

# Households as Corporate Firms

An Analysis of Household Finance Using Integrated Household  
Surveys and Corporate Financial Accounting

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## Preface

This monograph emerged from our efforts to study the behavior of the households from the Townsend Thai Monthly Survey. This experience convinced us that imposing an accounting framework and creating financial statements would be a useful, indeed a necessary, first step for the analysis of household finance, especially from high-frequency, monthly data. We believe that this accounting framework will help researchers better define and more accurately measure household income, consumption, saving, and other financial variables, and in the end enhance our understanding of the behavior of the households in developing countries. As we illustrate in this monograph, the corporate accounting framework also allows us to apply the concepts of corporate financial analysis and theories in corporate finance to the study of household behavior. It is important to emphasize that although some specific, arbitrary decisions have to be made when we work with survey data such as those from the Townsend Thai Monthly Survey in this monograph, the accounting framework in general is not specific to any survey. The accounting framework could be largely applied to other household surveys in developing countries.

The work on this monograph began when both of us were at the University of Chicago. The early idea benefited from our conversation with former students in the Townsend research group, especially Masayuki Tachiiri. Subsequently, Nick Bloom, Angus Deaton, Takeo Hoshi, Costas Meghir, Jonathan Morduch, Chris Woodruff, the editor (Andrew Chesher), and three anonymous referees have provided detailed comments and suggestions, at various stages of the project.

We have also benefited from the comments from seminar participants at the Massachusetts Institute of Technology (MIT), Princeton University, the University of California at San Diego, the University of Thai Chamber of Commerce in Bangkok, and the Ministry of Finance of Thailand, as well as students at the University of Chicago and MIT. Anan Pawasutipaisit and Archawa Paweenawat were a tremendous part of writing the code to extract data from monthly surveys consistent with the conceptualization of the accounts. Each is now using and further refining the data from these accounts in their papers on household enterprises and trade, respectively. Hiroyuki Yamada helped impute the returns on household labor, allowing us to adjust our measures of return on household assets and wealth. Parts of this monograph were previously circulated as a working paper under the title "Households as Corporate Firms: Constructing Financial Statements from Integrated Household Surveys."

We are grateful to Angus Deaton for his contributions to the measurement of household behavior in developing countries. This is the foundation on which this monograph is built, and we hope that the framework proposed here addresses some of the issues he has raised. We also would like to thank Khun Sombat Sakuntasathien and the staff at the Thai Family Research Project (TFRP) in Thailand. Over the years, they have tirelessly and painstakingly conducted field surveys for the Townsend Thai Project, which yielded the data we use in this monograph. Anna Paulson played an important role in the original design of the instruments and early implementation. Scott Parris and Adam Levine of Cambridge University Press and Bindu Vinod of Newgen Imaging Systems provided excellent assistance throughout the publishing process. We gratefully acknowledge financial support from the National Institutes of Health, the National Science Foundation, the John Templeton Foundation, the Bill and Melinda Gates Foundation through the University of Chicago Consortium on Financial Systems and Poverty, and the University of California at San Diego. The findings and conclusions contained in this monograph are ours and do not necessarily represent the views of our funders. All remaining errors are our own.

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PART I

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**Households as Corporate Firms**



### **Introduction**

In his Presidential Address delivered to the American Finance Association, John Campbell argued for the importance of “household finance,” an academic field that has attracted much interest but still lacks definition and attention within the finance profession. Analogous to corporate finance, household finance asks how households use financial instruments to attain their objectives. We argue further that the study of household finance is not only important for households as investors in developed economies; but it is also crucial for households running businesses and farms in developing countries, where financial markets are often problematic and household consumption, investment, and production decisions are likely nonseparable. Understanding the financial environment and financial behavior of these households should ultimately help researchers and policymakers gain a greater understanding of behavior, evaluate existing policies targeting poverty, and potentially help remove distortions in financial markets.

The study of the financial environment and household financial behavior occupies a large share of the growing literature on empirical development economics in the past few decades. Household surveys have been promoted by governments, international organizations, academics, and survey groups in many countries, providing useful data for research into various aspects of household finance. Although studies using data from household surveys have provided several important insights about the financial situation and behavior of households in developing countries, some challenges remain. Most



importantly, definition and measurement of variables used in these surveys and studies are sometimes inconsistent or unclear. This problem is acute for the studies using high frequency data, even though such data are much needed for the analysis of short-term behavior of the households for understanding risks, liquidity management, and how they interact with the longer term performance of household enterprises and wealth accumulation of household units.

This monograph proposes a conceptual framework for measurement that is widely accepted and used in other areas, namely corporate financial accounting and national income accounting. We modify the concepts of corporate financial accounting so that the accounts are more appropriate to the study of household finance in developing countries. We impose this modified accounting framework onto an integrated household survey and construct the three main household financial statements accordingly: the balance sheet, the income statement, and the statement of cash flows. Finally, we illustrate the use of the accounts for the analysis of household finance.

### **1.1. THE CHALLENGES**

As emphasized by Campbell (2006), the study of household finance is particularly challenging because household behavior is difficult to measure and households face constraints not captured by standard finance literature, namely participation and diversification constraints. Households also have important non-traded assets, namely their human capital. They also hold illiquid assets, namely land and houses. Although Campbell's argument is based on studies using data from developed countries, a similar argument applies to households in developing countries. Indeed, the study of household finance in developing countries poses yet even more challenges. Many households in developing countries are not simply consumers supplying factor inputs and purchasing and consuming outputs. They are also engaged in production in both farm and non-farm activities. There are often large timing differences between inputs purchased and outputs sold, as for farmers with infrequent harvests; and timing differences

between inputs acquired and revenue received, as for businesses with inventories and trade credits. Thus high frequency data are important for the study of liquidity, the protection of consumption and investment from cash flow fluctuations, and how the households finance the operation of their business activities. We also wish to know the long-run underlying financial situation of these households. How effectively does the household as a business use its assets in productive activities to generate income? What are the rates of return on assets and credit relative to alternative uses?

These issues necessitate the distinction between cash flow as a measure of liquidity and net income as a measure of performance. While this distinction has been at the heart of financial economics for some time, recent events in the US and global financial markets more than remind us of the difference. For corporate firms, liquidity problems causing failures or capital injections are in principle distinct from poor performance, bankruptcies, and inefficient bailouts. In developing economies these problems are compounded by the fact that many households are also running small business, and their consumption and investment are likely nonseparable. How in practice does one draw the distinction between liquidity and performance, even during normal times?

Definitions of income and cash flow are clear in the corporate finance and accounting literature, but how do we apply them to households running business? On the one hand, most surveys of firms do not consider the situation of the owners. Although consumption of shareholders is less relevant for decision making in large corporations with dispersed shareholders, it is tightly linked to the policies of private, closely-held businesses in which the shareholders are the owners and dividends largely contribute to their consumption. On the other hand, Living Standards Measurement Study (LSMS) surveys, Family Life Surveys, and other household surveys in developing countries do recognize both consumption and production activities. Although these surveys are remarkably detailed and ask many excellent questions, they are often unclear about the concept and measurement of income as well as consumption, investment, and financing: What do we mean by *income*? In other words, is income entered at the time of

production or the time of sale? How do we treat multi-period production? What do we do with input costs that come substantially before the eventual output?

We illustrate with some examples. Although the agricultural module in the World Bank's Living Standards Measurement Study questionnaires asks the households several useful questions, its wording or meaning of questions is sometimes unclear. The survey asks about inputs used over a specified cropping season, and the amount spent, equating the two. But for some households these are not equal.<sup>1</sup> If the households used inputs held in previous inventory, then expenditures during the specified season might be recorded as zero. Likewise, inputs purchased during the season may not have been used on the plot. Revenue raises similar timing issues. The LSMS agricultural module asks about production during the past 12 months or the past cropping seasons, and also about sale of any of that product, but sales from product inventory is typically not asked, or at least not clearly distinguished.<sup>2</sup> Other transactions commonly observed in developing economies are also sometimes nontrivial when it comes to an economic analysis of household behavior: How do we deal with consumption of household production, output which is never sold? How are input and output carry-overs entered in the accounts? Where do we put gifts, transfers, and remittances, which are typically thought of as income while they are not clearly associated with a production activity? Aside from measurement errors that naturally occur during any survey, it is crucial that we define variables in such a way that they are consistent with a logical framework, measure them accordingly, and organize them systematically. Indeed, several studies such as Singh, Squire and Strauss (1986) as well as Deaton (1997) discuss

<sup>1</sup> The LSMS questionnaire from the Albanian Institute of Statistics (2005) asks "How much [...] did you use during the past cropping season?" (Module 12: Agriculture, Part D: Inputs, Questions 2 and 3) and "How much did you spend in total for [...] during the last cropping season? (Question 4).

<sup>2</sup> LSMS questionnaire from Reardon and Glewwe (2000) asks "How much of the [...] you harvested during the last two cropping seasons was sold?" (Agricultural Module, Standard Version, Part C2: Disposition, Question 3) and "What price did you get for the [...] you sold?" (Question 4).

various important issues pertaining to the subject of household models and surveys, especially data requirements and implications for data collection.

## **1.2. OUR SOLUTION: CONSTRUCTING FINANCIAL STATEMENTS FROM INTEGRATED HOUSEHOLD SURVEYS**

We argue in this monograph that there is a need to impose an accounting framework on the survey data. As anticipated in the quote in the introduction from Angus Deaton (1997), individual transactions need to be measured in order to construct the overall variables of interest. However, this procedure is not straightforward. Thus, we apply, and modify where appropriate, the standard corporate financial accounting to household survey data as it was invented to deal with various types of both trivial and nontrivial transactions. Corporate financial accounts are also a foundation of national income and product accounts, allowing researchers to link the study of household finance at the micro level to the aggregate macroeconomy.

Specifically, we create the balance sheet, income statement, and statement of cash flows for households in developing countries. The purpose is to better measure productivity, risk, and the short-run and long-run financial situations in an analysis of high frequency but long duration panel data. Although measurement errors from the survey still remain in the accounts, the accounting framework with book-keeping and integrated accounts helps one detect errors and think through the multiple places where the errors would enter. For example, unreported cash expenditure on food implies that consumption in the income statement is underreported and cash holding and wealth in the balance sheet are overstated.

What emerges is an analogy between households and corporate firms. For example, household wealth can be viewed as equity, consumption as dividends, gifts as equity issue, and the household budget constraint as the firm cash flow constraint. We distinguish savings as budget surplus in the cash flow statement versus savings as wealth accumulation in the balance sheet. Likewise we distinguish

the liquidity management of the budget deficit from asset and liability management of wealth accumulation.

We use an existing high frequency household survey that contains a series of detailed questions to create the line items of each of the financial statements. We do this by identifying for every single transaction exactly how it enters into the balance sheet, income statement, and statement of cash flows. This procedure had to be done at least initially on a household-by-household and period-by-period basis. There are many nontrivial decisions concerning multi-period production activities, storage, inventories, livestock aging, loan repayments, barter transactions, gifts and transfers, consumption of household-produced outputs, and other intra-household transactions, for example.

More specifically we use data from the Townsend Thai Monthly Survey, a monthly survey covering 16 villages and approximately 700 households in rural and semi-urban areas of Thailand. First, we deliberately selected two distinctive households with both typical and unconventional, challenging transactions. We created the accounts for these households by hand, as we conceptualized the problem and made decisions. Then, with our conceptualization, we automated the procedure for all households in the survey, using computerized codes to create the accounts. Much of this manuscript contains a discussion of the issues and the particular decisions we have made. We place a great priority on clarity and a systematic treatment, though we are open about particularly challenging transactions and alternatives to what we have done. Essentially, for some of the nontrivial transactions, the financial accounting framework forces us to make arbitrary decisions and be clear about them. This is an important contribution of this monograph as otherwise there would be ambiguity in the concepts and measurement. Others may disagree with some of our arbitrary decisions. However, we still encourage them to impose the accounting discipline of bookkeeping onto the survey data, as we argue for its advantages below.

Obviously, creating household financial statements is not the only method that can be used to study financial situations and behavior of the households in developing countries. There are studies on

consumption smoothing, financing of household investment, and productivity of household production activities that do not rely on an accounting framework. We argue however that using corporate financial accounting as a conceptual framework for an analysis of household finance does have several advantages.

First, corporate financial accounts help the researcher better define financial variables. As argued earlier, financial accounting clearly distinguishes between accrued income versus cash flow and savings as wealth accumulation versus savings as budget surplus. It also clarifies the distinction between household assets and household wealth (equity), hence leading to the difference between returns on assets and returns on wealth. Financial accounting also helps researchers systematically categorize many sub-items of the main variables in each account. For example, total assets of a household consist of cash, account receivables, deposits at financial institutions, other lending, inventories, and fixed assets. Liabilities include account payables and other borrowing. Wealth is from cumulative savings and gifts received. Net income is the difference between total revenue and total expense, and is spent on consumption or saved. Financing comes from cash in hand, deposits at financial institutions, rotating savings and credit association (ROSCA) (recalls of) lending, borrowing, and gifts received. Clear definitions of the variables of interest in turn help improve the clarity of the survey questionnaire, especially for delicate issues that arise in the wording of the questions, e.g. the ambiguity in the LSMS agricultural module we discussed earlier. The accounting framework helps us design questionnaires that distinguish between the timing of acquisition, uses, harvests, and sales of inventories.

Second, another advantage of corporate financial accounts is that, by definition, financial statements have to reconcile across accounts. Specifically, we use three accounting identities to confirm that the accounts are constructed correctly: (1) In the balance sheet, household total assets must equal the sum of household total liabilities and household wealth. (2) An increase in household wealth from the balance sheet must equal the sum of gifts received and household savings, where gifts received are from the statement of cash flows, and savings are the difference between accrued net income and household

consumption from the income statement. (3) The net change in cash from the statement of cash flows must equal to the change in cash from the balance sheet. With these balanced accounts, we do not have a problem commonly encountered in other multi-topic surveys, that a variable generated from one set of questionnaire responses yields a different value when computed from an alternative set of responses. For example, Kochar (2000) reports that household savings in the LSMS surveys computed as household income minus consumption is different from household savings computed from change in household assets. Obviously, one of the possible explanations is that the change in household assets could be financed from an increase in household liabilities in addition to household savings. Another is that the cash flow concept could be implicit in the first measure of savings while accrual concept was used in the second. The rigorous accounting framework guarantees that various ways to compute the same variable give us identical result or makes clear that they are not the same variable after all.

Third, financial accounts provide us with a simple way to apply the standard financial accounting analysis to the study of household finance. In fact, we illustrate this financial analysis in chapter 5 with two case study households. We present returns on household assets and wealth, various measures of risk and liquidity, financing mechanisms of consumption and investment, as well as wealth management strategies of these two households. In addition, for economic modeling, financial accounts allow us to apply theories and empirical strategies in the finance literature to the study of parallel issues for households. These theories include capital structure and the financing of fixed investment, dividend payouts, liquidity management, portfolio allocation, performance of assets, and trade-off between risks and expected returns. We present one of these possible applications in chapter 6, analyzing liquidity constraints, kinship networks, and the financing of household investment. We also discuss other possible modeling of households as corporate firms in chapter 7.

Finally, although not explicitly illustrated in this monograph, applying standard corporate financial accounting to households and their business enterprises allows the researcher to have consistent metrics

that can be used to compare and contrast the performance and financial situations of small and medium household enterprises with the performance and financial situations of larger corporations. For example, how representative of the business sector of an economy is the data from large corporate firms? To answer this question, the performance and financial situations must be measured in the same way. Moreover, as we argue in chapter 2, corporate financial accounting defines the measure of accrued income from household enterprises in such a way that the line items can be used to yield the value added from production. This measure is thus consistent with the definition of national income in the National Income and Product Accounts (NIPA). In fact, the private enterprise income account of NIPA is derived precisely from the standard corporate income statements of business enterprises. Therefore, these household financial accounts can be used to estimate the contribution of small household enterprises to GDP and to study the microfoundations of the aggregate macroeconomy more generally.

### **1.3. WHAT WE LEARN: SOME FINDINGS FROM THE TOWNSEND THAI MONTHLY SURVEY**

As mentioned in the previous section, we apply our conceptual framework to the Townsend Thai Monthly Survey to illustrate how we construct financial statements, and how we use the accounts in an analysis of household finance. We demonstrate two different, but complementary, approaches to the analysis of household finance. First, in chapter 5, we conduct a financial analysis of two illustrative case study households: a relatively rich retailer and a relatively poor farmer. Second, we use regression analysis to study liquidity constraints and the financing of household investment in chapter 6. The case study approach is of course the one used by financial analysts and creditors, as one wants to know how well, or how poorly, a given firm or household is doing. The findings from the case study method are likely to be specific and may not be general so we supplement each finding from these two households with the quartiles from their corresponding provinces.



These supplementary statistics not only allow us to make comparative statements of the case study households relative to others in the same region, they also give us important summaries of key statistics in the Townsend Thai data. Regression analysis, on the other hand, provides us with some structure and hypothesis testing of neoclassical benchmarks using the entire sample of households, but of course this approach foregoes the details of the behavior of individual households.

The application of the accounts reveals some interesting findings regarding households as entrepreneurs in a developing economy. Although the detailed discussions are in chapters 5 and 6 of this monograph, we highlight some of the findings here.

First, there is a relatively large dispersion of the average rates of return on assets across households (even after the returns are adjusted for household labor and risks, as discussed below). Relatively poor households seem to have higher rates of return. We can decompose rates of return into a profit margin ratio and an asset turnover ratio, to get a sense of different business strategies, as in industrial organization and microfinance literature.

Second, for some households, the rate of return on assets can be substantially different from the rate of return on wealth (or equity) of the household, especially for households with high levels of debt relative to wealth. For others, the small difference between return on assets and return on wealth would indicate that debt levels are relatively low, likely because either there are credit market imperfections or such households appear unwilling to borrow.

Third, the returns on assets drop dramatically when we subtract off imputed opportunity costs of household labor. The variation in the rates of return remains. Further adjusting for risk premia suggested by the Capital Asset Pricing Model (CAPM) lowers the return of some households relative to their position in the cross-sectional distribution of households in the village if their returns are highly covariate with the village average. Poor households seem to have higher risk-adjusted return than rich households.

Fourth, income volatility is high. Cash flow highly fluctuates, much more so than accrued income. Consumption is smoother, however,