (bus. assets) (Rp x 10 ⁻³)	4.854 [2.247] **	4.817 [2.241] **	4.575 [1.907] *	3.837 [1.611]	4.575 [1.907] *
Interactions					
<i>log</i> (land owned) (Rp x 10 ⁻³)					
x household head's schooling			0.675 [0.959]	0.552 [0.777]	0.675 [0.959]
x max. of non-head claimants' schooling			-0.355 [0.432]	-0.307 [0.383]	-0.355 [0.432]
<i>log</i> (bus. assets) (Rp x 10 ⁻³)					
x household head's schooling			0.523 [1.221]	0.492 [1.129]	0.523 [1.221]
x max. of non-head claimants' schooling			-0.47 [0.764]	-0.376 [0.626]	-0.47 [0.764]
Observations	1,911	1,911	1,911	1,911	1,911
Province dummies	No	No	No	Yes	No
Community dummies	No	No	No	No	Yes
F-test (<i>p-values</i>)					
Head's education			0.050	0.374	0.228
Non-head claimants' max. educ.			0.228	0.037	0.050
Education variables	0.028	0.053	0.082	0.076	0.082
Land variables			0.774	0.884	0.774
Other assets variables			0.097	0.179	0.097
Land and assets variables	0.0291	0.028	0.040	0.162	0.040

Claimants include head of household and children or siblings who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.4
Determinant of Household Division between 1993 and 2000, Claimant 1: Rural

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.133 [7.872] ***	0.129 [7.577] ***	0.128 [7.475] ***	0.128 [7.435] ***	0.134 [7.983] ***	0.144 [7.440] ***
Proportion of claimants:						
15-19 years, male	-0.090 [0.899]	-0.096 [0.960]	-0.093 [0.928]	-0.093 [0.927]	-0.104 [1.044]	-0.155 [1.415]
20-29 years, male	0.132 [1.207]	0.130 [1.184]	0.136 [1.240]	0.138 [1.263]	0.154 [1.381]	0.134 [1.093]
30-49 years, male	-0.103 [0.734]	-0.100 [0.712]	-0.094 [0.670]	-0.095 [0.673]	-0.073 [0.507]	-0.156 [0.948]
50 years or older, male	-0.082 [0.478]	-0.075 [0.435]	-0.068 [0.399]	-0.065 [0.378]	-0.045 [0.255]	-0.187 [0.928]
12-14 years, female	0.081 [0.918]	0.077 [0.869]	0.079 [0.894]	0.074 [0.843]	0.075 [0.847]	0.082 [0.841]
15-19 years, female	-0.131 [1.295]	-0.140 [1.403]	-0.137 [1.375]	-0.137 [1.375]	-0.144 [1.451]	-0.19 [1.754] *
20-29 years, female	-0.078 [0.702]	-0.079 [0.718]	-0.080 [0.723]	-0.079 [0.713]	-0.057 [0.500]	-0.074 [0.618]
30-49 years, female	-0.227 [1.595]	-0.231 [1.613]	-0.229 [1.602]	-0.232 [1.626]	-0.197 [1.336]	-0.186 [1.134]
50 years or older, female	-0.276 [1.523]	-0.271 [1.487]	-0.264 [1.436]	-0.280 [1.541]	-0.265 [1.425]	-0.263 [1.402]
# Non-claimant members 12+	0.055 [2.824] ***	0.056 [2.880] ***	0.055 [2.762] ***	0.055 [2.752] ***	0.058 [2.918] ***	0.062 [2.754] ***
Age of head	-0.001 [0.217]	-0.002 [0.227]	-0.002 [0.281]	-0.003 [0.443]	-0.004 [0.508]	-0.004 [0.578]
Age of head squared x 10 ⁻³	0.018 [0.284]	0.018 [0.290]	0.022 [0.352]	0.033 [0.517]	0.037 [0.566]	0.056 [0.810]
Head of hh's schooling	0.002 [0.445]	-0.001 [0.242]	-0.001 [0.249]	-0.003 [0.606]	-0.003 [0.542]	-0.001 [0.260]
Max. schooling, non-head claimants	0.002 [0.519]	0.007 [1.387]	0.007 [1.377]	0.009 [1.766] *	0.009 [1.712] *	0.013 [2.130] **
Sd. dev. of claimants' schooling		-0.013 [1.617]	-0.013 [1.631]	-0.012 [1.386]	-0.009 [1.119]	-0.012 [1.228]
# Boys 0-5	0.011 [0.491]	0.010 [0.459]	0.010 [0.481]	0.012 [0.554]	0.01 [0.472]	0.026 [1.055]
# Girls 0-5	0.047 [2.277] **	0.046 [2.244] **	0.045 [2.223] **	0.046 [2.243] **	0.046 [2.223] **	0.076 [3.099] ***
# Boys 6-11	0.068 [3.740] ***	0.068 [3.742] ***	0.069 [3.789] ***	0.068 [3.739] ***	0.069 [3.767] ***	0.075 [3.506] ***
# Girls 6-11	0.053 [2.616] ***	0.052 [2.575]	0.053 [2.620] ***	0.052 [2.604] ***	0.055 [2.856] ***	0.063 [2.846] ***
Male head (=1)	-0.074 [1.075]	-0.077 [1.119]	-0.078 [1.131]	-0.077 [1.127]	-0.091 [1.332]	-0.055 [0.757]

(continued)

<i>log(land owned) (Rp x 10⁻³)</i>	-0.053 [1.348]	-0.055 [1.407]	-0.066 [1.380]	-0.061 [1.271]	-0.067 [1.320]	0.945 [0.096]
<i>log(bus. assets) (Rp x 10⁻³)</i>	2.758 [1.234]	2.849 [1.274]	0.219 [0.024]	-0.257 [0.029]	1.161 [0.132]	3.811 [0.917]
Farm household (=1)	3.337 [1.053]	3.337 [1.046]	1.019 [0.260]	2.359 [0.596]	1.88 [0.464]	-0.086 [1.566]
Interactions						
Farm hh (=1) x <i>log(land owned) (Rp x 10⁻³)</i>			2.329 [0.244]	1.920 [0.203]	0.339 [0.036]	3.275 [0.308]
Farm hh (=1) x <i>log(bus. assets) (Rp x 10⁻³)</i>			8.612 [1.389]	9.155 [1.454]	9.822 [1.560]	5.847 [0.779]
<i>log(land owned) (Rp x 10⁻³)</i> x head's schooling				-0.040 [0.056]	-0.207 [0.293]	0.101 [0.133]
x max. of non-head claimants' schooling				-0.753 [0.960]	-0.721 [0.925]	-0.603 [0.714]
<i>log(bus. assets) (Rp x 10⁻³)</i> x head's schooling				1.119 [1.374]	1.308 [1.574]	1.008 [1.141]
x max. of non-head claimants' schooling				0.109 [0.117]	0.14 [0.149]	-0.471 [0.489]
Observations	2,040	2,040	2,040	2,040	2,040	2,040
Province dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.329	0.302	0.394
Non-head claimants' max. educ.				0.251	0.268	0.114
Education variables	0.744	0.332	0.329	0.473	0.487	0.303
Land variables			0.550	0.659	0.595	0.501
Other assets variables			0.183	0.229	0.172	0.480
Land and assets variables	0.1821	0.172	0.262	0.349	0.321	0.284

Claimants include head of household and children or siblings who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.5
Determinant of Household Division between 1997 and 2000, Claimant 1: Urban

1997 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.068 [5.076] ***	0.068 [5.031] ***	0.066 [4.887] ***	0.070 [5.265] ***	0.071 [5.078] ***
Proportion of claimants:					
20-29 years, male	0.152 [2.007] **	0.152 [2.001] **	0.157 [2.066] **	0.160 [2.093] **	0.192 [2.630] ***
30-49 years, male	0.147 [1.373]	0.148 [1.386]	0.142 [1.319]	0.154 [1.431]	0.155 [1.423]
50 years or older, male	0.033 [0.225]	0.034 [0.232]	0.010 [0.070]	0.042 [0.282]	0.008 [0.053]
16-19 years, female	0.098 [1.231]	0.098 [1.227]	0.097 [1.222]	0.102 [1.285]	0.105 [1.360]
20-29 years, female	0.282 [3.120] ***	0.283 [3.119] ***	0.290 [3.188] ***	0.276 [3.012] ***	0.284 [3.372] ***
30-49 years, female	-0.140 [1.271]	-0.139 [1.272]	-0.155 [1.429]	-0.159 [1.444]	-0.056 [0.514]
50 years or older, female	-0.229 [1.355]	-0.228 [1.354]	-0.263 [1.565]	-0.257 [1.530]	-0.164 [0.966]
# Non-claimant members 16+	0.019 [1.200]	0.019 [1.203]	0.021 [1.320]	0.019 [1.170]	0.047 [2.544] **
Age of head	0.013 [1.624]	0.013 [1.619]	0.014 [1.679] *	0.013 [1.541]	0.014 [1.582]
Age of head squared x 10 ⁻³	-0.100 [1.392]	-0.100 [1.386]	-0.106 [1.431]	-0.098 [1.322]	-0.117 [1.407]
Head of hh's schooling	0.002 [0.661]	0.002 [0.438]	0.001 [0.148]	0.001 [0.147]	0.000 [0.019]
Max. schooling, non-head claimants	0.002 [0.516]	0.003 [0.516]	0.002 [0.356]	0.003 [0.577]	0.010 [1.830] *
Sd. dev. of claimants' schooling		-0.001 [0.099]	0.001 [0.071]	0.000 [0.001]	-0.006 [0.612]
# Boys 0-11	0.040 [2.332] **	0.040 [2.339] **	0.041 [2.383] **	0.041 [2.354] **	0.047 [2.715] ***
# Girls 0-11	0.001 [0.079]	0.001 [0.074]	0.002 [0.114]	0.000 [0.003]	-0.009 [0.481]
# Boys 12-15	0.019 [0.697]	0.019 [0.695]	0.018 [0.668]	0.022 [0.794]	0.024 [0.895]
# Girls 12-15	0.087 [3.822] ***	0.087 [3.820] ***	0.086 [3.779] ***	0.092 [3.955] ***	0.113 [4.825] ***
Male head (=1)	-0.104 [1.820] *	-0.104 [1.819] *	-0.111 [1.938] *	-0.114 [1.960] **	-0.079 [1.277]
log(land owned) (Rp x 10 ⁻³)	2.661 [1.022]	2.654 [1.020]	2.306 [0.814]	1.280 [0.452]	-0.603 [0.225]
log(bus. assets) (Rp x 10 ⁻³)	5.176 [2.696] ***	5.181 [2.701] ***	6.927 [3.339] ***	6.694 [3.152] ***	5.090 [2.477] **

(continued)

*(continued)*Interactions*log(land owned) (Rp x 10⁻³)*

x household head's schooling	-0.430	-0.405	-0.340
	[0.656]	[0.621]	[0.548]
x max. of non-head claimants' schooling	0.653	0.627	1.118
	[0.917]	[0.877]	[1.610]

log(bus. assets) (Rp x 10⁻³)

x household head's schooling	0.386	0.369	0.429
	[0.797]	[0.767]	[0.920]
x max. of non-head claimants' schooling	-1.456	-1.389	-1.314
	[2.338]	[2.234]	[2.160]

Observations	1,721	1,721	1,721	1,721	1,721
Province dummies	No	No	No	Yes	No
Community dummies	No	No	No	No	Yes

F-test (*p-values*)

Head's education			0.784	0.811	0.817
Non-head claimants' max. educ.			0.131	0.145	0.037
Education variables	0.546	0.743	0.460	0.477	0.208
Land variables			0.515	0.694	0.442
Other assets variables			0.004	0.007	0.039
Land and assets variables	0.003	0.003	0.005	0.016	0.126

Claimants include head of household and children or siblings who were 16 or over in 1997. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.6
Determinant of Household Division between 1997 and 2000, Claimant 1: Rural

1997 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.068 [4.030] ***	0.065 [3.771] ***	0.065 [3.724] ***	0.065 [3.754] ***	0.066 [3.951] ***	0.064 [3.831] ***
Proportion of claimants:						
20-29 years, male	0.058 [0.750]	0.062 [0.812]	0.061 [0.790]	0.06 [0.781]	0.059 [0.767]	0.011 [0.142]
30-49 years, male	-0.156 [1.411]	-0.149 [1.349]	-0.153 [1.383]	-0.154 [1.375]	-0.155 [1.340]	-0.209 [1.714] *
50 years or older, male	-0.246 [1.659] *	-0.236 [1.595]	-0.238 [1.597]	-0.236 [1.580]	-0.239 [1.534]	-0.239 [1.485]
16-19 years, female	0.15 [1.909] *	0.151 [1.912] *	0.147 [1.861] *	0.147 [1.846] *	0.154 [1.916] *	0.083 [0.935]
20-29 years, female	0.014 [0.163]	0.018 [0.201]	0.017 [0.198]	0.015 [0.174]	0.031 [0.361]	-0.002 [0.021]
30-49 years, female	-0.232 [2.103] **	-0.228 [2.063] **	-0.232 [2.089] **	-0.234 [2.111] **	-0.243 [2.067] **	-0.204 [1.584]
50 years or older, female	-0.232 [1.345]	-0.219 [1.284]	-0.221 [1.276]	-0.218 [1.271]	-0.209 [1.219]	-0.142 [0.814]
# Non-claimant members 16+	0.058 [2.803] ***	0.058 [2.792] ***	0.057 [2.770] ***	0.058 [2.797] ***	0.059 [2.822] ***	0.071 [3.154] ***
Age of head	0.003 [0.378]	0.002 [0.289]	0.002 [0.254]	0.002 [0.293]	0.003 [0.321]	0.001 [0.083]
Age of head squared x 10 ⁻³	-0.01 [0.141]	-0.004 [0.060]	-0.002 [0.030]	-0.005 [0.068]	-0.006 [0.082]	0.008 [0.104]
Head of hh's schooling	-0.003 [0.818]	-0.006 [1.242]	-0.006 [1.227]	-0.004 [0.891]	-0.003 [0.637]	0 [0.023]
Max. schooling, non-head claimants	0.005 [1.348]	0.009 [1.605]	0.009 [1.612]	0.009 [1.643]	0.01 [1.739]	0.007 * [1.117]
Sd. dev. of claimants' schooling		-0.008 [0.888]	-0.009 [0.898]	-0.008 [0.808]	-0.008 [0.820]	-0.007 [0.670]
# Boys 0-11	0.009 [0.527]	0.009 [0.532]	0.008 [0.513]	0.009 [0.545]	0.01 [0.609]	0.012 [0.734]
# Girls 0-11	0.036 [2.247] **	0.036 [2.257] **	0.035 [2.216] **	0.035 [2.236] **	0.037 [2.260] **	0.057 [3.055] ***
# Boys 12-15	0.099 [4.111] ***	0.099 [4.120] ***	0.099 [4.153] ***	0.099 [4.126] ***	0.105 [4.547] ***	0.097 [3.738] ***
# Girls 12-15	0.129 [5.534] ***	0.129 [5.538] ***	0.128 [5.456] ***	0.128 [5.451] ***	0.133 [5.568] ***	0.137 [5.374] ***
Male head (=1)	-0.048 [0.692]	-0.048 [0.685]	-0.047 [0.668]	-0.05 [0.708]	-0.058 [0.809]	-0.034 [0.468]
log(land owned) (Rp x 10 ⁻³)	0.001 [0.022]	0.001 [0.030]	-0.019 [0.392]	-0.023 [0.474]	-0.011 [0.237]	8.445 [1.518]
log(bus. assets) (Rp x 10 ⁻³)	2.598 [1.069]	2.685 [1.108]	10.005 [1.988] **	10.059 [1.988] **	9.423 [1.802] *	3.663 [0.971]
Farm household (=1)	2.916 [1.069]	2.809 [1.030]	1.821 [0.571]	1.471 [0.444]	1.92 [0.552]	-0.008 [0.160]

(continued)

(continued)

Interactions						
Farm hh (=1) x $\log(\text{land owned})$ (Rp x 10^{-3})	-8.709	-8.802	-8.644	-8.311		
	[1.454]	[1.451]	[1.398]	[1.264]		
Farm hh (=1) x $\log(\text{bus. assets})$ (Rp x 10^{-3})	1.854	2.43	0.444	-1.915		
	[0.273]	[0.352]	[0.065]	[0.263]		
$\log(\text{land owned})$ (Rp x 10^{-3}) x head's schooling		0.283	0.277	-0.03		
		[0.468]	[0.460]	[0.046]		
x max. of non-head claimants' schooling		-0.633	-0.706	-0.749		
		[1.004]	[1.071]	[1.131]		
$\log(\text{bus. assets})$ (Rp x 10^{-3}) x head's schooling		-0.546	-0.537	-0.288		
		[0.743]	[0.727]	[0.351]		
x max. of non-head claimants' schooling		0.45	0.459	1.011		
		[0.605]	[0.606]	[1.262]		
Observations	1,696	1,696	1,696	1,696	1,696	1,696
Province dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.632	0.754	0.970
Non-head claimants' max. educ.				0.314	0.275	0.337
Education variables	0.376	0.417	0.417	0.749	0.719	0.789
Land variables			0.115	0.251	0.358	0.374
Other assets variables			0.691	0.805	0.831	0.599
Land and assets variables	0.283	0.285	0.225	0.469	0.522	0.435

Claimants include head of household and children or siblings who were 16 or over in 1997. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.7
Determinant of Household Division between 1993 and 1997, Claimant 2: Urban

1993 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.039 [9.138] ***	0.039 [9.142] ***	0.039 [9.167] ***	0.039 [9.328] ***	0.009 [8.901] ***
Proportion of claimants:					
20-29 years, male	0.205 [2.955] ***	0.204 [2.936] ***	0.204 [2.940] ***	0.215 [3.128] ***	0.048 [3.217] ***
30-49 years, male	0.249 [3.683] ***	0.249 [3.664] ***	0.249 [3.678] ***	0.254 [3.790] ***	0.06 [4.065] ***
50 years or older, male	0.290 [3.139] ***	0.290 [3.137] ***	0.283 [3.089] ***	0.291 [3.132] ***	0.071 [3.376] ***
15-19 years, female	0.005 [0.082]	0.005 [0.074]	0.005 [0.081]	0.014 [0.224]	0.01 [0.736]
20-29 years, female	0.034 [0.506]	0.033 [0.479]	0.031 [0.452]	0.026 [0.391]	0.014 [0.970]
30-49 years, female	0.080 [1.046]	0.076 [0.997]	0.072 [0.958]	0.055 [0.762]	0.013 [0.835]
50 years or older, female	0.170 [2.376] **	0.161 [2.227] **	0.160 [2.226] **	0.137 [1.915] *	0.035 [2.211] **
Age of head	-0.001 [0.361]	-0.001 [0.366]	-0.001 [0.392]	-0.001 [0.306]	0 [0.482]
Age of head squared x 10 ⁻³	0.003 [0.098]	0.004 [0.101]	0.005 [0.139]	0.002 [0.055]	-0.006 [0.797]
Head of hh's schooling	-0.003 [1.876] *	-0.003 [1.732] *	-0.001 [0.404]	-0.001 [0.424]	0 [0.039]
Max. schooling, non-head claimants	0.005 [2.625] ***	0.005 [2.105] **	0.004 [1.882] *	0.004 [1.979] **	0.001 [2.031] **
Sd. dev. of claimants' schooling		0.002 [0.584]	0.003 [0.678]	0.003 [0.778]	0 [0.263]
# Boys 0-11	0.012 [1.666] *	0.012 [1.659] *	0.012 [1.676] *	0.012 [1.656] *	0.003 [1.588]
# Girls 0-11	0.013 [1.695] *	0.012 [1.646] *	0.012 [1.612]	0.013 [1.769] *	0.003 [1.470]
# Boys 12-14	0.010 [0.788]	0.010 [0.809]	0.010 [0.759]	0.01 [0.830]	0.003 [1.184]
# Girls 12-14	0.047 [3.515] ***	0.047 [3.515] ***	0.047 [3.565] ***	0.047 [3.642] ***	0.011 [3.677] ***
Male head (=1)	-0.124 [4.363] ***	-0.125 [4.427] ***	-0.123 [4.356] ***	-0.136 [4.774] ***	-0.042 [4.624] ***
log(land owned) (Rp x 10 ⁻³)	0.395 [0.318]	0.362 [0.292]	-0.433 [0.257]	-0.437 [0.264]	-0.198 [0.513]
log(bus. assets) (Rp x 10 ⁻³)	0.166 [0.197]	0.155 [0.183]	0.921 [0.876]	0.887 [0.818]	0.38 [1.595]

(continued)

(continued)

Interactions					
<i>log(land owned) (Rp x 10⁻³)</i>			0.339	0.297	0.097
x household head's schooling			[0.988]	[0.866]	[1.194]
x max. of non-head claimants' schooling			0.115	0.131	0.03
			[0.290]	[0.326]	[0.335]
<i>log(bus. assets) (Rp x 10⁻³)</i>			0.104	0.106	-0.014
x household head's schooling			[0.487]	[0.501]	[0.288]
x max. of non-head claimants' schooling			-0.397	-0.406	-0.103
			[1.492]	[1.545]	[1.766]
Observations	2,862	2,862	2,862	2,862	2,862
Province dummies	No	No	No	Yes	No
Community dummies	No	No	No	No	Yes
F-test (<i>p-values</i>)					
Head's education			0.262	0.310	0.054
Non-head claimants' max. educ.			0.116	0.108	0.476
Education variables	0.025	0.042	0.092	0.090	0.084
Land variables			0.470	0.530	0.361
Other assets variables			0.517	0.486	0.205
Land and assets variables	0.908	0.922	0.505	0.547	0.331

Claimants include head of household and any member who were 15 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the 1993 community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.8
Determinant of Household Division between 1993 and 1997, Claimant 2: Rural

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.049 [8.332] ***	0.049 [8.295] ***	0.049 [8.195] ***	0.049 [8.168] ***	0.05 [8.177] ***	0.031 [8.203] ***
Proportion of claimants:						
20-29 years, male	0.182 [3.343] ***	0.180 [3.301] ***	0.181 [3.326] ***	0.179 [3.283] ***	0.176 [3.271] ***	0.098 [3.052] ***
30-49 years, male	0.214 [3.522] ***	0.210 [3.430] ***	0.210 [3.426] ***	0.209 [3.406] ***	0.208 [3.394] ***	0.12 [3.127] ***
50 years or older, male	0.130 [1.791] *	0.126 [1.726] *	0.126 [1.725] *	0.125 [1.698] *	0.124 [1.690] *	0.079 [1.707] *
15-19 years, female	0.048 [0.760]	0.046 [0.730]	0.042 [0.669]	0.041 [0.655]	0.041 [0.669]	0.046 [1.344]
20-29 years, female	0.134 [2.111] **	0.132 [2.090] **	0.129 [2.038] **	0.127 [1.988] **	0.127 [2.049] **	0.085 [2.387] **
30-49 years, female	0.177 [2.716] ***	0.173 [2.651] ***	0.171 [2.603] ***	0.169 [2.579] ***	0.173 [2.689] ***	0.104 [2.837] ***
50 years or older, female	0.170 [3.041] ***	0.157 [2.800] ***	0.154 [2.735] ***	0.154 [2.737] ***	0.164 [2.913] ***	0.109 [3.278] ***
Age of head	0.000 [0.045]	0.000 [0.023]	0.000 [0.035]	0.000 [0.034]	0.000 [0.111]	-0.001 [0.317]
Age of head squared x 10 ⁻³	0.014 [0.449]	0.013 [0.429]	0.014 [0.458]	0.014 [0.454]	0.015 [0.504]	0.012 [0.628]
Head of hh's schooling	-0.001 [0.517]	-0.001 [0.472]	-0.001 [0.445]	-0.001 [0.549]	-0.001 [0.727]	0 [0.318]
Max. schooling, non-head claimants	0.003 [1.376]	0.001 [0.629]	0.001 [0.565]	0.001 [0.420]	0.001 [0.531]	0.004 [1.869] *
Sd. dev. of claimants' schooling		0.005 [1.712] *	0.005 [1.726] *	0.004 [1.322]	0.005 [1.378]	-0.896 [0.901]
# Boys 0-11	-0.003 [0.543]	-0.004 [0.554]	-0.004 [0.590]	-0.004 [0.622]	-0.002 [0.367]	0.001 [0.149]
# Girls 0-11	0.010 [1.534]	0.010 [1.496]	0.009 [1.427]	0.010 [1.437]	0.01 [1.572]	0.009 [2.321] **
# Boys 12-14	0.041 [3.312] ***	0.041 [3.279] ***	0.041 [3.304] ***	0.041 [3.292] ***	0.042 [3.326] ***	0.027 [3.436] ***
# Girls 12-14	0.094 [7.627] ***	0.095 [7.649] ***	0.095 [7.655] ***	0.094 [7.681] ***	0.094 [7.658] ***	0.059 [7.788] ***
Male head (=1)	-0.049 [1.896] *	-0.049 [1.874] *	-0.051 [1.966] **	-0.051 [1.965] **	-0.056 [2.183] **	-0.03 [1.775] *
log(land owned) (Rp x 10 ⁻³)	1.656 [1.463]	1.601 [1.415]	8.070 [2.214] **	7.744 [2.123] **	8.487 [2.418] **	0.001 [0.855]
log(bus. assets) (Rp x 10 ⁻³)	-0.128 [0.098]	-0.243 [0.187]	-1.846 [1.214]	-1.910 [1.227]	-1.728 [1.132]	4.611 [2.183] **
Farm household (=1)	-0.020 [1.007]	-0.019 [0.938]	-0.046 [1.807] *	-0.045 [1.807] *	-0.05 [1.961]	-0.027 [1.693] *

(continued)

(continued)

Interactions						
Farm hh (=1) x $\log(\text{land owned})$ (Rp x 10^{-3})	-7.375	-6.986	-7.744	-4.052		
	[1.996] **	[1.888] *	[2.140] **	[1.838] *		
Farm hh (=1) x $\log(\text{bus. assets})$ (Rp x 10^{-3})	3.687	3.408	2.983	0.706		
	[1.145]	[1.069]	[0.924]	[0.358]		
$\log(\text{land owned})$ (Rp x 10^{-3}) x head's schooling		-0.032	-0.063	0.045		
		[0.115]	[0.231]	[0.270]		
x max. of non-head claimants' schooling		0.358	0.396	0.218		
		[1.215]	[1.382]	[1.176]		
$\log(\text{bus. assets})$ (Rp x 10^{-3}) x head's schooling		-0.048	-0.035	-0.171		
		[0.160]	[0.121]	[0.975]		
x max. of non-head claimants' schooling		-0.192	-0.193	-0.175		
		[0.624]	[0.627]	[0.888]		
Observations	3,365	3,365	3,365	3,365	3,365	3,365
Province dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p-values</i>)						
Head's education				0.909	0.822	0.629
Non-head claimants' max. educ.				0.592	0.473	0.582
Education variables	0.382	0.199	0.212	0.507	0.387	0.088
Land variables				0.137	0.061	0.073
Other assets variables				0.724	0.768	0.459
Land and assets variables	0.340	0.367	0.167	0.416	0.263	0.336

Claimants include head of household and any member who were 15 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.9
Determinant of Household Division between 1993 and 2000, Claimant 2: Urban

1993 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.103 [6.727] ***	0.103 [6.730] ***	0.103 [6.701] ***	0.104 [6.831] ***	0.113 [6.343] ***
<u>Proportion of claimants:</u>					
15-19 years, male	-0.526 [2.109] **	-0.521 [2.089] **	-0.530 [2.128] **	-0.514 [2.071] **	-0.617 [2.234] **
20-29 years, male	-0.393 [1.626]	-0.390 [1.618]	-0.399 [1.660]	-0.366 [1.526]	-0.469 [1.744]
30-49 years, male	-0.668 [2.955] ***	-0.664 [2.945] ***	-0.671 [2.984] ***	-0.63 [2.787] ***	-0.729 [2.920] ***
50 years or older, male	-0.753 [3.216] ***	-0.747 [3.196] ***	-0.762 [3.256] ***	-0.699 [2.976] ***	-0.851 [3.291] ***
12-14 years, female	-0.074 [0.725]	-0.074 [0.727]	-0.079 [0.777]	-0.071 [0.700]	-0.059 [0.518]
15-19 years, female	-0.517 [2.221] **	-0.512 [2.199] **	-0.518 [2.223] **	-0.484 [2.092] **	-0.551 [2.150] **
20-29 years, female	-0.541 [2.224] **	-0.539 [2.217] **	-0.545 [2.250] **	-0.513 [2.128] **	-0.61 [2.287] **
30-49 years, female	-0.702 [2.820] ***	-0.704 [2.837] ***	-0.713 [2.884] ***	-0.686 [2.772] ***	-0.846 [3.091] ***
50 years or older, female	-0.540 [2.232] **	-0.553 [2.299] **	-0.558 [2.328] **	-0.552 [2.294] **	-0.649 [2.428] **
# Non-claimant members 12+	0.104 [1.689] *	0.103 [1.678] *	0.104 [1.697] *	0.097 [1.597]	0.111 [1.621]
Age of head	0.017 [2.466] **	0.017 [2.462] **	0.017 [2.451] **	0.017 [2.420] **	0.02 [2.448] **
Age of head squared x 10 ⁻³	-0.146 [2.216] **	-0.145 [2.214] **	-0.145 [2.201] **	-0.142 [2.144] **	-0.158 [2.071] **
Head of hh's schooling	-0.004 [1.402]	-0.004 [1.324]	-0.001 [0.203]	-0.001 [0.178]	0.003 [0.720]
Max. schooling, non-head claimants	0.012 [3.417] ***	0.011 [3.071] ***	0.010 [2.792] ***	0.01 [2.926] ***	0.014 [3.538] ***
Sd. dev. of claimants' schooling		0.005 [0.781]	0.005 [0.770]	0.005 [0.773]	0.004 [0.530]
# Boys 0-5	0.024 [1.330]	0.024 [1.326]	0.023 [1.295]	0.025 [1.369]	0.025 [1.285]
# Girls 0-5	-0.012 [0.659]	-0.013 [0.690]	-0.013 [0.719]	-0.016 [0.823]	-0.015 [0.739]
# Boys 6-11	0.055 [3.611] ***	0.055 [3.622] ***	0.055 [3.628] ***	0.055 [3.482] ***	0.06 [3.430] ***
# Girls 6-11	0.031 [1.869] *	0.031 [1.832] *	0.031 [1.843] *	0.033 [1.935] *	0.039 [2.153] **
Male head (=1)	-0.019 [0.363]	-0.019 [0.364]	-0.016 [0.305]	-0.028 [0.536]	-0.043 [0.717]

(continued)

<i>(continued)</i>					
<i>log(land owned)</i> (Rp x 10 ⁻³)	0.437	0.351	0.444	0.957	-0.657
	[0.185]	[0.149]	[0.157]	[0.343]	[0.211]
<i>log(bus. assets)</i> (Rp x 10 ⁻³)	4.157	4.148	4.597	4.47	5.734
	[2.349] **	[2.338] **	[2.248] **	[2.165] **	[2.423] **
Interactions					
<i>log(land owned)</i> (Rp x 10 ⁻³)					
x household head's schooling			0.609	0.54	0.805
			[1.071]	[0.925]	[1.305]
x max. of non-head claimants' schooling			-0.252	-0.2	-0.226
			[0.375]	[0.300]	[0.308]
<i>log(bus. assets)</i> (Rp x 10 ⁻³)					
x household head's schooling			0.140	0.107	0.015
			[0.381]	[0.290]	[0.037]
x max. of non-head claimants' schooling			-0.401	-0.352	-0.07
			[0.847]	[0.761]	[0.145]
Observations	2,913	2,913	2,913	2,913	2,913
Province dummies	No	No	No	Yes	No
Community dummies	No	No	No	No	Yes
F-test (<i>p-values</i>)					
Head's education			0.353	0.476	0.558
Non-head claimants' max. educ.			0.010	0.012	0.004
Education variables	0.003	0.007	0.031	0.038	0.007
Land variables			0.723	0.754	0.599
Other assets variables			0.112	0.142	0.048
Land and assets variables	0.027	0.029	0.107	0.128	0.058

Claimants include head of household and any member who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.10
Determinant of Household Division between 1993 and 2000, Claimant 2: Rural

1993 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.145 [10.703] ***	0.145 [10.705] ***	0.144 [10.512] ***	0.144 [10.551] ***	0.150 [11.248] ***	0.161 [10.653] ***
Proportion of claimants:						
15-19 years, male	-0.684 [3.022] ***	-0.678 [2.983] ***	-0.679 [2.967] ***	-0.671 [2.904] ***	-0.692 [2.961] ***	-0.781 [3.128] ***
20-29 years, male	-0.601 [2.631] ***	-0.594 [2.591] ***	-0.594 [2.576] ***	-0.583 [2.515] **	-0.587 [2.494] **	-0.687 [2.707] ***
30-49 years, male	-0.785 [3.404] ***	-0.780 [3.372] ***	-0.780 [3.351] ***	-0.774 [3.301] ***	-0.771 [3.248] ***	-0.861 [3.348] ***
50 years or older, male	-0.918 [3.763] ***	-0.913 [3.732] ***	-0.919 [3.723] ***	-0.906 [3.657] ***	-0.900 [3.593] ***	-1.033 [3.809] ***
12-14 years, female	0.034 [0.407]	0.035 [0.424]	0.036 [0.430]	0.029 [0.346]	0.027 [0.322]	0.056 [0.632]
15-19 years, female	-0.776 [3.291] ***	-0.770 [3.266] ***	-0.774 [3.256] ***	-0.771 [3.218] ***	-0.787 [3.262] ***	-0.866 [3.332] ***
20-29 years, female	-0.847 [3.807] ***	-0.841 [3.781] ***	-0.844 [3.759] ***	-0.842 [3.726] ***	-0.839 [3.673] ***	-0.973 [3.940] ***
30-49 years, female	-0.795 [3.709] ***	-0.790 [3.684] ***	-0.794 [3.669] ***	-0.793 [3.634] ***	-0.772 [3.480] ***	-0.909 [3.747] ***
50 years or older, female	-0.986 [4.418] ***	-0.989 [4.437] ***	-0.993 [4.415] ***	-0.993 [4.395] ***	-0.960 [4.190] ***	-1.067 [4.311] ***
# Non-claimant members 12+	0.171 [2.702] ***	0.169 [2.663] ***	0.169 [2.632] ***	0.167 [2.594] ***	0.171 [2.618] ***	0.191 [2.750] ***
Age of head	0.009 [1.748] *	0.009 [1.762] *	0.009 [1.750] *	0.009 [1.665] *	0.008 [1.611]	0.009 [1.727] *
Age of head squared x 10 ⁻³	-0.048 [1.002]	-0.048 [1.013]	-0.047 [0.978]	-0.043 [0.891]	-0.043 [0.883]	-0.042 [0.853]
Head of hh's schooling	-0.003 [1.070]	-0.003 [1.005]	-0.003 [1.004]	-0.004 [1.424]	-0.005 [1.648] *	-0.002 [0.765]
Max. schooling, non-head claimants	0.008 [2.580] ***	0.007 [1.997] **	0.007 [1.982] **	0.007 [1.735] *	0.009 [2.170] **	0.010 [2.285] **
Sd. dev. of claimants' schooling		0.004 [0.623]	0.004 [0.591]	0.004 [0.549]	0.004 [0.607]	0.008 [1.078]
# Boys 0-5	-0.019 [1.141]	-0.019 [1.136]	-0.018 [1.122]	-0.018 [1.069]	-0.018 [1.116]	-0.005 [0.253]
# Girls 0-5	0.012 [0.785]	0.012 [0.768]	0.012 [0.764]	0.012 [0.776]	0.013 [0.833]	0.031 [1.744] *
# Boys 6-11	0.075 [4.806] ***	0.075 [4.791] ***	0.075 [4.790] ***	0.074 [4.737] ***	0.076 [4.675] ***	0.084 [4.853] ***
# Girls 6-11	0.080 [4.458] ***	0.080 [4.467] ***	0.080 [4.465] ***	0.081 [4.545] ***	0.082 [4.664] ***	0.095 [4.944] ***
Male head (=1)	-0.119 [2.636] ***	-0.119 [2.629] ***	-0.121 [2.676] ***	-0.119 [2.641] ***	-0.132 [3.039] ***	-0.148 [3.137] ***

(continued)

(continued)

<i>log</i> (land owned) (Rp x 10 ⁻³)	-0.296 [0.163]	-0.335 [0.184]	2.270 [0.360]	2.188 [0.343]	3.869 [0.625]	2.675 [0.408]
<i>log</i> (bus. assets) (Rp x 10 ⁻³)	2.745 [1.111]	2.710 [1.099]	0.193 [0.063]	1.558 [0.497]	1.547 [0.474]	2.837 [0.829]
Farm household (=1)	0.000 [0.008]	0.001 [0.023]	-0.027 [0.727]	-0.019 [0.522]	-0.024 [0.626]	-0.051 [1.223]
Interactions						
Farm hh (=1) x <i>log</i> (land owned) (Rp x 10 ⁻³)			-3.369 [0.499]	-3.098 [0.461]	-5.251 [0.797]	-2.372 [0.340]
Farm hh (=1) x <i>log</i> (bus. assets) (Rp x 10 ⁻³)			8.523 [1.714] *	8.088 [1.595]	7.846 [1.557]	4.491 [0.806]
<i>log</i> (land owned) (Rp x 10 ⁻³) x head's schooling				0.281 [0.526]	0.134 [0.254]	0.286 [0.506]
x max. of non-head claimants' schooling				-0.227 [0.372]	-0.178 [0.294]	-0.055 [0.082]
<i>log</i> (bus. assets) (Rp x 10 ⁻³) x head's schooling				0.647 [1.070]	0.736 [1.225]	0.340 [0.531]
x max. of non-head claimants' schooling				0.506 [0.771]	0.554 [0.840]	0.333 [0.471]
Observations	3,417	3,417	3,417	3,417	3,417	3,417
Province dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
F-test (<i>p</i>-values)						
Head's education				0.133	0.157	0.580
Non-head claimants' max. educ.				0.153	0.058	0.049
Education variables	0.036	0.076	0.085	0.063	0.026	0.027
Land variables			0.813	0.960	0.919	0.974
Other assets variables			0.100	0.119	0.092	0.521
Land and assets variables	0.538	0.546	0.317	0.107	0.108	0.476

Claimants include head of household and any member who were 12 or over in 1993. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.11
Determinant of Household Division between 1997 and 2000, Claimant 2: Urban

1997 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.053 [7.412] ***	0.053 [7.404] ***	0.053 [7.459] ***	0.054 [7.477] ***	0.042 [8.690] ***
Proportion of claimants:					
20-29 years, male	0.056 [0.772]	0.057 [0.787]	0.057 [0.772]	0.06 [0.832]	0.038 [0.794]
30-49 years, male	-0.187 [2.312] **	-0.187 [2.316] **	-0.191 [2.358] **	-0.184 [2.292] **	-0.113 [2.054] **
50 years or older, male	-0.256 [2.518] **	-0.257 [2.530] **	-0.264 [2.590] **	-0.253 [2.493] **	-0.165 [2.404] **
15-19 years, female	0.091 [1.169]	0.091 [1.168]	0.091 [1.165]	0.101 [1.288]	0.062 [1.196]
20-29 years, female	0.064 [0.810]	0.063 [0.802]	0.063 [0.806]	0.062 [0.792]	0.025 [0.483]
30-49 years, female	-0.089 [1.089]	-0.092 [1.125]	-0.098 [1.196]	-0.102 [1.230]	-0.051 [0.891]
50 years or older, female	-0.094 [1.143]	-0.103 [1.233]	-0.109 [1.307]	-0.115 [1.356]	-0.057 [1.035]
Age of head	0.016 [3.615] ***	0.016 [3.622] ***	0.016 [3.704] ***	0.016 [3.750] ***	0.01 [3.462] ***
Age of head squared x 10 ⁻³	-0.116 [2.846] ***	-0.117 [2.851] ***	-0.119 [2.910] ***	-0.12 [2.954] ***	-0.078 [2.846] ***
Head of hh's schooling	-0.002 [1.187]	-0.002 [1.030]	-0.003 [1.189]	-0.003 [1.147]	-0.001 [0.454]
Max. schooling, non-head claimants	0.006 [2.119] **	0.005 [1.957] *	0.005 [1.875] *	0.005 [1.946] *	0.004 [2.370] **
Sd. dev. of claimants' schooling		0.003 [0.594]	0.004 [0.907]	0.004 [0.914]	0.002 [0.552]
# Boys 0-11	0.023 [2.361] **	0.023 [2.353] **	0.022 [2.319] **	0.024 [2.416] **	0.015 [2.202] **
# Girls 0-11	-0.009 [0.804]	-0.009 [0.808]	-0.009 [0.783]	-0.009 [0.791]	-0.009 [1.111]
# Boys 12-15	0.047 [2.549] **	0.047 [2.550] **	0.048 [2.605] **	0.051 [2.779] ***	0.032 [2.630] ***
# Girls 12-15	0.088 [5.698] ***	0.088 [5.683] ***	0.088 [5.684] ***	0.091 [5.870] ***	0.063 [6.139] ***
Male head (=1)	-0.021 [0.695]	-0.021 [0.715]	-0.021 [0.706]	-0.024 [0.807]	-0.01 [0.496]
log(land owned) (Rp x 10 ⁻³)	1.273 [0.781]	1.253 [0.770]	-0.009 [0.005]	-0.312 [0.161]	-0.303 [0.225]
log(bus. assets) (Rp x 10 ⁻³)	2.974 [2.328] **	2.943 [2.296] **	4.290 [2.905] ***	4.152 [2.811] ***	2.519 [2.578] ***

(continued)

(continued)

Interactions*log(land owned) (Rp x 10⁻³)*

x household head's schooling	-0.302	-0.274	-0.124
	[0.727]	[0.658]	[0.464]
x max. of non-head claimants' schooling	0.515	0.45	0.316
	[1.111]	[0.968]	[0.991]

log(bus. assets) (Rp x 10⁻³)

x household head's schooling	-0.235	-0.229	-0.182
	[0.772]	[0.747]	[0.916]
x max. of non-head claimants' schooling	-0.383	-0.349	-0.267
	[1.124]	[1.027]	[1.191]

Observations	3,047	3,047	3,047	3,047	3,047
Province dummies	No	No	No	Yes	No
Community dummies	No	No	No	No	Yes

F-test (*p-values*)

Head's education			0.403	0.454	0.585
Non-head claimants' max. educ.			0.228	0.228	0.092
Education variables	0.105	0.210	0.252	0.277	0.106
Land variables			0.639	0.771	0.765
Other assets variables			0.035	0.046	0.053
Land and assets variables	0.013	0.015	0.060	0.108	0.130

Claimants include head of household and any member who were 16 or over in 1997. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.12
Determinant of Household Division between 1997 and 2000, Claimant 2: Urban

1997 Variables:	(1)	(2)	(3)	(4)	(5)	(6)
# Claimants	0.075 [9.619] ***	0.075 [9.641] ***	0.075 [9.621] ***	0.075 [9.703] ***	0.075 [9.911] ***	0.06 [9.044] ***
<u>Proportion of claimants:</u>						
20-29 years, male	0.028 [0.382]	0.028 [0.380]	0.028 [0.378]	0.025 [0.344]	0.024 [0.340]	-0.035 [0.668]
30-49 years, male	-0.185 [2.243] **	-0.185 [2.240] **	-0.185 [2.234] **	-0.183 [2.209] **	-0.19 [2.303] **	-0.174 [2.887] ***
50 years or older, male	-0.175 [1.881] *	-0.175 [1.879] *	-0.175 [1.878] *	-0.171 [1.830] *	-0.178 [1.904] *	-0.16 [2.390]
15-19 years, female	0.163 [2.037] **	0.162 [2.030] **	0.162 [2.008] **	0.162 [2.018] **	0.166 [2.070] **	0.062 [1.017]
20-29 years, female	-0.06 [0.780]	-0.06 [0.784]	-0.06 [0.778]	-0.061 [0.795]	-0.062 [0.820]	-0.109 [1.897] *
30-49 years, female	-0.037 [0.468]	-0.038 [0.480]	-0.037 [0.471]	-0.038 [0.485]	-0.038 [0.489]	-0.062 [1.068]
50 years or older, female	-0.199 [2.400] **	-0.205 [2.442] **	-0.204 [2.432] **	-0.206 [2.445] **	-0.203 [2.366] **	-0.161 [2.545] **
Age of head	0.009 [2.127] **	0.009 [2.133] **	0.009 [2.126] **	0.009 [2.168] **	0.009 [2.154] **	0.004 [1.297]
Age of head squared x 10 ⁻³	-0.058 [1.520]	-0.058 [1.523]	-0.058 [1.516]	-0.06 [1.560]	-0.06 [1.527]	-0.02 [0.692]
Head of hh's schooling	-0.002 [1.142]	-0.002 [1.072]	-0.002 [1.078]	-0.002 [0.758]	-0.001 [0.689]	0.001 [0.626]
Max. schooling, non-head claimants	0.004 [1.843] *	0.003 [1.450]	0.003 [1.475]	0.002 [0.954]	0.003 [1.179]	0.003 [1.788] *
Sd. dev. of claimants' schooling		0.002 [0.541]	0.002 [0.546]	0.003 [0.617]	0.002 [0.441]	-0.001 [0.400]
# Boys 0-11	0.016 [1.557]	0.016 [1.549]	0.015 [1.539]	0.016 [1.578]	0.018 [1.828] *	0.01 [1.448]
# Girls 0-11	0.011 [1.158]	0.011 [1.158]	0.01 [1.148]	0.01 [1.112]	0.011 [1.239]	0.009 [1.238]
# Boys 12-15	0.093 [6.371] ***	0.093 [6.350] ***	0.093 [6.352] ***	0.093 [6.380] ***	0.097 [6.569] ***	0.074 [6.931] ***
# Girls 12-15	0.122 [9.746] ***	0.122 [9.729] ***	0.122 [9.700] ***	0.122 [9.669] ***	0.124 [9.670] ***	0.096 [9.936] ***
Male head (=1)	-0.059 [1.676] *	-0.059 [1.680] *	-0.059 [1.674] *	-0.062 [1.784] *	-0.068 [1.905] *	-0.058 [2.055] **
log(land owned) (Rp x 10 ⁻³)	2.836 [1.912] *	2.811 [1.889] *	3.531 [1.115]	3.477 [1.092]	3.2 [0.984]	3.012 [1.272]
log(bus. assets) (Rp x 10 ⁻³)	-0.057 [0.036]	-0.05 [0.032]	0.128 [0.074]	0.262 [0.151]	0.379 [0.214]	0.394 [0.285]
Farm household (=1)	-0.005 [0.197]	-0.005 [0.205]	-0.002 [0.086]	0 [0.005]	0.003 [0.117]	0.005 [0.233]

(continued)

(continued)

<u>Interactions</u>						
Farm hh (=1) x $\log(\text{land owned})$ (Rp x 10^{-3})	-0.817	-1.249	-0.853	-2.092		
	[0.224]	[0.344]	[0.230]	[0.771]		
Farm hh (=1) x $\log(\text{bus. assets})$ (Rp x 10^{-3})	-1.149	-0.797	-1.452	-2.77		
	[0.322]	[0.226]	[0.414]	[0.993]		
$\log(\text{land owned})$ (Rp x 10^{-3}) x head's schooling		-0.215	-0.236	-0.209		
		[0.660]	[0.734]	[0.854]		
x max. of non-head claimants' schooling		-0.098	-0.088	0.001		
		[0.304]	[0.270]	[0.004]		
$\log(\text{bus. assets})$ (Rp x 10^{-3}) x head's schooling		0.008	-0.027	-0.189		
		[0.021]	[0.072]	[0.657]		
x max. of non-head claimants' schooling		0.531	0.562	0.398		
		[1.560]	[1.638]	[1.501]		
Observations	3,617	3,617	3,617	3,617	3,617	3,617
Province dummies	No	No	No	No	Yes	No
Community dummies	No	No	No	No	No	Yes
<u>F-test (<i>p-values</i>)</u>						
Head's education				0.346	0.598	0.030
Non-head claimants' max. educ.				0.674	0.116	0.393
Education variables	0.164	0.289	0.276	0.191	0.249	0.088
Land variables			0.148	0.361	0.326	0.420
Other assets variables			0.948	0.577	0.542	0.553
Land and assets variables	0.149	0.156	0.408	0.470	0.395	0.247

Claimants include head of household and any member who were 16 or over in 1997. The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.13
Determinant of Household Division between 1993 and 1997, Claimants are
Household Heads, Their Sons, and Brothers Age 15 or Above in 1993

1993 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.082 [6.134] ***	0.076 [5.488] ***	0.076 [5.474] ***	0.076 [5.474] ***	0.076 [5.379] ***
<u>Proportion of claimants:</u>					
20-29 years	0.258 [5.969] ***	0.255 [5.930] ***	0.254 [5.914] ***	0.254 [5.915] ***	0.266 [6.190] ***
30-49 years	0.375 [6.236] ***	0.382 [6.411] ***	0.382 [6.409] ***	0.379 [6.366] ***	0.393 [6.617] ***
50 years or older	0.392 [4.611] ***	0.4 [4.754] ***	0.401 [4.757] ***	0.401 [4.740] ***	0.387 [4.598] ***
# Non-claimant members 15 and over	0.027 [3.678] ***	0.027 [3.676] ***	0.027 [3.670] ***	0.027 [3.614] ***	0.028 [3.661] ***
Age of head	-0.013 [2.641] ***	-0.014 [2.731] ***	-0.014 [2.716] ***	-0.014 [2.767] ***	-0.013 [2.689] ***
Age of head squared x 10 ⁻³	0.113 [2.530] **	0.117 [2.626] ***	0.116 [2.618] ***	0.118 [2.664]	0.11 [2.558] **
Head of hh's educ.	-0.002 [0.837]	-0.008 [2.428] **	-0.008 [2.428] **	-0.008 [2.308] **	-0.008 [2.526] **
Max. schooling, non-head claimants	0.003 [1.189]	0.010 [2.832] ***	0.010 [2.822] ***	0.011 [2.909]	0.011 [3.065]
Sd. dev. of claimants' schooling		-0.016 [2.614] ***	-0.016 [2.613] ***	-0.016 [2.548]	-0.015 [2.516] **
# Boys 0-11	0.011 [1.090]	0.011 [1.057]	0.011 [1.052]	0.011 [1.087]	0.012 [1.141]
# Girls 0-11	0.024 [2.369] **	0.023 [2.326] **	0.023 [2.332] **	0.023 [2.358] **	0.024 [2.487] **
# Boys 12-14	-0.02 [1.134]	-0.021 [1.212]	-0.021 [1.205]	-0.021 [1.175]	-0.023 [1.382]
# Girls 12-14	0.087 [5.056] ***	0.086 [4.989] ***	0.086 [4.994] ***	0.085 [4.947] ***	0.081 [4.774] ***
Male head (=1)	-0.022 [0.838]	-0.025 [0.955]	-0.025 [0.979]	-0.024 [0.915]	-0.03 [1.159]
log(land owned) (Rp x 10 ⁻³)	2.122 [1.484]	2.201 [1.542]	2.69 [1.380]	2.55 [1.360]	2.677 [1.467]
log(bus. assets) (Rp x 10 ⁻³)	-2.47 [1.650]	-2.542 [1.703]	-2.428 [0.926]	-1.969 [0.746]	-2.595 [1.001]
Urban (=1)	-0.041 [1.989]	-0.041 [1.982]	-0.041 [1.968]	-0.042 [2.017]	-0.026 [0.374]
<u>Interactions</u>					
Urban x log (land owned) x 10 ⁻³			-1.533 [0.514]	-0.573 [0.198]	-0.832 [0.293]
Urban x log(bus. assets) x 10 ⁻³			-0.092 [0.029]	-1.116 [0.336]	-1.087 [0.336]

(continued)

(continued)

<i>log(land owned) (Rp x 10⁻³)</i>					
x household head's schooling				0.112	-0.009
				[0.280]	[0.021]
x max. of non-head claimants' schooling				-0.412	-0.347
				[0.922]	[0.821]
<i>log(bus. assets) (Rp x 10⁻³)</i>					
x household head's schooling				0.144	0.143
				[0.357]	[0.356]
x max. of non-head claimants' schooling				0.191	0.196
				[0.386]	[0.412]
Observations	2395	2395	2395	2395	2395
Province, urban, interaction dummies	No	No	No	No	Yes
<i>F-test (p-values)</i>					
Head's education				0.095	0.068
Non-head claimants' max. educ.				0.027	0.018
Education variables	0.4474	0.029	0.029	0.175	0.139
Land variables			0.341	0.554	0.508
Other assets variables			0.247	0.481	0.279
Land and assets variables	0.1889	0.167	0.422	0.747	0.586

The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the 1993 community level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.14
Determinant of Household Division between 1993 and 2000, Claimants are
Household Heads, Their Sons, and Brothers Aged 12 or Above in 1993

1993 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.118 [7.085] ***	0.116 [6.899] ***	0.116 [6.900] ***	0.117 [6.910] ***	0.122 [7.109] ***
<u>Proportion of claimants:</u>					
15-19 years	-0.073 [1.146]	-0.078 [1.216]	-0.078 [1.217]	-0.078 [1.220]	-0.093 [1.438]
20-29 years	0.155 [2.268] **	0.15 [2.186] **	0.15 [2.188] **	0.148 [2.145] **	0.156 [2.190] **
30-49 years	-0.07 [0.798]	-0.072 [0.825]	-0.072 [0.829]	-0.079 [0.899]	-0.06 [0.670]
50 years or older	-0.037 [0.350]	-0.04 [0.381]	-0.04 [0.386]	-0.039 [0.372]	-0.034 [0.309]
# Non-claimant members 12 and over	0.084 [7.824] ***	0.084 [7.810] ***	0.084 [7.791] ***	0.084 [7.771] ***	0.087 [8.043] ***
Age of head	-0.003 [0.469]	-0.003 [0.468]	-0.003 [0.471]	-0.004 [0.603]	-0.004 [0.656]
Age of head squared x 10 ⁻³	0.015 [0.277]	0.016 [0.290]	0.016 [0.293]	0.022 [0.398]	0.026 [0.456]
Head of hh's educ.	0.001 [0.391]	0.0001 [0.003]	0.0001 [0.001]	0.0001 [0.049]	0.0001 [0.084]
Max. schooling, non-head claimants	0.004 [1.220]	0.006 [1.549]	0.006 [1.557]	0.007 [1.805] *	0.007 [1.700] *
Sd. dev. of claimants' schooling		-0.005 [0.872]	-0.005 [0.875]	-0.004 [0.714]	-0.002 [0.331]
# Boys 0-5	0.014 [0.799]	0.015 [0.817]	0.015 [0.815]	0.016 [0.894]	0.017 [0.940]
# Girls 0-5	0.028 [1.511]	0.029 [1.527]	0.029 [1.525]	0.031 [1.638]	0.026 [1.374]
# Boys 6-11	0.055 [3.413] ***	0.054 [3.381] ***	0.054 [3.390] ***	0.056 [3.486] ***	0.05 [3.017] ***
# Girls 6-11	0.046 [2.737] ***	0.045 [2.715] ***	0.046 [2.717] ***	0.045 [2.685] ***	0.041 [2.475] ***
Male head (=1)	-0.034 [1.103]	-0.036 [1.148]	-0.035 [1.134]	-0.03 [0.965]	-0.035 [1.094]
log(land owned) (Rp x 10 ⁻³)	-1.026 [0.563]	-0.983 [0.540]	-1.349 [0.592]	-1.9 [0.806]	-1.889 [0.794]
log(bus. assets) (Rp x 10 ⁻³)	3.401 [1.719] *	3.377 [1.707] *	3.217 [1.015]	4.973 [1.523]	4.09 [1.181]
Urban (=1)	-0.075 [2.882] ***	-0.074 [2.853] ***	-0.074 [2.807] ***	-0.074 [2.822] ***	-0.12 [1.683] ***

(continued)

(continued)

Interactions

Urban x $\log(\text{land owned}) \times 10^{-3}$				1.265	4.135	3.488
				[0.324]	[1.007]	[0.849]
Urban x $\log(\text{bus. assets}) \times 10^{-3}$				0.173	-3.335	-3.231
				[0.043]	[0.764]	[0.723]
$\log(\text{land owned})$ (Rp x 10^{-3})						
x household head's schooling					0.039	-0.17
					[0.074]	[0.320]
x max. of non-head claimants' schooling					-1.169	-0.957
					[1.911] *	[1.592]
$\log(\text{bus. assets})$ (Rp x 10^{-3})						
x household head's schooling					1.079	1.077
					[2.596] ***	[2.523] **
x max. of non-head claimants' schooling					0.315	0.397
					[0.536]	[0.674]
Observations	2,904	2,904	2,904	2,904	2,904	2,904
Province, urban, interaction dummies	No	No	No	No	No	Yes
<u>F-test (<i>p-values</i>)</u>						
Head's education					0.021	0.048
Non-head claimants' max. educ.					0.077	0.163
Education variables	0.299	0.366	0.361	0.041	0.064	
Land variables			0.839	0.247	0.301	
Other assets variables			0.245	0.077	0.033	
Land and assets variables	0.220	0.223	0.531	0.036	0.119	

The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Appendix Table 2.6.15
Determinant of Household Division between 1997 and 2000, Claimants are Household
Heads, Their Sons, and Brothers Aged 16 or Above in 1997

1997 Variables:	(1)	(2)	(3)	(4)	(5)
# Claimants	0.070 [3.692] ***	0.069 [3.602] ***	0.068 [3.579] ***	0.067 [3.512] ***	0.068 [3.605] ***
<u>Proportion of claimants:</u>					
20-29 years	0.150 [3.210] ***	0.151 [3.216] ***	0.149 [3.187] ***	0.149 [3.165] ***	0.161 [3.398] ***
30-49 years	0.023 [0.317]	0.024 [0.333]	0.021 [0.296]	0.014 [0.192]	0.036 [0.496]
50 years or older	-0.119 [1.180]	-0.118 [1.171]	-0.121 [1.193]	-0.133 [1.317]	-0.107 [1.036]
# Non-claimant members 16 and over	0.067 [5.863] ***	0.067 [5.855] ***	0.068 [5.946] ***	0.068 [5.906] ***	0.069 [5.906] ***
Age of head	0.014 [2.054] **	0.014 [2.048] **	0.014 [2.040] **	0.014 [1.987] **	0.013 [1.878] *
Age of head squared x 10 ⁻³	-0.110 [1.774] *	-0.110 [1.764] *	-0.109 [1.751] *	-0.106 [1.686] *	-0.100 [1.578] *
Head of hh's educ.	0.002 [0.594]	0.001 [0.202]	0.001 [0.215]	0.001 [0.354]	0.002 [0.589]
Max. schooling, non-head claimants	-0.0010 [0.446]	0.0000 [0.103]	-0.0010 [0.143]	0.0000 [0.008]	0.0000 [0.106]
Sd. dev. of claimants' schooling		-0.003 [0.424]	-0.003 [0.406]	-0.002 [0.241]	-0.002 [0.235]
# Boys 0-11	0.016 [1.207]	0.016 [1.217]	0.016 [1.181]	0.016 [1.155]	0.015 [1.140]
# Girls 0-11	0.021 [1.464]	0.021 [1.457]	0.022 [1.481]	0.022 [1.532]	0.021 [1.439]
# Boys 12-15	0.065 [2.973] ***	0.065 [2.971] ***	0.065 [2.974] ***	0.066 [3.016]	0.068 [3.101] ***
# Girls 12-15	0.109 [5.137] ***	0.109 [5.141] ***	0.109 [5.123] ***	0.108 [5.110]	0.111 [5.144] ***
Male head (=1)	-0.07 [2.277] **	-0.07 [2.292] **	-0.073 [2.401] **	-0.073 [2.396] **	-0.073 [2.352] **
log(land owned) (Rp x 10 ⁻³)	3.81 [2.314] **	3.833 [2.330] **	2.908 [1.512]	2.958 [1.445]	2.279 [1.051]
log(bus. assets) (Rp x 10 ⁻³)	2.624 [1.462]	2.614 [1.455]	5.318 [1.827] *	4.371 [1.446]	4.618 [1.491]
Urban (=1)	-0.002 [0.080]	-0.002 [0.064]	0.001 [0.027]	0.001 [0.040]	-0.042 [0.496]
<u>Interactions</u>					
Urban x log (land owned) x 10 ⁻³			1.176 [0.337]	2.129 [0.570]	1.814 [0.477]
Urban x log(bus. assets) x 10 ⁻³			-4.224 [1.128]	-1.908 [0.473]	-2.419 [0.592]

(continued)

(continued)

<i>log(land owned) (Rp x 10⁻³)</i>					
x household head's schooling				0.259	0.339
				[0.535]	[0.701]
x max. of non-head claimants' schooling				-0.441	-0.515
				[0.812]	[0.960]
<i>log(bus. assets) (Rp x 10⁻³)</i>					
x household head's schooling				-0.353	-0.366
				[0.770]	[0.796]
x max. of non-head claimants' schooling				-0.53	-0.436
				[0.971]	[0.797]
Observations	2,489	2,489	2,489	2,489	2,489
Province, urban, interaction dummies	No	No	No	No	No
Community dummies	No	No	No	No	Yes
<i>F-test (p-values)</i>					
Head's education					0.821
Non-head claimants' max. educ.					0.402
Education variables	0.582	0.472	0.421	0.584	0.549
Land variables				0.464	0.486
Other assets variables				0.276	0.196
Land and assets variables	0.164	0.155	0.160	0.244	0.092

The table shows the marginal effects of a change in explanatory variables. Standard errors are corrected for clustering at the individual level and heteroskedasticity. Absolute value of z statistics are in brackets with statistical significance at 10% (*); 5% (**); and 1% (***) indicated.

Bibliography

- Becker, Gary S. (1974), "A Theory of Social Interaction", *The Journal of Political Economy* 82:6, p. 1177-98.
- Bergstorm, Theodore C. (1996), "A Survey of Theories of the Family", in M. Rosenzweig and O. Stark (eds). *Handbook of Population and Family Economics*, vol, Amsterdam: North-Holland.
- Cameron, Lisa and Deborah Cobb-Clark (2001), "Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements" *Working Paper No.773*, Department of Economics, University of Melbourne, Australia
- Cameron, Lisa (2000), "The Residency Decision of Elderly Indonesians: A Nested Logit Analysis" *Demography* 37:1, p.17-27.
- Chiappori, Pierre A. (1988), "Rational Household Labor Supply" *Econometrica* 56:1, p. 63-89.
- Costa, D.L. (1997), "Displacing the Family: Union Army Pensions and Elderly Living Arrangements", *The Journal of Political Economy* 106:6, p.1269-92.
- Doss, Cheryl. (1996), "Testing among Models of Intrahousehold Resource Allocation" *World Development* 24:10, p. 1597-1609.
- Deaton, Angus. (1997), *Analysis of Household Surveys: A Microeconomic Approach to Development Policy*, Washington: The World Bank.
- Foster, Andrew (1993), "Household Partition in Rural Bangladesh", *Population Studies*, 47, p.97-114
- Foster, Andrew and Mark R. Rosenzweig (2002), "Household Division and Rural Economic Growth", *Review of Economic Studies*, p.839-69.
- Foster, Andrew and Mark R. Rosenzweig (1996). "Technical Change and Human Capital Returns and Investment : Evidence from the Green Revolution", *American Economic Review*, 86:4, p.931-53
- Foster, Andrew and Mark R. Rosenzweig (1995) "Learning by Doing and Learning from Others: Human Capital and Technical Change in Agriculture", *The Journal of Political Economy*, 103: 6, p. 1176-1209.
- Frankenberg, Elizabeth, James P. Smith, and Duncan Thomas (2003), "Economic Shocks, Wealth and Welfare", *The Journal of Human Resources*, 38:2, p. 280-321.

- Frankenberg, Elizabeth., Angelique Chan, M.B. Ofstedal (2002), "Stability and Change in Living Arrangements in Indonesia, Singapore, and Taiwan, 1993-1999" *Population Studies*, 56, p. 201-13.
- Frankenberg, Elizabeth and L. Karoly (1995). *The 1993 Indonesian Family Life Survey: Overview and Field Report*, Publication No. DRU-1195/1-NICHD/AID, RAND, Santa Monica, CA.
- Frankenberg, Elizabeth. and DuncanThomas, (2000), *The Indonesia Family Life Survey (IFLS): Study Design and Results from Waves 1 and 2*. RAND, Santa Monica, CA. DRU-2238/1-NIA/NICHD.
- Geertz, Hildred (1961), *The Javanese Family*. New York: Free Press of Glencoe.
- Haddad, L., J. Hoddinott, and H. Alderman (1997) eds. *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*, Baltimore: John Hopkins University Press.
- Heaton, T.B., M. Cammack, and L. Young (2001), "Why is the Divorce Rate Declining in Indonesia?" *Journal of Marriage and the Family* 63:2. p,480-90.
- Jay, Robert (1969), *Javanese Villagers*. Cambridge: MIT Press.
- Johnson, R.W, and J. DaVanzo (1998),"Economic and Cultural Influences on the Decision to Leave Home in Peninsular Malaysia", *Demography*, 35:1 p. 97-114.
- Jolliffe, D. (1997), "Whose Education Matters in the Determination of Household Income: Evidence from a Developing Country" *IFPRI Food and Consumption Nutrition Division Discussion Paper* No. 39.
- Jones, Gavin (1994), *Marriage and Divorce in Islamic Southeast Asia*, Kuala Lumpur: Oxford University Press.
- Koentjaraningrat, R.M. (1985) *Javanese Culture*, Singapore: Oxford University Press.
- Levine, David and Michael Kevane (2003), "Are Investments in Daughters Lower when Daughters Move Away? Evidence from Indonesia", *World Development*, 31:6, p. 1065-1084.
- Lucas, R.E.B. (1997), "Internal Migration in Developing Countries" in *Handbook of Population and Family Economics*, M. Rosenzweig and O.Stark, Vol. 1B, Amsterdam: North Holland.
- Lundberg, S., R. Pollak (1993), "Separate Spheres Bargaining and the Marriage Market" *The Journal of Political Economy*, 101:6, p.988-1010.

- Lundberg, S., R. Pollak, and T.J. Walles (1997), "Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit", *Journal of Human Resources* 32:3, p.463-80.
- McElroy, M.B. (1990), "The Empirical Content of Nash-Bargained Household Behavior", *Journal of Human Resources*, 25:4, p.559-83.
- McElroy, M.B. and M.J. Horney (1981), "Nash-Bargained Household Decisions: Toward a Generalization of the Theory of Demand", *International Economic Review* 22:2, p. 333-49.
- Quisumbing, Agnes eds. (2003), *Household Decisions, Gender and Development: A Synthesis of Recent Research*, New York: IFPRI.
- Rosenzweig, M.R. (2003), "Payoff from Panels in Low-Income Countries: Economic Development and Economic Mobility" *American Economic Review*, 93:2, p. 112-17.
- Rosenzweig, M.R., Oded Stark (1989), "Consumption Smoothing, Migration, and Marriage: Evidence from Rural India", *The Journal of Political Economy*, 97:4 p. 905-926.
- Schultz, T.Paul (1990), "Testing the Neoclassical Model of Family Labor Supply and Fertility", *The Journal of Human Resources*, 24:4, p. 599-634.
- Singh, I., L. Squire, and J. Strauss (1986) *Agricultural Household Models: Extensions, Applications and Policy*. Baltimore: John Hopkins University Press.
- Smith, James P., and DuncanThomas (1998), "On the Road: Marriage and Mobility in Malaysia", *The Journal of Human Resources*, 33:4, p.805-32
- Strauss, John, Kathleen Beegle, Bondan Sikoki, Agus Dwiyanto, Yulia Herawati and Firman Witoelar (2003), *The Third Wave of the Indonesia Family Life Survey (IFLS3): Overview and Field Report*. RAND, Santa Monica, California.
- Strauss, John, and DuncanThomas (1995), "Human Resources: Empirical Modeling of Household and Family Decisions", in *Handbook of Development Economics*, J. Behrman and T. N. Srinivasan, Vol. 3A, Amsterdam: North Holland.
- Strauss, John, G. Mwabu and Kathleen Beegle (2000), "Intrahousehold Allocations: a Review of Theories and Empirical Evidence", *Journal of African Economies*, 9, p.83-143.
- Thomas, Duncan, D. Contreras, Elizabeth Frankenberg (2002), "Distribution of Power within Household and Child Health", RAND.

Thomas, Duncan, James P. Smith, and Elizabeth Frankenberg (2001), "Lost but Not Forgotten: Attrition and Follow-up in the Indonesia Family Life", *The Journal of Human Resources*, 36:3, p. 556-92.

Witoelar, Firman (2004), "Inter-household Allocations within Extended Households: Evidence from the Indonesia Family Life Survey", *Two Essays on the Economics of the Household of the Developing Countries*, Dissertation, Michigan State University.

MICHIGAN STATE UNIVERSITY LIBRARIES



3 1293 02504 2791