Determinants of Banking Behaviour and Gendered Preferences in the Household: The Case of Costa-Rica

Author: Paul Michael Kearns

(4543827)

Major Paper Presented to the

Department of Economics of the University of Ottawa,

Faculty of Graduate and Post-Doctoral Studies

in Partial Fulfillment of the Requirements of the M.A. Degree

Supervisor: Professor Louis Hotte

ECO 7997

Ottawa, Ontario

January, 2008

Abstract:

A field study is conducted in North-Western Costa-Rica to collect data related to the household level banking decisions of women. The data are used in an analysis of the effects of intra-household conflict, crime, and the transactions costs of banking. Several other potentially significant factors affecting banking choice and the probability that a female head of household holds a bank account are explored. A logit model of banking choice for women is estimated in which the dependent variable is a dummy variable indicating whether or not a female head of household holds a bank account. We find that a woman's relationship status, and her household's experiences with crime, significantly affect her decision to hold a bank account, and we posit that this supports an internal conflict and a global safety motivation for banking choice. We also find evidence that geography, household income, household size, as well as a woman's education level and her share of total household income significantly affect the probability that she will hold a bank account.

Table of Contents

1) Introduction to the Research Project

The goal of this project is to improve our understanding of the effects of security and intra-household conflict on the banking behaviour of women in poor households. It concentrates on the difficulties encountered by women in developing countries who do not have access to formal banking institutions, or for whom access may be restricted by high transactions costs. In such situations, individual savings in the home are often poorly protected against theft or against competing claims and demands from other household and family members.

The central question of this analysis is an investigation into what factors influence the probability that a woman will hold a bank account. The hypothesis is that the simple access to safe and anonymous bank accounts can encourage women to save while also reducing theft and diminishing the incidence of conflict over household resources. Given the important role played by savings in the process of economic development, the implications of this project for economic policy as it relates to poverty reduction are clear and direct.

The project is empirical in nature, and, as such, required first hand data collection in a relevant geographical area. Data were collected in the North-Western region of Costa Rica in the month of August, 2007, and this was achieved using a randomly sampled household survey designed specifically for this study. The survey questionnaire contains nine sections with questions relating to basic household characteristics, the education of its members, household decision making patterns, crime and victimization rates, consumption patterns, durable assets, employment and income, and banking behaviour. In total, one hundred and one respondents participated in the survey.

Our analysis suggests that education levels, household size, household income, relationship status, crime, and whether or not a household is located in a rural or an urban area are all significant factors in determining the probability that a woman will hold a bank account. These results are arrived at by the logit estimation of a female individual bank account dummy variable on a set of potentially significant explanatory variables. The most significant and interesting result is that intra-household conflict appears to have a significant effect on the probability that women will hold a bank account. Crime is also observed to be significant, and this suggests a global safety argument for banking behaviour.

The paper begins with a brief introduction to the subject and a review of the literature. It then describes the survey questionnaire and process that was undertaken in Costa Rica before describing the variables and data set, and outlining the results obtained from regression analysis. Several sampling issues are discussed, and different avenues for potential future research are proposed.

2) Background

i) The Question

In recent years, the subject of micro-finance has been of much interest in the development economics literature, and it is now widely recognized as an important means of enabling people to become self-sufficient. Naturally, emphasis has been placed on making credit accessible to small borrowers in order to encourage wealth generating projects. However, evidence now suggests that these loans are often used for consumption rather than investment purposes and that they are ultimately repaid from existing sources of income (Sinha and Martin 1998; Johnston 1998). It has also been noted that there is no universal need for investment capital among those living in poverty (Johnson and Kidder 1999, 1996). As such, it becomes quite evident that the banking component of micro-finance deserves equal emphasis.

The poor, according to Vonderlack and Schreiner, "have a strong demand not just for micro-enterprise loans but also for financial services that help them manage liquidity in the household" (2002, pg 603), and it has been suggested that savings should be the core financial service on offer in poor countries (Johnson and Kidder 1999, 1996). Savings institutions are used by the poor either to turn small, frequent cash inflows into usefully large sums, or to turn large inflows into small, frequent outflows (Rutherford, 2000). It is a strategy which can be employed to accumulate the funds necessary for the purchase of a large durable good, or to prepare for old age, ensure the future education of a child, or guard against economic crises in the home. Some may choose to save simply because they do not wish to incur debt to finance a project or because they are uncomfortable with the process of borrowing. In any case, the ability to save is a well known and important variable for poverty reduction and economic development.

When people wish to use banking services, the conditions under which they are able to do so becomes a subject of great importance. Currently, the academic literature pertaining to banking is primarily focused on the issues of return and liquidity, and little consideration has been given to the aspect of security. Nevertheless, Vonderlack and Schreiner have identified this "lack of a safe place" as "the main constraint against saving for the poor" (2002, pg 603), and its omission from the literature may be due to the fact that the problem of security is an irrelevant factor in most developed countries. When formal banking institutions do exist in poor areas, people's willingness to use them is also a function of the associated transactions costs. Presumably, transactions costs are lowest when people choose not to use formal institutions, and, rather, opt to keep their accumulated savings in the home. Accumulating cash and other valuables in the home is not, however, the safest method of banking, as assets kept in the home are vulnerable to crime problems external to home, as well as competing demands for the use of cash inside the household.

Increasingly, studies in the field of development economics have focused in on the issue of intra-household conflicts of interest, and there is now a general consensus that the household is better modeled as conflictual than atomistic (Bruce 1989). The safety of savings in the home is, therefore, a function of the extent to which preferences differ across household members, and, in this regard, there is a gender aspect to the banking decision.

The work of Hoddinott and Haddad (1995), Thomas (1990), and Pitt and Khandker (1998) illustrates that there is a gender component to this analysis, as it suggests that, generally, men have a greater preference for private consumption while women's consumption preferences tend to be more in line with overall household welfare. Therefore, while men are generally observed to use their liquid assets to fund their personal consumption, women, it is seen, generally make purchases for the benefit of the home. Women who wish to save for a large purchase must resist demands from children who need clothes, husbands who want to drink or gamble, and relatives and neighbours who want loans or gifts. These short-term pressures weigh less if cash is out of sight and out of reach, but the ability to impose these conditions depends on the extent to which they can hold their income anonymously. This anonymity can be achieved through the use of a bank, but the feasibility of this option depends on the associated transactions costs.

ii) Methodology

To address this topic, a survey was conducted in North-Western Costa Rica to understand how Costa Rican women tend to save and to discover the effects of any barriers/deterrents that might exist for them. Information on income, employment, durables, and banking behaviour was gathered through the delivery of a randomly sampled questionnaire. Questions relating to conflict in the home were not addressed directly in the questionnaire. Instead, based on the work of Anderson and Baland (2002) and Grogan and Witt (2006), the potential for household conflict is measured using an indirect method of questioning that enables one to establish a bargaining power index for individual household members.

The tools of econometric analysis have been applied to the data, and a logit model of banking choice was estimated. The dependent variable in the analysis is a binary dummy variable indicating whether or not the female head member of each household uses a bank account. Estimation is carried out in order to further understand the effects of various explanatory variables on banking behaviour. Of particular interest are the effects of internal-conflict and crime, of distance and transactions costs, and the effects of various socio-economic variables such as education levels and income. The precise question that we wish to address is an inquiry into the effect that each of the explanatory variables included in the analysis has on the probability that a female head of household will be observed to hold a bank account.

3) The Questionnaire

The questionnaire that was used in the household survey consists of eight sections designed to capture demographic and socio-economic data relevant to the topic of banking and security. It was drafted using a World Bank publication entitled "Designing Household Survey Questionnaires for Developing Countries: Lessons from 15 years of the Living Standards Measurement Survey" (Grosh and Glewwe 2000). The questionnaire is thorough and comprehensive, and not all of the information that was collected was ultimately used in the analysis that is presented in this paper. The eight sections include a household roster and seven topical sections on the subjects of education, the household decision making process, crime, household consumption, durable goods, employment, household income, and bank use by members of the household. Also included in the questionnaire is a brief introduction placed at the beginning which was used to inform potential participants of the purpose of the survey, and a witness sheet placed at the end in order to record the time of each interview and confirm the consent of each participant.

i) Household Roster

The Household Roster section was, essentially, designed to identify the members of a household, and to collect basic information on each. The three main reasons to include such a section in any household survey, according to the World Bank, are to determine household membership, collect basic information on household members, and collect information on nonresident family members (Grosh and Glewwe 2000). It includes a list of all household members, as well as information regarding each person's sex and age. This section captures the length of time that the household has lived in the current home, the marital status of the head couple, and the length of time that the household heads have lived in Costa Rica as well as whether or not either of the household heads lives away from the home for significant periods of time throughout the year. We collect the religious affiliation of each of the household heads, and determine who in the household (if anyone) has access to a vehicle.

ii) Education

The education section of the survey questionnaire was designed to collect descriptive information on which household members attend school, the grade levels and diplomas of each household member, and the costs of education. Information on education is collected for two primary reasons. First, because intuition and economic theory dictate that there is a positive relationship between education levels and the use of banks accounts, and second, because expenditures on schooling represent a potentially welfare increasing public good expenditure in the home. This type of expenditure might be expected to influence the need to use bank accounts, and if there is a divergence of preferences across household members for public versus private goods consumption, it might create the need for individual bank accounts among household heads. This topic is also of interest because it is now widely recognized that investments in human capital are crucial for economic growth (Grosh and Glewwe 2000).

iii) Decision Making

A section on intra-household decision making has been included in the survey questionnaire in order to construct bargaining power indices for each household member. Based on the work of Grogan and Witt (2006), survey respondents were asked who in the household is responsible for making the following decisions: 1. Visits to friends. 2. Purchasing something expensive. 3. Children's visits to the doctor. 4. Children's education. 5. Daily meals. 6. Discipline of Children. 7. General Money Decisions. 8. Decisions to Save. This information has been used to establish the relative power of each household member in the intra-household decision making process, and it is included in the analysis in order to investigate the relationship that exists between a person's bargaining power and their use of bank accounts.

iv) Crime

The questionnaire includes a section related to a household's experience with crime. It is included, as the central hypothesis of this paper is that there is a security motive for the use of bank accounts, and crime represents a conflict / security argument external to the home. To simplify the analysis, the questionnaire focuses on theft from homes in the last year and the last five years, and it collects information on whether or not a household has been the victim of such a crime over the relevant time period as well as an estimate of the value of all that was lost.

v) Private Consumption

Information on the private consumption of household members is collected in order to assess the extent to which preferences might differ across household members, and investigate the relationship between this variable and bank account use. In order to arrive at this information a standard set of private consumption categories were established based on the work of Grosh and Glewwe (2000), and each survey participant was asked to estimate the household's weekly expenditure on each consumption category. The consumption categories which were included in the questionnaire are tobacco products, newspapers and magazines, lottery tickets and gaming, fares for busses and taxis, gasoline for motor vehicle use, regular worship, and food consumed outside of the home. It should be noted that the questionnaire does not disaggregate this data by household member, collecting instead totals for each category across the home.

vi) Durable Goods

There are two sections related to durable goods in the survey questionnaire. These sections were included in order to observe each household's asset ownership. Survey participants were presented with a list of twenty common household durables, and were then asked to identify the items which they owned. For each item that was owned by the household, participants were asked to indicate how long they had owned the item in question, as well as how they had acquired it (gift, credit, savings, other). It was hoped that this information would be used to construct a durable goods index (under the assumption that durable good acquisition follows lexicographic preferences), and that this could be used to rank households in terms of their durables wealth and to then investigate the relationship that exists between this variable and banking behaviour, as well as other factors such as household income. This investigation is not undertaken in the present paper, and it is a potential area for future research.

The second section related to durable good wealth treats the items that are not owned in a given household. Participants were asked why they do not own the items in question (e.g. because they are too expensive, because they have no need for them, or because they have access to them elsewhere), and were then asked to rank these items in order of importance for their homes based on their preferences and then based on what they perceive to be the preferences of their partner (if their preferences differ, we take this as a sign of potential conflict in household decision making). Participants were asked whether or not they currently had a plan to acquire any of the items, and if so, how they planned to do so (e.g. savings, credit, inheritance). This information was gathered in order to establish a potential need to save or use bank accounts in the home.

vii) Employment and Household Income

The employment section of the questionnaire provides a list of all household members who earn a wage-income outside of the home. It collects information on what type of employment they are engaged in, how many hours they work per week, and their approximate monthly earnings. Individual monthly incomes are added together in order to determine total household monthly income. Participants were also asked what percentage share of total household income is contributed by each member, and whether or not the household has any other income sources (e.g. pensions, remittances from other family members). This information is critical to the analysis, given the relationship that we expect to exist between household income and banking behaviour.

viii) Bank Branches

Survey participants were asked whether or not they share a bank account with their spouse, whether or not they have an individual bank account, and whether or not their partner has an individual bank account. Information was then gathered on the transactions costs of banking, as participants were asked how far the nearest bank is from their home, how much it costs to open a bank account at the nearest branch, how much it costs them to travel to this bank, and how long it takes them to travel there. This information was gathered as one of our central hypotheses is that transactions costs are negatively related to bank account use. As such, we are able to estimate the effect of transactions costs on bank account use. The analysis that is presented in this paper uses the time that it takes to travel to the bank as the relevant transaction cost.

4) The Survey

The survey was carried out in the month of August, 2007 in and around the city of Cañas in North-Western Costa Rica. In total, one hundred and one questionnaires were completed. In order to ensure randomness, a standard selection rule for participants was applied during the survey process (see below). Geographical locations were determined in order to ensure that the data set included a representative cross-section of household income levels and geographic proximity to urban areas. That is, attempts were made to ensure that the sample included households from a wide range of income levels, as well as both urban and rural locations at varying distances from urban centres. The survey was centered on Cañas as the main urban area, and smaller cities, towns, and villages were chosen at distances of up to 50 kilometres from Cañas.

The survey was carried out on weekdays during the survey period. Each day of sampling generally consisted of two 2 - 3 hour sessions of sampling in the same geographical location. Survey teams, which consisted of either the author and a survey assistant or the author's academic supervisor and a survey assistant, would arrive at a pre-determined survey area around 9 AM, and would choose what appeared to be a main street in the chosen area. To ensure randomness, they would knock at every door as they moved in a chosen direction down the street, and would only skip a household if no one was home or if the person who was solicited refused to participate. When both survey teams worked in the same location simultaneously, they would either start at opposite ends of the same street and work towards one another, or would separate to different streets within the same geographical area. This process would continue until approximately 12-12:30 PM at which point they would break for lunch until approximately 2 PM. After lunch the teams would choose to either continue on the same street they sampled in the morning time, or, if a majority of the houses had been reached before lunchtime, either a new street would be chosen, or they would travel to a new geographical area. They would then work until approximately 5 – 6 PM.

5) The Data (See Table 1)

The variables employed in this analysis are based on demographic and socio-economic data that has been collected in the household survey. Variables relating to female labour supply patterns are also included. The definitions of the variables are reported in Table 1.

Female Bank Account (Variable Name: FACCT)

The dependent variable in the analysis is a binary variable which takes the value of 1 if the female head of household uses an individual bank account and 0 otherwise. Individual bank account has been defined here as a bank account that only one person is able to access (i.e. the account must not be shared with a spouse or any other household member).

a) Household Characteristics

Age of the Female Head of Household (Variable Name: FAGE)

The age of the female head of household (measured in years) is included in the analysis, as it is hypothesized that a person's age may affect their willingness to use bank accounts or their propensity to do so. This, we assume, could occur for various reasons including differences in social perceptions of banking across generations, differences in bargaining power across age groups, or differences related to how income generating activities or income sources may change across age groups (e.g. The Costa Rican government requires that the recipients of state pensions are holders of bank accounts for direct deposit of funds. As a result, we may expect to find a greater proportion of bank account users among pension recipients than in the general population).

Household Size (Variable Name: HHSIZE)

This variable is included here because expenditures on public goods in the home will likely be greater in larger households (because there are more people that need to be taken care of), and this may influence the need to use bank accounts to save for household expenditures. For example, households with more children will have greater education related expenses for which the head couple may need to save. Alternatively, in larger homes, there may be a greater need to save to make renovations to the house to accommodate a larger family.

Relationship Status of the Head(s) of Household (Variable Name: COUPLE)

The variable for relationship status of the head of household is a simple binary variable that takes the value of 1 if the household is headed by a couple (either married or common-law), and 0 if it is headed by a single individual, whether male or female. It is included in the analysis because it is assumed that a woman's relationship status might affect her banking behaviour. As it relates to the conflict motive for savings, women who live in couples are, presumably, those most at risk of having their personal income appropriated or claimed by a partner. Though the conflict motive argument extends to members of the extended family, it is likely the case that women with partners experience a greater degree of conflict in this regard. Bank accounts, we posit, are one mechanism which women can use to shield their personal income, thereby increasing their bargaining power and ensuring that household consumption patterns more accurately reflect their preferences. We therefore expect to observe that women who live in couples have a higher propensity to use bank accounts than those who do not. It should be noted that a positive relationship between relationship status and use of bank accounts may, however, also be indicative of the fact that households which are led by couples are likely to have a higher household income than single family households. If this is indeed the case, we would expect to observe greater rates of female savings in households led by couples simply because the women in these households potentially command more income and, therefore, have a greater ability to save.

Another argument related to banking behaviour is that, at the level of the household, and in the absence of a conflict motive for individual accounts, one bank account should be adequate for the household's overall banking needs. We should, therefore, observe that women in couples are less likely to use individual bank accounts than women who live on their own, as women living in couples are able to address household needs with a partner's account or a shared account, while women who live alone can only address these needs using personal individual accounts (i.e. they do not have partners with which they can share an account and substitute their individual accounts for their partner's as it relates to household banking needs). This implies that if women in couples are observed to be more likely to hold bank accounts than women living alone, then there is likely some underlying motivation for this behaviour aside from just household banking needs. This, we posit, is a need to shield personal income from other household members

Female Bargaining Power in Household Decision Making (Variable Name: FBP)

A bargaining power index has been created for the purpose of examining the relationship between the power that women have in the household decision making process and the use of bank accounts. Following the work of Grogan and Witt (2006), survey respondents were asked who in the household is responsible for making the following decisions: 1. Visits to friends. 2. Purchasing something expensive. 3. Children's visits to the doctor. 4. Children's education. 5. Daily meals. 6. Discipline of Children. 7. General Money Decisions. 8. Decisions to Save.

For each decision category, the household is assigned a value of -1 if the woman is responsible for making the decision alone, 0 if the decision is made jointly between partners or 1 if the woman's partner makes the decision alone. The index is then created as a simple average of these 8 values for each household in the data set. As such, "neutral" households in which partners have equal bargaining power take index values of 0. Households in which women are "more powerful" take negative values that approach -1 in the limit, and households in which men are "more powerful" take positive values that approach 1 in the limit.

Rural / Urban Dummy Variable (Variable Name: RURURB)

This dummy variable takes the value of 1 if the responding household is located in an urban area (defined in this sample as the cities of Cañas or Tilaran), and 0 otherwise. It has been included to take account of the fact that the motivations for savings and attitudes towards savings may differ across rural and urban areas. The degree to which families are exposed to the broader community may also differ across rural and urban areas, and social expectations are likely to diverge. These differences could foster or impede the incidence of internal conflict within homes, and this variable is included to take account of that possibility. The variable is also likely related to the transactions costs of banking (there are less banks in rural areas, people living in rural areas must, therefore, travel further to get to a bank, and so the transactions costs for banking are elevated for rural residents), and it may also be related to variables related to employment (farming families are more likely to be self employed, with women underreporting their work in the home or on the farm for which they do not receive a cash income). For this reason alone, we might expect that women will be less likely to use banking services in rural areas.

b) Demographic Factors

Victim of Crime in the Last 12 Months (Variable Name: CRIME12)

This variable indicates whether or not a household has been the victim of a crime in the past year (12 months), and takes the value of 1 if the observation has been the victim of a crime in the past year, and 0 otherwise. For purposes of the survey, crime was defined as someone attempting to enter a person's home without their permission and stealing or attempting to steal something. It is assumed that living in an area where crime is prevalent, or being the victim of a crime, will cause a person to feel that their assets are less secure in the home, and will therefore encourage them to safeguard their valuables. This is a conflict motivation for savings that is external to the home. Crime is expected to increase a person's demand for banking services, and, as such, increase the prevalence of bank account use in households and geographical areas in which crime is common.

Victim of Crime in the Last 5 Years (Variable Name: CRIME5)

This variable is defined in the same manner as the victim of crime in the past year variable. In this case, the variable takes the value of 1 if the observation has been the victim of crime in the past five years, and 0 otherwise.

c) Economic Factors

The Income Generating Activities of Women (Variable Name: FWORK)

A variable indicating whether or not the female head of household works for income outside of the home is included in the analysis, as income generating activities are expected to positively influence a person's demand for banking services. The presence or absence of female income generating activities is also expected to influence female use of bank accounts, as it is likely that paid work serves to strengthen a woman's bargaining position in her home. This, we assume, occurs because paid work enables women to make a monetary contribution to household welfare (which presumably entitles her to some degree of ownership over the assets she contributes), while also increasing and reinforcing her social and commercial ties to the broader community. There are causality issues between female bargaining power and female bank account use, and so the relationship that exists between activities that increase a woman's bargaining power and her decision to use a bank account is somewhat unclear. Nevertheless, we expect that this variable will be positively related to female bank account use.

Education Level of the Female Head of Household (Variable Name: FEDUC)

The education level of the female head of household is measured as the number of years of formal schooling she had completed at the time of the survey. We expect education to be positively related to bank account use, as women with more education have greater opportunities to work for an income, are presumably more aware of the benefits and availability of banking services, and have the knowledge and skills to become financially independent of her partner.

Household Income (Variable Name: HHINC)

Household income is measured as the total monthly income of all household members. It is reported in thousands of Costa Rican Colones, the exchange rate of which was 528.93 CRC / $1 U.S. on the first day that sampling began (August 1st, 2007). This variable is included in the analysis because it likely influences a woman's decision to use a bank account as well as her ability to do so. Survey respondents were asked to identify the income category that best matches their total household income from a set of predetermined ranges, and midpoints were used for each income range.

Female Share of Total Household Income (Variable Name: FSHARE)

Female income share is given as a percentage of total household income. Information on this variable was gathered by asking directly what percentage of total household income is contributed by each member. Female income share is, intuitively, related to a woman's use of banking services. It is also likely that a woman's income share determines or is related to her bargaining power within the home.

Female Income Share Categories (Variable Names: FS25, FS50, FS75, FS100)

These variables have been included to enable us to observe how the determinants of female banking differ across levels of female contribution to household income. It is likely that women with higher levels of contributions have higher rates of bank account use. However, if a female's income contributions strengthen their bargaining power in a home, then women that contribute more would, in fact, be less vulnerable to internal conflict, and the internal conflict motivation for savings would, therefore, be less of a factor in their decision making process. The traditional determinants of bank use would still affect empowered women in the same way as others, and so it is unclear what we expect to observe.

Education Expenditure (Variable Name: EDEXP)

Education expenditures can be regarded as a "public good" within the home, and this variable is included in the analysis in order to proxy the level of public goods expenditure within each home. Expenditures on the education of children may establish a need to save (especially if tuition is due in one lump sum rather than a series of payments throughout the year), and based on the literature on gendered preferences in the home, we expect women to have a greater preference for this type of public expenditure than men (Hoddinott and Haddad 1995; Bruce 1989; Thomas 1990).

Luxury / Private Consumption Expenditures (Variable Name: LUXCONS)

Luxury consumption expenditures are defined here as the monthly sum of expenditures on tobacco, cigarettes, magazines or newspapers, lottery tickets and gaming, and food and drinks consumed outside of the home, given in thousands of Costa Rican Colones. Data was gathered on other types of luxury consumption (eg: spending on gas, and worship, etc) however these categories were ultimately not included, as they should not necessarily be classified as luxury consumption items (especially in the case of gas being an input into household production). It should be noted that we are likely to have encountered strategic answering in regards to these questions, as people seem to have underreported luxury consumption expenditures. See the discussion related to sampling issues for further information on how strategic answering may have affected the study.

Travel Time to the Nearest Bank (Variable Name: TBANK)

We take the time it takes to travel to the nearest bank as the transaction cost of banking. Direct account costs and transportation costs were ignored for simplicity, and we expect that time costs associated with banking will be the most relevant cost for the majority of decision makers. We expect this variable to be negatively related to the decision to use a bank account.

6) Summary Statistics (See Tables 2 and 3)

Table 2 gives summary statistics across the entire sample, for women living in couples, and for single female headed households. The total sample and women living in couples groups are further divided into two sub groups, one for observations that report the use of a bank account by the female head of household, and the other for observations that do not. This provides a tool which can be used in preliminary analysis of the data, and there are observations to be made from this table.

Comparing columns 1, 4, and 7, we see that the proportion of households where women report using bank accounts is slightly higher in the sample of women living in couples than the total sample, while this proportion is lower in the single female household sample than in both other groups. This supports an internal conflict motivation for bank account use, as, without controlling for anything, we observe that women living in couples are "more likely" to have a bank account than women living alone. Given the fact that there are factors which influence the need for a bank account at the level of the household, while other factors (including private consumption preferences and internal conflict) establish the need for privately held accounts; shared or private male bank accounts can reasonably be expected to act as substitutes for private female bank accounts at the level of the household (i.e. in addressing household wide banking needs) when there is a head couple. Using this explanation, women in single female headed households should, on average, be observed to hold more bank accounts than women living in couples. The fact that this is not the case suggests that women in couples have greater incentives to hold bank accounts than single women, which supports the argument that women in couples use banking as a strategy to shield their income from partners or other family members.

Several noteworthy differences are observed between the summary statistics for the total sample restricted to observations that do not report the use of a female bank account (column 2) and those that do (column 3). Average education expenditure is higher for households in the bank account group, and reported expenditures on luxury consumption also tend to be greater in this group. The female bank account group also includes a greater proportion of households that have been the victims of crimes, while the average time it takes to travel to a bank is lower for this group. The female income share is higher on average in the bank account group, as is female education; the incidence of females working outside of the home is also greater in the bank account group. These things would, however, be expected based on intuition and existing economic theory, and so, although they are included in regression analyses, the effects of these variables on bank account use will not be treated in depth in this paper. These differences persist even when we compare the summary statistics for the un-banked group of women living in couples versus the women in couples group restricted to include only observations that report female use of a bank account.

The observation that average education expenditure is higher in the bank account groups is expected, as paying for a child's education represents a need to save. Furthermore, the literature pertaining to public goods provision in the home indicates that expenditures on children's welfare tend to be preferred by women (Hoddinott and Haddad 1995; Bruce 1989; Thomas 1990). As such, we would expect to observe greater average expenditures on children's education within the groups of households that report the use of female bank accounts.

Higher average expenditures on luxury consumption in the female bank account group can also be related to theory on gendered preferences in the home, as where luxury consumption is higher there is a greater need for women to shield their income from private consumption demands. Therefore, in houses with higher rates of private consumption, we would expect to observe a greater incidence of female banking behavior. Luxury consumption has, however, only been measured at the level of the household and has not been disaggregated by member. As such, it is unclear as to which household member is the primary consumer of the private goods expenditures, and it must be noted that in the absence of disaggregated data on private consumption, it could be the case that higher observed rates of luxury consumption in the female bank account group could be due to the fact that women are saving to fund private consumption. There is, in fact, some evidence of this, as the magnitude of the difference in luxury consumption expenditures between the restricted and unrestricted groups in the total sample is greater than the magnitude of this difference in the women living in couples group. However, the difference does persist for the couples group and this may, indeed, be indicative of an internal conflict motivation for savings.

On average, there are more people who have been victims of crime in both the last year, and in the last five years, in the bank account group than in the general population. This is consistent with the idea that people use banks to protect their assets against crime where they may feel that assets kept in the home are not secure. This tendency is not expected to be gender specific, although one may argue that women are more vulnerable than men. It likely reflects a general security argument for savings in the home rather than any internal conflict argument. The average time it takes to travel to a bank is also lower in the bank account group than in the general population. This would be expected based on theory related to the transactions costs of banking and how this should affect peoples' use of bank accounts.

Tables 3A and 3B give the correlations between variables for the total sample and for women living in couples. The variables for female work, education, and income share are positively correlated with the dummy variable, indicating whether or not a woman has a bank account in both groups. This would be expected based on intuition. Education expenditures and expenditures on luxury consumption are also both positively correlated with the female bank account dummy variable. Both of the crime variables are also positively correlated with the bank account variable; however it appears as though the incidence of crime in the last five years is much more so. This may suggest that people who have been the victims of crime in the last five years feel more urgent about the need to protect their savings from outside threats. It could also indicate that those who have been victimized more recently have simply not reacted to this new threat quickly, or have been divested of a significant enough portion of their accumulated assets that, for a period of time, they have nothing left to bank. It could even indicate that people who experience crime in the last 5 years tend to live in areas that have entrenched crime problems, which represent a serious threat to assets in their homes.

There appears to be a greater tendency to use bank accounts for females living in urban rather than rural areas, as we observe a positive correlation between the rural-urban dummy variable (which takes the value of 1 for urban observations) and the female bank account dummy variable. This is probably reflected in the transactions costs for savings argument (i.e. it is likely easier for people living in urban areas to access bank than people living in rural areas). It is important to note that, as we would expect, the rural-urban dummy variable is negatively correlated with the time to bank variable. While the dummy variable for female income share between 0 and 25 percent is negatively correlated with female bank account use, those for female income share between 25-50 percent and 75-100 percent exhibit positive correlations with this variable. This indicates that in households in which women earn between 0-25 percent of total income, it is less likely that women will save any of their income in a bank, while in households in which women earn between 50-100 percent of the total income women are more likely to save some of their earnings in a bank. Not surprisingly, the time it takes to get to a bank is negatively correlated with whether or not a woman has a bank account. This is expected, as we would expect to observe people being deterred from saving where transactions costs are higher.

7) Estimation and Regression Results (See Tables 4, 5, and 6)

A logit model is estimated with the binary female bank account variable serving as the dependent variable. This model provides estimates of the effect that each explanatory variable has in influencing the probability that a female head of household will hold a bank account. Initial estimation results are reported in Table 4.

We are primarily interested in the marginal effects of each explanatory variable on the dependent variable. These marginal effects give the effect of a one unit change in the given explanatory variable on the probability of a female head of household using a bank account. In the case of dummy variables, they give the difference in probability as the case values change from zero to one.

i) Procedure

Three logit regressions are performed. In order to perform diagnostic testing for heteroskedasticity, a procedure was also written in Shazam that can be used to detect the presence of heteroskedasticity. This procedure performs a likelihood ratio test for heteroskedasticty in logit models based on the set of explanatory variables that are included in the regression of interest. Based on the work of Davidson and MacKinnon

(1984), it is assumed that the heteroskedasiticity is a function of a set of variables Z which are chosen from the set of explanatory variables that are included in the model.

First Regression Equation (See Table 4)

In the first regression equation, all explanatory variables are regressed upon the female bank account dummy variable. The equation is presented below:

FACCT = B0 + B1FAGE + B2COUPLE + B3FWORK + B4FEDUC + B5HHINC + B6FSHARE + B7FS50 + B8FS100 + B10HHSIZE + B11EDEXP + B12LUXCONS + B13CRIME12 + B14CRIME5 + B15TBANK + B16RURURB + B17FBP + e

This base case provides us with a starting point for interpretation of the effects of each explanatory, which then enables us to refine the regression equation. The results of this regression are presented in Table 4.

In this first regression, we test for heteroskedasticity related to all the variables, and the likelihood ratio test indicates that heteroskedasticity is present in this regression. The value of the statistic for this test is 41.37, with a p-value of 0.00049, and we can therefore conclude that at any reasonable level of significance, a test of the null of heteroskedasticity against the alternative of no heteroskedasticity is rejected. We conclude that heteroskedasticity is, indeed, present in this model.

Second Regression (See Table 5)

In an attempt to address the problem of heteroskedasticity and begin to refine the regression equation, a new logit regression is estimated omitting the dummy variables indicating female income share categories, as well as the "travel time to bank" variable. This is a logical first step, as none of these variables are significant, and, furthermore, because there is reason to believe that there may be a multicollinearity problem associated with some or all of these variables.

There is a degree of correlation between the rural urban dummy variable and the travel time to bank variable (see Table 3A), which makes intuitive sense, as people who live in remote rural areas will certainly have a longer travel time to banks. There is also a high degree of correlation between the female income share variable and the female income share dummy variable categories (see Table 3A). This also makes intuitive sense, as this group of dummy variables simply re-classifies the information contained in the female income share variable. Since none of these variables are significant, we begin to refine the regression equation by dropping them from the analysis to observe any significant changes.

FACCT = B0 + B1FAGE + B2COUPLE + B3FWORK + B4FEDUC + B5HHINC + B6FSHARE + B7HHSIZE + B8EDEXP + B9LUXCONS + B10CRIME12 + B11CRIME5 + B12RURURB + B13FBP + e

All variables that were reported as significant in the first estimation remain significant, though their estimated marginal effects change. Female income share becomes a significant variable in this regression.

A likelihood ratio test for heteroskedasticity indicates that heteroskedasticity is present in this regression. The value of the statistic for this test is 23.61419, with a p-value of 0.03487, and we can therefore reject a null hypothesis of heteroskedasticity against the alternative of no heteroskedasticity and conclude that this problem is still present in the second regression.

Final Regression Equation (See Table 6)

In order to arrive at the final regression that is presented in this paper, a number of regression equations were estimated deleting and adding the remaining set of insignificant variables from the second regression in order to observe the effects on heteroskedasticity. The final model includes all of the variables that were observed to be significant in the second regression equation plus the "crime in the past one year" variable, and we do not find evidence of heteroskedasticity in this regression equation. The reason this is chosen as the preferred estimation is that the absence of heteroskedasticity increases our confidence in the interpretations of the effects of each explanatory variable. All of the explanatory variables remain significant in this formulation with the exception of the "household size" variable, and some of the estimated marginal effects change.

FACCT = B0 + B1COUPLE + B2FEDUC + B3HHINC + B4FSHARE + B5HHSIZE + B6CRIME12 + B7CRIME5 + B8RURURB + e

A likelihood ratio test for heteroskedasticity indicates that heteroskedasticity is not present in this regression. The value of the statistic for this test is 14.60514, with 8 degrees of freedom, and a p-value of 0.06729, and we therefore cannot reject a null hypothesis of heteroskedasticity against the alternative of no heteroskedasticity. We conclude that there is no evidence of heteroskedasticity in this final regression analysis. This is an encouraging result, and it increases our confidence in the results we have obtained. Nevertheless, since heteroskedasticity presented a problem in the two earlier regressions, we may wish to investigate this result further in future studies.

In an attempt to correct for the problem of heteroskedasticity associated with the two earlier models, non-linear maximum likelihood estimation of the logit model presented in this paper was considered at great length. Regrettably, this estimation procedure simply did not work for the dataset. As such, the logit estimates are the best that can be arrived at for the present analysis. Since we do not find evidence of heteroskedasticity in the final formulation of the regression equation, we do not pursue this issue further in the paper.

ii) Results

a) Household Characteristics

Relationship Status

The estimation results support the hypothesis of an internal conflict motivation for savings. The "couple" dummy variable (which indicates whether or not the household is headed by a couple or a single woman) is positively related to the probability that a woman will hold a bank account, and this result is significant in all three regressions.

In the first regression, the estimated marginal effect of this variable suggests that, when all other variables are held constant, the estimated probability that a female head of household will hold a bank account increases by 10.25% as an observation changes from being single to being part of a couple. In the second regression, this estimate increases to 23.61%, and, in the final set of results, it is estimated that women who live with partners are 23.72% more likely to hold a bank account than those who do not.

These results suggest that there is some factor associated with living in a couple that increases the need for women to use banking services. This factor, we posit, is conflicting preferences between a woman and her partner in household decision-making which results in conflict and encourages women to shield their income from competing claims. This result supports our hypothesis of intra-household conflict as a factor influencing bank account use by women, and it remains robust throughout the analyses presented in this paper.

Rural/Urban Location

The estimate for the rural-urban dummy variable is statistically significant, and positively related to the probability of female bank account use. This is in line with our expectation that urban households have easier access to banks and should, therefore, be more likely to use bank accounts than their rural counterparts. This variable also takes account of other differences between rural and urban areas including cultural and other socio-economic factors.

In the first set of regression results, the estimated marginal effect of this variable suggests that women from urban households are 17.16% more likely to use bank accounts than their rural counterparts, and this result is statistically significant. This estimated marginal effect increases to 23.27% in the second regression analysis, and the final set of regression results suggest that women in urban households are 22.74% more likely than those in rural households to hold bank accounts.

Household Size

In the first set of regression results, the variable that reports the number of people in each household is positively related to the female bank account use variable, and significant at the 10% level of confidence, however, this variable is not significant in the final regression. In the base case, the estimated marginal effect of this variable in the first set of results is 0.0599, indicating that, as household size increases by one person, the probability that a female head will use a bank account increases by 5.99%. This result would be in line with the expectation presented earlier in the paper, but the fact that this result does not remain significant throughout the analysis prevents a general interpretation of this as supporting our expectations. This size effect may not, in fact, be an important factor in a woman's decision to hold a bank account, and estimating the effects of household size on banking behaviour is another interesting avenue for future research.

b) Demographic Factors

Crime

The estimation supports the global safety motivation for banking argument over a long time period, but not in the shorter run. The dummy variable indicating whether or not a household has been the victim of a crime in the last five years takes a positive sign and is statistically significant; however, though the "crime in the last year" variable is not statistically significant, it takes a negative sign.

In the first regression, the estimated probability of female bank use increases by 24.17% as this variable changes from zero to one. This indicates that, all else equal, if a household has been victimized by crime in the last five years, they are much more likely to use banking services than if they have not. In the second regression, this marginal effect increases from to 37.68%, and in the final regression it is estimated that the probability of female bank use increases 35.14% as this variable changes from zero to one. All else equal, these results indicate that, if an observation has been victimized by crime in the last five years, they are much more likely to use banking services than if they have not. Such an observation supports the idea that people use banking services to protect their assets from threats external to their home, as people that have been victimized by crime (and are therefore presumably more aware of the threat that crime represents) are seen to be more likely to use banks and store their income and assets in a secure manner.

The dummy variable for crime in the last year is not statistically significant, but it takes a negative sign, and, as such, contradicts a general statement that being the victim of crime increases a person's probability of using banking services. This contradicts our expectations for the effects of crime on bank use; however this divergence could be attributable to some other factor such as a high degree of correlation with the crime in the last five years variable. Another explanation could be that people who have been the victims of crimes most recently have had less time to react to this event than those who have been victimized further in the past, and so have not yet decided how to mitigate the threat of future crime. In cases where the crime has been more severe, a person may have been divested of a significant enough portion of their assets that it takes them time to re-accumulate their assets for banking. Nevertheless, the negatively signed estimate for the crime in the last year dummy variable prevents a general conclusion that people respond to crime by increasing protection for their assets through the use of banking services.

In the present study, since the "crime in the last five years" variable is the only one of the two crime variables with a statistically significant coefficient estimate, we will rely most heavily on the interpretation of this variable. As such, we conclude that our analysis does support the external conflict / crime motivation for the use of banking services. The divergence in signs across these two variables may illustrate that there is a time dimension to the effect of crime on banking behaviour, and this requires further study.

c) Economic Factors

Education

Estimation supports our expectations regarding the effect of education on female use of banking services. Years of female education is positively related to the probability that a female head of household will use a bank account, and the coefficient estimates are statistically significant. The base case regression estimates suggest that, holding all other variables constant, an extra year of schooling for the female head of household increases the probability that she will use banking services by 6.34%. The marginal effect of this variable decreases to 0.0437 in the final regression, implying that an additional year of schooling for a female head of household increases the probability that they will hold a bank account by 4.37%. This observation is in line with our expectations, as well as existing economic theory related to the effects of female education.

Household Income

The household income variable is negatively related to the female bank account variable, and this result is significant at the 10% level of confidence. In the first regression, the estimated marginal effect of this variable is -0.0006, which indicates that, as household income increases by 1000 CRC per month (approximately 2 USD), the probability that the female head of household will hold an individual bank account decreases by 0.06%. In the final regression, household income continues to be significant and negatively related to the probability that a female head of household will hold a bank account, and its estimated marginal effect is equal to -0.0005. This suggests that, as household income increases by 1000 CRC per month, the probability that the female head of household will hold an individual bank account decreases by 0.05%.

This runs contrary to our expectation that household income should positively influence the probability that a female head of household will hold an individual bank account, but it might be indicative of something that was not anticipated a-priori. For example, though we certainly expect household income to be positively related to bank account use in a home in general (i.e. as a household's income increases, we expect that there will be a greater probability that there will be at least one bank account in the household), it may be the case that, as a household's income increases, the need for women to hold individual bank accounts separate from their partners actually decreases, as the basic needs that such behaviour would be undertaken to address are generally budgeted for in wealthier households. That is to say that if women shield their income from competing claims in the home in order to ensure that the basic needs of the home are taken care of, then household income is likely to be negatively related to the probability that a female will hold a bank account simply because wealthier households are more likely to afford basic needs expenditures even in cases where preferences of the household heads diverge. This presents an interesting question for future research.

Another potential explanation for the negative effect of household income is that we do not control for household protection measures. That is, households invest in different levels of protection from external threats (for example, through the construction of security fences and bars, etc), and, since we would expect to observe higher income household having higher levels of investment in protection, it is possible that the crime effect on banking diminishes as household income rises.

Female Income Share

The variable indicating the percentage of total household income that is contributed by the female head of household is positively related to the probability that a female head will use a bank account. In the first set of regression results, this variable is not, in fact, observed to be significant, as there is a multicollinearity problem with the female income share category variables. In the second set of regression results, however, the female income share category variables are omitted, and this variable becomes statistically significant. Its estimated marginal effect in the second regression suggests that, as the female head's contribution to total household income increases by one percent, the probability that she will hold an individual bank account increase by 0.74%. Female income share remains a significant predictor of the probability that a female head of household will hold a bank account in the final set of regression results, where its marginal effect is estimated to be 0.0065. This implies that as a woman's contribution to total household income increases by 1%, the probability that they will be observed to hold a bank account increases by 0.65%.

This positive relationship supports our expectation that women who contribute greater shares of total income are more likely to hold individual bank accounts. This result is in line with the expectations laid out earlier in the paper, and it is intuitively appealing, as we expect that women who earn income outside of the home are likely to bank some of that income.

Transactions Costs

The time it takes to travel to the nearest bank is not statistically significant in this analysis. The estimated effect of this variable on the probability that a female head of household will use a bank account is negative, which is in line with our expectations and intuition, but the lack of statistical significance prevents an interpretation of this as supporting our hypothesis.

This variable is, however, somewhat correlated with the rural-urban dummy variable (r= -0.3516), and this might be causing a multicollinearity problem in the model. Since the rural-urban dummy variable is seen to be statistically significant, while this variable is not, the travel time variable has been omitted in the final two regressions in order to obtain a better estimate of the effect of the rural-urban factor. Nevertheless, it is intuitive that the travel time to bank should influence bank account use, and so this is a potential question for future research.

d) Insignificant Variables

The following variables are not significant in the analysis: "woman working outside of home," "education expenditure," "luxury consumption," "crime in the past year," "female bargaining power index," and "travel time to bank." Since we expect all of these variables to affect a woman's banking decision, this is not an expected result, however there could be underlying statistical issues that causes them to remain insignificant. At this stage of the analysis, different variations of the regression equation will be considered in order to observe how the regression results change when some or all of these variables are omitted from the regression.

8) Sampling Issues

i) Answering Strategically

While there is no way to measure the extent to which this may have affected our study, it is important to note the possibility that survey participants have answered questions strategically, and that this would bias the estimation results. For example, though it was never suggested, when answering the section regarding household durable goods, the authors often had the impression that some participants felt that if they answered "correctly" they may receive some of the durables that they are in most need of (especially when asked to rank the articles they do not possess in order of importance according to them and then according to their spouse / mate). As it pertains to this section, this strategic answering may, in fact, ensure the accuracy of responses (ie: if respondents are under the impression that they may receive something in return for the "correct" response, they are likely to accurately reveal their needs), however, it is also important to note that such strategic answering is also likely to misrepresent their needs. For example, in such a case, a respondent is likely to answer that they are most in need of the most expensive goods (eg: a computer or car), while their immediate needs may, in fact, be for things of a much more basic nature (eg: a stove or a washing machine).

Furthermore, since interviewees are asked not only to rank the goods they need according to their preferences, but according to the preferences of their spouse / mate as well, if they are answering strategically, it is likely that they will underreport any difference in needs/preferences that may exist between them and their spouse in order to reflect, not only a greater need, but also the existence of a discourse and a consensus regarding needed goods in the household. In such cases, the extent of intra-household conflict is underreported. Nevertheless, this would not have affected our study, as this information has not been included in the analysis.

As it pertains to the section on bank accounts, respondents may not have been honest, as this is sensitive information. This may have been especially true in cases where one mate has a secret bank account and both members were present during the interview. Note also that there are several cases in which no bank account is reported whatsoever while there is a significant income, or a formal employer, both of which, it would seem, would require a bank account. If women in couples did, however, underreport bank account use in the presence of their partners, this lends greater credibility to the results observed here, as, even in the absence of these observations, we still observe a significant increase in the probability of women in couples using bank accounts versus those that live alone.

Strategic answering may have also been a problem in regards to the questions on crime. People are often reluctant to speak about their experiences with crime, and, though most survey participants seemed willing to answer the questions they were posed, it is likely that many survey participants underreported their experiences with crime due the feelings of vulnerability that this topic can create.

ii) Transaction Costs of Banking

It is evident that the time cost associated with banking is a transaction cost that must be taken into account by those who use banks. In this study, we have attempted to include the time cost associated with banking by directly asking each survey participant the amount of time it takes them to travel to their bank using their preferred method of transport. Another significant time cost, which, unfortunately, has not been taken into account in this study, is the average time that savers expect to actually have to spend in a bank or performing bank related activities in order to complete a transaction. Several survey participants have indicated that the time it takes them to get to their bank is only a small fraction of the total amount of time it takes them to complete a transaction (oftentimes the time reported to complete a deposit in a bank is in excess of 2 to 3 hours) (also note that some banks in Costa Rica have a policy which allows savers only to make deposits on certain days of the week (eg: Tuesday to Thursday) which also represents a barrier to banking for some). This oversight can likely be attributed to the fact that banking in Canada appears to be much more efficient than banking in Costa Rica, and, as such, this did not appear to be a significant variable to the authors, a priori. Any future study of this nature should, however, attempt to measure this transaction cost.

9) Conclusion

This paper has presented the results of a field survey and study into the factors affecting bank account use by women in developing countries. Of particular interest are the effects of intra-household conflict, crime, and the transactions costs of banking, and we present evidence that all three of these variables significantly affect the probability that a female head of household will be observed to hold a bank account. We gauge the effect of internal conflict by assuming that, in the absence of a conflict motive for banking, women living alone should be observed to have a greater likelihood of holding bank accounts than those living in couples (based on an argument that one bank account should be adequate for general household needs), but the results of this analysis suggest that women living with couples are more likely to hold bank accounts than women alone. We posit that the reason for this is the existence of conflict inside the home which creates a need for individual bank accounts.

A global safety argument for banking behaviour is put forth, and the results of the analysis support this hypothesis. Female heads of households that have been victimized by crime in the past five years are observed to be more likely to hold individual bank accounts than those who have not, and this suggests that people use bank accounts as a strategy to shield their income from conflict problems external to the home. The effects of being victimized by crime in the past year seem to contradict this result, but this variable is not significant, and so we leave this to future analysis.

There is a significant difference in the likelihood that a female head of household will be observed to hold a bank account between rural and urban areas. The analysis suggests that women in urban household are much more likely than their rural counterparts to hold bank accounts, and we take this to be indicative of varying transactions costs for banking across the two areas. It also likely reflects differences in attitudes, and other socio-economic variables across the two geographical areas. The "travel time to bank" variable is not, however, observed to be significant, and it is likely that our measurement of transactions costs is not completely accurate (see sampling issues section). The accurate measurement of transactions costs is an interesting area for future research.

10) Future Research

i) The time dimension of crime

An interesting avenue for future research is the apparent time dimension of crime. Recall that, though the "crime in the last year" is not observed to be significant, it takes a negative sign. This is contrary to our expectations, and it indicates that female heads of households which have been victimized by crime in the past year are less likely than those who have not to hold a bank account. Future research is required to determine whether or not this result is robust and, if so, to identify the cause of this time dimension in peoples' reaction to crime as it relates to bank account use.

ii) Household Income

The negative relationship between household income and bank account use that has been observed to be significant in this analysis is interesting and requires future research. A priori, we expected to observe a positive relationship between household income and bank account use by the female head of household, but have proposed an alternative explanation which supports the internal conflict hypothesis. Further research is required to identify the true nature of this relationship and to understand the cause. Future studies should also attempt to measure the level of protection in each household (security bars and fences, etc) in order to control for the way in which this might affect the relationship between household income and banking behaviour.

iii) Bargaining Power Indices

The bargaining power index that was constructed based on the work of Grogan and Witt (2006) is not significant in the analysis. Nevertheless, one would intuitively believe that a woman's bargaining power in her household is related to her decision to use a bank account. The fact that this variable is not observed to be significant likely reflects a poorly constructed index which does not capture what it is intended to capture rather than the fact that bargaining power is not related to banking decisions. In future studies, the accurate measurement of bargaining power is something that should be considered at length.

iv) Private consumption as an indicator of intra-household conflict

Ultimately, it seems as though the section of the questionnaire which was designed to capture the extent of household conflict based on private consumption (See Appendix 3) across members of the household will not give evidence of much conflict. We have observed that most households do not consume tobacco, nor do they consume food outside of the house, newspapers and magazines, or lottery tickets / gaming.

Households, it appears, do however tend to spend on transportation (either gasoline for a car or motorbike, fares for busses or taxis, or both), and in many cases we have found evidence that a primary consumer of the expenditure can, indeed, be identified. However, this cannot be regarded as a sufficient indicator of intra-household conflict, as if the primary user of the vehicle (or public transport) makes this expenditure for work related purposes then, in fact, this expenditure should be regarded as an input cost into the production of household income (a public rather than private expenditure at the level of the household), and, as such, more information is needed.

In regards to this section of the questionnaire, it is of interest to note that, while most households did not report much private consumption, the large majority of households did, in fact, report significant weekly expenditures for regular worship (%) (donations to churches). Furthermore, the majority of households (even those that did not report any expenditure on regular worship) report that they are members of a church (either Catholic (%) or Evangelical Christian (%)). As such, an interesting question for future study is the extent to which membership in an organized religion affects the consumption preferences of a household, or (if empirically possible) the extent to which membership in an organized religion causes people to underreport such consumption. NB: An interesting example is of a woman from Hotel de Cañas answering no to the question of whether or not her family spends on public transport, but when asked how she travels to the banks replies that she travels in bus. Another example is of a woman in La Chorotega who denied spending on magazines, but her son interrupted to inform us that she did, indeed, spend on a weekly magazine that she picked up each Monday afternoon.

Our initial hope in including this section was to observe whether or not there is a noticeable difference in weekly private consumption of income between the man and woman of a household, and to use this as an indicator of the extent of intra-household conflict in any given household. Regrettably, due to the lack of sufficient information, the author is unable to use this section of the questionnaire as it was originally intended.

v) Sample Size

In future studies, it would, of course, be helpful to attempt to gather a larger dataset. This may improve the estimation results by providing more accurate information and a more complete data set. In this study, for example, we had hoped to obtain data on all four female income share categories (FS25, 50, 75, and 100), but did not encounter any observations during sampling that reported a female income share of 50-75%. If the sample had been larger and the time dedicated to sampling longer, it is likely that we would have encountered a number of observations that would fit this category, and this would have enabled us to say something more concrete about the effects of female income share on female bank account use.

Works Cited

Anderson, S. and J.-M. Baland (2002). "The Economics of Roscas and Intra-household Resource Allocation." *Quarterly Journal of Economics* 117(3): 963-995.

Ardener, S. and S. Burman (1995). Money-go-rounds: The Importance of Rotating Savings and Credit Associations for Women, Oxford: Berg.

Ashraf, N., D. Karlan, and W. Yin (2006). "Household Decision Making and Savings Impacts: Further Evidence from a Commitment Savings Product in the Phillipines." Center Discussion Paper No. 939. Accessed from <http://ssrn.com/abstract=912771>

Bradshaw, S (1995). "Women's Access to Employment and the Formation of Female-Headed Households in Rural and Urban Honduras." *Bulletin of Latin American Research* 14 (2): 143-158.

Bruce, J (1989). "Homes Divided." *World Development* 17 (7): 979-991.

Davidson, R. and J.G. MacKinnon (1984). "Convenient Specification Tests for Logit and Probit Models", *Journal of Econometrics*, Vol 25, 1984, pp. 241-262.

Doss, C (1996). "Women's Bargaining Power in Household Economic Decisions: Evidence from Ghana." *Staff Paper Series, Department of Applied Economics, University of Minnesota* (P96-11).

Goetz, A.M. and R. Sen Gupta (1996). "Who Takes the Credit? Gender, Power, and Control Over Loan Use in Rural Credit Programs in Bangladesh." *World Development* 24: 45–63.

Greene, W. (2000) *Econometric Analysis*, Fourth Edition, Prentice-Hall, 2000. Ch. 19.

Grogan, L. and J. Witt (2006). "Domestic Violence and Intrahousehold Resource Allocation." **Preliminary Draft**

Grosh, M. and P. Glewwe (2000). Designing Household Survey Questionnaires for Developing Countries: Lessons from 15 Years of the Living Standards Measurement Study, The World Bank.

Gugerty, M. K. (2007). "You Can't Save Alone: Testing Theories of Rotating Savings and Credit Organizations." *Economic Development and Cultural Change* forthcoming.

Hashemi, S.M., S.R. Schuler, and A.P. Riley (1996). "Rural Credit Programs and Women's Empowerment in Bangladesh." *World Development* 24:635–53.

Hoddinott, J. and L. Haddad (1995). "Does Female Income Share Influence Household Expenditures? Evidence from Côte d'Ivoire." *Oxford Bulletin of Economics and Statistics* 57: 77-96.

Johnston, S (1998). "Programme Impact Assessment in Microfinance: The Need for Analysis of Real Markets." *IDS Bulletin* 29(4): 21-30.

Johnston, S. and T. Kidder (1999). "Globalization and Gender – Dilemmas for Microfinance Organizations." *Small Enterprise Development* 10(3): 4-15.

Kabeer, N (2001). "Conflicts over Credit: Re-evaluating the Empowerment Potential of Loans to Women in Rural Bangladesh." *World Development* 29 (1): 63–84.

Koenig, M.A. (2003). "Women's Status and Domestic Violence in Rural Bangladesh: Individual- and Community-Level Effects." *Demography* 40 (2): 269-288.

Lundberg, S. and R.A. Pollak (1996). "Bargaining and Distribution in Marriage." *Journal of Economic Perspectives* 10(4): 139-58.

Pitt, M. and S. Khandker (1998), "The Impact of Group-Based Credit Programs on Poor Households in Bangladesh: Does the Gender of Participants Matter?" *Journal of Political*, CVI: 958-996.

Rutherford, S (2000). *The Poor and Their Money*, Delhi: OUP. (As quoted in Vonderlack and Schreiner, 2002)

Sinha, S. and I. Matin (1998). "Informal Credit Transactions of Microcredit Borrowers in Rural Bangladesh." *IDS Bulletin* 29(4): 66-80.

Thomas, D (1990). "Intra-household Resource Allocation: An Inferential Approach." *Journal of Human Resources* 25(4): 635-64.

Tsai, K.S (2000). "Banquet Banking: Gender and Rotating Savings and Credit Associations in South China." *The China Quarterly* 161: 142-170.

Vonderlack, R.M., and M. Schreiner (2002). "Women, Microfinance, and Savings: Lessons and Proposals." *Development in Practice* 12(5): 602-612.

Wooldridge, J. M. (2000) *Introductory Econometrics: A Modern Approach*, South-Western College Publishing, 2000. Ch. 17.

Appendix: Tables

TABLE 1: Variable Descriptions

Variable Name	Description
FACCT	=1 if the female head of household uses a bank account, 0 otherwise
FAGE	Age of the female head of household
HHSIZE	Number of people in the household
COUPLE	=1 if the female head has a partner, 0 otherwise
FBP	Constructed index of a female's bargaining power in household decisions making
RURURB	=1 if the household lives in an urban area, 0 otherwise
CRIME12	=1 if the household has been the victim of a crime in the last 12 months, 0 otherwise
CRIME5	=1 if the household has been the victim of a crime in the last 5 years, 0 otherwise
FWORK	=1 if the female head of household works for income outside of the home, 0 otherwise
FEDUC	Number of years of formal schooling completed by the female head of household
HHINC	The total household income (in thousands of Colones)
FSHARE	Percentage of total household income that is contributed by the female head
FS25	=1 if the female's share of total income is between 0-25%, 0 otherwise
FS50	=1 if the female's share of total income is between 25-50%, 0 otherwise
FS75	=1 if the female's share of total income is between 50-75%, 0 otherwise
FS100	=1 if the female's share of total income is between 75-100%, 0 otherwise
EDEXP	The household's total monthly expenditures for children's education (in thousands of Colones)
LUXCONS	The household's total monthly expenditure on luxury consumption items (tobacco, lottery/gaming, food outside of house, and magazines/news) (1000s)
TBANK	The time it takes for a family member to travel from their house to the nearest bank (in minutes)

TABLE 2

MEANS AND STANDARD DEVIATIONS OF CHARACTERISTICS OF POPULATIONS AND FEMALE BANK ACCOUNT HOLDERS: TOTAL SAMPLE, WOMEN LIVING IN COUPLES, AND SINGLE FEMALE HOUSEHOLDS

	Total sample			Women Living in Couples			Single
Variable	(1) All	(2)No Acct	(3) Account	(4) All	(5) No Acct	(6) Account	(7) All
Female Bank Account	0.36 (0.48)	0.00 (0.00)	1.00 (0.00)	0.38 (0.49)	0.00 (0.00)	1.00 (0.00)	0.29 (0.46)
Female's Age	45.59 (14.91)	45.92 (16.17)	45.00 (12.59)	45.01 (14.32)	44.00 (15.49)	46.66 (12.27)	47.67 (17.12)
Couple Dummy Variable	0.78 (0.41)	0.76 (0.43)	0.83 (0.38)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	0.00 (0.00)
Female works outside home	0.35 (0.48)	0.26 (0.44)	0.51 (0.51)	0.32 (0.47)	0.21 (0.41)	0.48 (0.51)	0.48 (0.51)
Years of female education	6.14 (3.24)	5.43 (2.95)	7.40 (3.40)	6.20 (3.33)	5.53 (3.02)	7.28 (3.58)	5.95 (2.94)
Household Income	200.35(198.97)	178.85(200.00)	238.43(194.10)	229.04(214.19)	213.80(218.45)	253.72(208.48)	96.52 (59.46)
Female Income Share (%)	22.76 (33.35)	16.49 (30.56)	33.86 (35.60)	15.23 (24.03)	7.50 (15.80)	27.76 (29.56)	50.00 (46.69)
Female Share 0-25 (%)	0.68 (0.47)	0.79 (0.41)	0.49 (0.51)	0.74 (0.44)	0.87 (0.34)	0.52 (0.51)	0.48 (0.51)
Female Share 26-50 (%)	0.19 (0.39)	0.11 (0.32)	0.31 (0.47)	0.22 (0.42)	0.13 (0.34)	0.38 (0.49)	0.05 (0.22)
Female Share 51-75 (%)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Female Share 76-100 (%)	0.13 (0.34)	0.10 (0.30)	0.20 (0.41)	0.04 (0.20)	0.00 (0.00)	0.10 (0.31)	0.48 (0.51)
Number of Years in House	13.88 (15.18)	14.34 (16.50)	13.06 (12.71)	14.50 (16.04)	14.67 (17.65)	14.24 (13.33)	11.62 (11.61)
Household Size (# of people)	3.91 (1.74)	3.77 (1.72)	4.14 (1.78)	4.01 (1.60)	3.98 (1.65)	4.07 (1.56)	3.52 (2.18)
Education Expenditure (1000's)	16.39 (33.32)	14.81 (29.40)	19.19 (39.63)	17.22 (36.00)	15.36 (31.38)	20.23 (42.87)	13.40 (21.37)
Luxury Expenditures (1000's)	15.42 (28.20)	13.66 (32.90)	18.55 (16.99)	18.30 (30.96)	17.52 (36.92)	19.57 (18.02)	5.00 (8.86)
Victim of Crime in the Past Year	0.11 (0.32)	0.10 (0.30)	0.14 (0.36)	0.13 (0.34)	0.11 (0.31)	0.17 (0.38)	0.05 (0.22)
Victim of Crime in Past 5 years	0.20 (0.40)	0.10 (0.30)	0.37 (0.49)	0.18 (0.39)	0.11 (0.31)	0.31 (0.47)	0.24 (0.44)
Time (Minutes) to Nearest Bank	21.38 (15.25)	23.81 (16.30)	17.09 (12.27)	21.43 (16.14)	24.49 (17.56)	16.48 (12.26)	21.19 (11.82)
Female Bargaining Power Index	-0.21 (0.42)	-0.20 (0.45)	-0.23 (0.36)	-0.10 (0.28)	-0.08 (0.30)	-0.13 (0.24)	-0.62 (0.57)
Rural / Urban Dummy Variable	0.42 (0.50)	0.32 (0.47)	0.60 (0.49)	0.43 (0.50)	0.34 (0.48)	0.59 (0.50)	0.38 (0.50)
Number of Observations	97	62	35	76	47	29	21

TABLE 3(A)
CORRELATION MATRIX OF VARIABLES: TOTAL SAMPLE

	FACCT	FSHARE	FS25	FS50	FS100	EDEXP	CRIME12	CRIME5	TBANK	FBP	RURURB
FACCT	1.0000	0.2471	-0.2973	0.2451	0.1437	0.0631	0.0692	0.3271	-0.1948	-0.0354	0.24820
FAGE	-0.0213	0.1346	0.0465	0.0661	0.0973	-0.1049	-0.1089	-0.0973	0.1774	-0.2060	-0.1337
COUPLE	0.0822	-0.4312	0.2302	0.1865	-0.5280	0.0475	0.1091	-0.0560	0.0066	0.5131	0.0444
FWORK	0.2533	0.5997	-0.5544	0.4879	0.2875	0.2380	0.1525	0.2981	-0.3541	-0.2646	0.1591
FEDUC	0.2769	0.1404	-0.1349	0.3092	-0.0043	0.3387	0.0711	0.2421	-0.2724	-0.2325	0.2829
HHINC	0.1495	0.0783	-0.2357	0.4205	-0.1194	0.4185	0.1251	0.1405	-0.3623	0.0916	0.2756
FSHARE	0.2471	1.0000	-0.8050	0.2912	0.8611	-0.0325	-0.0173	0.1437	-0.1527	-0.5388	-0.0059
FS25	-0.2973	-0.8050	1.0000	-0.6528	-0.5386	0.0255	-0.0850	-0.1905	0.1852	0.2302	-0.0308
FS50	0.24511	0.2912	-0.6528	1.0000	-0.1811	0.1026	0.2512	0.2375	-0.1824	0.0027	0.1287
FS75	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FS100	0.1437	0.8611	-0.5386	-0.1811	1.0000	-0.1098	-0.1359	0.0402	-0.0445	-0.5557	-0.0877
YEARSIN	-0.0392	-0.0872	0.1119	-0.1085	-0.0363	-0.0722	-0.1353	-0.1695	0.1072	0.0831	-0.1971
HHSIZE	0.1149	-0.2770	0.2256	-0.0030	-0.3024	0.3649	0.1671	0.1596	-0.1592	0.1421	0.2002
EDEXP	0.0631	-0.0325	0.0255	0.1026	-0.1098	1.0000	0.2419	0.2085	-0.2616	0.0071	0.2303
LUXCONS	0.0841	-0.0218	-0.0137	0.1119	-0.0948	0.2656	0.1098	0.1534	-0.2414	0.1196	0.2508
CRIME12	0.0692	-0.0173	-0.0850	0.2512	-0.1359	0.2419	1.0000	0.3185	-0.2488	0.1175	0.2836
CRIME5	0.3271	0.1437	-0.1905	0.2375	0.0402	0.2085	0.3185	1.0000	-0.2251	-0.0292	0.2593
TBANK	-0.1948	-0.1527	0.1852	-0.1824	-0.0445	-0.2616	-0.2488	-0.2251	1.0000	-0.1154	-0.3516
FBP	-0.0354	-0.5388	0.2302	0.0027	-0.5557	0.0071	0.1175	-0.0292	-0.1154	1.0000	0.1336
RURURB	0.2482	-0.0059	-0.03080	0.1287	-0.0877	0.2303	0.2836	0.2593	-0.3516	0.1336	1.0000
Number of Observations	97	97	97	97	97	97	97	97	97	97	97

TABLE 3(B)

CORRELATION MATRIX OF VARIABLES: WOMEN LIVING IN COUPLES

	FACCT	FSHARE	FS25	FS50	FS100	EDEXP	CRIME12	CRIME5	TBANK	FBP	RURURB
FACCT	1.0000	0.4123	-0.3917	0.2934	0.2581	0.0662	0.0949	0.2556	-0.2426	-0.0825	0.2409
FAGE	0.0907	0.1192	-0.0709	0.0039	0.1519	-0.1299	-0.1345	-0.0673	0.2075	0.1869	-0.1576
COUPLE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FWORK	0.2822	0.6166	-0.6225	0.6543	0.0077	0.2429	0.2380	0.3344	-0.4333	-0.0351	0.3186
FEDUC	0.2557	0.1627	-0.2891	0.3683	-0.1345	0.3670	0.0591	0.1664	-0.3053	-0.2087	0.3325
HHINC	0.0911	0.2757	-0.3791	0.4061	-0.0118	0.4463	0.1066	0.1370	-0.4082	-0.0022	0.2847
FSHARE	0.4123	1.0000	-0.8649	0.6040	0.6633	0.0412	0.1186	0.15894	-0.2832	-0.1145	0.2390
FS25	-0.3917	-0.8649	1.0000	-0.8982	-0.3392	-0.0767	-0.2094	-0.2556	0.2883	0.1076	-0.2000
FS50	0.2934	0.6040	-0.8982	1.0000	-0.1088	0.1083	0.2581	0.3151	-0.2863	-0.0480	0.1668
FS75	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FS100	0.2581	0.6633	-0.3392	-0.1088	1.0000	-0.0582	-0.0789	-0.0963	-0.0392	-0.1406	0.0951
YEARSIN	0.0130	-0.0655	0.0930	-0.1170	0.0402	-0.0839	-0.1528	-0.1215	0.1447	0.0973	-0.2401
HHSIZE	0.0275	-0.0978	0.0612	-0.0044	-0.1289	0.3298	0.1678	0.1878	-0.1470	-0.1729	0.0594
EDEXP	0.0662	0.0412	0.3298	0.1083	-0.0582	1.0000	0.2293	0.2902	-0.2643	-0.0226	0.2625
LUXCONS	0.0322	0.1227	-0.0957	0.0836	0.0376	0.2764	0.1015	0.1799	-0.2607	0.0417	0.2346
CRIME12	0.0949	0.1186	-0.2094	0.2581	-0.0789	0.2293	1.0000	0.4175	-0.2703	0.0357	0.2873
CRIME5	0.2556	0.1589	-0.2556	0.3151	-0.0963	0.2902	0.4175	1.0000	-0.2902	0.0498	0.2685
TBANK	-0.2426	-0.2832	0.2883	-0.2863	-0.0392	-0.2643	-0.2703	-0.2902	1.0000	-0.1367	-0.3499
FBP	-0.0825	-0.1145	0.1076	-0.0480	-0.1406	-0.0226	0.0357	0.0498	-0.1367	1.0000	-0.1024
RURURB	0.2409	0.2390	-0.2000	0.1668	0.0951	0.2625	0.2873	0.2685	-0.3499	-0.1024	1.0000
Number of Observations	76	76	76	76	76	76	76	76	76	76	76

TABLE 4

Initial Logit Estimation Results (Base Case with all Variables)

Variable Name	Est. Coefficient	T-Ratio	Marginal Effect
Female's Age	0.0332*	1.4332	0.0071
Couple Dummy Variable	2.4402***	2.2748	0.1025
Female works outside home	0.3307	0.3285	0.0378
Years of female education	0.2974***	2.2041	0.0634
Household Income	-0.0030*	-1.4781	-0.0006
Female Income Share (%)	-0.0172	-0.3738	-0.0037
Female Share 26-50 (%)	1.7008	1.0011	0.2988
Female Share 76-100 (%)	4.9833	1.1384	0.8357
Household Size (# of people)	0.2814*	1.5185	0.0599
Education Expenditure (1000's)	-0.0048	-0.4872	-0.0010
Luxury Expenditures (1000's)	-0.0109	-0.8226	-0.0023
Victim Crime in the Past Year	-0.8203	-0.8128	-0.0602
Victim Crime in Past 5 years	1.4587***	2.0327	0.2417
Time (Minutes) to Nearest Bank	-0.0164	-0.7357	-0.0035
Female Bargaining Power Index	0.6435	0.6073	0.1371
Rural / Urban D. Variable	1.1359***	1.8685	0.1716
Constant	-7.2171	-3.1116	N/A

***indicates significance at the 5% level of significance.
*indicates significance at the 10% level of significance.

ESTRELLA R-SQUARE	0.35580
MADDALA R-SQUARE	0.31165
CRAGG-UHLER R-SQUARE	0.42716
MCFADDEN R-SQUARE	0.28556

A likelihood ratio test for overall significance is performed for the null hypothesis that the model has no explanatory power, and we find that the overall regression equation is significant at the 1% level of significance. The test statistic for this test is Chi-Squared, with 16 degrees of freedom, and the value of the test statistic is 36.2249, with a p-value of 0.00269. This indicates that at the 1% level of significance, the null of no explanatory power can be rejected. We conclude that this base case regression equation is statistically significant overall.

TABLE 5

Logit Estimation Results Omitting TBANK and FS Categories

Variable Name	Est. Coefficient	T-Ratio	Marginal Effect
Female's Age	0.0268	1.2171	0.0058
Couple Dummy Variable	2.1254***	2.2322	0.2361
Female works outside home	-0.2018	-0.2555	-0.0389
Years of female education	0.2938***	2.2432	0.0633
Household Income	-0.0024*	-1.3307	-0.0005
Female Income Share (%)	0.0343***	2.3849	0.0074
Household Size (# of people)	0.2551*	1.4362	0.0549
Education Expenditure (1000's)	-0.0054	-0.5580	-0.0012
Luxury Expenditures (1000's)	-0.0097	-0.7925	-0.0021
Crime in the Past Year	-0.7039	-0.7395	-0.1189
Crime in Past 5 years	1.5932***	2.2898	0.3768
Female Bargaining Power Index	0.4407	0.4506	0.0949
Rural / Urban D. Variable	1.0808***	1.8616	0.2327
Constant	-7.0587	-3.4780	N/A

*** indicates significance at the 5% level of significance.
*indicates significance at the 10% level of significance.

ESTRELLA R-SQUARE	0.33729
MADDALA R-SQUARE	0.29742
CRAGG-UHLER R-SQUARE	0.40765
MCFADDEN R-SQUARE	0.26992

A likelihood ratio test for overall significance is performed for the null hypothesis that the model has no explanatory power, and we find that the overall regression equation is significant at the 1% level of significance. The test statistic for this test is Chi-Squared, with 13 degrees of freedom, and the value of the test statistic is 34.2401, with a p-value of 0.00111. This indicates that at the 1% level of significance, the null of no explanatory power can be rejected. We conclude that the new regression equation is statistically significant overall.

TABLE 6

Logit Estimation Results: Omitting Insignificant Variables

Variable Name	Est. Coefficient	T-Ratio	Marginal Effect
Couple Dummy Variable	2.0890***	2.3871	0.2372
Years of female education	0.2019***	1.8949	0.0437
Household Income	-0.0024*	-1.4706	-0.0005
Female Income Share (%)	0.0230***	3.0297	0.0065
Household Size (# of people)	0.1576	0.9676	0.0341
Crime in the Past Year	-0.8108	-0.8933	-0.1341
Crime in Past 5 years	1.4804***	2.1977	0.3514
Rural / Urban D. Variable	0.9702***	1.7732	0.2274
Constant	-5.0798***	-3.8394	N/A

***indicates significance at the 5% level of significance
*indicates significance at the 10% level of significance

ESTRELLA R-SQUARE	0.30655
MADDALA R-SQUARE	0.27335
CRAGG-UHLER R-SQUARE	0.37466
MCFADDEN R-SQUARE	0.24416

A likelihood ratio test for overall significance is performed for the null hypothesis that the model has no explanatory power, and we find that the overall regression equation is significant at the 1% level of significance. The test statistic for this test is Chi-Squared, with 8 degrees of freedom, and the value of the test statistic is 30.9728, with a p-value of 0.00014. This indicates that at the 1% level of significance, the null of no explanatory power can be rejected. We conclude that the final regression equation is statistically significant overall.