Financial diaries in Cambodia

Jeremy J. Sze
Baruch College

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Financial Diaries in Cambodia

By: Jeremy J. Sze

Submitted to the Committee on Undergraduate Honors at Baruch College of the City University of New York on May 9th 2014 in partial fulfilment of the requirements for the CUNY Baccalaureate for Unique and Interdisciplinary Studies degree of Bachelors of Science in Data Driven Policy Evaluation.

Professor Michele Costello
Faculty Sponsor

Professor Annette Gourgey
Departmental Honors Committee

Professor Kishore Tandon
Departmental Honors Committee
Financial Diaries in Cambodia

Jeremy J. Sze

Professor Michele Costello

May 9 2014
Abstract

This paper will focus on identifying opportunities for relevant microfinance products and services that can improve the lives of the rural poor in Cambodia by using the Financial Diaries methodology. The industry in Cambodia is highly competitive—37 licensed Microfinance Institutions and countless Non-governmental Organizations that provide microcredit. These organizations compete with each other to provide products to meet the needs of Cambodians. According to Cohen, founder of Microfinance Opportunities, “the [microfinance industry] has been largely product-led” (Cohen, 2003, p. 2). The Financial Diaries methodology adapted from Microfinance Opportunities in this study is unique as the data collected is highly detailed and cannot be replicated by focus groups and traditional surveys. My primary research looked to identify, from the consumer up, the needs and behavior of low-income Cambodians. Over 23 weeks, I collected financial and economic data from nine respondents in four villages. These collections were facilitated through interviews and follow up meetings by two local research assistants who met with the respondents weekly. In the interviews, I learned about my respondents’ family, assets, support structure, market and education costs that provided context to the data. Each week, we recorded the respondent’s transactions and significant events in their household. Low-income households frequently face large lump-sum expenditures and financial shocks and they deal with them by borrowing from formal or informal sources, depleting savings, or seeking cash gifts (Cohen, Ferguson & Stuart, 2011; Morduch, 1995; Rutherford, 1999). The respondents also faced the same consumption smoothing and lump sum expenditure challenges and managed cash short falls and financial shocks in a similar manner to other financial diaries respondents. This paper will explore the sources of income and most common expenditures rural Cambodians in my study face and how they pay for these items. One of my key findings is that the respondents use a sophisticated form of rotating savings and credit association called Tongtin, which is the most common form of financing that I encountered in the study. Industry analysts and financial service providers in Cambodia can use my research findings to better understand the cash flows and risk management techniques of low-income households in order to design useful financial products for them.
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Introduction

The Financial Diaries in Cambodia project identifies major trends in household financial transactions by analyzing cash inflows and outflows of rural Cambodians over 23 weeks. Using surveys, interviews and financial diaries, I gained an understanding of typical household financial flows, which industry analysts and practitioners can use to better identify opportunities for relevant products that can improve the lives of the rural poor. The Financial Diaries methodology is unique in that the data collected is highly detailed and cannot be replicated by focus groups and traditional surveys. The diaries were then supplemented by in depth interviews to further explore major trends and provide a more complete picture of household financial needs and management.

This methodology has been used in many countries around the world, including Uganda, Malawi, Kenya, India, Bangladesh, South Africa, and the United States. It requires respondents to record their household cash inflows and outflows on a daily basis in a notebook (Stuart, Ferguson, & Cohen, 2011). Then, researchers will visit participants regularly to collect the data and transcribe them into a database. In addition, the researchers will question the respondents on major trends or unusual transactions. The goal of the methodology is to discover patterns that would not be captured in typical income surveys because respondents have forgotten their expenses or are unwilling to report their information. In this paper, major trends observed in other studies will be compared to the outcomes observed in rural Cambodia to interpret the findings.

It is crucial to understand how rural households manage their household cash flows, as unequal inflows and outflows of cash and emergencies can push a household into debt. Financial tools that rural households employ can come in all shapes and sizes. It is important to identify what tools are available to rural Cambodians and to assess their ability to understand and use them.

The following questions would be answered in detail:

1. What is the typical household income profile?
2. How is money spent?
3. How do households cope with zero income weeks?
4. What financial tools do households use?
5. How do households manage large lump-sum expenditures?

Products need to be designed to meet the needs of the rural community. With information gathered through this bottom up approach, interesting patterns emerge that can help identify the problems that rural Cambodians face in their businesses and homes. The research findings will allow microfinance institutions and non-governmental organizations to better understand the market needs of rural Cambodians and provide more appropriate products and services.

In the study, respondents spent money on a set of products ranging from food and fuel to construction materials and hospital treatment. How the money is spent on these things can help us understand the level of poverty in the rural markets and how much disposable income is left after having their needs fulfilled. The ways in which respondents obtain cash to make purchases of small divisible items, such as food, compared to large indivisible items, such as construction materials, were also examined.

Zero income weeks are of particular interest, as these households must find ways to balance their income. The Cambodian diaries research indicated that a household does not have to go hungry when there is not enough or no money during the week. According to the financial diaries, emergency funding could come from friends and families, or from credit given by the food shop.

Finally, lump sum expenditures are informative because the funding typically comes from a different source than basic daily expenditures, such as food. A lump sum expenditure is defined as a large expense of a non-divisible good, such as motorcycles. How these households make their lump sum expense tells us about their saving capacity and impatience with regard to that item.
Research Design

The Financial Diaries methodology allows us to gather detailed information about rural households, as well as important contextual information. The Financial Diaries in Cambodia is supported by Microfinance Opportunities (MFO), a non-profit organization based in Washington, D.C. that conducts research and develops solutions for financial well-being. The methodology is based on MFO’s Financial Diaries Tool and uses MFO’s Financial Diaries Data Entry database to sort and maintain the data (Microfinance Opportunities).

Typical and referral sampling were applied to gather our respondents (Palys, n.d.). Observing typical households will allow us to understand cash flows that could be representative of Cambodia’s rural villages. Referral sampling enables us to reach households that are similar to each other. In selecting the villages, I considered three factors: whether they represented Cambodia’s rural villages, how far they were from the city, and whether they were safe for the researchers to conduct data collection.

The villages (Phom) in the north—Koh Duch and Ronas—have a weaving tradition that can be found in many parts of the country. These villages weave the traditional Khmer skirts called Sampot. The villages in the south—Koh Krabei and Prek Thmei—on the other hand, are involved in agriculture. These respondents grow jasmine, longans, and oranges. The main crop in these villages is jasmine, which provides buds daily for the farmers to sell. This crop is closely related to the Cambodian culture as it is used for sacred offerings to Buddha, as well as decorations in festivals, birthdays and weddings (Wandersee & Clary, 2009).

These villages are approximately 18 km from Phnom Penh city, and they take around an hour to reach on the motorcycle. The close proximity to the city was a tradeoff made due to limited time and resources. In addition, the safety of the researchers was paramount to this study because the interviews were usually conducted in the house. These villages were chosen because the households were close-knit, and had open areas within the house to
conduct the weekly interviews. Furthermore, in Cambodian culture, women do not travel alone; however, I found these villages to be accepting of female researchers.

The recruitment phase began in June 2013 with the target of recruiting between 20 and 25 households. However, due to day and time constraints, as well as high attrition rates, the study began with 20 respondents and concluded with 9 respondents in November 2013. I conducted the research with two assistants who performed translation, data entry, as well as interviews. We held weekly meetings with each respondent where we recorded all economic transactions performed by the respondent in the prior week (Stuart, 2012).

The most important instruments were the respondents’ notebooks and the research assistants’ paper survey forms used to record the respondents’ transactions. The respondents used the notebook and pen provided.

According to Microfinance Opportunity research (2011), the kinds of transactions that the financial diaries could capture were as follows:

- Purchases and sales of goods and services
- Income from employment
- Borrowings or proceeds from Rotating savings and credit associations (“Roscas”)
- Savings or contributions to Roscas
- Money lent out
- Loan payments made or received
- Winnings from gambling/lottery
- Barter exchanges
- Gifts given or received
- Food/grains taken from or put into storage
- Intra-household cash transfers

Moreover, ten additional data points accompany each transaction: date and day of transaction, week, type of transaction, purpose (business, household, or mixed), quantity,
unit, amount, person transacting, place where exchange took place, location where exchange took place, the other party to the transaction, and his/her gender. However, as the detail required is very high, there were occasions where we could not collect all of the minor details. For example, a very common detail left out was the quantity of goods; the respondents sometimes could not remember, especially if it were a low cost good.

After collecting the diaries data and building trust with the respondents, in-depth interviews were arranged to probe trends and questions with the data. The interviews were conducted twice. The first was conducted in the middle of the study in August 2013, and the second at the end of the study in November 2013. So that trust can be built between the respondents and us, the first interview was conducted about six weeks into the financial diaries study. The questions were about the respondent’s family support structure, assets, education costs, Roscas, and savings. As we had 87 questions to go through, the interviews were broken up into four parts and conducted over four weekends. In the second interview, we probed significant trends—Rosca (called Tongtin), future income expectations, food consumption patterns, health expenditure, view of microfinance, and financial diaries. These various topics were selected so that we could better understand the respondents’ transactions and what they thought about the financial diaries that they had recorded so far. The questions for the two interviews can be found in the appendix.

The aim of this study was to follow the respondents as they went about their daily lives; the financial diaries played the most important role in recording their transactions – all of the weekly inflows and outflows of cash, as well as in-kind gifts and exchanges.

Through analysis of respondents’ financial transactions, we learned about their spending behaviors. In addition, financial service providers could then find an in-depth view of their target market. Even though the sample size was small and was non-randomized, the data collected will be analyzed in a case study approach to take a close look these nine households. Furthermore, we identified interesting trends and stories that we were unable
to investigate due to the limited scope of this research. This provides further opportunities for future research.
This chapter explores various aspects of Cambodia’s economic and financial sectors, in order to understand and interpret the research findings.

**Country**

Cambodia is located in South East Asia, and shares its borders with Laos, Vietnam and Thailand. It is divided into twenty-four provinces and has a population of approximately 14.8 million people, with 80% of its population living in rural regions (World Bank, n.d.). It is governed by a constitutional monarchy with the Prime Minister Hun Sen, as the head of government, and King Sihanouk, as the head of state. The ruling party, Cambodian People's Party (CPP), has been governing Cambodia since the 1998. However, after the 2013 elections, CPP lost 22 legislative seats to the opposition party. The overall political climate is precarious, as the opposition frequently conducts protests in the city (Coface, n.d.).

With a per capita GDP of US$ 944, Cambodia is one of the poorest countries in the region (World Bank, n.d.). After the period of 1975 to 1979, when Pol Pot was the head of the
Khmer Rouge political revolution that killed approximately 3 million Cambodians, Cambodia began to grow at a relatively high rate of 7% per annum (Brinkley, 2012; Guimbert, 2010). If Cambodia continues to grow at that rate (an estimate of 2012 Per Capita GDP growing at 7% until 2022 would be US$ 944 * 1.07^{10} equals US$1857), it is projected that it would take another ten years to double its per capita income. In addition, inflation has remained on average below 5% during these periods (Guimbert, 2010). Moreover, the poverty headcount ratio (counting people living user $1.25 a day) had lowered from 44.5 in 1994 to 18.6 in 2009 (World Bank, n.d.). However, looking at a different level of the poverty headcount ratio reveals that much (49.5%) of the population still lives under $2 per day (World Bank, n.d.).

Cambodia is a partially dollarized economy (Kang, Is Dollarization good for Cambodia?, 2005). During the reign of Khmer Rouge, they banned money and blew up the national bank (Launey, 2011). The Vietnamese introduced the Riel currency in the 1980’s after defeating the Khmer Rouge. However, during the United Nation’s administration of Cambodia in 1992 US dollars was used widely. In addition, the Cambodians did not trust the “Vietnamese” riel (Launey, 2011). Hence, though the official currency of Cambodia is called the Riel, the Dollar and Riel are used interchangeably in daily transactions and official transactions. For example, government issued documents such as a tourist or business visa are paid for in US dollars at the airport. For this reason, all monetary figures in this paper will be in US dollars. The official exchange rate is 4000 riels to a dollar according to XE.com as of February 6th 2014. This rate has also been the informal street exchange rate.

The main sectors of its economy are agriculture, garments, tourism, and construction (Kang, 2005). There are 3.2 million hectares of agricultural land in 2012 most (95%) of which are privately owned (National Institute of Statistics, 2013). The agricultural sector is mainly driven by its grain production and it remains an important part of the economy (Guimbert, 2010). According to Cambodia’s Socio-Economic Survey 2012, 71% of farmers grow grains (National Institute of Statistics, 2013). However, productivity in rice
production remains low; in 2010 it produced a yield of 2.9, while its neighbor, Vietnam produced a yield of 5.0 (Food and Agriculture Organization, 2013). This is likely due to the fact that most of the agricultural land is privately owned. In my sample, the rice harvest by one of the respondents was not enough for subsistence for the year, and he had to buy from the market. Other agricultural crops grown by the respondents in the sample are cucumber, jasmine, bananas, sesame, and longans. In the next chapter, I will examine the incomes of households that sell these crops.

In the industrial sector, garments and construction are the main drivers (Guimbert, 2010). The export of garments has been growing by 11.3% year on year due to demand from the US and Europe (Guimbert, 2010). Construction, on the other hand, has been supported by bank credit (Guimbert, 2010). The respondents in the north make traditional Sampots (traditional skirts) using the loom, while not directly involved in garment manufacturing industry, are earning less because of competition from cheaper skirts made with machines. In addition, some family members are involved in construction work.

Lastly, the services industry comprises mainly of trade, tourism, transportation, and finance, which has been growing at 7% from 2006 to 2010 (Asian Development Bank, 2013). This sector is a major earner of foreign exchange and important source of employment in the formal and informal sectors (Asian Development Bank, 2013). Hotels and restaurants are a key component of the services sector in Cambodia, and they account for 4.4% of the GDP (National Institute of Statistics, 2008). Financial Services, on the other hand, only accounts for 1.6% of the GDP (National Institute of Statistics, 2008). However, it is growing rapidly because of “private sector participation and supported by growing public confidence” (Asian Development Bank, 2013, p. 220).

The households in my sample are involved in these sectors; most of them work in agriculture, and garments, while some have family members that work in construction and services.
The four villages highlighted in the map of Phnom Penh are my research sites.

The villages are located from the top down as follows:

- Koh Duch
- Ronas
- Koh Krabei
- Prek Thmei 1

The villages have similar income to daily gross domestic product of $2.58. However, there are three outliers in the sample that earn over $5 per day, while the rest averaged $2.88 per day during the study. Earlier in the chapter, poverty measures of Cambodia found that half of the country lives below $2 a day, hence our respondents appear to be economically better off than most Cambodians. However, the average income per day recorded in the diaries only took into account the 23-weeks of data collected and with a non-randomized sample. On the other hand, the respondents are in typical industries of agriculture and home-based production of cloth, which can help us understand the financial lives of others. Within these villages, I also observed political stability and good infrastructure, such as viable road and high access to electricity.
Figure 3: Statistics on Selected Villages

<table>
<thead>
<tr>
<th>Description</th>
<th>Ronas</th>
<th>Koh Duch</th>
<th>Koh Krabei</th>
<th>Prek Thmei</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (2010)</td>
<td>2253</td>
<td>2143</td>
<td>5191</td>
<td>6316</td>
</tr>
<tr>
<td>No. of Chamkar farmer families (2010)¹</td>
<td>25</td>
<td>19</td>
<td>785</td>
<td>1144</td>
</tr>
<tr>
<td>Main Occupation (Commune level, 2010)</td>
<td>Textile</td>
<td>Textile</td>
<td>Long-term crops</td>
<td>Long-term crops</td>
</tr>
<tr>
<td>Access to electricity (Commune level, 2010)</td>
<td>77.73%</td>
<td>77.73%</td>
<td>97.11%</td>
<td>97.11%</td>
</tr>
<tr>
<td>Small-scale food shop businesses (Commune level, 2010)</td>
<td>68</td>
<td>68</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Rice production per capita (Commune level, 2010)</td>
<td>12kg/person</td>
<td>12kg/person</td>
<td>2kg/person</td>
<td>2kg/person</td>
</tr>
</tbody>
</table>

**Ronas**

According to the village chief, his village has 603 households and the villagers work at home (making cotton and silk cloths with their looms), garment factories, and farms. In the farms, they grow eggplants, pumpkins, papayas, lemon grass, bananas, corn, sesame and rice, of which the main crops are bananas and corn. The main road running through the village is paved with earth. Most houses sit elevated on concrete stilts, as they are situated on an island prone to flooding.

**Koh Dach**

Down the road from Phom Ronas, about 15 minutes away, is Phom Koh Dach. According to the village chief, her village has 602 households. Roads are mostly paved with concrete based on my observations. There is a primary and secondary school in this village and a high school about 5 km away in another village. Its villagers used to make more silk cloths (with about three looms per household). But that has changed since 1990’s and the villagers now find work in factories, construction, and restaurants in Phnom Penh. Farming in this village is mostly low maintenance fruit plantations like mangos, bananas and jackfruit. Every few days, buyers will visit the village to buy the produce.

¹ Chamkar land is land that is used to grow a variety of crops.
Koh Krabei
This is the largest village in the sample with more than 1000 households. The villagers grow mostly jasmine, which supplies Phnom Penh’s ceremonial and religious needs. Other crops include, papayas, bananas, longans, and oranges. During important events like weddings, festivals, Khmer New Year, and Pchum Ben, where demand would exceed supply of jasmine flowers, villagers can reap a very high profit.

Prek Thmei-1
Phom Prek Thmei 1 is about 15 minutes south from Koh Krabei. Prek Thmei is split into 1 and 2 because it is large, and we only interviewed the village chief from Prek Thmei-1. This village has 551 households according to the village chief. Most villagers operate small businesses (buying vegetable from the market and re-selling them), plant vegetables (long beans, cucumbers, bananas, longans, and mangos) and harvest jasmine buds. More the half of the main road that runs through the village is paved with concrete.

Phom Ronas and Koh Dach are both situated on Mekong Island, which is also known as Silk Island. In order to get to the village, you will have to take a ferry at the Prek Lep ferry point. The people living on this island are a mix of farmers, silk-weavers, and salaried workers. While, Phom Koh Krabei and Prek Thmei-1 are both situated in the southeast of Phnom Penh across the river from the city. These two villages grow jasmine and are very similar to each other. According to an article by Phnom Penh Post (2009), Koh Krabei is famous for having many jasmine farms. Most farms will sell their produce to wholesalers who go to the markets in Phnom Penh to sell them to tea makers. However, each week most households would send a family member to sell jasmine wreaths and ornaments in the markets or Pagodas. Jasmine is a crop that will provide fresh flower buds almost daily, and it is closely tied to the culture of Cambodians.

Figure 4: Summary of the sample population

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the sample, the household averaged about 6 people, with 4 children per family. Six out of nine respondents reported their livelihoods as farmers, two reported as household business—making skirts, and one reported as being a housewife. In these households, the father and husbands work in other jobs—like being a police officer, construction worker, and truck driver, that often form the main source of income in the household. This is significant because it tells us that both parents are working to support their household.

In conclusion, the political and economic stability of Cambodia are ideal for microfinance to flourish – its inflation is in check, growth rates positive, and there is stable but precarious political stability (Ledgerwood, 1999). In fact Cambodia does have large number of microfinance institutions, which have opened since the industry began in 1990 (Cambodia Microfinance Association, n.d.).

**Microfinance Sector**

Prior to 1990s, banks were the only formal financial service provider in the city, and informal moneylenders served the rural areas. The formal financial sector developed from a very low base and expanded rapidly. It remains dominated by banking, with a small insurance sector (Guimbert, 2010). It is growing in terms of the share of the gross domestic product. In 2008, it comprises 1.6% of the GDP compared to 1.3% of the GDP in 2006 (National Institute of Statistics, 2008). However, it is still a small percentage of GDP, therefore it is not surprising that Cambodia has low ratio of bank accounts per thousand adults –108 bank accounts per 1,000 adults (World Bank, 2013). This ratio is low compared to the average of low and middle-income countries with 612 bank accounts per 1000 adults (World Bank, 2013). Another measure of financial access, the World Bank...
survey found that only 1 in 5 firms have a loan and the loans to deposits ratio remained high. As of 2012, there are 83 registered financial institutions in Cambodia (International Monetary Fund, 2013). In the 1990’s, international donors and non-governmental organizations began launching non-profit micro-credit projects within rural development programs. In short, these micro-credit projects eventually became the microfinance institutions we see today. A large subset of the 83 institutions is the thirty-seven microfinance institutions\(^2\) (MFI) licensed by the central bank (National Bank of Cambodia, n.d.). According to Cambodia Microfinance Association, an industry trade organization microfinance institutions\(^3\) serve 1.9 million people (Cambodian Microfinance Association, n.d.). When the government established the Central Bank Law of 1996, it gave the National Bank of Cambodia, responsibility to regulate and oversee the microfinance sector (Vada, 2010). Most recently, the central bank created the Credit Bureau of Cambodia, which tracked a person’s credit history (Credit Bureau Cambodia, n.d.).

There are special regulations and delegations for Microfinance Institutions in Cambodia. In 2000, the National Bank of Cambodia issued regulations regarding the classifications for Microfinance Institutions (Vada, 2010). The classifications are given according to the level of operations. The largest MFIs are required to be licensed by the central bank, and are regulated in a similar manner to commercial banks with the exception of a lower capital requirement (Vada, 2010). Medium-sized MFIs, on the other hand are required to register with the central bank, and are subjected to less stringent rules – less complicated reports (Vada, 2010). Lastly, the smallest MFIs are not regulated or supervised because of the high operating costs of such work (Vada, 2010).

Many of these large MFIs began as NGO led projects where the identification of permanent shareholding of individuals or organizations is not known. In order for a large and medium

\(^2\) Seven of the thirty-seven MFI are licensed to take deposits
\(^3\) A microfinance Institution is defined by the National Bank of Cambodia, as having a loan portfolio outstanding equal to or greater than $25,000, or have mobilized savings of $250 or more, or having 100 depositors or more.
sized MFI to register for operations, it must meet certain qualifications. Institutions must have loans outstanding of KHR 1,000 million (USD 250,000), or have more than 1000 borrowers. Additional requirements include a minimum paid-up capital of KHR 250 million (USD 62,500), liquidity, and solvency ratios of 50% and 15% respectively. Another important regulation is the mandatory methodology to follow for the calculation interest rate is based on remaining balance of credit.

There is another set of regulation for these MFIs to obtain the deposit-taking license, which will allow them to hold clients’ savings. This license is more rigorous with higher requirements. The institutions need to have held the MFI license, as described in the previous paragraph, for three years, and have a good and sound financial condition judged by the central bank’s internal rating system for at least two years, before they can apply for this license. In addition, these MFIs need at least KHR 10,000 million (USD 2.5 million), a Management Information System, to conform to the chart of accounts, and have a sustainable profitability for two consecutive years.

**Interest Rates**

The microfinance regulation and market conditions allows MFIs to charge a sustainably interest rate, which is above break-even cost (Armendariz & Morduch, 2007). In Cambodia, the National Bank of Cambodia did not establish a maximum lawful interest rate, or ‘usury law. Therefore, the MFIs could set market based interest rates. Because MFIs typically have higher transaction costs, they generally need high interest to price that cost into the interest rate. The transaction cost of having a loan officer interview is the same whether the loan is US$100 or US$ 500. Moreover, MFIs are required to check your credit history via the Credit Bureau of Cambodia, which charges a fixed fee each time you access its database.

Yet, the interest rate charged by the MFI is still two to three times lower than the interest rate charged by the moneylenders (Vada, 2010). Therefore, the launch of the microfinance sector has provided a source of low cost loans to the rural population.
The government has taken steps to protect the clients by setting the internet rate calculation based on a declining balance and not by the fixed interest rate. Microfinance institutions must follow the declining balance method to calculate interest. The declining balance method calculates the interest based on the remaining loan balance. This was regulated by the central bank to “[prevent] the borrowers’ loss from using the [flat interest rate],” which calculates interest based on the original amount borrowed at the beginning (Vada, 2010).

**Lending methodology**

There are three main types of credit that is provided by MFIs in Cambodia – individual loans, solidarity group loans, and community bank loans (Vada, 2010) (Kredit Microfinance, n.d.). The individual loan the largest form of credit provided by the MFIs, but it typically requires collateral and guarantor to reduce the default risk. They are first evaluated by a MFI credit officer, who interviews the client, his or her neighbor, and village chief.

The second type of credit is the solidarity group loan, where the borrowers form groups to borrow money together. If one person in the group defaults, the entire group is deemed as in default as well. The group loan reduces the problem of adverse selection—where the MFI does not know if the client is creditworthy and the problem of moral hazard—where the MFI cannot observe if the loans are put to good use or carelessly frittered away (Ledgerwood, 1999). As a result, groups will now look for people they trust to take the loan together, and also look out for each other to ensure that the loans are put to good use. Once a group is formed, the credit officer will evaluate them and then conduct weekly visits to collect the repayment.

The third type of credit is the community bank, which is usually formed in villages that are difficult for the MFI to access (Ledgerwood, 1999). This product is very similar to the solidarity group loan, however the loans are monitored by an association of village members and guided by a credit officer (Kredit Microfinance, n.d.). The MFI would lend
seed capital to the community bank, and all members would sign a loan agreement to guarantee each other (Ledgerwood, 1999). Members will form small groups between 4 and 6 people and can form up to a maximum of 20 such groups (Kredit Microfinance, n.d.). The loan cycle is 12 months and the loan amount increases with each successful completion of the cycle (Kredit Microfinance, n.d.).

**Competition and Over-indebtedness**

The microfinance industry in Cambodia is very competitive given the number of institutions in the country alone. Competition and limited reach of the Credit Bureau can give rise to clients with multiple loans. Moreover, because of the competitive nature of the industry, the problem of over-indebtedness could become a reality if there are no ways to keep track of everyone’s credit history. The Credit Bureau was created in 2011 but not all loans are required to be reported as only registered MFIs need to report, so effectiveness is still limited. In an interview with a microfinance practitioner, the list of credit history is updated once a month and if the client is in need of a large sum, he/she could go to two or more MFIs at the same time to obtain the loan and the MFIs would not know.

The Cambodian Institute of Development Study looked at this question and gathered data regarding the level of penetration and over-indebtedness, through eight microfinance institutions that represent 77% of the borrowers in the microfinance industry, and 88% of outstanding gross loans (Liv, 2013).
The study selected 44 villages that had overlapping coverage from the 8 partner MFIs. From these villages a random sample of 1,500 clients was selected from the total of 10,266 clients. In these villages, the report measures over-indebtedness by taking the monthly installments on all business and household debt over the monthly net income, which includes the revenue from business and household minus expenses from business and households excluding debt expenses (Liv, 2013). They found that a majority (56%) of borrowers were solvent, where their monthly debt repayments were 75% of less than their new monthly income. 12% of the sample was considered “at risk” while 22% was considered “insolvent”. Another 10% was not classified because they did not have their income data. The study confirmed that about a fifth of MFI clients have obtained more loans than they can pay back.
Financial Diaries Data

“I don’t know how much money I earned or spent last week, but I know that my expenses are higher than my income, so I borrow money from my sister” said Thida, from Koh Krabei village. Low-income households typically struggle with consumption smoothing because of their volatile income and expense profiles. According to the existing literature, households deal with this problem through various mechanisms, such as borrowing from formal or informal sources, depleting savings, or seeking cash gifts (Morduch, 1995). In addition, studies of low-income households show that they frequently face large lump-sum expenditures and financial shocks, such as illness, death of loved ones, poor harvest, and weather (Stuart, Ferguson & Cohen, 2011; Rutherford. 1999).

In the Cambodian Diaries research, households face the same consumption smoothing and lump-sum expenditure challenges reported in other financial diaries studies. The respondents also managed cash short falls and financial shocks in a similar manner to other financial diaries sample populations (e.g. selling assets, rotating savings and credit associations, cash gifts, savings at home, and loans from formal and informal providers). This paper will explore the sources of income and most common expenditures that the respondents in the study faced and how they paid for these items.

In addition, one of the key findings is that the respondents use a much more sophisticated form of rotating savings and credit association compared to those reported in the existing published research (Rutherford, 1999). This form of rotating savings and credit associations, called Tongtin, is significant in terms of its design and function because the leader assumes all the credit risk of the group and the bidding mechanism is similar to the Dutch auction. Tongtin is the most common form of financing in the study and a detailed explanation of Tongtin will be provided later in this paper.

Industry analysts and financial service providers in Cambodia can use the research findings to better understand the cash flows and risk management techniques of low-income households in order to design more useful financial products for rural Cambodians.
**Household Income Profile**

The households in the north and south villages both exhibited net income shortfalls in the 23-week study. However, the main sources of income were different among the respondents in the north compared to the respondents in the south based on their primary industries. The difference in the primary vocation in the north compared to the south generated a significant difference in income volatility and expense management in the study.

Figure 6: Aggregated Income for the North

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Household</th>
<th>Total (US $)</th>
<th>Median (US $)</th>
<th>Std. Dev. (US $)</th>
<th>Mean (US $)</th>
<th>% Zero Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer</td>
<td>Boupha (101)</td>
<td>4100.00</td>
<td>50.00</td>
<td>526.49</td>
<td>178.26</td>
<td>39%</td>
</tr>
<tr>
<td>Weaver</td>
<td>Champey (102)</td>
<td>1500.63</td>
<td>13.50</td>
<td>78.56</td>
<td>65.24</td>
<td>9%</td>
</tr>
<tr>
<td>Weaver</td>
<td>Kaliyan (105)</td>
<td>760.08</td>
<td>25.00</td>
<td>41.14</td>
<td>33.05</td>
<td>30%</td>
</tr>
<tr>
<td>Farmer</td>
<td>Sopheap (203)</td>
<td>4208.38</td>
<td>10.25</td>
<td>597.51</td>
<td>182.97</td>
<td>23%</td>
</tr>
</tbody>
</table>

Figure 7: Aggregated Income for the South

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Household</th>
<th>Total (US $)</th>
<th>Median (US $)</th>
<th>Std. Dev. (US $)</th>
<th>Mean (US $)</th>
<th>% Zero Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer</td>
<td>Thida (301)</td>
<td>1650.65</td>
<td>50.75</td>
<td>62.58</td>
<td>71.77</td>
<td>9%</td>
</tr>
<tr>
<td>Farmer</td>
<td>Chenda (302)</td>
<td>2514.85</td>
<td>102.50</td>
<td>79.26</td>
<td>109.34</td>
<td>9%</td>
</tr>
<tr>
<td>Shop Owner</td>
<td>Somaly (303)</td>
<td>2755.53</td>
<td>113.68</td>
<td>51.82</td>
<td>119.81</td>
<td>4%</td>
</tr>
<tr>
<td>Farmer</td>
<td>Ary (304)</td>
<td>1364.83</td>
<td>38.38</td>
<td>53.44</td>
<td>59.34</td>
<td>13%</td>
</tr>
<tr>
<td>Laborer</td>
<td>Veata (403)</td>
<td>673.75</td>
<td>29.63</td>
<td>15.35</td>
<td>29.29</td>
<td>4%</td>
</tr>
</tbody>
</table>

Figure 5 and 6 present the aggregated incomes and descriptive statistics for all the respondents in the study. The standard deviation of the households in the north are higher than the mean of the weekly incomes reflects their income volatility. In addition, they also indicate the presence of high outliers, which may account for most of the volatility. We can see this in Figure 8, where there is a very right skewed chart of Somaly’s jasmine sales. The
households in the south have high standard deviations, however they are not higher than the means, which indicates that the income is not as volatile.

The differences in primary industries in the north and south is reflected in the percentage of zero income weeks, which is the source of concentration of the low values and also contributes to the high standard deviation. The respondents in the south have a more stable income source that provides revenue in most weeks. These respondents are selling jasmine, which can be monetized at the pagoda weekly or at the market every day. Whereas, the livelihoods of the respondents in the north provide income intermittently. For example, the weavers need to spend at least 2 days to make a skirt, before she can sell to a whole-buyer, who comes every two weeks.

In addition, Somaly—the jasmine seller also faced income volatility driven by the seasonal change in price and volume for their product. The rainy season typically occurs from May to October (week 1 to week 19 of the study), with the heaviest rain fall between September to October (weeks 11 to 19 of the study). As a result, the jasmine bushes produce less flower buds, and the cost per kg increases. Every week, she goes to Tah Khmao market across the river to sell her jasmine. In Figure 2, we can see her net purchases and sales of jasmine. In week 1 and 2, I observed large margins from her sales, however, as the weeks continued she made losses. In the interviews, she said that she would accumulate the jasmine during the week before going to sell on the designated temple day, and sometimes the price she paid during the week cost more than the market price for her jasmine. She said that when the supply of jasmine is high she could sell them for $0.20 per stick of jasmine and when supply of jasmine drops she could sell them for $0.63 per stick of jasmine.
Figure 7 did not indicate the volume of jasmine sold because Somaly did not report it, I assumed that the amount she bought was the amount she sold because she does not grow jasmine and only buys them from her neighbors. Moreover, jasmine is a perishable good that can only be kept for one week and thrown away if it is not sold. Therefore, Somaly does not keep stock left over to sell the following week. Overall, she earned $56.83 from the sales of jasmine at Tah Khmao market.

In contrast to the livelihoods of the respondents in the south, the two highest total incomes were reported from two households in the north – Boupha’s and Sopheap’s household. They both had sold big ticket items during the study, which required long term investment in the agriculture and livestock. Boupha sold more than 7,000 kg of mangos, which she can only harvest 2 times a year. Sopheap sold three cows, which take many years to mature because of the long dry season where there is scarcity in term of available forages and difficult in storing food for the cattle (Sath, 2012). Despite the large income from these illiquid assets, these two households face difficulty in smoothing income because their products can only be sold after a period of investment to mature the crops and cows. In the study, these households took money from savings to cover zero income weeks. For Sopheap, he also sold a cow when saving ran out.
The household in the north selling mangos had significant difference in cash flow from households selling jasmine in the south. Jasmine can produce their buds daily and therefore provide daily liquidity, while the mango can only be harvested twice a year.

Boupha’s household rents a large mango farm for $6,000. A month prior to the study, she borrowed $3,000 from her relatives to accumulate enough money to rent the farm. At the end of August, she sold around 7,000 kg of mangos for $2,565. During an interview, she mentioned that she rented the mango farm on a yearly basis, and complained that if the rent increases she will go back into pig raising, which was her previous livelihood. In addition, she said that the farm provides her with mangos twice a year in June and in September, and yields around 20,000 kg of mangos per year. However, because the study began at the end of June, the prior sale was not recorded.

The mango farm requires additional investments prior to harvest. Boupha spent $350.50 on ripening agents and $20 on fertilizers. The ripening agents causes green mangos to develop into full color in seven days (Morton, 1987). The main advantage of using this agent is that the fruits can be picked all at once, and that the fruits will have a uniform color. Thus, allowing Boupha to sell her mangos at a good price. This treatment is said to be used in India, Puerto Rico, Israel, and Florida (Morton, 1987).

However, she did not invest in pest control, which is a significant risk in the region. A study by the Cambodian Agriculture Research and Development Institute (2012) identified pests that affect mango production. They are namely stem and root borer, fruit flies, branch borer and mango mealy bug. A study of Pest Management in the Mekong Delta, Vietnam found that use of pesticides and fungicides are based on damage symptoms and increasing use of these products are the result of pesticide sellers (Van Mele, Nguyen, & Van Huis, 2001). For Boupha these two papers highlight the risks from pests and overuse of pesticides that affects yields and profit. These risks can affect Boupha’s investment in the mango farm, especially because of high sunked cost in renting the farm. Hence, information...
workshops on these risk as well as insurance coverage can help the risk of loss and over-use of pesticides.

Investment in cows also brought zero income weeks, but higher average income during the study. Sopheap’s household grows corn, sesame, and rice and owns 16 cows, 2 of which were given as a gift to his daughter when she was married. During the study, he sold 40kg of sesame for $50, no corn and rice, and sold three cows and bought two cows for $3,825 and $2,875 respectively. He purchases cows as an investment and also sells them to cover household expenses when there is not enough money at home. Most of his cows were bought a long time ago because he buys them as young calves to rear. In the Microfinance Handbook (1999), the purchase of livestock as a form of investment is commonly found in other microfinance research. Moreover, additional information learned during the interviews emphasized the investment aspect of Sopheap’s cow rearing. Three months prior to the study, Sopheap bought a boat costing $137.50 to ensure that he can go out and obtain grass to feed his cows during the rainy season when the banks are flooded. He had to make this purchase because his old boat was stolen during that period.

Additionally, he mentioned that his household has savings in the form of cash at home for emergencies, and that these savings have also been converted into cows. When he sees that the cows are not growing well, he sells them to buy another. Thus, protecting his savings and investments. Moreover, he thinks of “trading in cows [as] his business,” and not just savings.

Raising livestock as a form of investment comes with risk, for example a paper by Shankar, Morzaria, Fiorucci, and Hak who found that Foot and Mouth Disease (FMD) is a significant shock to affects households in their sample in the same region in Cambodia. They found that even though a majority of households were hypothetically willing to pay for FMD vaccinations, most households failed to undertake biosecurity actions such as quarantining newly purchased animals and sick animals. As a result when animals become infected, they
found that the cost imposed on low income households could constitute as much as 10% of their income.

Their study highlights the risk involved in raising cattle that Sopheap will experience. The long term investment of Sopheap in his cows will involve many risks if precautions are not taken. Especially for such a sizable number of cows (the mean number of cows owned in the described study was 3), disease can spread quickly through improper care and lack of vaccinations. Hence, proper animal husbandry knowledge, as well as informational workshops can help reduce the risk for people raising livestock. Moreover, Sopheap can also be an interesting candidate for insurance to prevent income shocks.

These two households have large income flows occurring infrequently. This is important because they are different from other households that have regular income from husband’s salary, selling jasmine, and small shops. The jasmine sellers can perform a much higher number of savings, but save a lower amount of savings. However, the other two households highlighted have to save less frequently and then spend down the savings to smooth their consumption. In order to understand the difference, I looked at the high frequency and life cycle savings model, as described by economics of microfinance.

The “high-frequency” model describes frequent transactions such as savings to fund short term investments and to smooth consumption in the short term (Armendariz & Morduch, 2007). On the other hand, the life cycle model describes that households should borrow at the beginning of their lifetime, save in the middle working years, and spend down the savings in retirement (Armendariz & Morduch, 2007). The households with the daily income and operate in the high-frequency model. However, as you can see from the table below, these two households with high upfront investments for their businesses have to save money for the long term. The cash flow charts of Sopheap’s and Boupha’s household depict something closer to a “life cycle” model that describes “low frequency” savings because they do not have daily income that they can save from.
Sopheap has a large inflow in week 11 when he sold a cow because he does not have enough savings. In week 15, his son sold two more mature cows, and on week 17, Sopheap bought 2 younger cows to rear. In this exchange, he earned a difference of $950. Without the cow sales, his standard deviation of $30.47 will fall within his mean weekly expense $52.77.

Figure 10: Boupha's Household Cash Flow
Boupha’s household saw a large inflow from the sales of her mango crop in week 11. Even though, her husband brings in occasional income from driving his truck for the neighbors. The income for sales of mangos is saved and drawn upon in later weeks.

Understanding the significance of these types of income profile will enable financial industry practitioners to provide products that help smooth income for these households. Some of these households have daily liquidity, while others have long term investments that take many months to monetize. As a result, they are more susceptible to risks and could be candidates for insurance products. MFIs should also consider the timing of cash received from products grown or animals raised when creating a loan repayment schedule.

**Household Expenditure Profiles**

The households in the north and south face the same types of typical and lump sum expenses, with the exception of business input costs (e.g. yarn to weave traditional skirt, inventory to sell in small stores, fertilizers to cultivate jasmine and mangos).

As detailed in the chart below, controlling for outliers, the primary household expenses were food (20.07% on average) and financial gifts and loans (17.15% on average). In the south, the percentage of spending on agriculture is much higher due to the main vocation being jasmine farming. Two respondents who have small shops have higher than average expenditure. One household in the north had very high expenses due to construction related to building a house. A different household in the north had a high expense in livestock due to the purchase of cows as an investment. Regarding health expense, there were two outliers, one respondent in the north had a baby, and one respondent in the south had a daughter who required gastro-intestinal surgery.
In general respondents reduced consumption of food and other flexible items in lean income weeks. However, business expenditures (fertilizer, labor to harvest, yarn, and inventory for stores) were less likely to be reduced or put off due to lean income weeks. Finally emergency expenses such as health were non-discretionary, although one
respondent with low cash flow told us that they rely on traditional medicine instead of expensive hospital treatment.

The typical household expense management is explained by the case study below. The respondent had variable food expenditures from week to week, and frequently gave and received cash gifts during the study to manage shortfalls or contribute to a neighbor in need. Religious cash gifts were less elastic expenses in the study, which could be because the respondents' belief that these action build merit. Moreover, they are very important in the community from a cultural perspective. This household also managed a large expense to build a new house by accessing the highly developed MFI loan sector in Cambodia. Finally, savings were mainly held in Tongtin groups because the respondent found that it was too difficult not to spend cash at home.

**Case Study: 102**

Champey, 45, lives in Koh Duch village with her husband and three children, in a wooden house on stilts, with three families – hers and her two sisters. She makes skirts at home with the loom, while her husband works as a police officer in Phnom Penh. Her two daughters are currently studying in high school and her son, who is still very young, stays at home. Champey's household earned an average of US $ 65.24 per week over 23 weeks. At the start of the study, she was buying materials to build her new house on the land across from her current home. The construction of the house was finished in the middle of the study.

*Champey’s household built a new house across the street during the period with the help of a MFI loan.*

**Loans**

Champey was building her house at the start of the study, and she took a US$ 2000 loan from Maxima MFI in week 2 to buy the building materials needed. This loan will have a repayment period of 20 months, and a fixed repayment amount of $110 per month. This amount is paid by her husband.

**ROSCAs: Tongtin**

Champey is part of two Tongtin groups one is a 43-member group which require $30 payment each month, the other is a 30-member group $20 payment each month. These groups run for a long time, so she does not remember when she began. When asked why
she joined the Tongtin, she indicated that she was a net saver, because she never bids for the lump sum. She said that money saved at home was “too easy to spend.”

**Home savings**
Champey's household did not save at home, however she did have money left from that loan that she did not spend. She uses Tongtin, as described above, to save.

**Cash gifts**
Champey received three cash gifts of $22.13 from family members, and gave out one funeral contributions of $1.50 and one cash gift to a neighbor of $0.75. In addition, she regularly makes charity and religious cash gifts in 16 out of the 23 weeks giving a total of $18.25.

**Cash flow management and Planning**
Champey's net cash flows is positive. She took a loan of US$ 2000 to build her new house in week 2. In addition, the household’s loan repayments were paid by her husband from his salary and was not included in the data.

Cash outflows varies drastically over the study, with $1566.75 spent on construction material in the first 6 weeks and on week 12 she paid $100 to workers who built her house. Apart from the construction and financial expense to build the house, the majority of her cash outflows were for food (58.10%).

On the other hand, cash inflows are mostly from her husband's salaried job as a policeman, and his second job as a chauffeur for his superior's son. He gets paid monthly for both jobs. In addition, Champey makes skirts on her loom, and sells them to a buyer who would call on her every few weeks at home. She made $ 141 from selling 24 skirts over 23 weeks.

**Cash flow chart**

![Cash flow chart]

**Outcomes**
After recording the diaries for 23 weeks, Champey indicated that she would not do anything differently, and the charts reflected what she expected to see. She reported that the diaries helped her to understand her expenses and income.

In the appendix of this paper, there are similar summaries for every household in the study. All of the households are using a multiple tools simultaneously to manage their income and expenses. This is an expected outcome based on existing research such a *Portfolios of the Poor* (Collins, Morduch, Rutherford, & Ruthven, 2009). Among the nine households, only one reported having a savings account with AMK Microfinance Institution. However, in terms of having a bank loan, seven had a loan at one point in time, and five are currently making repayments. Thus, tells us that the level of financial access in my sample is high. Furthermore, one household has reported having two loans from two sources: Camma Microfinance and a Nongovernmental Organization. One major caveat is that since the household sampling was not randomized, I am unable to make the assumption that this is the case for rural villages. However, I can conclude that the sample had access of formal financing but still chose informal financing in addition to them.

A type of informal financing, rotating savings and credit association (Rosca) called Tongtin is used very commonly in the sample. Eight out of nine had used Tongtin at one point in time, while six are currently involved in at least one Tongtin cycle. These types of Roscas are common in the world, and are often called different names (Ledgerwood, 1999). Hence, some level of participation in these groups were expected.

In the sample, there were a total of 36 transactions of cash gifts were received totaling $844.75, with a mean and median of $7.71 and $1.25. These gifts came mostly from immediate family and relatives, and the others were from a NGO organization and government official. In terms of cash gifts given out, the sample gave more than received, however the total in monetary terms are similar. They gave out 123 transactions of cash gifts totaling $853.83, with a mean and median of $7.10 and $1.13. These cash gifts come in the form of ceremony gifts to monks, cash gifts to family members, wedding and funeral cash gifts. The importance of these culture and events, made this finding so prevalent. In
the Malawi study that was conducted by Microfinance Opportunities, they found that cash gifts helped households during the non-earning weeks, and that over 90% of cash gifts were from informal sources.

In line with other financial diaries research, two households faced unexpected financial shocks mainly in the form of health expenses. The respondents used savings and loans to manage these large expenses. The Case Study 301 helps illustrate the impact of an income shock from pest infestation and expense shock from a health emergency. As a result of these shocks, the respondent had to take emergency loans because she had no savings.

**Case Study: 301**

<table>
<thead>
<tr>
<th>Thida, 53, lives in Koh Krabei village with her husband, two sons and three daughters. Her husband, eldest son and she are farmers; her eldest daughter is a physical therapist, while the other three members of the family are still studying. Her husband also works as a tractor middleman, who connects farmers in need of a tractor, with the people with a tractor. Her eldest son works as a cook, in addition to farming.</th>
</tr>
</thead>
</table>

*During the study, she suffered an income shock when her jasmine bushes had a pest outbreak, and an expense shock when her daughter had an emergency operation for stomach problems.*

**Loans**

During the study, Thida received two loans, one $50 loan from the moneylender, and another $150 loan from her aunt. She received two loan repayments from her neighbor of $75 in total at the start of the study. Throughout the study, she had to pay loan repayments every week. In total, she paid $726.70 for her loans. These are for her two outstanding loans, from an NGO, and from CAMMA Microfinance.

**ROSCAs – Tongtin**

Thida is a part of 3 Tongtin groups. One, 60 member group, which require $7.50 payment every week. Second, another 60 member group, which require $12.50 payment every week. Lastly, 90 member group, which require $5 payments every week. In the first and second group, she participates as two “players,” which allows her to bid twice. In total, she plays as 5 “players” in these 3 groups.

**Savings**

Thida’s household has no savings.

**Cash Gifts**
Thida received cash gifts of $13.75 from her extended family and the Cambodian People’s Party official, and cash gifts of $525 from her daughter who is working as a Physical Therapist. She gave out $18.75 of cash gifts to relatives, $34.13 of ceremony gifts, and $25 of wedding gifts.

**Cash Flow Management**
Thida’s net cash flow during the study is negative. Over the period of the study, her loan repayments took up 44% of her total inflows. Moreover, she suffered an income and expense shock. Her daughter had an emergency operation in week 16 that cost $500 and her jasmine bushes suffered a pest infestation in week 17. The pest infestation caused her to lose revenue from the sale of her jasmine, this drop in revenue can be observed in the chart below. Furthermore, she had to pay for her daughter’s university fees of $900, which was not planned.

**Cash Flow Chart**

<table>
<thead>
<tr>
<th>US Dollar</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23</td>
</tr>
<tr>
<td>-200</td>
<td></td>
</tr>
<tr>
<td>-400</td>
<td></td>
</tr>
<tr>
<td>-600</td>
<td></td>
</tr>
<tr>
<td>-800</td>
<td></td>
</tr>
<tr>
<td>-1000</td>
<td></td>
</tr>
<tr>
<td>-1200</td>
<td></td>
</tr>
</tbody>
</table>

**Outcomes**
Thida found that financial diaries helped her to understand her income and expenses. However, she said that she would not change her spending patterns.

During the study, Thida’s daughter suffered a stomach problem and she had no large sums saved up to pay for the operation. In the interviews with the researchers, she mentioned that she borrowed $450 from the person from the Happy General school (a local NGO school), who handled money on behalf of the donors.
Thida’s daughter has a financial sponsor for school fees from Germany since she was grade 2 and the sponsor also paid for her education in high school. Now that she is in University, the sponsor pays 70% of the fees, and Thida pays 30%. Thida borrowed US$ 450 from the person that received money from the sponsor at no interest to pay for the stomach operation. Thida decided to quickly borrow from the middleman and then ask the German sponsor to pay for her loan. This way she only needed to deal with a more manageable $50.

The second household case study 105 experience also experience a health expense shock. However, her case is different because she had savings that she was able to draw down upon them during as well as two loans from AMK Microfinance.

**Case Study: 105**

<table>
<thead>
<tr>
<th>Kaliyan, 44, lives in Koh Duch village with her husband, son, and mother. She makes a living making skirts on the loom, and buying empty plastic bottles to sell, while her husband, the Village Chief Assistant works in odd jobs as a cook and as a construction worker. Her mother also works at home making cotton threads from cottonseeds. Lastly, her son is currently studying Korean because he intends to work in a factory in Korea, after passing the Korean language test.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kaliyan gave birth to her baby in week 18.</strong></td>
</tr>
</tbody>
</table>

**Loans**

Kaliyan took two loans in the past to build her house and the loom. Recently, she became pregnant, and took two loans from AMK Microfinance of $250 and $100.

**ROSCA – Tongtin**

Kaliyan is a part of three Tongtin groups in her village. One, 50 member group that requires $20 every month. Second, 45 member group that requires $10 every 2 weeks. Lastly, a 40 member group that requires $5 every 2 weeks. She has finished 5 Tongtin cycles in the past, and she does not know how long it would take to finish the ones she is currently in.

**Savings**

Kaliyan saves money at home for her business and for ceremonies and weddings. In addition, she said that her house was also built with her savings. She has US$ 1500 at the middle of the study saved at home.

In addition, Kaliyan has a savings account with AMK Microfinance with whom she works for as the village liaison. As the village liaison, she has informational about savings and loans and she will contact AMK if there are people, who are looking for loans. Each month
when she received a small compensation from AMK Microfinance, she would put $1.25 into the account she has with them.

**Cash Gifts**
Kaliyan gave out a total of $13.50 in ceremony gifts to Monks, and $10 for a wedding. In total, she received cash gifts of $130 from her sister, relatives and the Ministry for Women.

**Cash Flow Management**
Kaliyan net cash flow for the 23 weeks is negative. The health related cost - medicine, gynecology visits, and the operation, related to the baby came up to $1,158.88. These costs were dispersed through weeks 8 to 22.

Kaliyan paid $50 for her son to study Korean language in Phnom Penh and uses a number of ways to reduce her costs. For example, her son would stay at the Pagoda, so she does not have to pay rent. Her son travels by bicycle, so there are no fuel costs. And lastly, her brother supports her son with by providing him with food. He failed the test once, but has since passed the second test. Now, he is waiting to get a job in Korea.

As Kaliyan is pregnant her income generation capability was reduced, and she only made 8 skirts from week 1 to 8. However, she still earned passively from her job as the AMK microfinance liaison, sale of her collection of empty bottles, lottery winnings, and per diem from FAO’s chicken-raising workshop. Hence, the majority of household inflows is mainly from intra-household transfers from her husband’s odd jobs. The overall household inflows during the study are not regular and there were weeks with no income. During the visits to meet with her, she worries about finding money.

**Cash Flow Chart**

![Cash Flow Chart](image)
Outcomes
Kaliyan found the financial diaries very useful and it helped her manage her money. She now saves by cutting down on expenses that are not important for her family.

In the above case, we can see that even though Kaliyan had a rather pleasant but costly surprise, she had to piece together her savings and two loans to cover the lump sum expense of $1050 for her birth operation. She could do so because she had accumulated significant savings, which other respondents did not report to have.

Most of the respondents in the study had relied on mostly formal and informal sources of credit to obtain a lump sum of cash. One of the most common informal source of credit is the rotating savings and credit association – Tongtin, which will be reviewed in detail in the next chapter.
**Tongtin: An Alternative to Loans**

As referenced earlier in the paper, the Tongtin in rural Cambodia is significant because of its function and spread. Hence, industry practitioners and service providers can understand their clients and their experience with smoothing consumption using this tool that it will be informative in creating new financial products. A detailed analysis of this mechanism was carried out because this is the primary method that my respondents are using to borrow and save.

Tongtin is very prevalent in my sample; all of them have participated in Tongtin at one point. Three respondents have since stopped. However, the six respondents who are still participating in Tongtin use it frequently. Collectively, they are in 12 Tongtin groups but they play as 16 “players”, which allows them to bid for the lump sum more than once.

I discovered this in the initial phase of the research when I noticed an unexplained expense line item, which was a Tongtin transaction. Prior to this, I met an old man tending to his small shop, when I was selecting the villages. When I asked him how he paid for inventory in his store, he me about Tongtin. He said that members play by bidding each period, and the highest bid will win a lump sum. When I first heard it, it sounded like a gambling game. Over time I learned that Tongtin actually was a form of bidding rotating savings and credit association (Rosca) from talking to the respondents.

**Definition of Roscas**

Anthropologist Shirley Ardener (1964) defines the Rosca as, “an association formed upon a core of participants who make regular contributions to a fund, which is given, in whole or in part, to each contributor in rotation”. Tongtin fits this description. There are many existing research about Roscas, and one that clearly described the Tongtin is found in The Poor and their Money by Rutherford (1999). According to him, there are four main ways that Rosca users use to decide the order in which the lump sums is taken:

1. By prior agreement
2. By agreement each round
3. By lottery
4. By auction

In an imaginary group of 5 members, three basic requirements are decided upon – the duration between each collection, the amount, and the order by which the money is given. In this example, we will allocate the lump sum by prior agreement, the duration is a week, the amount is US$ 10 and the order is by oldest to the youngest. Each week, each member would contribute US$10 into the pot that is given to the oldest member. Once a member has collected the lump sum, she will not be allowed to collect again and can only contribute. This cycle continues for 5 weeks, and each member in the group would have collected $50 on one of the 5 week in the agreed order. The different methods of allocation mentioned by Rutherford would complicate how this ROSCA would work in various degrees, with the most complicated being the auction type.

Taking the same five member group above, a Rosca that allocates money by agreement in each round can decide which member can obtain the lump sum in several of ways. For example, the members can decide who has the greatest need for the money, and assign the lump sum of $50 to that person.

If the imaginary five member group were to instead allocate the lump sum by lottery, the winner will be decided by a random draw of names at each meeting. Members who have collected the lump sums before will not be able to put their names into the draw.

Lastly, in the auction Rosca the five member group would submit bids to the leader to win the lump sum each week. If one is not interested in bidding, they are not obliged to do so. In this Rosca, the highest bidder would win the lump sum. According to Rutherford (1999), “The Rosca is the world’s most efficient and cheapest financial intermediary device. The fest form of Rosca – the auction Rosca – matches savers perfectly with borrowers, and
rewards both of them.” The auction type Rosca was observed in our data, which I will explain in the following section.

*Tongtin*

The local name of the Rosca used by the respondents is called Tongtin, and it follows the first price, sealed-bid auction allocation method of deciding which member is allocated the lump sum (Klonner, 2003). Members participate in the bidding by writing their bids and names on a piece of paper and then sealing it by folding or rolling. The bid amount is the amount that the bidder is willing to give up in order to obtain an earlier lump sum (Hevener, 2006). Next, the leader would go through the bids, and the winner would be the member who has posted the highest bid and has not obtained the lump sum before. The bid amount, in turn becomes the discount for the members. In the case of a tie, members submit new sealed bids until a winner is determined. Members who have previously won can only pay the full amount to the winner. The winner will obtain the pot less the bid price from member who have not won and the full price from members who have previously won. Members can also participate as multiple players in the same Tongtin group.

I will demonstrate this Cambodian Tongtin with the following example. In this Tongtin game, there are five players, who would contribute a maximum of $10 each month. This group consist of the leader, Anna, Belle, Carrie, and Daisy. We begin this group on May 1st where Anna, Belle, Carrie and Daisy are required to give the leader $10 each. The leader will received a total of $40, and she will not have to pay any interest back to her members during the game.

The following month, June 1st will be the first meeting. Everyone is invited to give a bid of $0 to $9.99 to the leader by writing it on a piece of paper which is rolled up to conceal the bids. The bids written on the paper represents what the members are willing to pay in interest to the other members. In this round, Anna, Belle, Carrie and Daisy bid $1, $2, $3, $4 respectively. When the paper is read out by the leader, Daisy who had bid $4 will win this
round because she had bid the highest. She will collect from everyone else including the leader. The lump sum is calculated by removing the bid amount from the $10 and each player will pay $6. However, the leader who has already collected the money will have to pay the full amount of $10. Hence, Daisy will receive $28. She will not be able to bid again, and is required to pay the full amount of $10 each meeting. Any member who has collected the lump sum can only pay the full amount in the following meetings.

July 1st will be the second meeting. Everyone expect Daisy and the leader is invited to bid again. In this round, Anna, Belle and Carrie bid $1, $2.50 and $3.50 respectively. Carrie will win because she had bid the highest. She will receive $33 ($6.50 from both Anna and Bell and $10 from both the leader and Daisy).

August 1st will be the third meeting and only Anna and Belle can bid in this round. The leader, Daisy and Carrie cannot bid because they have already received the lump sum from this group. Anna and Belle bid $1 and $1.50 respectively, and Belle will win because she had bid the highest. Belle will receive $38.50 ($8.50 from Anna, and $10 each from the leader, Carrie and Daisy).

September 1st will be the fourth and last meeting for this Tongtin cycle. Since only Anna has not collected the lump sum, and there is no one to bid against. There is no bidding in the last round. Anna will receive $40 from the leader, Belle, Carrie and Daisy.
The table above sums up the transactions that occurred in the Tongtin group from May to September. In this chart, I made the assumption that bids tend to decrease over time because there are fewer members to bid against (Rutherford, 1999). However, in the research conducted by Klonner (2003) on auction Roscas in south India found that winning bids did not decrease over time but fluctuated over each period. I was unable to observe whether the winning bids were volatile or decreasing because the research covered only 23 weeks. Most of the respondents are part of large groups that run from 1 to 4 years and have collected their lump sums prior to the study. Hence, they have recorded a fixed payment in their diaries to their respective Tongtin groups.

**Tongtin Leader**

This chart also illustrate an interesting fact about the Tongtin - the leader of the group does not earn or pay any interest. She would collect the full amount and repay the full amount. This is strange because the leader carries the default risk, as well as the job of collecting the money from everyone. We would think that the leader would be better compensated. However, through the interview, the respondents mentioned that most leaders start the groups because they needed money urgently. Hence, the leader might have needed a large sum of money and saw Tongtin as an interest free loan because they obtain the money first and do not have to pay interest. This could be the main motivation for the leaders to begin their groups.
Moreover, the leader mitigates her risk by selecting her members, and setting rules in the Tongtin. As the Tongtin is often conducted in the village, each member has knowledge of each other’s trustworthiness and economic and financial wellbeing. This translates to social capital in the village that the leaders use to decide if the person can be a member in lieu of extensive credit and background checks that financial institutions conduct. Once the member proves to be unreliable in their participation their social capital will diminish and they might not be allowed to join the Tongtin again. This means that if they do not repay they will no longer be allowed to obtain larger sums of money though Tongtin, and this serves as the whip to incentivize repayment.

**Rules in Tongtin**

In the exit survey, I asked the respondents to describe their group. Unlike the fine print of financial products that we see today, the rules described by the respondents were fairly simple. These rules listed below are aggregated together, and are not given by a single respondent. It is interesting to note that some respondents reported that there were no rules in their Tongtin, which was contradicted by other members of the same group. This indicates that participants might not have a full understanding of how these complex groups operate.

1. The leader facilitates the Tongtin group by collecting bids, declaring a winner and gathering funds for distribution to the winner.
2. The leader is responsible for payment to the winner regardless of whether they are able to collect the money from each of the members.
3. When the leader starts a Tongtin group, he or she will normally inform the Chief of village, as well as the Chief of commune and request them to sign on the paper that contains the names of all the members.
4. Members are normally required to place their thumbprint next to their names on the list of members as a form of signature to acknowledge their membership.
5. Members normally will meet periodically at the leader’s house or an agreed work place (e.g. weekly, bi-weekly, and monthly), but are not required to attend the meetings unless they are bidding.

6. Members can bid multiple times until they win the lump sum, but they are not required to bid at any point in the game. Once a member wins the bid, they are not allowed to bid again.

7. Members can play as more than one player in a Tongtin group.

8. The leader can temporarily suspend the game during times of festivals or permanently suspend the game in a period of crisis when a lot of members run way.

9. The size of the group is determined by the leader.

10. Once the group begins, members cannot join or drop out.

11. The duration of the game is determined by the number of players (e.g. If there are 100 members in the Tongtin, they will meet for 100 weeks or months).

12. If members default on payment, the leader can in most cases go to their house to take items of value (e.g. cows and motorcycles).

As mentioned earlier the rules are aggregated together in this list, and they are not the same for everyone in my sample. This list is also not exhaustive as there are many implicit rules that the respondents might not think of. However, this list of rules help legitimize the Tongtin game with the collection of thumbprints, and signature by the Village Chief. Moreover, it also sets the rules when the members default, so the leader bears most but not all the risk. Despite this list of rules, respondents in my sample have reported hearing news of Tongtin groups collapsing when the leader is unable to pay for members who have run away, or that the Tongtin leader herself running away. This was what happened to one of my respondents. A leader recruited Sopheap to join her new Tongtin group in the north. Sopheap, who owned cows had intended to use this group to save money and earn interest. However, partway through the game the leader ran away and he lost $200. The informal nature of Tongtin means that there will be situations where the rules are unable to sufficiently eliminate the risk, and the members will lose money.
Despite the risk of losing money, Tongtin is still very prevalent in the rural villages that I encountered. There are many reasons for this with one of them being the ability to earn interest. As the members who participate in Tongtin can earn interest when they do not bid for the lump sum. Moreover, if they wait long enough before bidding, they could obtain lump sum and still earn interest. In the following simplified example, I am in a 10-person $10 Tongtin. The bids have been $4 for the past 5 weeks, which means that as a member I would have paid $30 over the 5 weeks. In week 6, if I were to bid $2 I would collect $72, and pay $10 in the subsequent weeks. Hence, I would have collected $72 and paid out $70, and earned $2 in the end.

The Tongtin in Cambodia has more members and run for a much longer time. The respondents in my sample have not recorded the amounts they paid and had an idea that the cost of capital from Tongtin is cheaper than the cost of capital from an MFI loan. The calculation of the cost of capital in Tongtin is complicated because they are affected by the bidding and uneven payments.

Figure 12 shows that the leader, who obtained the full sum first because of the rule described earlier, did not pay any interest. This is central to the leader’s motivation for organizing the Tongtin. On the other hand, we see that Daisy who bid second had paid a simple interest of 63% per year. In this example, Daisy was the most impatient member and she had to bid a higher interest rate to obtain the lump sum first, which resulted in the highest interest rate paid. Anna, in contrast, was not impatient for the money or was using the Tongtin as a mechanism to save up, earned a simple interest of 53% per year. Based on this simple interest calculation, it seems that net savers are able to obtain a better interest rate compared to the term deposit interest of 10% per year at KREDIT MFI and borrowers are getting a good loan rate compared to KREDIT 120% annual percentage rate. They can avoid transaction costs, so it is a rational activity for participants on an ex-post basis. However, interest is dynamic and participants cannot predict interest earnings on an ex-ante basis when they join a Tongtin.
Through the charts above, we can see that Daisy is a net borrower while Anna is a net saver. Over the life of the Tongtin, Daisy paid out $46 and only received $34, while Anna paid out $41 and received $50.

Even though, the interest rates calculated are from the example, research by Rutherford (1999, p. XXV) have discovered that auction Rosca members in Vietnam typically bid up to 50% of the lump sum in the early part of the game. In India, the government has attempted to regulated the bidding Roscas, known as Chit Funds, with the Chit Funds Act 1982, to protect consumers from fraud and financial lost. Moreover, Rutherford (1999, p. XXV) suggests that these bidding Roscas are efficient because it allows the lump sum to go to the people who are most impatient. However, his critics say that these funds will only go to those who can afford these payments. I found this to be true in for Veata (403), one of our respondents. She mentioned in the exit interview that she had participated in a Tongtin group in the past. She joined the group to obtain money to buy a motorcycle, and she won with an expensive bid of $3. In total, she collected $325 or $2 per member. Now, she says she had stopped two years ago because she does not have enough money to participate in the Tongtin group. Veata’s story also gives evidence to the high biddings as she had bid up to 60% ($3 of $5) of the lump sum to obtain the pot.
**Tongtin Participation**

The respondents in the sample often participate in more than one Tongtin group. Kaliyan participates in three different groups of different amounts. Her Tongtin have spiked up to $30 a week, and on average taken 14% of her weekly expenses recorded in the study. Figure 11 shows her payments during the 23 weeks. She reported that the $20 Tongtin group still has another two years before the cycle ends, for the $10 Tongtin group she reported that it will end on April 15 2014, and for her $5 Tongtin group she reported that it has since ended. The leader can decide to delay group meetings and payments and this is the reason why on certain weeks, there was no payments from Kaliyan.

*Figure 14: Tongtin Chart for Kaliyan*

Kaliyan won the $5, $10 and $20 Tongtin lump sums with bids of $1, $4.50 and $5 respectively. However, she found the bids of $4.50 and $5 expensive because they were 45% and 25% of the lump sum, while the other bid was 20% of the lump sum. She had used these lump sums to pay for her son’s school fees, to buy threads to make skirts, and to create working capital for her home based plastic bottle recycling business.

During Kaliyan’s participation in the $10 Tongtin group, the group encountered a problem with three members refusing to participate. She did not tell us if the three members had collected their lump sums, but she said that because of them the leader changed from the bidding method of allocating the money to a random method. Furthermore, the leader now has to pay on behalf of the three members $60 each meeting. Kaliyan commented that she
and her fellow members did not feel angry with the defaulters because the leader managed to solve the problem and continue the Tongtin. She did not mention if there were any penalties given to the three members, but that they still lived in the village and still spoke to each other.

In the sample, a third of respondents had multiple shares in the same Tongtin game. Boupha has three shares in one group, while Thida and Somaly both have two shares in one group. It is difficult to determine whether there were any factors that affected Tongtin participation in the north and the south because the sampling was not randomized. However, there are two differences between the Tongtins in the north and south that is the frequency of the meetings and size of Tongtins. As discussed in the previous chapter, the households in the south have daily sales of jasmine, and the households in the north rely on longer production turnaround time for the skirts.

**Figure 15: Tongtin in Sample**

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Number of Tongtin groups</th>
<th>Total Shares in Tongtin groups</th>
<th>Number of Shares won</th>
<th>Number of Shares left</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boupha (101)</strong></td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Champey (102)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Kaliyan (105)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Sopheap (203)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Thida (301)</strong></td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Chenda (302)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Somaly (303)</strong></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Ary (304)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Veata (403)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12</td>
<td>16</td>
<td>14</td>
<td>2</td>
</tr>
</tbody>
</table>
Figure 16: Tongtin Frequency

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Frequency of Meetings</th>
<th>Amount</th>
<th>Number of Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boupha (101)</td>
<td>Monthly</td>
<td>$20, $30</td>
<td>25, 40</td>
</tr>
<tr>
<td>Champey (102)</td>
<td>Monthly</td>
<td>$20, $30</td>
<td>30, 43</td>
</tr>
<tr>
<td>Kaliyan (105)</td>
<td>Bi-monthly / Monthly</td>
<td>$5, $10, $20</td>
<td>40, 45, 50</td>
</tr>
<tr>
<td>Thida (301)</td>
<td>Weekly</td>
<td>$5, $7.50, $12.50</td>
<td>90, 60, 60</td>
</tr>
<tr>
<td>Chenda (302)</td>
<td>Weekly</td>
<td>$12.50</td>
<td>165</td>
</tr>
<tr>
<td>Somaly (303)</td>
<td>Weekly</td>
<td>$5</td>
<td>75</td>
</tr>
</tbody>
</table>

I attribute this observation of frequency and amount to the differences in income flows. In the north, the Tongtin meetings are conducted bi-weekly and monthly because income from skirts and salaries are infrequent. Moreover, the higher payments requirements from Tongtins in the north could be due to the dual income households where both the wife and husband works. The Tongtins in the south, on the other hand, hold meeting weekly. This is likely due to the production output of the jasmine farms, where the farms can harvest and sell the buds on a weekly basis.

**Evaluation of Tongtin**

The cost and benefit of participating in the Tongtin Example in Figure 7 is easy to understand because of the small number of members and assumption that bids tend to decline. In reality, the cost and benefit of participating in Tongtin is affected by a number of factors such as the timing of bidding, the bids of others, information of others, emergencies, and whether the Tongtin finishes.

The households had different perceptions of the risk involved in Tongtin. Most of them said that they felt the Tongtin groups they were members of were safe because they know the leader and that the leader is responsible. They said that if a member were to run away from paying, the leader will pay the money for this member. The Leader in the Tongtin acts as the underwriter of the entire game, which is different from other bidding Roscas described
by Rutherford (1999) and Hevener (2006). Hence, the Tongtin should provide a higher risk adjusted return for net savers compared with other Roscas that could fail due to members defaulting. However, because the Tongtin is still very much dependent on social capital, respondents have reported that the subsequent winners of the Tongtin could also “forgive” that runaway’s payment and accept the loss. They could accept the lost as they are friends with the leader, or they fear that the leader might end the Tongtin abruptly due to huge losses. On the other hand, some Tongtin agreements allow the leader to go into the defaulter’s house and take something of value to cover their loss. Three respondents said that they felt that the Tongtin was risky because they have heard of Tongtin leaders and members running away. Two of the three had not participated since the start of the study, while the other had since finished her Tongtin group and said that she will start saving money with a Microfinance Institution instead.

In contrast, one of the respondents said “feel safety because before she play with who she need to see leader is good or not, also not much worried for her money is safety or not because she win already. If the leader run away she don’t worry [sic].” She is not afraid of losing money from the Tongtin because she had already won her lump sum. This appears to show that by collecting the lump sum at the earlier part of the Tongtin, the member pays a higher interest but eliminates the risk of losing her money. In other words, Tongtin works in a similar to other investment vehicles because risk-loving individuals would earn more due to their risk appetite. However, because Tongtin has a saving and credit aspect to it, we have to look at both the impatience and risk aversion.

Klonner (2003) found that under his model with risk adverse individuals, uncertain incomes and independent bidding, new information about the rest of the members allows the allocation of each pot to the member who has suffered the most income shock. Hence, the auction Rosca enables risk sharing among the members. With one bidding Rosca it helps “facilitate risk sharing among homogenous, risk averse individuals in the presence of information asymmetries” (Klonner, 2003). Moreover, he found that by joining multiple bidding Roscas, the limits imposed by a single Rosca can be reduced, so that the variability
in bidding Roscas are just as good as a linear risk-sharing contract. This appears to be the case as most of the respondents had more than one share of the Tongtin. They might have realized the shortcomings of participating in just one group, and had either more share of the same group or joined another group.

The complexity of the bidding and the long time horizon to complete the game creates uncertainty and prevents respondents from understanding their own outcomes. As a result, the outcome for any participant can only be known after the Tongtin group has completed its cycle (ex-post). However, many respondents do not make detailed records of amounts paid out and received but indicated that the primary benefit of Tongtin was income in the form of interest, and also emergency liquidity in terms of bidding.

Chenda: Tongtin

Chenda participates in one Tongtin group with 165 members, who require payments of $12.50 every week. Her group will run for at least 3.16 years, and she reported 3.5 years to account for postponements during festivals and New Year. On the last week of November, she reported that 106 members have collected their lump sums, which means that the Tongtin group began in the middle of November in 2011. Chenda's level of impatience was high as she was the first person after the leader to obtain the money. She had bid $6.25 or 50% of the lump sum to win the pot. Hence, she collected $1031 in week 2 and is currently paying the full $12.50 each week.
She would have paid out $2050 over the life of this Tongtin and an effective annual rate of 48.67%. She and her husband used the money to start the food business at home in 2011, which she had stopped for a while before starting again in week 10 of the study.

However it is difficult to predict ex-ante what the actual lump sum and interest would be. The respondents who participate in Tongtin groups do not know how much interest they would earn or pay at the beginning of the cycle. This is because the interest bidding each week by different members. If one is a member that borrowed early in the cycle, one usually has to bid a very high amount to obtain the money. In the end, he would be a net borrower and paying a very high interest. However, a member that borrows in the middle of the cycle could be a net saver at the end. This is all depends on the bidding of the other members before him.

In addition, most Tongtin take years to finish, as they have 25 members to as many as 165 members. As a result, the Tongtin group takes years to finish is because the number of meetings are determined by the number of members and the agreed frequency of meetings. Respondents have reported that there are daily, weekly and monthly Tongtins that can be found in the village. Moreover, these long cycles make it more difficult for the respondents
to monitor their participation in the game. The true interest earned or paid can only be calculated at the end of the game or ex-post because it is dynamic. Overall interest earned in the game changes based on bids made week to week.

One of the benefits that the respondent reported was that it was easier to join and win money from the Tongtin than to borrow from a microfinance institution. These groups are local and villagers can find them within their villages. There are no traveling and opportunity costs involved, as they do not have to go to a microfinance branch to queue up and pay their repayments. The leader will visit them to collect the money. The Tongtin is popular because if the member’s purpose is to save, she can often save more money in the Tongtin than with a savings account.

In addition, these groups also allocate the money to the people who need them faster. According to Rutherford, this auction style ROSCA is “an even more flexible way to cater fairly to a wide range of people and their individual needs.” (Rutherford, XXIV) This way of deciding who gets the lump sum is more efficient, as the bidding allows the person who most urgently needs the money to obtain the money first, and it also rewards the member who patiently “deposits” their money in the Tongtin to reap the “interest” at the end.

However, one of the downside is high relative cost to winning the bid and uncertainly to winning the bid in the first price, seal bid auction process. Members might not know beforehand how much they should bid, and might have to bid higher than they wished to obtain the money at the given time. This could lead to higher costs when compared to the interest they would have paid for a microfinance loan.

Overall, the Cambodian Tongtin in this research has many of the risks and benefits of an “auction” ROSCA described by Rutherford (1999). However, the leader plays an enhanced role as underwriter that increases the potential for ex post cost of capital if a member defaults and they are forced to cover the cost. In addition, players can leverage their investments or loan by playing as more than one player in the same Tongtin. Net
borrowers and savers face less risk to their loan availability or interest return on savings as compared to a typical auction Rosca as described by Rutherford (1999) because of the leader’s underwriting role.
Conclusions and Recommendations

In *Portfolios of the Poor* (2009), the authors found that even the poor have very complex financial lives. Most have networks of friends and family that can provide support and informal financial services. These Financial Diaries projects are focused on studying how respondents use their limited income to smooth consumption and income and discover what tools they use. The process of recording their expenses and income was found to help with increasing their financial literacy. As they become empowered with the knowledge of how they spent their money and they are more able to control their expenditures (Cab Calling, 2009).

As expected, I found that many respondents faced challenges with consumption smoothing and income shocks and used multiple sources of financing to face these challenges. The financial diaries research methodology allowed us to take a deep dive into a small number of typical households to better understand how they respond to expected and unexpected challenges. The Cambodia respondents used many of the consumption smoothing methods observed in other financial diaries research, such as cash gifts, borrowing from family and microfinance, and from Roscas. More importantly, I was able to observe informative trends such as the widespread use of Tongtin. Tongtin, a form of bidding Rosca, is the most typically used financial product in the sample and differs from other bidding Roscas in that the leader underwrites the group in case of default. Tongtin makes credit easier to access and interest earnings for savers is higher (unadjusted for risk) than in the formal sector. However, there are many aspects that are undesirable, such as leaders or members running away and high bids that drive costs up. Above all, the wide spread use of Tongtin signals a real need for credit products that provide easier access, and could also show that clients have sophisticated financial needs. The typical household challenges and responses described in this paper will be informative for industry analysts and practitioners working in Cambodia in order to better design programs and products for the population.

In addition, the Cambodia respondents were empowered by participation. The diaries reflected the complex transactions of the respondents, and respondents mentioned that
diaries had helped them understand the cash flows. In the exit survey, respondents indicated the project was good and they had a better understanding of their finances. Moreover, many respondents asked about what they should do about their spending during the study, which could signal a need for financial literacy training on budgeting techniques. As a result, similar to Microfinance Opportunities’ Malawi financial diaries project, financial literacy and education program can be very beneficial to our respondents in our survey.

Respondents with more infrequent income from livestock and long term agricultural investments can also benefit from specific education about proper risk management and prevention of pest/disease treatment to better manage risks to their income.

Finally, certain respondents faced risks which could be mitigated with insurance products. For example, the cow and mango farmers face more risk because they can only sell their output infrequently, and would be a suitable target for the crop or animal health insurance. The jasmine farmers would not be as suitable for insurance because they face less income risk due to high availability of jasmine plants and daily harvest potential which limits income shocks from crop disease.

Overall, the financial diaries study confirmed that typical consumption smoothing challenges and responses are present in the rural Cambodia sample, and also highlighted the specific characteristics of the Cambodia Rosca that are different from other bidding Roscas. Financial service providers and industry analysts have an interesting opportunity to develop products and education programs to address the specific needs and risks of the rural Cambodians.
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Appendix I: Respondent Summaries

Case Study: 101

Boupha, female, 33 lives in Koh Duch Village with her husband, parents-in-law, and four young sons. Her husband works in the community as a truck driver, as well as help with the family’s business of providing wedding supplies. Boupha’s household earned an average of $178.26 per week over the course of the study. Her seasonal income from selling mangos during the period of study contributed 62% of the total cash inflows. Her main job is to stay at home and take care of her four young sons. She and her husband owns a piece of land (6 by 22 meters), which is used to store firewood that is sold by her mother-in-law. Her father-in-law owns the piece of land (8.5 by 200 meters) that the house is sitting on.

Home savings
Boupha spends down her savings from the past, as she has negative cash flows most weeks. However, because of the huge cash inflow from the sales of mangos, her average net cash flows over 23 weeks of the study is positive at $22.30. She saves in her home. In addition, she also owns 12 chickens.

Loans
Boupha took a loan of $32.50 from her family business’s worker in week 2, which was returned the next day. Apart from this loan taken at the very start of the week, she did not take any loans from anyone else. Prior to the study, she borrowed $3,000 from her relatives to rent mango farm on May 20th 2013. She usually borrows from her relatives, else she would borrow from her neighbors.

Rosca: Tongtin
Boupha plays a form of auction ROSCAS common to the respondents in the study. She is currently involved in two such groups – “3 person” in a 40-person group that requires monthly payments of $30 group and in a 30-person group that requires monthly payments of $20. In her two groups, she has collected the money, and is currently paying back her “loan” in monthly repayments.

Cash Gifts
Boupha gave 12 cash gifts totaling $132.50 to Abbots and Monks during the study. In addition, on week 20 and 21, she spent a total of $287.50 on a ceremony celebration for Kathina day at her house, and hosted her neighbors and relatives. This celebration appeared to be a fund raising, as their neighbors and relatives gave cash gifts to Boupha’s mother-in-law, who then gives the money to the Abbot. The money given to her mother-in-law was not recorded.

Cash flow Management and Planning
Boupha’s weekly expenditure varies drastically with a mean of $157.38 and standard deviation of $116.17. The peaks in outflow were caused by the replacement of truck tires in
week 4, buying of mango ripening agent in week 11, buying 200kg of rice in week 15, and the hosting of a festival celebration at her house in week 20. Her cash inflows comes from three sources – her husband’s intra household transfers from his earnings from driving the truck, her family’s wedding supplies and events business, and her mango sales.

**Cash flow chart**

![Cash flow chart](image)

**Outcomes**

In the exit survey, Boupha indicated that she did not change her spending habits, but did gain knowledge of her spending and income on a daily basis.
Case Study: 102

Champey, 45, lives in Koh Duch village with her husband and three children, in a wooden house on stilts, with three families – hers and her two sisters. She makes skirts at home with the loom, while her husband works as a police officer in Phnom Penh. Her two daughters are currently studying in high school and her son, who is still very young, stays at home. Champey’s household earned an average of US $ 65.24 per week over 23 weeks. At the start of the study, she was buying materials to build her new house on the land across from her current home. The construction of the house was finished in the middle of the study.

Loans
Champey was building her house at the start of the study, and she took a US$ 2000 loan from Maxima MFI in week 2 to buy the building materials needed. This loan will have a repayment period of 20 months, and a fixed repayment amount of $110 per month. This amount is paid by her husband.

Rosca: Tongtin
Champey is part of two Tongtin groups one is a 43-member group which require $30 payment each month, the other is a 30-member group $20 payment each month. These groups run for a long time, so she does not remember when she began. When asked why she joined the Tongtin, she indicated that she was a net saver, because she never bids for the lump sum. She said that money saved at home was “too easy to spend.”

Home savings
Champey’s household did not save at home, however she did have money left from that loan that she did not spend. She uses Tongtin, as described above, to save.

Cash gifts
Champey received three cash gifts of $22.13 from family members, and gave out one funeral contributions of $1.50 and one cash gift to a neighbor of $0.75. In addition, she regularly makes charity and religious cash gifts in 16 out of the 23 weeks giving a total of $18.25.

Cash flow management and Planning
Champey’s net cash flows is positive. She took a loan of US$ 2000 to build her new house in week 2. In addition, the household’s loan repayments were paid by her husband from his salary and was not included in the data.

Cash outflows varies drastically over the study, with $1566.75 spent on construction material in the first 6 weeks and on week 12 she paid $100 to workers who built her house. Apart from the construction and financial expense to build the house, the majority of her cash outflows were for food (58.10%).
On the other hand, cash inflows are mostly from her husband’s salaried job as a policeman, and his second job as a chauffeur for his superior’s son. He gets paid monthly for both jobs. In addition, Champey makes skirts on her loom, and sells them to a buyer who would call on her every few weeks at home. She made $141 from selling 24 skirts over 23 weeks.

**Cash flow chart**

![Cash flow chart](chart.png)

**Outcomes**
After recording the diaries for 23 weeks, Champey indicated that she would not do anything differently, and the charts reflected what she expected to see. She reported that the diaries helped her to understand her expenses and income.
Case Study: 105

Kaliyan, 44, lives in Koh Duch village with her husband, son, and mother. She makes a living making skirts on the loom, and buying empty plastic bottles to sell, while her husband, the Village Chief Assistant works in odd jobs as a cook and as a construction worker. Her mother also works at home making cotton threads from cottonseeds. Lastly, her son is currently studying Korean because he intends to work in a factory in Korea, after passing the Korean language test.

Kaliyan gave birth to her baby in week 18.

Loans
Kaliyan took two loans in the past to build her house and the loom. Recently, she became pregnant, and took two loans from AMK Microfinance of $250 and $100.

Rosca – Tongtin
Kaliyan is a part of three Tongtin groups in her village. One, 50 member group that requires $20 every month. Second, 45 member group that requires $10 every 2 weeks. Lastly, a 40 member group that requires $5 every 2 weeks. She has finished 5 Tongtin cycles in the past, and she does not know how long it would take to finish the ones she is currently in.

Savings
Kaliyan saves money at home for her business and for ceremonies and weddings. In addition, she said that her house was also built with her savings. She has US$ 1500 at the middle of the study saved at home.

In addition, Kaliyan has a savings account with AMK Microfinance with whom she works for as the village liaison. As the village liaison, she has informational about savings and loans and she will contact AMK if there are people, who are looking for loans. Each month when she received a small compensation from AMK Microfinance, she would put $1.25 into the account she has with them.

Cash Gifts
Kaliyan gave out a total of $13.50 in ceremony gifts to Monks, and $10 for a wedding. In total, she received cash gifts of $130 from her sister, relatives and the Ministry for Women.

Cash Flow Management
Kaliyan net cash flow for the 23 weeks is negative. The health related cost - medicine, gynecology visits, and the operation, related to the baby came up to $1,158.88. These costs were dispersed through weeks 8 to 22.

Kaliyan paid $50 for her son to study Korean language in Phnom Penh and uses a number of ways to reduce her costs. For example, her son would stay at the Pagoda, so she does not have to pay rent. Her son travels by bicycle, so there are no fuel costs. And lastly, her
brother supports her son with by providing him with food. He failed the test once, but has since passed the second test. Now, he is waiting to get a job in Korea.

As Kaliyan is pregnant her income generation capability was reduced, and she only made 8 skirts from week 1 to 8. However, she still earned passively from her job as the AMK microfinance liaison, sale of her collection of empty bottles, lottery winnings, and per diem from FAO’s chicken-raising workshop. Hence, the majority of household inflows is mainly from intra-household transfers from her husband’s odd jobs. The overall household inflows during the study are not regular and there were weeks with no income. During the visits to meet with her, she worries about finding money.

**Cash Flow Chart**

Outcomes

Kaliyan found the financial diaries very useful and it helped her manage her money. She now saves by cutting down on expenses that are not important for her family.
Case Study: 203

Sopheap, 60, is the patriarch of his household of seven. He lives in the village of Ronas on Mekong island, which is a 5 minutes away from the ferry point on the island. He works as a farmer growing rice, sesame, and corn. His youngest daughter works on the loom to make skirts, and takes care of his elder’s daughter’s child. He has three sons - one helps him in the field, while the two younger sons are still studying. In the past, he used to work in the commune, as the Assistant Chief, trade cows and corn, while he wife sells vegetables.

Savings
Sopheap reported that he has savings at home for emergencies, and he also used his savings in the past to build the house. During the interviews, he reported that he had traded some cows in the few months prior to the study and made $750.

Loans
Sopheap had no loans or repayments during the study but had taken a loan from ACLEDA bank before.

Roscas – Tongtin
Sopheap reported that he had participated in two Tongtins five years ago with the intention to save money when his neighbor invited him to join. It was a 70 member group that required $10 monthly, and a 51 member group that required $20 monthly. Since, he was there to save he did not bid and lost about $500 when the leader ran away. Now, he only saves at home.

Cash flow management
Sopheap left the money management to his youngest daughter. This job is typically left to the wife, but his wife was not well. Hence, his daughter is in charge to buying the food and other household items for the family. In terms of expenditure, his household spent most (43%) of their cash outflows without counting the purchase of cows on food during the study.

He harvested 40kg of sesame and sold them for $1.25 per kg, which he considered a good price because the sesame only sold for $0.75 per kg the previous year. In addition, he also sold 43kg of pig feed made from rice for $7.50 to his relative. During study, he bought corn seeds to grow, however because the weather was not good he could not harvest them.

During the study, he reported that he sold a cow in week 11 because the savings was depleted. Later, he sold another two cows in week 15, and then bought another two cows in week 17. In the end, he made a profit of $950.

Overall, his household had a positive net cash flow balance of $119.75 at the end of the study.
Outcomes
Sopheap found the diaries useful to learn about his expenses on a weekly basis. Now, he wants to teach his daughter about managing money.
Case Study: 301

Thida, 53, lives in Koh Krabei village with her husband, two sons and three daughters. Her husband, eldest son and she are farmers; her eldest daughter is a physical therapist, while the other three members of the family are still studying. Her husband also works as a tractor middleman, who connects farmers in need of a tractor, with the people with a tractor. Her eldest son works as a cook, in addition to farming.

During the study, she suffered an income shock when her jasmine bushes had a pest outbreak, and an expense shock when her daughter had an emergency operation for stomach problems.

Loans

During the study, Thida received two loans, one $50 loan from the moneylender, and another $150 loan from her aunt. She received two loan repayments from her neighbor of $75 in total at the start of the study. Throughout the study, she had to pay loan repayments every week. In total, she paid $726.70 for her loans. These are for her two outstanding loans, from an NGO, and from CAMMA Microfinance.

Rosca –Tongtin

Thida is a part of 3 Tongtin groups. One, 60 member group, which require $7.50 payment every week. Second, another 60 member group, which require $12.50 payment every week. Lastly, 90 member group, which require $5 payments every week. In the first and second group, she participates as two “players,” which allows her to bid twice. In total, she plays as 5 “players” in these 3 groups.

Savings

Thida’s household has no savings.

Cash Gifts

Thida received cash gifts of $13.75 from her extended family and the Cambodian People’s Party official, and cash gifts of $525 from her daughter who is working as a Physical Therapist. She gave out $18.75 of cash gifts to relatives, $34.13 of ceremony gifts, and $25 of wedding gifts.

Cash Flow Management

Thida’s net cash flow during the study is negative. Over the period of the study, her loan repayments took up 44% of her total inflows. Moreover, she suffered an income and expense shock. Her daughter had an emergency operation in week 16 that cost $500 and her jasmine bushes suffered a pest infestation in week 17. The pest infestation caused her to lose revenue from the sale of her jasmine, this drop in revenue can be observed in the chart below. Furthermore, she had to pay for her daughter’s university fees of $900, which was not planned.

Cash Flow Chart
Outcomes
Thida found that financial diaries helped her to understand her income and expenses. However, she said that she would not change her spending patterns.
Case Study: 302

Chenda, female, 42, lives in Koh Krabei village in Mean Chey District, with her husband and daughter. She has a son, who lives with her mother-in-law, as she is unable to support another child. Both she and her husband are jasmine farmers. In addition, she also buys jasmine from her neighbors to sell in Kampong Thom province. Her husband helps her sell the jasmine in the province, and also works as the village security guard. He and his wife recently started to sell coffee, rice and fried noodles, which they stopped before due to lack of business.

Loans
Chenda and her husband borrowed from Piseth NGO and Lida MFI, $100 and $150 respectively. The money was used to plant jasmine bushes in his farm. During the study, $391.23 of loan repayments were paid out to the two lenders. However, she would borrow from her neighbors for short-term loans. During the study, she did not take a loan from her neighbors but she had borrowed in the past, and found it to be very expensive. When the neighbors lend money to them, they charge interest. For example, if they give you a loan of $25, they will want to collect $1.25 of interest every week.

Rosca – Tongtin
Chenda is part of a 165-member Tongtin group that require $12.50 payments on a weekly basis. The group began in November 2011 and it will take three and a half years to complete. She was the first person after the leader to collect the lump sum, with a bid of $6.25. In total, she had collected $1031. She used the money to buy soil to fill the land around her house and farm, which was low and would flood in the rainy season, and put up a fence around her house.

Savings
Chenda received $500 from her brother through ACLEDA bank in June prior to the start of the study. During the study, she did not save.

Cash gifts
Chenda gave out 6 cash gifts totaling $55 of gifts in the study. They are a mix of wedding contributions, cash gift to family members, and religious gifts. On the other hand, she received 4 cash gifts totaling $40 from her relatives, one of the gifts was given to her child for Pchum Ben day but kept with her.

Cash flow management
Chenda managed the money at home. Her household’s net cash flows at the end of the study was negative $709.18. This is contributed by the lack of recording of jasmine sales in week 1, 7, and 14. With an estimation of the missing sales based on prior weeks, she would have earned a total of $1645.80 ($1368.73 was actually recorded) and a profit margin of 21.5%. Her profit margin was actually lower than it could had been because her husband
stopped going to Kampong Thom to sell the jasmine. From week 19 to 23, they did not earn any money from jasmine and on week 22 they lost money.

On the other hand, she and her husband decided to start their food business at home on week 10. They only earned a profit in 9 out of the 12 weeks that they have operated, and earned a profit margin of 7% overall. During those weeks, her husband also went fishing to supplement the food for home and business use. He caught 41 kg of fish from the pond from week 8 to 21 and estimated to be about $57.13 in total.

Her two major expenses were for her food business and her purchase of jasmine taking up 68% of her entire expenses during the study.

**Cash flow chart**

Outcomes
Chenda benefited from recording her financial diaries as she had learnt about her income and spending. She commented that she would not do anything differently from before.
Case Study: 303

Somaly, female, 40, lives in Koh Krabei Village, in Mean Chey District, south of Phnom Penh. She lives with her mother, four sons, and daughter-in-law. She sells jasmine flower wreaths at the market and operates her little shop in her house selling snacks and non-perishable food. Her three elder sons work as laborers in construction, while her daughter-in-law picks jasmine to earn a living. In addition, her third son occasionally works as a cook as well as a lay person who prepares the pagoda for ceremonies. She did not always sell jasmine and worked at her shop. Before, she used to work at the jasmine farms, clearing weed.

Loans
Somaly had taken a $125 loan from TPC Microfinance through the Village bank group loan. She had used part of the money for her shop and the other part to return money owed to her Aunt. She usually borrows from Maxima Microfinance and her Aunt.

Rosca: Tongtin
Somaly was in one Tongtin group that meets weekly and requires $5 payments. She played as two person inside the group, which ended in week 22. She used the Tongtin to save money, and as a source of credit if she needed money. In addition, she was also a leader, who facilitated the Tongtin, and she shared that she does not want to be a leader anymore. This is because the leader's job is very difficult, as she had to spend a lot of time to obtain the money from all the members.

Cash Gifts
Somaly received one cash gift of $2.63 from a customer on Kathina day and gave out 11 cash gifts totaling $125 for religious purposes.

Cash Flow Management
Somaly's net cash flow during the study was negative at $2084.70. This is because her cash flow was negative most weeks with the exception of week 6. The first 3 weeks were omitted because she did not record all the data. Her negative cash flow is most likely due to her not recording all income sources. Her two sons give her $12.5 and $40 every month. Somaly's main expenses are her business expense and jasmine purchase. These together took 71% of her average weekly outflows, while 20.5% was spent on food. This could contribute to the under-accounting for revenue, as it is difficult for her to keep track on her earnings from the shop.

On week 7, she put down a deposit of $60 for the water company to lay pipes for her. Her payment of $60 will cover 4m of pipes, and she paid another $5 on week 11 when they needed more to connect her household.

Somaly's shop provided her main income source during the study as it contributed 78.3% of her average weekly inflows. This income is fairly stable with an average of $85.43 and
standard deviation of $18.83. However, her income from jasmine sales is varied with an average of $29.32 and a standard deviation of $24.50.

**Cash Flow Chart**

![Cash Flow Chart](image)

**Outcomes**

Somaly found the diaries helpful for her to understand her expenditure. She could now see where she could cut down spending.
Case Study: 304

Ary, 40 lives in Koh Krabei Village, in Mean Chey District of Phnom Penh with her husband and two daughters in a concrete-walled house that stands out from the rest of the wooden houses along the village road. She has a third daughter, who lives with her sister—who is childless—in Kandal Province. Her husband works as a security guard at FTB bank, while her eldest and youngest daughters go to university and high school respectively. She works at home tending to her jasmine and longan farms, as well as preparing the jasmine into sticks and wreaths for her neighbor to sell.

Loan
Ary has a $1000 loan from Maxima MFI. She has an agreement with a neighbor to split the amount when she obtained in the loan in December 2012. She paid her loan 3 times during the study in a declining amount of $35.50, $33, and $32.40. This loan was used for house improvements, wedding contributions, children’s education and household food expense.

Rosca: Tongtin
Ary did not participate in any Tongtin groups during the study, and the last Tongtin group she participated in was 3 years ago. She stopped because she did not have enough money to pay for these groups, as her daughter started university.

Savings
Ary reported that she was cutting down spending to save money for her children’s education.

Cash Gifts
Ary gave 6 cash gifts to relatives totaling $65, and gave 13 cash gifts totaling $57.25 to Abbots and Monks. In addition, she gave a wedding gift of $15.

Cash Flow Management
Ary’s net cash flow during the study was negative at $159.40. She said in the weekly interviews that she watches her spending very carefully, so that she has enough money set aside for her daughter’s education. She paid her water bill on week 7, made large cash gifts for relatives and monks on week 15 for Pchum Ben day. The two largest expenses were her eldest daughter’s university fees, which were paid on week 4 and 19 cost $205 and $200 respectively.

Ary’s large cash inflows were from her husband’s salary on week 1, 6, 15, 19 and 23 where her husband gave her between $100 and $125. In addition, she earned $812.33 from her sales of jasmine and longans, and from working for her neighbor making jasmine sticks and wreaths. This made up 59.5% of her household income during the study.
Outcomes
Ary felt that she has a good grasp of her household’s finances, but the diaries has helped her learn clearly what she had spent her money on. Furthermore, she said she has no plans to participate in Tongtin in the future, and would save money at home in a box. She also commented that obtaining a loan is much easier than before and it is safer as well.
Case Study: 403

Veata, female, 44, lives in Prek Thmei with her husband, three sons and daughter. She has an eldest daughter that does not live with them, but in Phnom Penh working as a film star. On the other hand, her husband and her are both farmers, and earn their wages as day laborer for their neighbors. Her eldest son, stopped school to work as a jasmine picker. Her younger daughter goes to a NGO sponsored school—Happy General School, while her two youngest sons remain at home as they not of schooling age.

Veata and her husband are a part of a crop-sharing scheme with the land owner in Phnom Penh. They take care of his farm that has bananas, and they will split the sales in half. During the study, Veata’s husband stopped giving her his wages, and started gambling. She reported that her husband sold some bananas from the farm as well.

Loan
Veata had borrowed $100 from a seed seller to buy cucumber seeds from him. They will only pay after they have sold the cucumbers, which would only ripen in February 2014.

Roscas: Tongtin
Veata did not participate in any Tongtin groups during the study. But she had participated in a Tongtin group three years ago, and she used the money to buy a motorcycle.

Savings
Veata found it very difficult to save money, as both and her husband earns daily wages.

Cash Gifts
Veata gave out 1 cash gift to her nephew in week 14 of $0.375 and 1 religious gift to a monk. She received 2 cash gifts from her eldest daughter and from a CPP official.

Cash Flow Management
Veata’s household had a negative net cash flow of $86.20 during the study. Her household’s income typically comes from her day job picking jasmine, her husband’s wage from working at a farm, and her son and daughter’s occasional work picking jasmine. She earned about 53% of the household's income, while her husband and children earned 40.3% of the household income. During the study, she also played the lottery and won $45 on week 18.

Veata spends most (59.5%) of the income on food, while another 29.5% is spend on allowances to her husband and children. The allowances are for food and snacks at school and work. She also spent $26.65 (3.5%) on the lottery.

Her eldest son had stopped school during the study period and was helping her husband at work or picking jasmine. On the other hand, her daughter goes to Happy General School, which is entirely free, and her two younger sons stay at home. Hence, her cost for education is kept at the minimal.
Veata reported that her spending and earning is expected and would not change her spending behavior. In addition, she found that it helped her to clearly know about her income and expenses.
## Appendix II: Statistics

### Figure 18: Sectors in Cambodia’s economy

<table>
<thead>
<tr>
<th>Sector</th>
<th>Value Added in 2006 (Millions of KHR)</th>
<th>Percentage Distribution 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture, Fisheries, &amp; Forestry</strong></td>
<td>6,830,328</td>
<td>28.0%</td>
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<tr>
<td>Crops</td>
<td>3,469,713</td>
<td>14.2%</td>
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<td>Paddy</td>
<td>1,891,428</td>
<td>7.8%</td>
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<tr>
<td>Other crops</td>
<td>1,578,285</td>
<td>6.5%</td>
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<tr>
<td>Livestock &amp; Poultry</td>
<td>1,080,184</td>
<td>4.4%</td>
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<tr>
<td>Fisheries</td>
<td>1,769,880</td>
<td>7.3%</td>
</tr>
<tr>
<td>Forestry &amp; Logging</td>
<td>510,551</td>
<td>2.1%</td>
</tr>
<tr>
<td><strong>Industry</strong></td>
<td>6,977,461</td>
<td>28.6%</td>
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<tr>
<td>Mining</td>
<td>100,908</td>
<td>0.4%</td>
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<tr>
<td>Manufacturing</td>
<td>5,059,756</td>
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<tr>
<td>Food, Beverages &amp; Tobacco</td>
<td>501,552</td>
<td>2.1%</td>
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<tr>
<td>Textile, Wearing, Apparel &amp; Footwear</td>
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<td>Wood, Paper &amp; Publishing</td>
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<tr>
<td>Rubber Manufacturing</td>
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<tr>
<td>Other Manufacturing</td>
<td>531,590</td>
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<tr>
<td>Non-Metallic Manufacturing</td>
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<tr>
<td>Basic Metal and Metal Products</td>
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<tr>
<td>Other Manufacturing</td>
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</tr>
<tr>
<td>Electricity, Gas &amp; Water</td>
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<tr>
<td>Construction</td>
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<tr>
<td><strong>Services</strong></td>
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<tr>
<td>Trade</td>
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<tr>
<td>Hotel &amp; Restaurants</td>
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<tr>
<td>Transport &amp; Communications</td>
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<tr>
<td>Finance</td>
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<tr>
<td>Public Administration</td>
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<td>Real Estate &amp; Business</td>
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<tr>
<td>Other Services</td>
<td>2,184,681</td>
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<tr>
<td><strong>Taxes on Products less Subsidies</strong></td>
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<tr>
<td>Taxes on Products</td>
<td>1,582,556</td>
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<tr>
<td>Less: Subsidies</td>
<td>112,329</td>
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<tr>
<td>Less: FISIM</td>
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<tr>
<td><strong>GROSS DOMESTIC PRODUCT (GDP)</strong></td>
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Appendix III: Snapshot of Financial Diary

A page in the diary

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Note: The amounts are in Cambodian riel (KHR).
Appendix IV: Forms and Interview Questions

Paper Survey Form

Figure 19: Snapshot of respondent’s weekly recording

Figure 20: Page 1 of Paper Survey form
Mid Term Survey

Family
1. Tell me about your household?
   a. Who lives with you?
   b. And what does each of them do/earn money?
2. What other ways have you earned money in the past?
   a. Do you trade goods/services? How often?
3. Tell me about your land?
   a. Did you buy the land?
   b. How did you come to own it?
   c. How long have you owned it?
   d. Have you sold parts of it? Could you?
   e. Have you given some to family/children?
4. Tell me about your animals?
   a. Did you buy the animals?
   b. Do you own it?
   c. How long have you owned it?
   d. Have you sold some of it? Could you?
   e. Have you given some to family/children?
5. What did you do the last time you had extra money?
   a. Did you save it?
   b. Bank?
c. Animals?
d. Buildings?
e. Invest in business?
6. What about members of your family?
7. Tell me about the last time you or your family members had to borrowed money?
   a. Who is it from?
   b. How much?
   c. Is this where you normally get money?
   d. Are there any other ways in the past?
   e. Do all members of your household use the same methods?
   f. Is that who/how you always borrow money from?

8. What was the last time you or your family had an unexpected expense/emergency?
   a. Is that who you usually go to for help?

[Break 1] (To be continued the following week)
9. I see that you have ____ people in your house now. Is this your entire household?
10. Are they your relatives/neighbors/friends?
    a. How often do they visit you?
    b. How far away do they live from here?
    c. Do you visit them often?
11. Tell me about your extended family?
12. Do you visit your family in other villages?
13. I recall that you said your extended family helps you with emergencies.
14. Are you support any extended family member financially?
15. Are you or anyone in your family part of a savings group?
16. Tell me about the last time someone asked you or your family members for money?
17. Do you have other people who sometimes live with you?
    a. Tell me about them.
    b. What do they do?
    c. How long have you supported them?
    d. How long do you plan to support?
    e. What are their plans once they finish school?
18. Do you support other people who do not live with you?
    a. Tell me about them.
    b. What do they do?
    c. How long have you supported them?
    d. How long do you plan to support?
    e. What are their plans once they finish school?
19. Do you have other people who visit frequently?
    a. Tell me about them.
    b. How long do they stay?
    c. What do they do?
    d. How often do they visit?

[Break 2] (To be continued the following week)
Market
20. Let’s see, can you tell me about your most recent trip to the market?
21. Where is this market that you are talking about and how (far) much does it costs to go there?
22. So it is mostly for selling / buying / trading?
23. Do you always go there?
24. What are the other things that you do at this market?
25. What are the things you do at other markets?
26. (If the above place is only for fishing/farming/business/family purposes) So where do you go to get your stuff for fishing/farming /business/family?

School
27. Tell me about your children?
28. Do you have to pay school fees?
29. How much do the school fees and books costs?
30. Do you give the teachers money?
31. How much do you give to them?
32. Tell me about the other costs that are related to school?
33. I hear that you did not talk about travel costs. Do your children walk to school?

[Break 3] (To be continued the following week)

Household
34. What do you use for light at night?
35. Do you have to change/restock it frequently?
36. Tell me about your cooking fuel?
37. Tell me about your drinking water?

Farming (If not applicable, skip to next part)
38. Tell me about the crops that you grow?
39. Do you go back to the same market to sell your crops?
40. Who do you sell them to?
41. Do you always go to that market to sell your crops?

Fishing (If not applicable, skip to next part)
42. Do you go fishing?
43. Is that to supplement your diet or to sell at the market?
44. For both places, how do you travel there? (Walk, bicycle, motorcycle, car, taxi, truck, tuk-tuk, buses)
45. What do you use most to get to places?

Observations about house
46. If applicable, I see you have decorations, what is the occasion?
Exit Survey

Tongtin
Please describe how your tongtin group works? (Amount, Frequency, Rules)
Is there a different type of tongtin that you heard of/participated in? What is like?
Why did you choose this one instead of the other one that you told me?
How many more contributions do you have until the tongtin group ends?
How many tongtin groups have you completed? (Finished cycles)
Do you feel that your money is safe in a tongtin group? Why?
   If respondent feel that their money is NOT SAFE, why do you continue to play tongtin?
What happens when a member runs away?
Who approved you to join the tongtin? How?

Income
Do you know today, how much money you have for next week to spend?
   If YES, how do you know?
   If NO, why is that so?
During this [refer to chart] week when income dropped, what did you do to manage your expenses?
How do you store money for the future, in case you have another period of low income?

Food
Do you change your household food consumption when there is less income?
   If YES, what do you cut down? Why do you cut down on those?

Health
I saw that you spend more money on health on [refer to outflow chart] week. Have you planned for this type of health expense before?
   If YES, how did you plan for it? What did you do?
   If NO, why?

Chart
Now that you have seen your cash chart that we built together, is there anything about your cash-flow that you would do differently?
   If YES, what would you do differently?
Do you think this diary helped you learn about your cash outflows/inflows?