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The Indian Household Finance Landscape[§]

ABSTRACT Using the most recent wave of the All India Debt and Investment Survey data, we describe and attempt to explain several important features of Indian household balance sheets. When compared with data on households in a range of developed and emerging economies, Indian households, on average, tend to hold a high fraction of non-financial assets with particularly high relative weights in real estate and gold, hold negligible retirement assets, and rely on non-institutional debt as their primary source of debt. These propensities are also evident along the life cycle, as well as at almost all points in the wealth distribution, and correlated with location (rural versus urban), education, and family composition. Controlling for demographics, substantial state-level variation remains in asset and debt holdings which is related to state-level factors including historical inflation volatility, the share of the population in public sector employment, and the density of bank branch networks. We discuss the potential implications of these results for policy.

Keywords: *Household Finance, Household Balance Sheet, International Comparisons, India, Gold, Indebtedness*

JEL Classification: *G21, N20, R21, R31*

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1. Introduction

In theoretically well-functioning economies, agents efficiently save and borrow to meet their lifetime goals and perfectly smooth consumption over their life cycle (see, for example, Campbell 1987; Friedman 1957; Hall 1978). To facilitate any transactions that may be necessary to achieve these goals, the financial system provides instruments such as deposits, bonds, equities, and retirement savings accounts to allow households to accumulate and easily access assets, as well as mortgages, and other secured and unsecured debt instruments to enable borrowing against future income streams or pledged collateral. Optimizing agents resident in these hypothetical economies are adept at using these instruments to achieve their goals and to insure themselves against adverse economic shocks.

In reality, however, economies are far from this utopian ideal. Households may be inhibited from participating in the financial system for a number of reasons, including missing markets for particular financial instruments, fraud or malfeasance that generates trust gaps between the sellers and buyers of financial products, or high transactions costs that impede access, in particular, for relatively poor households. And even when households do participate in financial markets, the complexities of optimization, combined with limits to household cognitive capacity, can generate negative financial outcomes rather than the optimality promised in theory. While such potentially adverse consequences for household welfare are an important issue on their own, it is also worth noting that in models ranging from simple Harrod–Domar formulations (Domar 1946; Harrod 2007 [1939]) to more sophisticated formulations such as Lucas (1988), Romer (1986 and 1989), and Mankiw et al. (1992), household decisions directly affect a country’s economic growth, when accumulated savings are transformed into productive investments in physical and human capital (see Deaton 1999 for an excellent survey).¹

In this paper, we describe and attempt to explain patterns in Indian household balance sheets, using data from the latest wave (2012) of the All India

1. The international evidence suggests that domestic resources are particularly important in this context, as domestic saving and domestic investment rates appear to be highly correlated (Feldstein and Horioka 1980). Empirically, Prasad, Rajan, and Subramanian (2007) present evidence that a reduced reliance on foreign capital is associated with higher growth, which further lends credence to the reliance on domestic savings in emerging economies.

Debt and Investment Survey (AIDIS).² By interrogating these data, we hope to glean insights about the extent to which Indian households efficiently participate in financial markets to achieve their lifetime objectives, or may be inhibited in doing so by inadequacies of the supply side, or by a lack of optimizing behavior on the demand side. While we do not explicitly compare household allocations to the prescriptions of a model in this exercise, we provide some benchmarks for evaluation by adopting an international comparative approach (see Badarinza, Campbell, and Ramadorai 2016), comparing the balance sheets of Indian households to those of households in a range of other countries in an attempt to document similarities and differences. Guided by these differences, we construct hypotheses and explore the specific factors driving Indian household decisions using a series of simple empirical tests. We then consider a number of possible policy prescriptions arising from our results.

Our paper makes four specific contributions, which are as follows: (a) we carefully document the composition of Indian household assets and liabilities along the life cycle as well as across the wealth distribution; (b) we compare these patterns to those of households in a range of advanced countries, as well as China, using detailed micro-data from household surveys in these countries; (c) we find several attributes of Indian households that are exceptional in the international context (as we describe below) and correlate these patterns with demographic characteristics; and (d) we find evidence that even after accounting for household demographic characteristics, considerable residual variation remains, which we connect with institutional factors including state-level variation in inflation uncertainty, financial access as proxied by the density of bank branch networks, and proxies for government-mandated participation in retirement savings plans.

We find that the balance sheets of Indian households appear distinct from those in other economies in a number of important respects. Three

2. We use the AIDIS to document patterns in Indian household finance as several committees in India have looked into the nature of aggregate household savings using macroeconomic data available through the National Accounts Statistics and raised concerns about data gaps, measurement challenges, and estimation error (Kaur 2011; Rangarajan 2009), suggesting that the use of micro-data (of which the best publicly available source is AIDIS) will help provide complementary and possibly more accurate evidence. In addition, many important distributional questions can only be addressed using micro-data, especially to document the role of demographic characteristics in household financial decisions (for example, age, education, and wealth).

significant attributes that are unusual in the international context are as follows: (a) Indian households allocate a high share of their wealth to physical assets, and in particular, to gold; (b) a substantial fraction of Indian household debt originates from non-institutional sources, and there is an unusually high reliance (especially in a subset of states) on loans secured with gold; and (c) Indian households have amassed a comparatively low stock of retirement assets.

Of course, some of these features of Indian balance sheets are plausibly explained by broad factors such as the overall state of financial development in the country. For example, American and European households invest significantly more than households in emerging markets in financial assets, partly on account of their significantly higher discretionary and mandatory retirement asset holdings (in both defined benefit and defined contribution schemes).³ Along the same lines, we find that the ratio of Indian households' physical asset holdings to financial asset holdings is broadly similar to that of Chinese households, with a substantial fraction (about 90 percent) of wealth in both countries held in real estate and other non-financial assets.

However, some of these patterns are difficult to explain by appealing to such macro-factors. For example, household gold holdings in India are exceptionally high when compared to those in China. This issue of excessive gold holdings has been a cause for concern among Indian policymakers for sound reasons. For one, there is the issue that much of Indian gold is imported, with important implications for the current account deficit.

Another important theoretical reason is that models in which savings predict growth connect savings with productive investments, which are more easily mapped to financial savings rather than to stores of value such as gold. One focus of our analysis, therefore, is to attempt to explain this puzzlingly high allocation to non-financial assets, leaving for future work an analysis of asset allocation patterns within the group of financial assets.⁴

While these facts describe the average Indian household's behavior, we also find that there is a great deal of cross-sectional variation in the composition of Indian household balance sheets. This cross-household variation

3. In India, there has been a long-standing problem of encouraging broad participation in pension schemes and incentivizing households not to liquidate retirement savings prior to formal retirement (see, for example, Shah 2006).

4. This is currently an active area of investigation. For example, Campbell, Ramadorai, and Ranish (2014) and Anagol, Balasubramaniam, and Ramadorai (2015 and 2016) explore Indian households' equity portfolio allocations using detailed micro-data, and Anagol and Kim (2012) study the impact of shrouded fees in the mutual funds market.

has a significant correlation with household demographic characteristics. For example, household allocations to physical assets decrease significantly with the level of education, but counterintuitively appear to increase with wealth. Within the set of physical assets, despite the fact that the share of wealth invested in gold falls as wealth rises, this is virtually entirely offset by an increase in the share of real estate in the portfolio, leaving the total physical asset fraction relatively unchanged. However, there is an effect of education, which is associated with an increase in the share of wealth allocated to financial assets and a reduction of borrowing from non-institutional sources. The role of education is a more important explanatory variable for the ratio of non-institutional borrowing to borrowing from more formal sources than the position of the household in the wealth distribution or the age of the household. We also find substantial variation in the composition of household balance sheets that is associated with household location (whether they are in urban or rural areas), and with the number of children in the household, which suggests the role of cultural factors in Indian households' savings and debt decisions.

Even after controlling for demographic characteristics, we find substantial residual variation in the ratio of gold to total assets, the ratio of pension funds to total assets, and the incidence of non-institutional lending. We are able to capture a significant amount of this variation using state-level fixed effects, which is useful, since it allows us to condition on variation in economic and institutional factors at the level of states. This allows us to establish interesting correlations and surmise (though without being able to claim causality in our essentially descriptive analysis) about changes to policy that might be of use in promoting better financial health among Indian households. The fact that regional factors play an important role in explaining the composition of Indian households' balance sheets also raises the possibility that there is intra-India variation in the cultural predisposition of households to make particular allocation decisions.⁵

An article of faith in the popular press is that Indian households hold gold because they perceive it to be an inflation hedge,⁶ and we explore the extent to which such hedging motives explain Indian households' propensity to hold gold. It is worth noting that we do not take a stand on whether this perception is indeed accurate, while also noting that the literature has cast

5. For example, we find that gold holdings in southern Indian states are substantial, which accords with casual empiricism about the cultural and religious significance of gold in these regions of the country.

6. See, for example, *Livemint* (2013) and Adappa (2016).

considerable doubt on this view (see, for example, Erb and Harvey 2013; Feldstein 2009). Our empirical specifications use the fact that Indian states, over the period of study, are not a single integrated market for goods given the considerable variation in state-level taxation as well as numerous non-tariff barriers to trade including high transactions costs and the difficulty of establishing supply chains (see, for example, Virmani and Mittal 2006). This means that there is significant cross-sectional variation in historical inflation rates across Indian states. We find that state-level gold holdings ratios are associated with higher experienced inflation volatility, and that the relationship becomes stronger when we condition on households that experienced historical inflation during their working years, in an analysis similar to that of Malmendier and Nagel (2011). We also find that the cross-sectional variation in the impact of inflation volatility on gold holdings is somewhat offset by a corresponding decrease in state-level household allocation to real estate, meaning that the total impact of experienced inflation volatility on the physical asset holdings ratio is flat. This finding suggests that inflation hedging motives may be important for explaining the lure of gold for Indian households, though our results suggest that such motivations appear to mainly affect the intensive margin within the set of physical assets in the household's portfolio.

Our next finding is that household savings for retirement tend to be higher in areas where a higher share of the population is employed in the public sector. Employment in the organized sectors of the economy is governed by labor laws in India that also mandate retirement savings. Since data on the fraction of population engaged in the organized sectors of the economy across Indian states are unknown, we use the share of public sector employment in the economy as a proxy for total organized sector employment. While there are certainly other possible interpretations of this result, we view these findings as suggesting that marginal participation rates in retirement savings observed across different states may be driven by such compulsory participation requirements, suggesting that the international literature on the effectiveness of mandatory pension rules and formal default options on pensions savings outcomes (see Choi et al. 2003) may also be of great relevance in the Indian context.⁷

7. We also note that this finding could be upwardly biased, owing to the fact that private sector employees have access to the option of early withdrawal from the Employees' Provident Fund (EPF) scheme whereas government employees, over the period of study, did not have a prematurity withdrawal option from either the National Pension Scheme (NPS) or the Traditional Civil Servants Pension (TCSP). If so, this potentially strengthens the case for formal default options with no option for early withdrawal prior to plan maturity.

We then turn to the relatively high share of non-institutional debt in Indian household portfolios at the state level. We relate the state-fixed effects for this share, cleaned of household-level demographic variation, to state-level variation in the density of bank branches. We show that financial access as proxied by bank branch density is negatively associated with the share of non-institutional debt in the overall portfolio of household loans. While our specifications do not permit causality to be strictly established, they are consistent with the hypothesis that increasing access to sources of formal debt could affect the behavior of households by facilitating better product choices, substantially decreasing the costs of debt service, and allowing for an improved allocation of resources along the life cycle.

Our work is related to a number of previous papers. A relatively large previous literature using survey data focuses on the credit or liabilities side of the Indian household balance sheet, including household indebtedness, access to formal sources of credit (Burgess, Pande, and Wong 2005; Cole et al. 2013), and alleviating credit constraints (for most recent work using survey data, see Pradhan 2013). A number of authors have done excellent work on household savings using earlier versions of the AIDIS that we use here (see, for example, Divatia 1976; Subramanian and Jayaraj 2006; Vaidyanathan 1993) and have also documented the pattern of a high relative allocation to physical assets. However, the focus of these papers has tended to be on the contribution of household allocation patterns to broad distributional questions, including wealth inequality, in contrast with our focus on household finance, meaning that for the most part, the literature has not attempted to explain the patterns in Indian household balance sheets using demographic characteristics or other factors.⁸ Moreover, we also compute estimates from a range of other countries in our paper, in an effort to contrast micro-data on households from these countries with the patterns detected in the AIDIS data. Finally, our work also forms part of the emerging literature on household finance in India, which has thus far tended to focus on and carefully document concerns related to consumer protection in Indian financial markets (Gaurav, Cole, and Tobacman 2011; Halan and Sane 2016; Halan, Sane, and Thomas 2014) and financial inclusion (Sane and Thomas 2015 and 2016).

8. Interestingly, while Subramanian and Jayaraj (2006) focus on wealth inequality across different categories of asset holdings, the paper does not take into account the fact that households choose the fractions of their total savings that they hold in different types of assets.

Our findings lead to a few potentially useful policy prescriptions. The first important finding is that even after controlling for a wide range of household characteristics, experiencing periods of high and volatile inflation, especially when young, is associated with households' propensity to hoard gold. The effect of this experience is considerable, comparable in magnitude to the effect of having children. The long-lasting nature of the impact of such experiences on asset allocation considerably strengthens the case for a strong inflation target to tackle inflation volatility at its source, in addition to strengthening the case for solutions recently put in place such as the RBI's gold monetization and gold bond schemes.

Our second important finding is that there is a strong positive effect of education on Indian households' allocation to financial assets, as well as a strong negative effect on their propensity to take on non-institutional debt, even after controlling for a range of demographic characteristics. This suggests that improving the quality of Indian households' financial decision-making will be a significant determinant of their lifetime outcomes. This could be achieved using a number of policy instruments, including consumer financial regulation and other targeted policy interventions (see Campbell 2016). However, there is clearly also a role for solving demand-side problems. Numerous authors have found a positive effect of financial education (see Lusardi and Mitchell 2009); however, this is just a necessary first step and best thought of as complementary to modern financial product design through nudges (Thaler and Sunstein 2008), peer information (see Beshears et al. 2015), and the design of default options (see Choi et al. 2003).

The largest untapped potential may lie, however, in the area of innovations in financial technology (see Karlan et al. 2016 and Philippon 2016). Gaps in the use of financial services by Indian households, their heavy accumulation of non-financial wealth, and intense reliance on high-cost unsecured debt appear to be opportunities for the future growth of household finance in the country. The challenge that remains is for the financial market to be able to tap into this potential by leveraging technology and for the regulator to ensure that Indian households benefit from fair competition in this emerging area. The remainder of the paper is organized as follows. Section 2 presents the data used in this paper, Section 3 characterizes the composition of Indian households' balance sheets, Section 4 explains the heterogeneity in patterns of allocation using data on household characteristics, Section 5 considers the relationship between state-level factors and residual state-level variation in household balance sheets, and Section 6 concludes.

2. Data

2.1. Macro-data and Micro-data

Before describing the household-level micro-data that we use in our analysis, we note that macroeconomic data estimate gross savings using a residual approach in the construction of the national account statistics and uses assumptions that often generate significant inaccuracies, especially when it pertains to statistics about the household sector. Furthermore, these estimates are often made under severe data constraints.⁹ For instance, the total savings in cash on hand for the household sector is determined as a proportion of the total currency in circulation and is currently set at 0.93. This proportion has been used since 1985 to determine the cash on hand with the household sector. The CSO notes in its documentation that, “this proportion is likely to undergo change as soon as more data based on the survey results of the RBI become available.”¹⁰ These problems with macroeconomic data are well documented by various high-level committees. Both the sub-group on household sector saving of the Working Group on Savings for the Twelfth Five-Year Plan (2012–13 to 2016–17), Kaur (2011), and the High Level Committee on the Estimation of Savings and Investment set up by the Ministry of Finance (Rangarajan 2009) note that there are weaknesses mainly due to data quality, data gaps, and estimation problems with respect to determining aggregate savings (for the economy as a whole and for the household sector) in India.

9. Direct estimates of household saving and its composition are not available in India as it is a sector comprising not only households but also non-government, non-corporate enterprises of farm business and non-farm business such as sole proprietorships and partnerships, and non-profit institutions. India does not have income–expenditure surveys that normally form the basis of analysis for savings and investments, and such surveys are not conducted for all these components of the household sector in India. Household financial savings are calculated as the sum of annual increase in financial assets net of increase in financial liabilities. The financial savings of households are estimated as residuals from the flow of funds accounts, compiled by the Reserve Bank of India. The Central Statistical Organisation (CSO) estimates household investment in physical capital (using another residual method) and this is defined as physical savings. Net addition to fixed assets include: investment in fixed assets of construction and machinery, equipment, and change in stocks. The residual approach for physical investments proceeds as follows: The CSO estimates total physical capital formation and then deducts estimates of public and private corporate sector investments from the total. The remainder is considered physical savings.

10. See <http://goo.gl/bByvID>, accessed June 7, 2016.

This does mean that for one of the main issues that we consider, the ratio of physical to total assets (which we term the “non-financial ratio” in the remainder of this paper), macroeconomic and household data show different patterns. Having said this, the broad patterns are similar across the two sources.¹¹ Broadly speaking, India’s aggregate savings rate is comparable to that of emerging economies such as Indonesia, Thailand, and South Korea and substantially higher than in most developed countries.¹² While the aggregate gross savings rate in the economy has been growing in the long historical context (see Mohan and Kapur 2015, for example), over the past several decades, this rate has levelled off at about 20 percent of GDP. When these savings are decomposed into those in physical assets (such as gold and real estate), as opposed to those in financial assets (in claims such as deposits, debt, and equity), a striking feature of the data is that Indian households have greatly favored physical over financial assets. To be more specific, in 2011–12, nearly 70 percent of aggregate annual household savings flowed into physical assets.¹³ The ratio of physical to financial asset holdings (the sum total of historical accumulated savings) for the average household are much higher, reflecting the fact that this allocation of savings flow to physical assets is a long-standing issue.

The implications of this phenomenon are non-trivial. In every period, households allocate limited resources to different saving vehicles, some of which are non-productive and solely serve as a store of value (for example, gold). However, both the households’ current income and welfare, as well as the productive capacity of the economy are determined by the accumulated stock of wealth, for example, the aggregate stock of household capital available for productive purposes. The current economic situation of Indian households, as reflected by their wealth holdings, is the product of decades of individual decisions taken within a wider macroeconomic

11. The differences in computing the non-financial ratio using micro and macro-data sources are similar to the discrepancy between per capita consumption expenditure estimated using National Accounts Statistics and the National Sample Survey (NSS) in India. For instance, see Ravallion (2003), Srinivasan (2000), and Sen (2000). Sundaram and Tendulkar (2002) seek to explain the discrepancy by looking into the consumption basket measured in micro-surveys and document the differences with the macroeconomic data.

12. World Bank data on the saving rate in economies ranks India at 37th out of 164 economies in 2014. See <http://goo.gl/sep5tP>. However, this aggregate saving rate is much lower than that of China whose saving as a percentage of GDP stands at 50 percent (ranked 9th).

13. In 2013, press reports highlighted that the rise in the share of physical savings seemed to have stalled. For instance, see <http://goo.gl/C7tkAg> and <http://goo.gl/crivp2>. However, the levels of these shares are still significant.

context and strongly influenced by social norms and personal experiences. This paper proposes a disaggregated micro-level view of both wealth and liabilities that enables us to map the Indian household finance landscape and to understand the underlying factors that determine product choice and allocation decisions.

2.2. AIDIS Data

Our main data source for this study is the NSS's AIDIS that records asset holdings as of June 2012 for households in India.¹⁴ AIDIS is a decennial survey conducted by the National Sample Survey Office (NSSO) since 1971, with a roughly 0.01 percent sample of the Indian population, through a multi-stage design that is adopted in all NSS data collection exercises.¹⁵ We observe demographic information such as the gender of the head of the household, age, education level, the number of children, the household sector (rural/urban), and the location of residence (state–region–district). To exclude the possibility that outliers drive our results, we drop observations for which the household head is younger than 24 years of age.

Over and above demographic and household characteristics, on the asset side of the household balance sheet, this survey records information on land holdings, buildings, and other constructions owned, livestock and poultry, transport equipment, farm equipment, non-farm business equipment, financial assets such as shares and debentures, bank deposits, insurance, pensions and other financial assets, amounts receivable for services rendered, and gold holdings. While other surveys such as the India Human Development Survey (IHDS) contain information about participation or ownership of different asset types, to the best of our knowledge, AIDIS is the only data source that provides explicit valuation of all assets held by households in great detail.

Some of the assets in AIDIS are valued not merely by asking respondents what the value of the asset is, but by government records of these assets. For instance, to assess the value of land, AIDIS records land acquired prior

14. Liabilities of the household were recorded in June 2012 and June 2013 depending on the visit during which this information was recorded.

15. A stratified multi-stage design has a First Stage Unit (FSU), consisting of the census villages (as of the 2001 Census) in rural areas, and Urban Frame Survey (UFS) blocks in urban areas (as of the 2007–12 list). Further, within these FSUs, the “Ultimate Stage Units” (USUs) are households. Should any of the FSUs be large, an additional intermediate stage of sampling using sub-blocks (hamlet groups in case of rural areas) is used. For more details, we refer to the NSS (2012) Handbook on Survey Design and Definitions available upon request from the authors or directly from the Ministry of Statistics and Programme Implementation, Government of India.

to the survey year on a guideline basis: these are valuations obtained from *patwaris* (village government accountants) for rural areas and the registrar's office (where land transactions are registered) in urban areas. It is important to note that these valuations are, in general, the lower bound of the value of these asset holdings, as the market prices of land are almost always higher, and the registered prices of land transactions are often understated to avoid paying stamp duty and state government taxes. For buildings, a similar approach is adopted and floor area prices are computed using government registration records. Residential building values exclude the value of the land on which the building is constructed and are thus not inclusive of the value of land recorded separately. For all other asset valuations, the value as stated by the respondent for the household is recorded.

For our purpose, we classify financial assets to include shares and debentures, all types of deposits, saving schemes, annuity schemes, provident fund, pension fund, NPS, other contributory funds, and payments receivable by the household. Likewise, non-financial assets include real estate assets (including land and buildings), durable assets and equipment (including livestock and poultry, transport equipment, agricultural machinery, non-farm business equipment),¹⁶ and finally holdings of gold/bullion.¹⁷ The survey also provides the sampling weight of each observation. The empirical measure of interest is the non-financial ratio and its sub-components, that is, the fraction of total assets that are held in non-financial, physical form, and in categories such as real estate and gold. Although this is the best source of data on the asset composition of households in India, there are some important limitations to keep in mind while interpreting the data. For example, the valuations of real estate and buildings are likely to be understated by official sources across the distribution and not just for one or the other household.¹⁸ As reiterated in Jayadev, Motiram, and Vakulabharanam (2007) and Brandolini et al.

16. Business assets are included at market value and no residual value is attached to goodwill and other non-tangible equity.

17. Although the survey collects information on gold and bullion, and classifies them as "financial" assets, our rationale behind this classification is also based on the liquidity in the asset market to which each asset belongs. Gold in India is physically held and not traded frequently.

18. The extent to which asset holdings in land, buildings, and gold are understated is difficult to assess for lack of alternate and better sources of information on such asset holdings. Having said that, Subramaniam and Jayaraj (2006) document that it is likely that some households (especially in the upper tail of the wealth distribution) understate their real estate holdings for fear of being reported for potential tax implications.

(2004), unless conscious efforts are made to oversample the wealthy, the extent of financialization of wealth will be misrepresented.¹⁹

Turning to liabilities, all types of personal liabilities are captured as amounts outstanding in June 2012. There are two broad categories of loans: secured and unsecured. Secured loans cover the following collateral types: surety security or guarantees by third party, crops, immovable property, gold/bullion/ornaments, shares of companies, government securities, insurance policies, and agricultural commodities. For each loan, we also know the type of the originating agency, which allows us to classify debt holdings as institutional (originated by government agencies, cooperative societies, banks, insurance companies, bank-linked self-help groups, non-bank financial companies) and non-institutional (originated by landlords, agricultural and professional moneylenders, input suppliers, relatives and friends, doctors, lawyers, and other professionals).

2.3. International Micro-data

We construct analogous measures for other countries for international comparison. We use the China Household Finance Survey (CHFS; 2012); the Household, Income and Labour Dynamics in Australia (HILDA) Survey (2010); the UK Wealth and Assets Survey (WAS; 2012); the Eurosystem's Household Finance and Consumption Survey (HFCS; 2010) for Germany; and the US Survey of Consumer Finances (SCF; 2010).²⁰ It is important to note that different surveys cover different asset categories and with different degrees of precision. To ensure comparability across countries and consistency with the structure of the Indian dataset, we pool asset categories with similar features.

One notable difference between India, China, and the remaining countries concerns holdings of private retirement savings in defined-contribution accounts. In the US, the UK, Australia, and Germany, such products have been robust fixtures of financial markets for decades. Most of the population relies at least partially on such private products to finance consumption in retirement, and respective household surveys adequately account for this observation. On the contrary, defined-contribution savings accounts are only held by a small part of the population both in China and India.

19. Income levels are not adequately captured by the survey. We use the age of the household head and their highest completed education level as proxy measures to capture the evolution of income along the life cycle and the distribution of income across households.

20. The US SCF was the first to capture detailed categorization of household balance sheets on a large scale and for representative cross-sections of the population. In this study, we report results based on the 2010 wave, which is the closest point in time to ensure comparability with the Indian micro-level data.

2.4. India: State-level Data

The state-level inflation data for this study is drawn from the Labour Bureau and uses the consumer price index (CPI) (Agricultural Workers [AW]) inflation as representative for all sampled households.²¹ The correlation between CPI (AW) and CPI (Industrial Workers [IW]) is high at 0.92 for the period during which the data is available. Since CPI (AW) is available for a longer time period to capture volatility experience, we use CPI (AW) for analysis. Finally, we measure financial access by using the Branch Banking Statistics of the RBI, in particular its Table 3, “State/Union Territory-wise Number of Branches of Scheduled Commercial Banks and Average Population per Bank Branch.”

3. International Comparative Approach

3.1. The Structure of the Household Balance Sheet

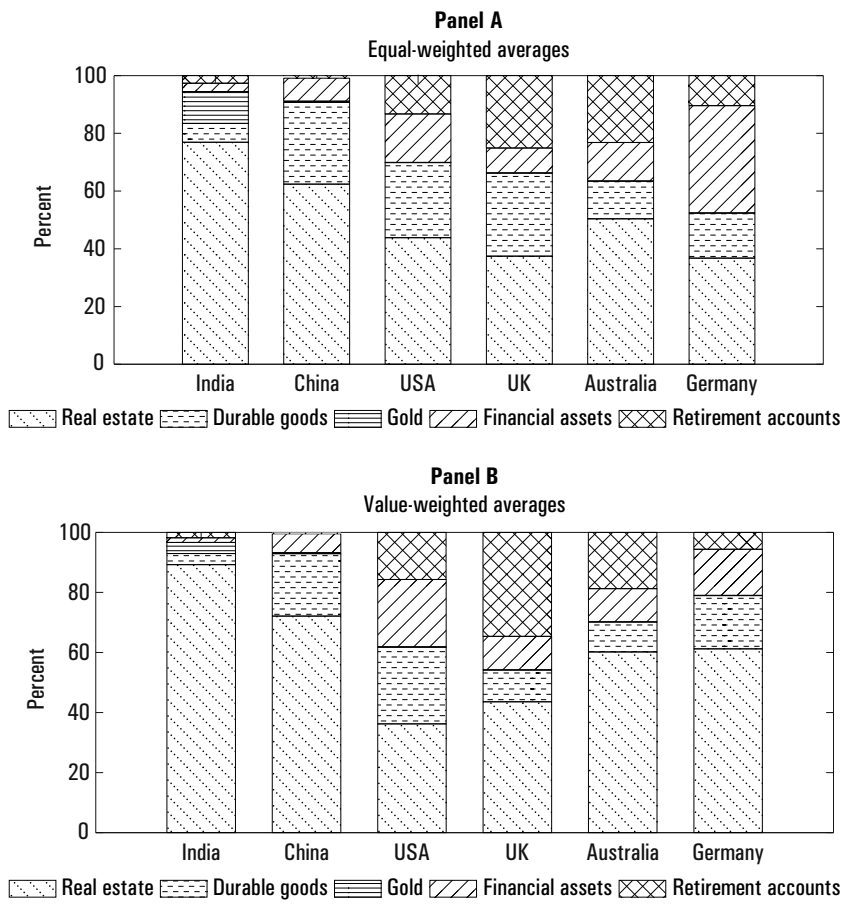
We begin by comparing the average allocations of household assets across different countries in Panel A of Figure 1. In India, the average household holds 77 percent of its total assets in real estate (which includes residential buildings, buildings used for farm and non-farm activities, constructions such as recreational facilities, and rural and urban land), 7 percent in other durable goods (such as transportation vehicles, livestock and poultry, agricultural machinery, and non-farm business equipment), 11 percent in gold, and the residual 5 percent in financial assets (such as deposits and savings accounts, publicly traded shares, mutual funds, life insurance, and retirement accounts). Non-financial assets, therefore, account for 95 percent of the household balance sheet, which is only slightly higher than the corresponding 91 percent for Chinese households. However, the average Chinese household has a relatively lower share of real estate wealth (62 percent), a higher share of durable assets (28 percent), and negligible amounts of gold (0.4 percent). Furthermore, household allocation choices are very different in India and China when compared with more advanced economies. On average, holdings of real estate account for low fractions of wealth in countries such as the US (44 percent) and particularly Germany (37 percent). Instead, retirement assets account for relatively large shares of wealth in Australia (23 percent) and the UK (25 percent).

Panel B of Figure 1 presents the value-weighted average allocations of household assets across countries. Value-weighted quantities are calculated

21. We thank Suyash Rai and Milan Vaishnav for providing us with the cleaned monthly CPI (AW) series for each state by taking the average of all centers available in each state.

FIGURE 1. Allocation of Household Wealth

In this figure, we compare the average allocations of household assets across countries. The data sources are the AIDIS (2012 wave), the Eurosystem's Household Finance and Consumption Survey (HFCS), the US SCF (2010 wave), the CHFS (2012 wave), the Australian HILDA (2010 wave), and the UK WAS (2012 wave). For consistency, in the CHFS, we classify business loans that originated with banks as secured loans and informal private loans as unsecured. In Panel A, we compute averages across households using population weights, as indicated in each survey. Additionally, in Panel B, we present the value-weighted averages across households.



by summing up the different types of assets across all surveyed households, appropriately weighted to ensure that the result is representative for the entire population. The resulting ratios of financial and non-financial assets relative to the sum total of household wealth, therefore, reflect the aggregate composition of asset holdings for the country as a whole. They are,

however, unrepresentative of the way in which the total wealth of the country is distributed among the population. That being said, the resulting pattern is quite similar to the equally weighted average allocations and suggests that Indian and Chinese households are heavily skewed toward real estate assets in their wealth composition, in contrast with the greater prevalence of financial assets in developed economies. The overall value-weighted non-financial assets ratio (the sum of real estate, durable goods, and gold holdings relative to total assets) is highest in India (96.6 percent) and only slightly lower in China (93.3 percent). At the other extreme, non-financial assets account for only 54.2 percent of total household wealth in the UK. Despite high rates of home ownership, which are also partially stimulated by government intervention (such as in the US), the overall role of real estate remains lower in advanced economies.

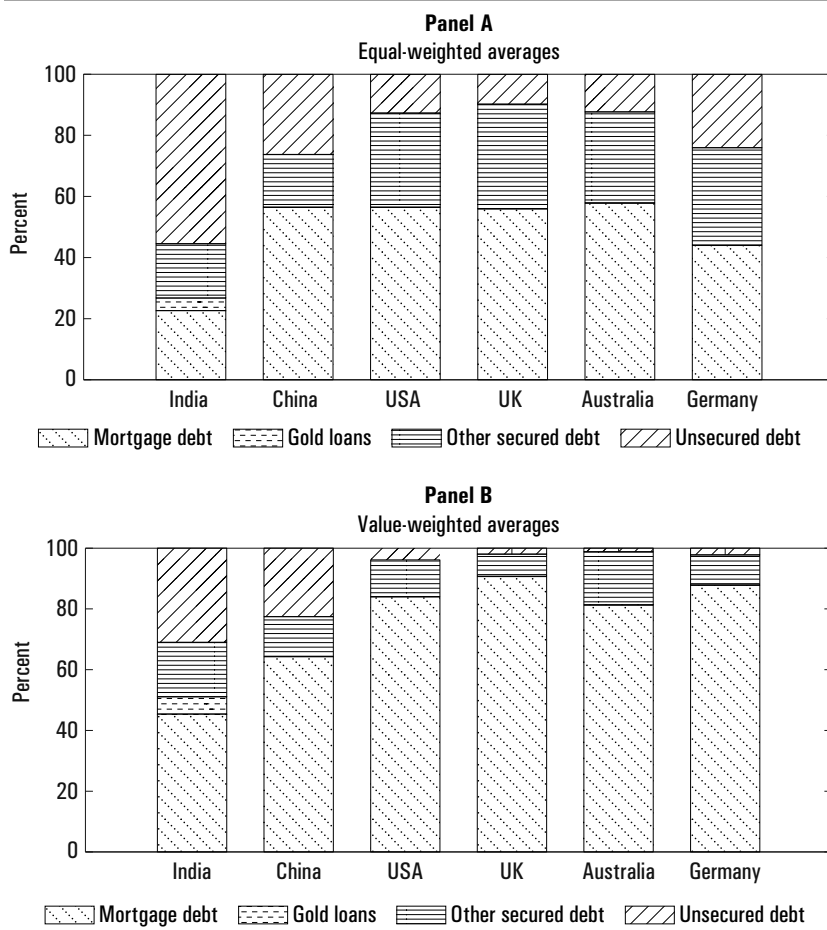
Households in advanced economies hold slightly more financial assets than their Indian counterparts, but perhaps more importantly, they accumulate sizeable amounts of funds in retirement accounts over the course of their lifetimes. The German case illustrates the substitution effect between public and private pension systems particularly well. Since the retirement system is mostly based on state-sponsored defined-benefit pensions, households in Germany only save small amounts in private retirement accounts and instead decide to invest larger amounts in financial assets such as sight deposits, government bonds, publicly traded shares, and mutual funds.

Turning to the liabilities side of the household balance sheet, in most countries, real estate holdings are financed through secured debt (that is, mortgages). Panel A of Figure 2 reports the average allocation of liabilities across all households that carry a positive amount of debt at the date of the survey. Mirroring the dominance of real estate as the dominant component of wealth, we find that mortgage loans are the largest liability of households in China, the US, the UK, and Australia. In these countries, the average household's mortgage holdings account for close to 60 percent of their total debt exposure. Germany is an exception to this rule (the share of mortgage debt is 44 percent), which is not surprising, given the low home ownership rate and the relative preference for renting over owning in the German population.

India stands out in a number of ways. Despite the prominent role of non-financial assets in the household balance sheet, mortgage loans account for only a small part of total liabilities (23 percent), and the role of other secured debt (such as vehicle loans and instalment credit for durable goods) is well below the levels observed in other countries, except China. Instead, most debt is unsecured (55 percent), which as we will see, also reflects the predominant reliance of Indian households on informal sources of lending. We also document a non-negligible role for gold loans (4 percent), which

FIGURE 2. Allocation of Household Liabilities

In this figure, we compare the average allocations of household liabilities across countries. We restrict the samples to observations for which total liabilities are positive. The data sources are the AIDIS (2012 wave), the Eurosystem's HFCS, the US SCF (2010 wave), the CHFS (2012 wave), the Australian HILDA (2010 wave), and the UK WAS (2012 wave). For consistency, in the CHFS, we classify business loans originated with banks as secured loans and informal private loans as unsecured. In Panel A, we compute averages across households using population weights, as indicated in each survey. Additionally, in Panel B, we present the value-weighted averages across households.



are a unique feature of the Indian market and absent from other countries. These conclusions are also apparent when averages are computed by value weighting (see Panel B of Figure 2), which suggests that for India and China, unsecured debt and gold loans also matter in the aggregate. Quantitatively,

the two categories of loans account for 23 percent of total debt in China and 35 percent in India, while they play a negligible role in the financial systems of developed countries (except in the US, where households rely relatively more on credit card debt for daily expenses and purchases of long-lived consumer goods).

These patterns mask a significant heterogeneity of decisions along the life cycle and across the wealth distribution. We next analyze this aspect of the data.

3.2. Decisions along the Life Cycle

Figure 3 reports the fractions of households that participate in asset and debt markets, by age of the household head. Panel A of the figure suggests that in developed countries, almost all households have positive amounts of financial assets and durable goods. In contrast, in India, only 65 percent of households where the head is younger than 35 years hold any financial assets. The participation rate increases to 77 percent for more mature households, but remains well below the one observed in developed countries, where close to all households own at least one bank account and use formal financial products as the preferred means of saving. In China, the pattern is reversed: young cohorts are more likely to hold financial assets, even relative to their Indian counterparts, but the participation rate decreases to 52 percent for older households and retirees. This reflects the very limited access to formal banking for large parts of the Chinese population, in particular in rural areas (see Gan et al. 2012).

In both China and India, the rate of participation in land and housing assets is 78 percent for the lowest age cohort, and increases to 95 percent for people close to retirement. More mature households are generally more likely to own real estate in all countries, but the upward-sloping life cycle profiles are much more pronounced in Australia, the UK and the US, where only 40–50 percent of young households own any land or housing. Germany is also an extreme case in this regard. The participation rate of households with heads below 35 years of age is as low as 19 percent and only reaches 67 percent for middle-aged cohorts.

Similar to the retirement asset puzzle that was widely documented in the US (and unlike in countries such as the UK, Australia, Germany, and even China), Indian households do not appear to reduce their holdings of real estate as they pass retirement age. This is probably the consequence of the prevalence of multi-generational households, in which land and residential properties constitute a significant share of bequests.

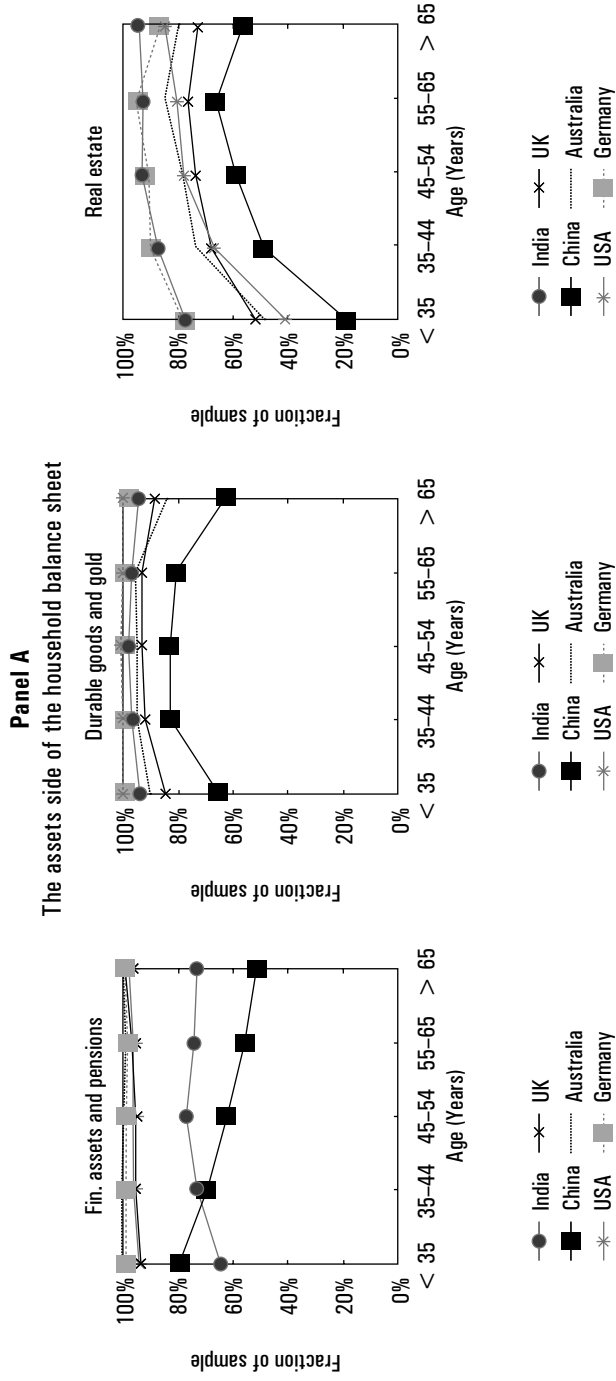
While these variations in behavior may seem striking, we note that home ownership can potentially have very different meanings in India and China relative to the other countries that we consider. Land is scarce and construction activity is expensive in developed countries, which leads to a natural threshold in terms of the type of buildings that can serve as residential property. In India and China, the urbanization rate is much lower, rental markets are virtually absent, and agricultural work is widely prevalent. People are, therefore, more likely to have legal or quasi-legal ownership status over the dwelling used as accommodation, such as a family farm, shop-house, workshop, or warehouse, either within or outside the village/town.

Panel B of Figure 3 shows clear trends in credit market participation rates for developed countries because down payment requirements and relatively large house prices prevent households from taking mortgage loans early in life, the participation profiles are upward sloping for age cohorts below 50 years; as they approach retirement age, property loans are paid off and the extent of home equity extraction is on aggregate too low to offset this pattern. For example, in the UK, the participation rate rises from 48 percent for the youngest cohort to 62 percent in middle age and decreases to 6 percent after retirement. This pattern is slightly less pronounced in the US and China, albeit probably for different reasons. The home ownership rate is high in the US even for older cohorts, and the mortgage loan remains the primary financing vehicle for house purchase. In China, the urbanization process has accelerated during recent years and house prices have been rising strongly, which makes it more difficult for younger households to amass enough savings to meet down payment requirements.

The case of India is quite different from all other countries, primarily because of a very significant difference in magnitudes. First, only 4 percent of Indian households with heads below 35 years of age have a mortgage loan, which is lower relative to their counterparts in developed countries (between 10 percent and 48 percent) and China (27 percent). Second, the participation trend is positive across life cycle groups, suggesting significant development potential in the market, once borrowing constraints are relaxed for young and middle-aged households. Third, the participation rate of old households and retirees is comparable to the ones prevalent in Australia and the UK. This suggests relatively higher financial burdens toward the end of life, probably reflecting intergenerational transfers. The same striking difference obtains when looking at other types of secured debt. Indian and Chinese households seem generally much less likely to use debt finance for durable assets such as transportation vehicles, which is very different from the behavior of people in developed countries, especially at young

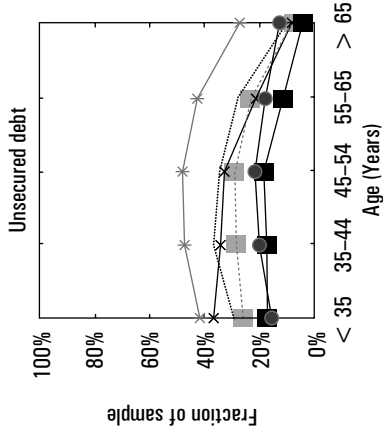
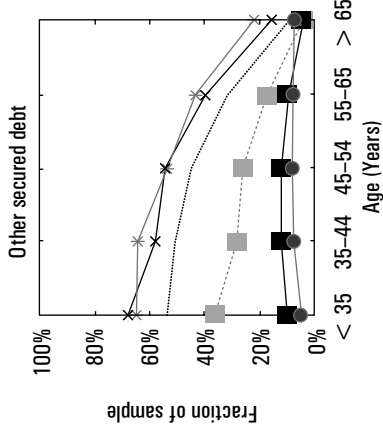
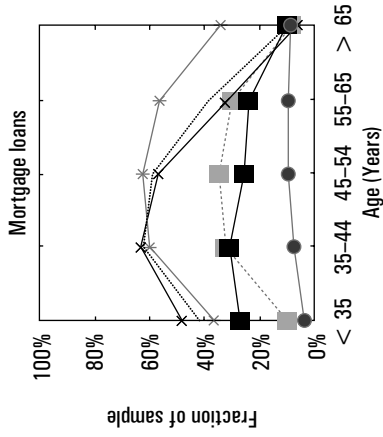
FIGURE 3. Participation in Asset and Debt Markets along the Life Cycle

This figure reports the shares of the population that holds positive amounts of different assets and debt classes. The data sources are the AIDIS (2012 wave), the Eurosystem's HFCS (2010 wave), the US SCF (2010 wave), the CHFS (2012 wave), the Australian HILDA (2010 wave), and the UK WAS (2012 wave). For consistency, in the CHFS we classify business loans originated with banks as secured loans and informal private loans as unsecured. We compute averages across households using population weights, as indicated in each survey.



Panel B

The liabilities side of the household balance sheet



● India × UK
 ■ China Australia
 * USA - - - Germany

● India × UK
 ■ China Australia
 * USA - - - Germany

● India × UK
 ■ China Australia
 * USA - - - Germany

ages. Finally, the use of unsecured debt is also atypical in India and China. In particular, in these countries, young households are more likely to have unsecured debt, unlike in the other countries where instruments such as credit cards, overdraft facilities, and other instalment loans are equally likely to be used by all age groups.

In Figure 4, we turn to analyzing the actual role played by different asset and debt categories in the overall structure of the household balance sheet. Panel A of the figure shows that households of all ages in both India and China have low savings in the form of both financial assets and retirement accounts. For the average household in these countries, financial assets account for between 3.6 percent and 13.3 percent of total asset holdings. In contrast with the more advanced economies, a large fraction of the wealth of young households in India and China is in the form of durable goods and gold (33 percent in China and 25 percent in India), and most of their wealth, as they approach retirement, is comprised of land and housing (65 percent in China and 84 percent in India).

In Panel B of Figure 4, we show that for households in developed countries, the share of mortgage debt relative to total liabilities follows a hump-shaped pattern along the life cycle. This observation is not surprising, given that very young and very old households have lower access to the market and may use alternative financing vehicles such as secured leasing arrangements and instalment loans. In China, the pattern is reversed, mostly reflecting the high rates of home ownership in retirement. India is exceptional in this context—it is the only country in which the share of mortgage loans relative to total liabilities is lower than the share of unsecured debt across all age cohorts. Moreover, unlike in other countries, in India, mortgages account for an increasing share of total liabilities as people approach retirement age.

3.3. Decisions across the Wealth Distribution

In Figure 5, we study participation rates for groups of households sorted in increasing order of their holdings of gross assets, with each group representing 20 percent of the sample. Panel A of the figure confirms the significant variation in magnitudes between participation rates across countries. In Australia, the UK, the US, and Germany, the use of financial instruments is pervasive across all parts of the population. In India, only 55 percent of the poorest and 90 percent of the richest households hold financial assets. Similarly, in China, 40 percent of the poor and 88 percent of the rich participate.

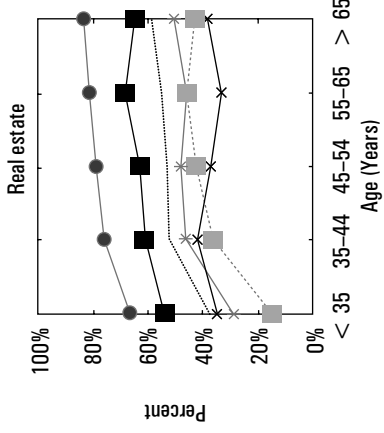
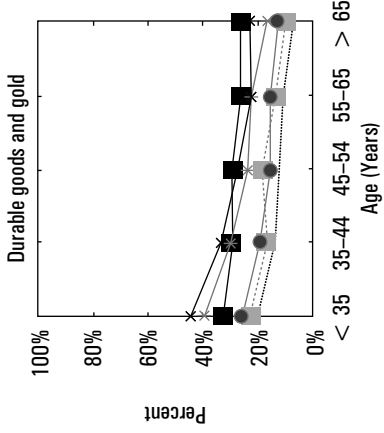
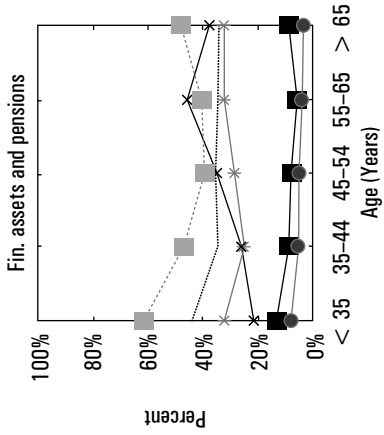
As regards non-financial assets, one particular finding stands out. At the bottom end of the wealth distribution, 60 percent of Indian and Chinese households have ownership over land or buildings, while in Germany,

FIGURE 4. Allocation of Household Assets and Liabilities Along the Life Cycle

This figure reports the average shares of different assets and debt classes, relative to total household wealth and total household liabilities, respectively. The data sources are the AIDIS (2012 wave), the Eurosystem's HFCS (2010 wave), the US SCF (2010 wave), the CHFS (2012 wave), the Australian HILDA (2010 wave), and the UK WAS (2012 wave). For consistency, in the CHFS, we classify business loans originated with banks as secured loans and informal private loans as unsecured. We compute averages across households using population weights, as indicated in each survey.

Panel A

The assets side of the household balance sheet



● India —× UK
 ■ China Australia
 * USA - - - - Germany

● India —× UK
 ■ China Australia
 * USA - - - - Germany

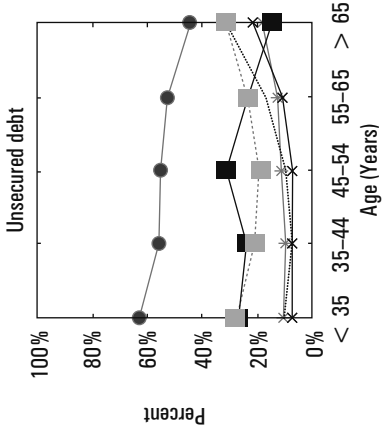
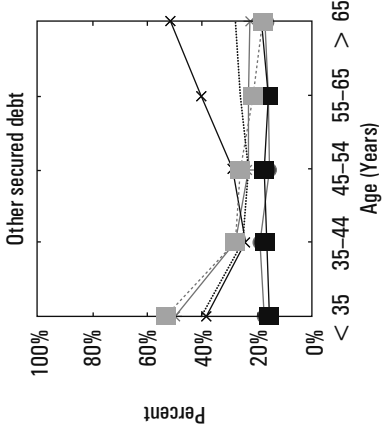
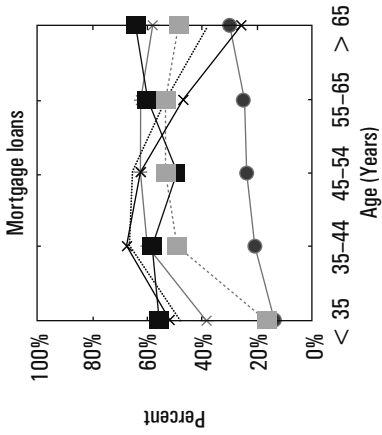
● India —× UK
 ■ China Australia
 * USA - - - - Germany

(Figure 4 Continued)

(Figure 4 Continued)

Panel B

The liabilities side of the household balance sheet



- India
- China
- ★ USA
- × UK
- ◆ Australia
- Germany

- India
- China
- ★ USA
- × UK
- ◆ Australia
- Germany

- India
- China
- ★ USA
- × UK
- ◆ Australia
- Germany

the UK, and Australia, this number is less than 1 percent. Even in the US, it rises to only around 5 percent. At least part of this observation can be attributed to the very different nature of what is considered and recorded as ownership of real estate across these countries.

The average value of the main residence in the bottom quintile group of Indian households is equal to ₹22,000, which is significantly lower than the lowest percentile of the value of the main residence in Germany (₹15 lakh) or the US (₹3.7 lakh). That having been said, our results show that almost all of the overall difference in the allocation of household wealth between India, China, and the other developed countries is driven by households in the lowest two quintile groups of the wealth distribution, that is, the 40 percent of people with the lowest amounts of gross assets.

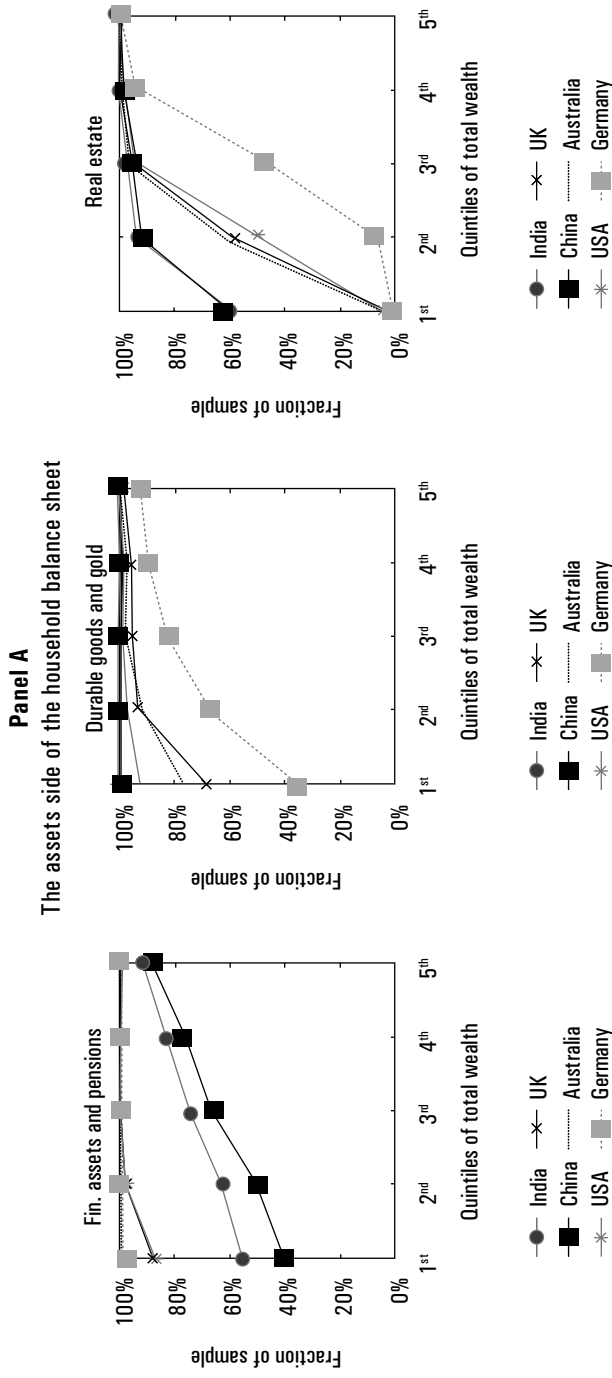
Turning to the liabilities side in Panel B of Figure 5, we note a pronounced substitution effect within the pool of available secured debt products across all developed countries. Relatively poorer households in the credit market tilt toward loans secured with assets such as vehicles or long-term consumer goods (between 35 percent and 53 percent). In contrast, richer households are much more likely to participate in the market for mortgage loans (between 45 percent and 68 percent), which is also reflected in their higher rate of home ownership. However in India, very few households have mortgage loans outstanding and it is only for the very rich that the rate of mortgage indebtedness rises significantly (18 percent), albeit remaining much lower than that in developed countries.

In Figure 6, we look at the assets and liabilities of households relative to their total amounts of wealth and total debt exposure, respectively. Panel A of the figure shows that despite more than half of Indian and Chinese households participating in financial markets, the actual amounts of financial assets and pensions account for a negligible portion of their total balance sheet (between 11.8 percent for the poor and 3.7 percent for the rich in India, and between 11.7 percent for the poor and 6.8 percent for the rich in China). Instead, we observe a pronounced substitution effect between durable goods, gold, and real estate. Poor households own more of the former two assets, and as they grow richer, they appear to move away from these assets and toward real estate. This pattern is partially consistent with the behavior of households in the UK, the US, Germany, and Australia, though in these countries, as households grow richer, they also tend to move toward financial and away from non-financial assets.

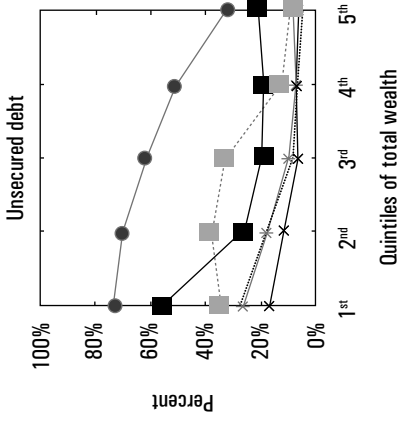
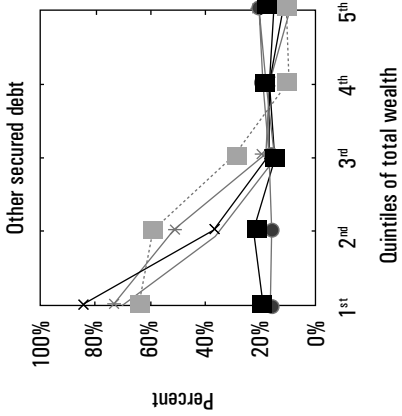
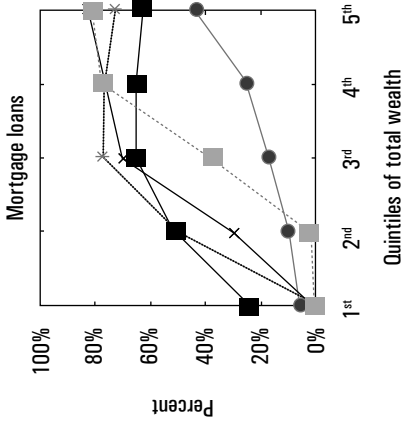
Panel B of Figure 6 reports the average allocation of liabilities across different forms of credit, for households that participate in the credit market, that is, those with positive amounts of debt. The debt allocation pattern

FIGURE 5. Participation in Asset and Debt Markets Across the Wealth Distribution

This figure reports the shares of the population that holds positive amounts of different assets and debt classes. The data sources are the AIDIS (2012 wave), the Eurosystem's HFCS (2010 wave), the US SCF (2010 wave), the CHFS (2012 wave), the Australian HILDA (2010 wave), and the UK WAS (2012 wave). For consistency, in the CHFS, we classify business loans that originated with banks as secured loans and informal private loans as unsecured. We compute averages across households using population weights, as indicated in each survey.



Panel B
The liabilities side of the household balance sheet



- India
- China
- ★ USA
- Australia
- Germany

- India
- China
- ★ USA
- Australia
- Germany

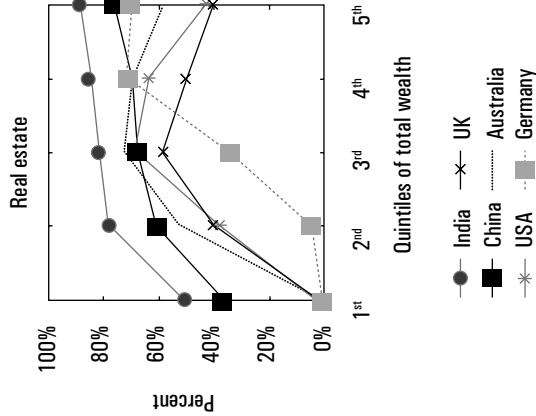
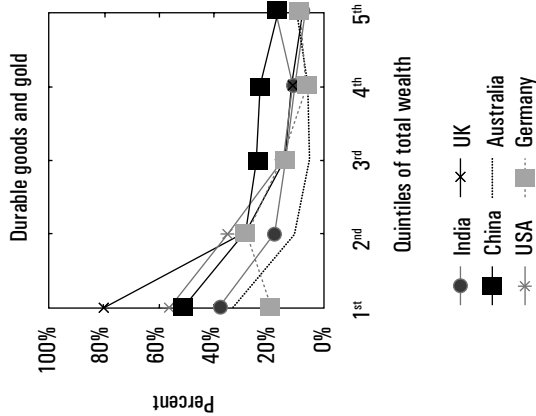
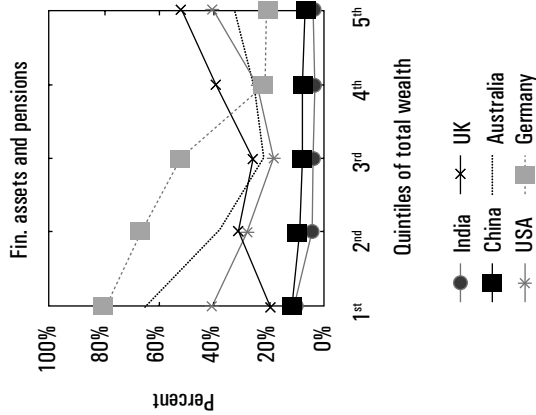
- India
- China
- ★ USA
- Australia
- Germany

FIGURE 6. Allocation of Household Assets and Liabilities Across the Wealth Distribution

This figure reports the average shares of different assets and debt classes, relative to total household wealth and total household liabilities, respectively. The data sources are the AIDIS (2012 wave), the Eurosystem's HFCS (2010 wave), the US SCF (2010 wave), the CHFS (2012 wave), the Australian HILDA (2010 wave), and the UK WAS (2012 wave). For consistency, in the CHFS, we classify business loans originated with banks as secured loans and informal private loans as unsecured. We compute averages across households using population weights, as indicated in each survey.

Panel A

The assets side of the household balance sheet



Quintiles of total wealth

Quintiles of total wealth

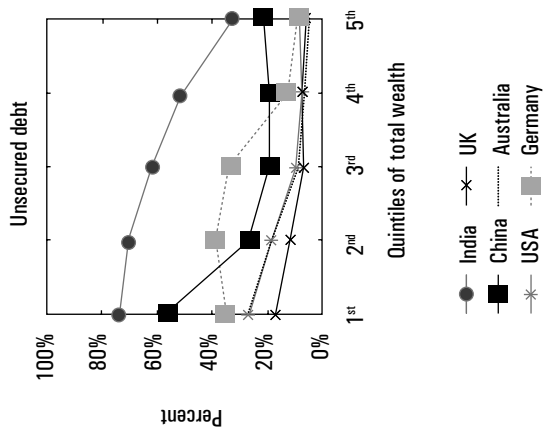
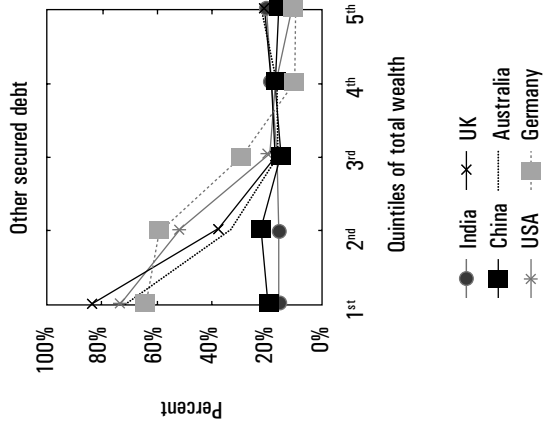
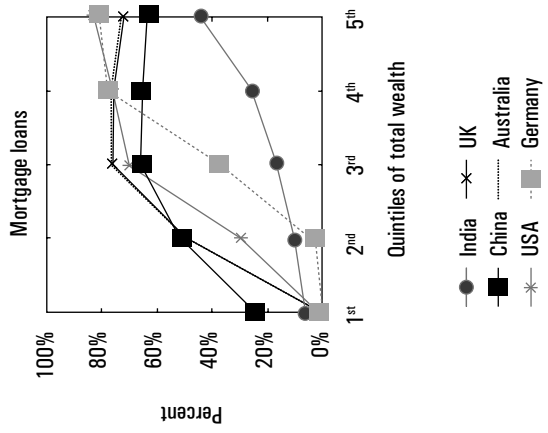
Quintiles of total wealth

India —●— UK —×—
China —■— Australia —··—
USA —*— Germany —□—

India —●— UK —×—
China —■— Australia —··—
USA —*— Germany —□—

India —●— UK —×—
China —■— Australia —··—
USA —*— Germany —□—

Panel B
The liabilities side of the household balance sheet



of the average Indian household stands out in a number of ways, even in contrast with the pattern observed in China. First, the role of mortgage credit is relatively low in India and not just at the very bottom of the wealth distribution. The relative share of mortgage debt in total liabilities remains lower in India than in China across all parts of the population, with the gap narrowing only at the very top. Second, in developed countries, secured debt backed by vehicles and consumer goods seems to be the preferred alternative to mortgage debt. This is very different in India, where unsecured debt accounts for close to two-thirds of the total liabilities for the very poor and one-third for the rich. In China, the patterns are similar in nature, that is, households also hold relatively high amounts of unsecured debt, but the variation across the population goes in the opposite direction from India, that is, there is a slight decrease of mortgage indebtedness among the rich.

4. Assets and Liabilities of Indian Households

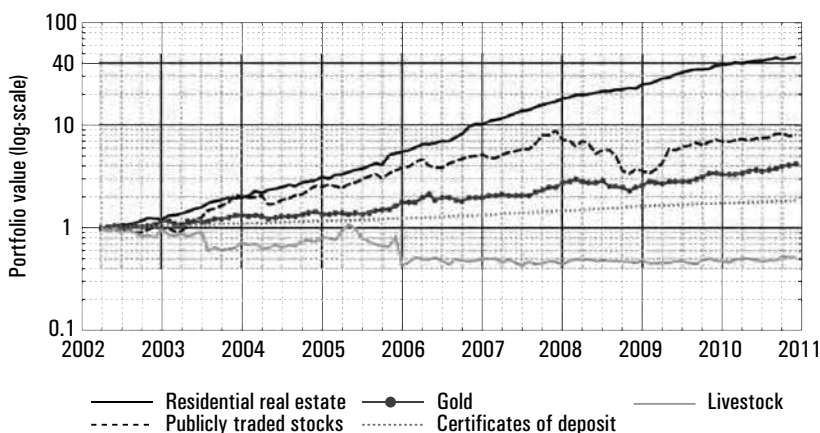
4.1. Summary Statistics

Figure 7 reports the performance of alternative asset classes in India over the decade prior to 2012. While most households have experienced large (nominal) appreciation of their real estate holdings, we note that the housing market is also highly illiquid. Particularly in rural areas and for farmers or holders of private family businesses, only a very small part of these returns have actually been realized during the period. Moreover, the evidence on the relative risk-adjusted performance of financial assets versus gold is inconclusive at best, and the benefits of diversification rather than over-investment in a single asset class are theoretically (and empirically) clear. The fact that there is negligible participation in financial products with exposure to the stock market suggests that there is significant potential for large improvements in the welfare of households.

We now focus on the micro-data from the AIDIS to understand Indian wealth allocation across the asset space in more detail. Panel A of Table 1 presents summary statistics on the asset composition held by Indian households. The value-weighted average household owns 96.6 percent of all assets in physical form, 90 percent of which are in real estate and housing assets. The next few columns present the distribution of each of the variables in columns from the 1st to the 99th percentile and document the wide variation in the composition of asset holdings by Indian households. At the median, households own about ₹1,350 of financial assets (which include bank deposits and small savings) and nearly 15 times more (₹20,000) in gold. Holdings of financial assets vary from

FIGURE 7. Nominal Portfolio Returns for Alternative Asset Classes

This figure reports the average cumulative returns for types of assets that are available as savings instruments for Indian households. Residential real estate returns data is computed as in Campbell, Ramadorai, and Ranish (2014); data on gold, certificate of deposits (> 1 year tenure), and publicly traded stocks are obtained from the Handbook of Statistics on the Indian Economy from the Reserve Bank of India. Livestock returns are computed as the equally weighted average of returns across all livestock markets in India for cows, sheep, buffaloes, and goats, and the data is obtained from the Ministry of Agriculture and Farmers Welfare's price portal (http://agmarknet.nic.in/index_old.html).



₹0 to over ₹10 million. Household financial assets, even at the maximum, only comprise 55 percent of total assets. On average (and across the distribution), Indian households mostly favor physical (non-financial) assets. Moreover, two important patterns emerge, namely, that Indian households hold a substantial fraction of wealth in gold and that retirement assets are nearly absent across the distribution. Even at the upper end of the distribution, the fraction of wealth held in retirement assets only just reaches the extent of wealth held in gold, and the combined total fraction of wealth in financial assets and retirement accounts is merely 4 percent of the wealth in real estate.

Panel B of Table 1 presents stylized facts about the liabilities side of the household balance sheet. Of the household debt, 67 percent is backed by some form of collateral, and a large proportion of secured loans are mortgage loans. Although unsecured loans form the remainder of the liabilities of a typical household, an important observation is that nearly half of Indian household liabilities are in the form of debt from non-institutional sources. Even at the top end of the distribution, one-fourth of total debt is from non-institutional sources, including that sourced from moneylenders and similar

TABLE 1. All India Debt and Investment Survey, 2012: Summary Statistics

This table reports summary statistics for each asset and debt category on the Indian households' balance sheets. In each row of the table, we report the mean, median, and selected percentile values, characterizing separately the distribution of each asset and debt category across the population.

Panel A									
The assets side of the household balance sheet (₹)									
	Mean	1 st	10 th	25 th	Percentiles				
					50 th	75 th	90 th	99 th	
Financial assets	24,681	0	0	0	1,350	8,000	34,000	400,000	
Retirement accounts	28,317	0	0	0	0	1,300	43,050	552,000	
Non-financial assets	1,528,232	1,200	59,700	172,550	478,300	1,277,131	3,197,200	14,700,000	
Real estate	1,411,279	0	0	130,000	407,000	1,149,855	2,960,000	14,000,000	
Durable goods	58,660	0	0	1,050	11,680	42,150	108,500	767,400	
Gold/bullion	58,292	0	0	4,000	20,000	60,000	150,000	550,000	
Total assets	1,581,228	4,000	67,954	183,000	501,880	1,330,200	3,320,700	15,000,000	

Panel B									
The liabilities side of the household balance sheet (₹)									
	Mean	1 st	10 th	25 th	Percentiles				
					50 th	75 th	90 th	99 th	
Secured loans	120,845	0	0	0	0	63,557	264,700	1,989,981	
Mortgage loans	86,631	0	0	0	0	11,000	138,375	1,800,000	
Gold loans	10,817	0	0	0	0	0	1,650	259,900	
Other secured loans	23,397	0	0	0	0	0	33,411	486,259	
Unsecured loans	59,308	0	0	0	11,250	50,000	137,500	613,218	
Total debt	180,153	2,000	9,203	20,000	51,614	147,000	378,000	2,220,950	
Non-institutional debt	49,108	0	0	0	8,000	48,000	128,000	539,260	

Source: AIDIS (2012).

sources, where interest rates are far higher than from institutional sources such as scheduled commercial banks.²²

Alongside these patterns in the share of assets and liabilities in different vehicles of savings and debt, we observe important differences along the life cycle and across the wealth distribution. Panel A of Figure 8 presents the variation along the life cycle, and Panel B of the figure presents the variation across the wealth distribution for three elements of the average Indian household balance sheet: gold (Column 1), retirement accounts (Column 2), and non-institutional debt (Column 3). The share of total assets in gold is highest at 20 percent for households whose heads are under 35 years of age and diminishes to about half at ages above 65. Similarly, the poorest households hold more gold than the richest, and the difference between the wealthiest and poorest households is large. The near absence of savings in retirement accounts for all parts of the population is also prominent. Finally, the share of non-institutional debt to total debt diminishes from 58 percent for households with head under 35 years of age to 38 percent for households with head over 65 years of age. The non-institutional debt share is 25 percent of total debt for the wealthiest households, suggesting that non-institutional sources play a prominent role across all wealth categories in India.

The patterns uncovered along the life cycle and across the wealth distribution are important because they suggest two distinct features that affect the economic welfare of households in India. Since retirement savings are minimal, households, regardless of how wealthy they are, do not have a steady source of financial savings to smooth consumption after retirement. At the same time, with a large fraction of non-institutional debt, Indian households are exposed to an intergenerational bequest not just of assets, but also of debt.²³

4.2. Regional Variation

Table 2 presents the average share of wealth in each asset type and share of debt across product types for Indian states. While a (poor) state like Bihar has households with barely any financial assets, cities/Union Territories²⁴ such as Chandigarh have the highest levels of financialization of the household balance sheet. Households in Tamil Nadu hold, on average, about 28 percent

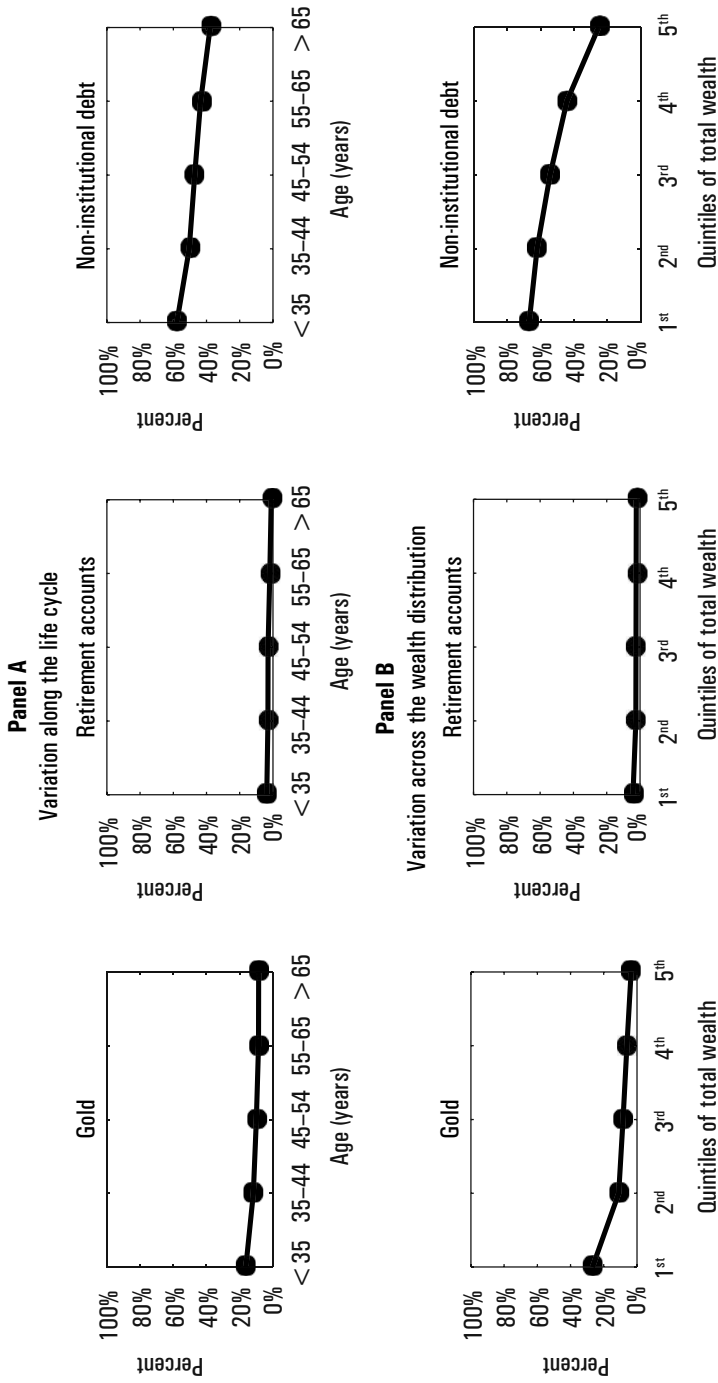
22. This pattern has been documented extensively in the Indian policy discourse. For instance, see Kochar (1997) and more recently Banerjee et al. (2015).

23. The average life expectancy of an adult in India is 65. Non-institutional sources of debt primarily comprise loans from moneylenders, friends, and family where limited liability may not apply.

24. Union Territories in India, unlike the states, are ruled directly by the Central Government and are federal territories that have no elected sub-national governments of their own.

FIGURE 8. Wealth and Debt Allocation of Indian Households

This figure reports the average shares of different assets and debt classes, relative to total household wealth and total household liabilities, respectively. The source of the data is the 2012 wave of the AIDIS. We report equal-weighted averages, using population weights as indicated in AIDIS.



T A B L E 2. Regional Variation in Household Balance Sheets

This table presents the average share of wealth in each asset type across Indian states (in rows) presented in the increasing order of the financial assets ratio.

	Portfolio Allocation			Allocation of Debt			Non-institutional Debt	
	Across Asset Categories			Across Product Types				
	Real Estate	Gold	Financial Assets	Retirement Accounts	Mortgage Loans	Gold Loans		Unsecured Loans
Bihar	90.5%	2.7%	1.0%	0.5%	8.2%	0.3%	81.9%	82.2%
Rajasthan	79.4%	9.5%	1.4%	1.7%	21.3%	1.0%	70.2%	68.7%
Nagaland	82.6%	1.6%	1.5%	7.3%	8.0%	0.0%	30.8%	40.3%
Manipur	84.0%	5.1%	1.6%	2.8%	3.1%	14.2%	30.4%	77.7%
Uttar Pradesh	85.4%	5.6%	1.8%	1.5%	27.3%	1.3%	63.0%	59.2%
Madhya Pradesh	82.2%	7.4%	1.9%	1.7%	30.4%	1.0%	60.0%	53.6%
Telangana	70.5%	17.5%	2.0%	2.4%	11.3%	2.9%	73.0%	55.8%
Odisha	78.9%	10.0%	2.1%	2.0%	26.9%	2.3%	59.1%	47.1%
Gujarat	72.5%	13.7%	2.1%	3.5%	38.0%	2.8%	38.2%	39.9%
Uttarakhand	78.7%	10.0%	2.2%	2.2%	18.8%	0.0%	67.6%	45.4%
Lakshadweep	80.4%	11.2%	2.5%	3.1%	9.7%	9.3%	66.7%	24.2%
Jharkhand	85.6%	4.4%	2.5%	1.9%	12.9%	0.2%	79.7%	62.8%
Chhattisgarh	81.7%	6.8%	2.7%	1.1%	14.7%	0.2%	65.2%	54.3%
Kerala	78.9%	13.1%	2.8%	1.8%	38.3%	17.2%	31.6%	20.0%
Jammu & Kashmir	84.2%	4.7%	2.9%	3.1%	10.1%	0.0%	62.2%	56.3%
Tripura	76.5%	10.0%	3.0%	3.8%	3.8%	0.2%	72.7%	44.7%
Maharashtra	76.6%	10.4%	3.1%	3.6%	47.0%	1.4%	36.0%	27.9%
Tamil Nadu	59.4%	28.3%	3.1%	3.2%	11.3%	41.3%	37.9%	42.1%
Punjab	81.6%	4.9%	3.1%	4.5%	25.7%	2.1%	57.4%	57.7%
Haryana	81.1%	5.9%	3.4%	3.0%	27.8%	0.0%	53.2%	48.1%
Goa	60.0%	20.2%	3.7%	6.0%	18.1%	3.5%	19.0%	8.0%
Andhra Pradesh	62.8%	21.6%	3.8%	3.1%	9.5%	9.5%	55.3%	48.9%

(Table 2 Continued)

(Table 2 Continued)

	Portfolio Allocation Across Asset Categories				Allocation of Debt Across Product Types			
	Real Estate	Gold	Financial Assets	Retirement Accounts	Mortgage Loans	Gold Loans	Unsecured Loans	Non-institutional Debt
	West Bengal	81.2%	6.7%	4.0%	3.3%	16.7%	2.8%	69.5%
Meghalaya	80.7%	3.0%	4.3%	3.5%	2.3%	0.2%	74.0%	24.7%
Mizoram	79.6%	1.2%	5.0%	5.7%	40.7%	0.0%	34.0%	17.2%
Karnataka	67.1%	16.1%	5.0%	4.4%	24.8%	3.4%	53.8%	49.2%
Assam	76.1%	6.6%	5.3%	2.6%	15.8%	1.2%	62.9%	48.0%
Andaman & Nicobar	42.5%	23.5%	6.3%	18.1%	6.4%	13.1%	66.4%	36.2%
Himachal Pradesh	71.8%	13.6%	6.8%	3.5%	35.6%	0.0%	42.4%	35.1%
Puducherry	56.9%	25.7%	7.2%	4.5%	3.4%	50.1%	33.3%	40.2%
Arunachal Pradesh	63.3%	5.1%	8.3%	5.0%	18.1%	1.3%	33.3%	45.7%
Chandigarh	57.0%	10.2%	8.3%	14.1%	47.1%	0.0%	23.0%	9.5%
Delhi	54.9%	17.4%	9.8%	6.2%	15.6%	0.4%	63.9%	46.6%
Dadra & Nagar Haveli	62.8%	6.5%	10.5%	12.4%	52.7%	2.4%	34.6%	31.3%
Sikkim	55.6%	14.6%	11.6%	10.3%	27.0%	0.0%	48.2%	17.8%
Daman & Diu	48.0%	24.4%	11.8%	10.8%	5.0%	0.0%	69.1%	66.9%

Source: AIDIS (2012).

of assets in gold (and bullion), followed closely by Andhra Pradesh (at 22 percent)—these high gold holdings in southern Indian states suggest that strong cultural factors may be at play in these cross-state patterns. Across states, we observe much more variation within the non-financial ratio, that is, between real estate and gold.

Similarly, large differences can be observed in patterns of debt allocation across states in India. While poor states such as Bihar have nearly 82 percent of their loans as unsecured debt and almost the same magnitude from non-institutional sources, states such as Goa have only 19 percent of their debt in unsecured loans and 8 percent of debt from non-institutional sources. States such as Tamil Nadu that own a high fraction of their assets in gold also have more than 40 percent of their total debt in gold loans. However, asset ownership shares do not necessarily translate into similar debt allocation patterns. For instance, households in Andhra Pradesh, one of the states with the highest average allocations of total assets to gold, only hold 9.5 percent of total debt in gold loans.

So far, we observe a few broad features of Indian household balance sheets. Differences exist at the household level along the life cycle and across the wealth distribution. At the same time, we also observe that the average household in different states of India exhibits strong differences, suggesting patterns potentially associated with regional characteristics. In the next sections, we explore this heterogeneity more formally in a multiple regression set-up and then use this setting to study the role of regional characteristics that potentially explain the regional variation observed in household balance sheet decisions.

4.3. Explaining the Heterogeneity of Household Balance Sheets

The framework of interest is given by a cross-sectional regression at the household level, across all Indian states. We estimate the following empirical specification:

$$f_{i,k} = \alpha + \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth shares of different asset types of household i in state k , μ_k are the state-fixed effects, and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural and urban residency, and number of children. Table 3 presents the regression results where $f_{i,k}$ is the non-financial ratio, real estate ratio, and gold ratio across three adjacent columns.

The non-financial ratio is a declining function of education. Relative to the group of households with illiterate heads (or ones with below primary school

T A B L E 3. Explaining Heterogeneity in Wealth Allocation across Indian Households

This table reports estimated β coefficients from the following estimated specification:

$$f_{i,k} = \alpha + \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth shares of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. We use household-level data from the 2012 wave of the Indian AIDIS and inflation data from the Labour Bureau, Government of India. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Real Estate	Gold	Financial Assets	Retirement Accounts
Total Assets				
< 136,000	-	-	-	-
136,000 to 344,560	0.253***	-0.143***	-0.049***	-0.011***
344,560 to 7 lakh	0.324***	-0.186***	-0.056***	-0.016***
7 lakh to 17 lakh	0.388***	-0.224***	-0.063***	-0.024***
> 17 lakh	0.495***	-0.279***	-0.079***	-0.044***
Age				
24 to 34 years	-	-	-	-
35 to 44 years	0.020**	-0.012***	-0.005	0.000
45 to 54 years	0.013	-0.011**	-0.003	0.002
55 to 65 years	0.021*	-0.011***	-0.002	-0.006***
> 65 years	0.038***	-0.012**	-0.002	-0.013***
Education				
Illiterate/Below Primary School	-	-	-	-
Primary and Middle School	-0.042***	0.023***	0.009***	0.004***
Secondary School	-0.080***	0.039***	0.017***	0.010***
Diploma	-0.130***	0.051***	0.026***	0.030***
Graduate and Post-graduate	-0.194***	0.045***	0.043***	0.067***
Region Type				
Rural	-	-	-	-
Urban	-0.137***	0.065***	0.029***	0.033***
Children				
0	-	-	-	-
1	-0.028***	0.030***	-0.014***	-0.004
> 1	-0.020**	0.027***	-0.017***	-0.008*
Constant term				
State-fixed effects	0.603***	0.206***	0.068***	0.030***
No. of obs.	Yes 107,947	Yes 107,947	Yes 107,947	Yes 107,947
Adjusted R ²	0.42	0.33	0.13	0.10

education), having earned a diploma is associated with a 13 percentage points lower real estate assets share. For graduate and post-graduate household heads, the difference is even more substantial, reaching 19.4 percentage points. In contrast, investments in gold are an increasing, though non-monotonic function of education, even after controlling for total asset holdings.

Compared to households with less than ₹136,000 in total assets, we observe a very large increase in the non-financial ratio at the highest ends of the wealth distribution. While the overall increase in non-financial ratio is noteworthy, the rise in the fraction of real estate (land and buildings) owned by rich households (a nearly 50 percentage point increase) is offset by the decline in the role of gold (a drop of 28 percentage points relative to households with less than ₹136,000). To the extent that the wealth distribution is representative of rich households in India, this suggests that the financialization of the asset side of the household balance sheet is meager, even among the rich. Urban households hold 3 percentage points more financial assets than their rural counterparts. However, urban households notably also carry 6.5 percentage points more gold on their balance sheets. One possible explanation for the decline in real estate holdings for urban households is that the relative costs of these assets may be higher; another is that there is a greater prevalence of rental contracts in such locations, precluding the need to own a housing asset.

The non-financial ratio does not exhibit much variation across the life cycle. At different segments of the age distribution, there is no significant difference in the non-financial ratio or the real estate ratio, except for the highest end of the age distribution where households tend to reduce their gold holdings (by a small margin of 1 percentage point) and increase land and housing holdings (by 3.8 percentage points). Put differently, the real estate holdings appear to become a slightly higher fraction on the household balance sheet as households age, perhaps on account of liquid assets being drawn down as they approach and pass the point of retirement. As a function of the number of children in the household, gold holdings increase relative to households with no children and then decrease marginally.

Turning to the liabilities side, family composition seems to be less relevant in determining household choice among alternative products (see Table 4). Instead, education continues to play an important role, in particular with regard to the relative contributions of non-institutional debt and gold loans. Households with at least one member with graduate or post-graduate education have 15.1 percent more mortgage debt relative to the poorly educated group and a 28.7 percent lower share of non-institutional debt.

After controlling for household characteristics, the extent of variation across states remains large. Figure 9 suggests that the maximum (average) real

TABLE 4. Explaining Heterogeneity in Credit Product Choice across Indian Households

This table reports estimated β coefficients from the following estimated specification:

$$f_{i,k} = \alpha + \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth shares of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. We use household-level data from the 2012 wave of the Indian AIDIS and inflation data from the Labour Bureau, Government of India. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

	<i>Mortgage Loans</i>	<i>Gold Loans</i>	<i>Unsecured Debt</i>	<i>Non-institutional Debt</i>
Total Assets				
< 136,000	–	–	–	–
136,000 to 344,560	0.028	0.011	-0.035	-0.044
344,560 to 7 lakh	0.085***	0.023	-0.097***	-0.100***
7 lakh to 17 lakh	0.153***	0.017	-0.182***	-0.184***
> 17 lakh	0.299***	-0.005	-0.307***	-0.297***
Age				
24 to 34 years	–	–	–	–
35 to 44 years	0.027**	-0.023**	-0.023	-0.035*
45 to 54 years	0.027***	-0.033**	-0.009	-0.051***
55 to 65 years	0.038***	-0.021	-0.039*	-0.100***
> 65 years	0.069***	-0.005	-0.085***	-0.132***
Education				
Illiterate/Below Primary School	–	–	–	–
Primary and Middle School	0.025**	0.015	-0.061***	-0.060***
Secondary School	0.037***	0.008	-0.060***	-0.090***
Diploma	0.049***	0.015	-0.108***	-0.157***
Graduate and Post-graduate	0.151***	-0.017**	-0.206***	-0.287***
Region Type				
Rural	–	–	–	–
Urban	-0.036*	0.002	0.035*	0.010
Children				
0	–	–	–	–
1	0.001	0.001	-0.024	-0.009
> 1	-0.025***	0.008	-0.014	-0.012
Constant term	0.253***	0.015	0.654***	0.636***
State-fixed effects	Yes	Yes	Yes	Yes
No. of obs.	45,292	45,292	45,292	45,292
Adjusted R²	0.18	0.26	0.18	0.20

estate ratio unexplained by household characteristics is in the state of Bihar and the least in the Andaman and Nicobar Islands. Similarly, the maximum unexplained gold ratio is in the state of Tamil Nadu and least in the state of Mizoram. Figure 10 suggests that the highest unexplained retirement accounts ratio is in the Andaman and Nicobar Islands and the lowest in the state of Bihar. The state with the highest unexplained ratio of non-institutional debt is Manipur and the one with the lowest is Goa. This variation is important, as

FIGURE 9. Residual Variation of Real Estate and Gold Ratios across Indian States

This figure reports estimated μ_k coefficients from the following specification:

$$f_{i,k} = \alpha + \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth shares of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. The indicator variable for the state of Maharashtra is omitted from the regressions, which implies that this state is taken as a reference. We use household-level data from the 2012 wave of the Indian AIDIS.

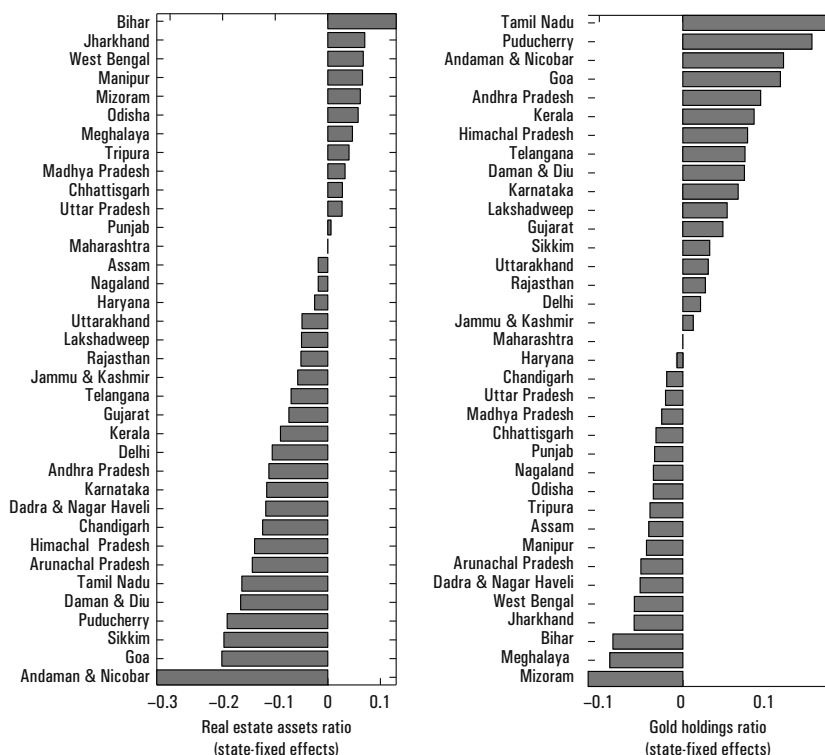
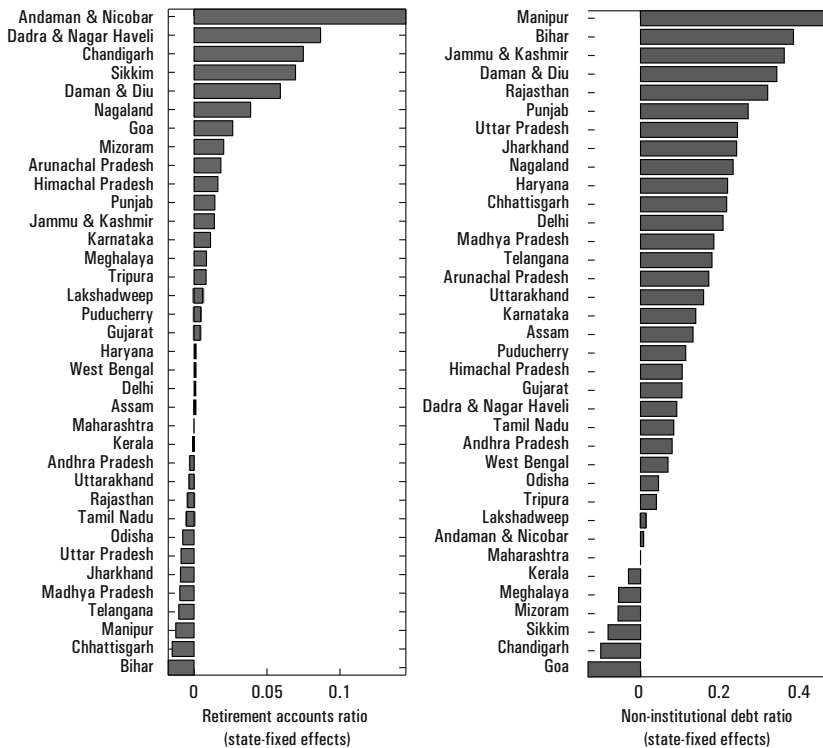


FIGURE 10. Residual Variation of Retirement Accounts and Non-institutional Debt Ratios across Indian States

This figure reports estimated μ_k coefficients from the following specification:

$$f_{i,k} = \alpha + \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth and liability shares of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. The indicator variable for the state of Maharashtra is omitted from the regressions, which implies that this state is taken as a reference. We use household-level data from the 2012 wave of the Indian AIDIS.



it suggests a closer investigation of the region-specific variation in factors that determine household asset and liability choices.

5. Explaining Residual Cross-state Variation

We now turn to explaining the residual cross-state variation in the composition of household balance sheets, cleaned of household demographic characteristics. We focus on three specific attributes of Indian household

balance sheets, namely the high allocation to gold, the low fraction of retirement assets, and the high incidence of non-institutional debt. In each case, we employ features of the institutional and economic environment which vary at the state level, in an attempt to better understand potential levers of policy to enable better household financial outcomes.

5.1. Inflation Uncertainty and Wealth Allocation

In terms of household welfare, the theoretical benefits of participating in formal financial markets are well documented (see, for example, Campbell 2006; Karlan and Morduch 2009). While the optimal split between physical and financial assets involves complex life cycle portfolio choice calculations, most models struggle to explain the observed Indian household's average allocation to physical assets, and in particular, to gold, as an optimal portfolio allocation given the liquidity benefits of financial assets in addition to basic diversification arguments.

The permanent income hypothesis counterfactually predicts a low savings rate for fast-growing countries like India, since households expecting higher income in the future should borrow against future income.²⁵ To explain the data, an intriguing possibility that has been raised is that high-growth countries might exhibit high savings rates and low indebtedness for precautionary motives, for example, to hedge against expected adverse shocks to future income (see Chamon and Prasad 2010 for evidence in China of this channel), as well as likely binding borrowing constraints. We are motivated by this hedging argument and by the repeated assertions in the popular press that Indian households hold gold because they perceive it to be an inflation hedge. We, therefore, check how the extent of inflation uncertainty experienced by households in different regions in India affects their allocation decisions.

To identify this effect, we use the fact that India does not have a unified market for goods and the state-level markets are deeply segmented, meaning that a regional demand or supply shock is almost always not arbitrated. This means that we can use realized inflation, which differs across Indian states, to attempt to explain the state-level variation in physical asset holdings, under the assumption that households' lived experience of inflation is a strong predictor of their inflation hedging motivations.

25. In contrast, most standard life cycle models such as Modigliani (1986) would predict an increasing savings rate accompanying high levels of growth using standard age-compositional arguments (that is, households that are saving in middle age are more highly weighted than ageing households that are dissaving in retirement), but given the lack of a wide prevalence of formal retirement savings schemes in most emerging economies, this explanation is somewhat less appealing for such economies.

How do inflation and inflation uncertainty affect wealth allocations in India? We study this by reporting the correlation between household wealth shares and inflation developments across states. We obtain the state-specific wealth share as fixed effects (μ_k) from Section 4, after having controlled for an array of household-level characteristics. For 15 of the Indian states, state-wise inflation experience can be computed on the basis of reported inflation data collected from centers across India, which is also used to compute the national inflation series. We proxy inflation uncertainty using the in-sample standard deviation of the CPI (AW) between 2003 and 2012. Figure 11 presents the relationship between inflation experience and the non-financial ratio and its sub-components.

While the relationship between inflation and total non-financial ratio is flat, the relationship between inflation volatility and the real estate ratio, and inflation volatility and the gold ratio are strongly (and statistically significantly) decreasing and increasing, respectively. Within the set of non-financial assets that households could choose from, these correlations suggest that there is a substitution effect between real estate and gold that can be explained by the extent of inflation uncertainty in different regions of India.

Our explanation of the result is that if financial assets are not easily available/accessible or if demand-side frictions cause investors to eschew them, investors seek alternative savings vehicles.²⁶ Since very few households invest internationally, and there are regulatory restrictions to how much money can be invested abroad, the set of viable alternatives is restricted to the space of non-financial, physical assets.²⁷ In the space of non-financial assets, gold may be seen as an inflation hedge.

At the same time, the relationship between inflation uncertainty and real estate suggests that people with high experienced inflation volatility avoid real estate. Several potential channels of explanation exist. Most plausibly, real estate has lower liquidity when compared with gold, and if liquidity needs are correlated with inflation volatility, gold better serves the purpose than real estate. Gold as a non-financial asset also has additional properties that are not provided for by real estate, such as a high collateral value and physical verifiability (as opposed to the great many challenges inherent in property verification in India). Yet another possibility has to do with the

26. Most recently, an RBI-appointed committee on financial inclusion concluded that “despite improved financial access, usage remains low, underscoring the need to better leverage technology to facilitate usage” (Mohanty 2015).

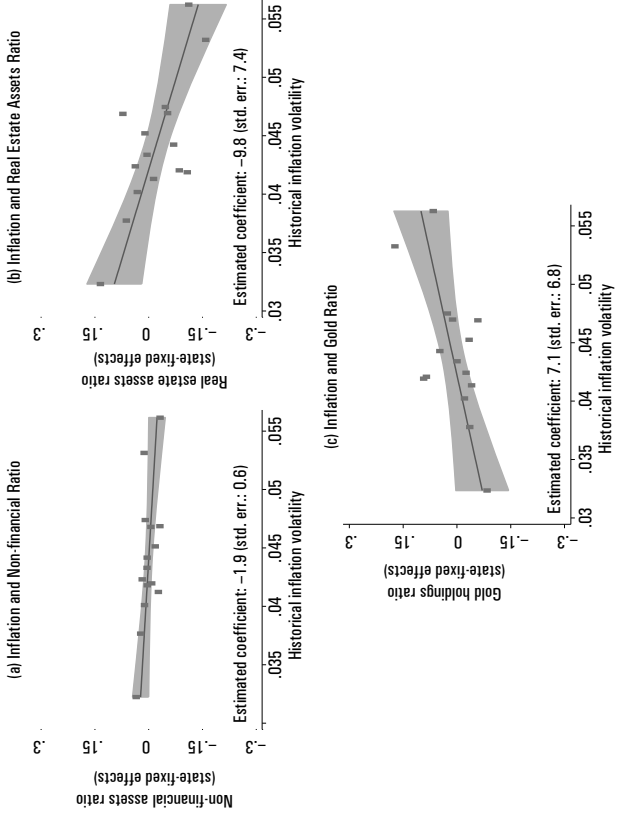
27. Caballero and Krishnamurthy (2009) show that these have real macroeconomic consequences in terms of the global imbalances in savings.

FIGURE 11. Relationship between Inflation Uncertainty and Wealth Allocation in India

This figure reports the correlation between household wealth shares and inflation developments across Indian states. We obtain state-specific wealth shares as fixed effects μ_k from the following estimated specification:

$$f_{i,k} = \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth shares of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. The sample contains 15 states for which we are able to match household-level information from the AIDIS and historical regional consumer price indexes: Maharashtra, Karnataka, Rajasthan, Gujarat, Uttar Pradesh, West Bengal, Bihar, Madhya Pradesh, Odisha, Tamil Nadu, Assam, Kerala, Punjab, and Jammu & Kashmir. We use household-level data from the 2012 wave of the Indian AIDIS. Inflation volatility is calculated as the in-sample standard deviation of the consumer price index between 2003 and 2012. Inflation data is sourced from the Labour Bureau, Government of India.



financing mechanism for real estate investments. It may be that the prevalence of adjustable rate mortgages in India makes mortgage-financed real estate a more risky proposition in an environment of high inflation volatility, especially if households face a current income affordability constraint (see Campbell and Cocco 2003).

For a deeper understanding of these phenomena, and in the spirit of Malmendier and Nagel (2011), we go on to run a regression in which we explicitly consider the role of experienced inflation at the age of 25 (Table 5), under the assumption that experiences earlier in one's working life have stronger effects on future financial decision-making. We find that the magnitude of the estimated effect is large: a shift from the mean to the top inflation observed in the sample is associated with an increase of 1.4 percent in the gold ratio. In terms of benchmarking, the size of the effect amounts to about half the contribution of having a child in the household. This suggests that inflation remains important in shaping household decisions on the intensive margin, beyond other more deep-seated household preferences that are related to social norms in India.

5.2. Public Sector Employment and Retirement Accounts

We turn our attention to retirement savings as a share of total assets in the balance sheets of Indian households. Although the share of retirement savings is low, households in the highest wealth quintile do have some retirement savings, and the average amount of savings varies across different Indian

TABLE 5. The Role of Inflation Experiences

This table reports estimated γ coefficients from the following specification:

$$f_{i,k} = \alpha + \mu_k + \beta X_{i,k} + \gamma \Pi_{i,k}^{25} + \varepsilon_{i,k}$$

where $f_{i,k}$ are wealth shares of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. $\Pi_{i,k}$ is inflation in state k during the year in which the head of household i was 25 years of age. We normalize the inflation level by subtracting the in-sample mean and dividing by the standard deviation. We use household-level data from the 2012 wave of the Indian AIDIS and inflation data from the Labour Bureau, Government of India. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

	<i>Non-financial Ratio</i>	<i>Real Estate Ratio</i>	<i>Gold Ratio</i>
Inflation experience when young	0.001	-0.000	0.002**
State-fixed effects	Yes	Yes	Yes
Demographic characteristics	Yes	Yes	Yes
No. of obs.	78,486	78,486	78,486
Adjusted R ²	0.18	0.41	0.33

states even after controlling for demographic characteristics. We explore the extent to which these differences can be explained by policy-induced, compulsory retirement programs such as the NPS and EPF contributions. If they are, this suggests the potential relevance of mandating participation in retirement savings programs in which investments are locked away for a long period of time.²⁸

Employment in the organized sectors of the Indian economy is governed by labor laws that also mandate retirement savings. Since data on the fraction of population engaged in the organized sectors of the economy across Indian states are unknown, in this section, we proxy for this fraction by the share of state residents that are in public sector employment in each state. The AIDIS indicates the type of organization in which the household head is employed. We use this information to compute an estimated fraction of each state's population that is employed by a government organization or a public sector enterprise. We note that this is a noisy proxy for the channel that we attempt to identify and also note that it is difficult to establish causality using this approach.

Nevertheless, Figure 12 shows that the variation in state-level share of assets in retirement accounts is explained by the share of public sector employment in these states. However, a large share of the residual variation remains unexplained by public sector employment as it may be a relatively poor proxy for organized employment in India. Overall, we view this finding as suggesting that households in India may be driven by the immediacy of their economic needs and may not place enough importance on long-term financial savings for retirement. To the extent that such behavior can be countered by compulsory participation programs, a means to counter the lack of retirement savings exist and should be considered seriously.

5.3. Financial Access and Non-institutional Lending

Financial market imperfections such as information asymmetries, transactions costs, and contract enforcement costs are particularly binding on households that lack collateral, credit histories, and networks (Levine 2005). To the extent that formal financial penetration is low, households have little choice but to borrow from traditional and other non-institutional sources such as friends and family, and moneylenders. Non-institutional sources of credit can be costly to households in a variety of ways. For one, interest rates

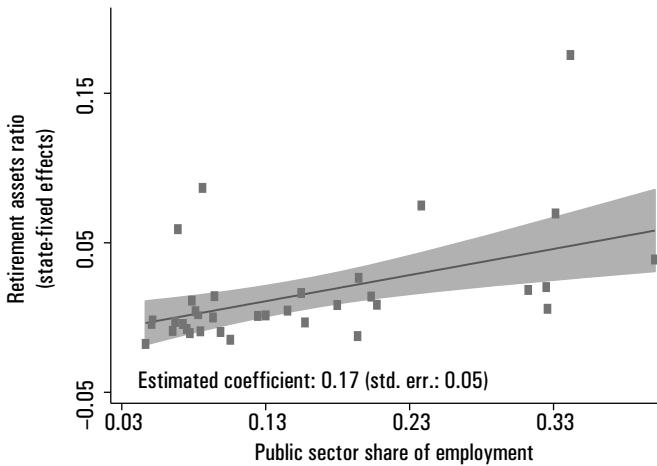
28. Policies surrounding retirement saving have been seen from the prism of self-control and disparities emanating out of socio-economic characteristics. See, for instance, Laibson et al. (1998) and Sunden and Surette (1998).

FIGURE 12. Relationship between Public Sector Employment and Retirement Accounts Ratios in India

This figure reports the correlation between household shares of retirement accounts and the share of households employed by the public sector across Indian states. We obtain state-specific shares as fixed effects μ_k from the following estimated specification:

$$f_{i,k} = \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ is the retirement accounts share of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. We use household-level data from the 2012 wave of the Indian AIDIS.



can be higher, especially when extended by moneylenders. Another issue is that credit from such sources is often not bound by limited liability or other legal protections that govern formal credit contracts between borrowers and lenders. This, in turn, could have serious implications for how risk sharing occurs intergenerationally, as younger generations may be called upon to fulfil the credit obligations of older generations, especially when such debt is not backed by collateral.

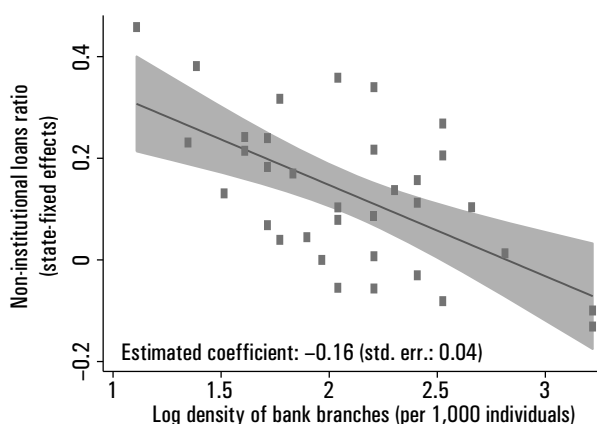
Our principal focus is on whether the residual variation in non-institutional debt ratios across Indian states is correlated with the extent to which institutional sources of credit are available to households. Burgess, Pande, and Wong (2005) provide some evidence on how directed bank lending requirements, which presuppose the existence of a bank branch in a local area, have increased credit uptake from institutional sources. If the correlation between residual variation in non-institutional debt and institutional penetration—measured as the log density of bank branches

FIGURE 13. Relationship between Bank Presence and Non-institutional Lending in India

This figure reports the correlation between household shares of non-institutional liabilities and the density of bank branches across Indian states. We obtain state-specific shares as fixed effects μ_k from the following estimated specification:

$$f_{i,k} = \mu_k + \beta X_{i,k} + \varepsilon_{i,k}$$

where $f_{i,k}$ is the non-institutional debt share of household i in state k , and $X_{i,k}$ are dummy variables capturing wealth and age quintiles, education groups, rural versus urban residence, and number of children. We use household-level data from the 2012 wave of the Indian AIDIS. The density of bank branches is obtained from the RBI.



per 1,000 individuals in a state—is negative, it could suggest that access to institutional credit might help to explain variations across states in non-institutional debt.

Figure 13 presents the relationship between bank presence and non-institutional lending in India. We find a negative relationship between bank branch penetration, which we associate with supply-side variation in institutional debt and the fraction of non-institutional debt that households take on. Of course, this analysis is descriptive rather than causal, and this raises the possibility that high penetration of bank branches in certain states could be caused by the fraction of non-institutional debt on household balance sheets—or both could be caused by a common source. Nonetheless, the relationship between these two variables does raise the possibility that the high levels of non-institutional debt that we observe may not be the result of an active choice by Indian households to avoid institutional sources, but rather, could reflect the lack of a menu of options for households to alleviate credit constraints.

6. Conclusion

This paper describes the allocation of Indian household wealth and liabilities, and compares these allocations with those observed in other countries, using the most recent wave of the AIDIS (2012) household survey, in combination with international micro-data on household balance sheets. We document the dominant role of non-financial assets in the balance sheets of Indian households, particularly of gold holdings and residential real estate, both land and buildings. Other important features of the typical Indian household balance sheet include the lack of investment in retirement accounts, the very low participation rate in mortgage loans, and the heavy reliance on non-institutional debt.

The structure of household balance sheets varies significantly between rural and urban areas, by household characteristics (such as the age and education of the household head and the number of children), and by wealth. Controlling for these determinants, we find substantial residual heterogeneity across Indian states.

We attempt to explain this residual heterogeneity in the balance sheets of Indian households. For one, we exploit the state-level history of inflation developments and highlight the role of personal experiences of variable inflation in shaping the reliance of Indian households on non-financial assets. Our results suggest that a part of this demand could be attributed to the perceived role of gold as an inflation hedge. We also show that public sector employment (where retirement savings plans are compulsory) at the state level is related to the variation in state-level retirement savings in household balance sheets after controlling for demographic characteristics, suggesting the potential importance of mandating retirement savings. Finally, using variation in the density of bank branches across Indian states, we find that states with high bank branch penetration also exhibit a lower reliance on non-institutional sources of debt. While these correlations clearly cannot be interpreted as causal, they do highlight potentially important links that might hold the clue for future policy interventions and certainly suggest the need for more detailed research in this area.

In terms of specific directions for future policy, we suggest that there is a continuing need for policy to alleviate the dependence on physical savings such as gold. In particular, our results on the long-lasting correlation between inflation experiences and asset allocation strengthens the case for a strong inflation target to tackle inflation volatility, in addition to solutions recently put in place such as the RBI's gold monetization and gold bond schemes.

Second, improving the quality of financial decision-making by Indian households holds the promise of significant improvements in their welfare. Education is correlated with increases in household allocation to financial assets and is associated with a shift toward lower cost institutional sources of debt. This suggests that further investment in education, and in particular financial education, could generate gains on this margin as well as the more obvious ones.

Positive outcomes could also be achieved using a number of other policy instruments, including consumer financial regulation. However, our results suggest that great benefit may lie in specifically targeting the households' demand-side problems. These include modern financial product design through nudges, peer information, and default options.

The largest untapped potential may, however, lie in the area of innovations in financial technology that help solve demand-side issues (see Karlan et al. 2016 and Philippon 2016). Gaps in the use of financial services by Indian households, their heavy accumulation of non-financial wealth, and intense reliance on high-cost unsecured debt are also potential opportunities for the future growth of household finance in the country. The challenge that remains is for the financial market to be able to tap into this potential by leveraging technology and for the regulator to ensure that Indian households benefit from fair competition in this emerging area. Carefully designing a regulatory regime for financial technology that will help to alleviate the obvious shortcomings in Indian household finance, while enabling competition and controlling risks to Indian households, will be an important policy imperative going forward.

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Comments and Discussion*

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Introduction

When I concluded my discussion of this paper at the IPF, I noted that this was “... a thought provoking, unique paper ... [but it] is still a work in progress. I look forward to a more detailed parsing of its implications for financial theory.” In the current version, the authors have substantially revised it, incorporating the comments of both the discussants and the participants. I view the revised version as complementary to the excellent paper, “Sources of Growth in the Indian Economy” by Bosworth, Collins, and Virmani (2006). It is likely to become a definitive reference on Indian household finance.

To briefly summarize the paper, the authors use the latest wave (2012) of the All India Debt and Investment Survey (AIDIS) to characterize and provide a snapshot of the asset holdings of Indian households. They also construct similar measures for other countries—China, Australia, the UK, Germany, and the US—to facilitate international comparisons.

In the first part of the paper, the authors highlight two observations:

- a) As compared to households in developed countries, households in India and China hold a substantially higher fraction of non-financial assets in their portfolios.
- b) Household portfolios in India hold a relatively higher fraction of gold bullion than in any other developed or developing country.

* To preserve the sense of the discussions at the India Policy Forum (IPF), these discussants’ comments reflect the views expressed at the IPF and do not necessarily take into account revisions to the conference version of the paper in response to these and other comments in preparing the final, revised version published in this volume. The original conference version of the paper is available at www.ncaer.org.

^δ I am thankful to Ravi Bansal, John Donaldson, Chaitanya Mehra, and Edward Prescott for several stimulating discussions and comments.

In the second part of the paper, they focus on two questions:

- a) Why are the portfolio allocations of Indian and Chinese households different from households in developed markets?
- b) Do the portfolio allocations of Indian households differ by region, age, education, and family characteristics?

Assets and Liabilities of Indian Households

The strength and the major contribution of the paper is its comprehensive documentation of data in Section 4. Table 1 summarizes the assets and liabilities of Indian households using a number of statistics, Panels A and B in Figure 8 illustrate the variation along the life cycle and wealth distribution, while Table 2 documents the regional variation in household balance sheets. The authors are careful in pointing out the limitations of their dataset.¹ A striking feature of the data in Table 1 is the extreme skewness in the distribution of assets and liabilities. It reinforces the conclusions of a Credit Suisse report (Credit Suisse Research Institute 2014) that in 2014, the top 1 percent of the Indian population owned 49 percent of the country's total wealth and the top decile 74 percent. Further, the bottom 50 percent owned 4.5 percent, and the bottom 80 percent owned 16.6 percent of the wealth.

Given this highly skewed wealth distribution, the value-weighted asset holdings represent the holdings of the top decile, rather than the holdings of an average household.² The mean and median household allocations are very different.

The reader should be cautioned that the data presented is a cross-sectional snapshot of the composition of household savings. It is one (invaluable) observation of a stochastic process characterizing the evolution of different types of asset holdings. The Indian economy is in transition and this process is unlikely to be ergodic—ensemble averages and averages over time are likely to be quite different. It would be unwise to use this one observation for either policy prescriptions or to evaluate portfolio allocations.

1. Given the data limitations, it would have been comforting had the authors done a robustness check on the micro-data using the macro-data in the National Accounts and reported the findings.

2. In the Indian context, this is a meaningless concept. Unfortunately, the authors extensively use the potentially misleading phrase “average household.” For example, on page 14 they state, “In India, the average household holds 77 percent of its total assets in real estate.”

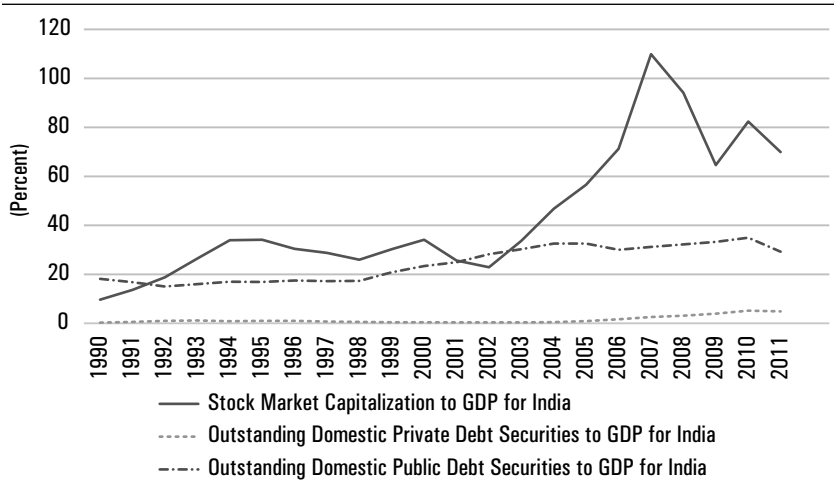
To elaborate, at a point in time, all assets must be held. The aggregate portfolio holdings simply reflect the value-weighted average of the available assets in the economy. While an individual investor or a group of investors may allocate assets taking prices as given, in the aggregate, at a point in time, the aggregate holdings simply reflect the assets available in the economy. Aggregate household net worth mimics the economy-wide fluctuation in asset valuation. As the relative market value of different asset classes changes over time, this will be reflected as changes in aggregate portfolio weights, even without active portfolio rebalancing.

For example, had this analysis been done in the 1990s, the holdings of debt and equity assets would have been negligible. Thus, rather than being suggestive of long-term portfolio decisions of Indian households, the results reported in the paper may simply reflect the degree of financial development in India.

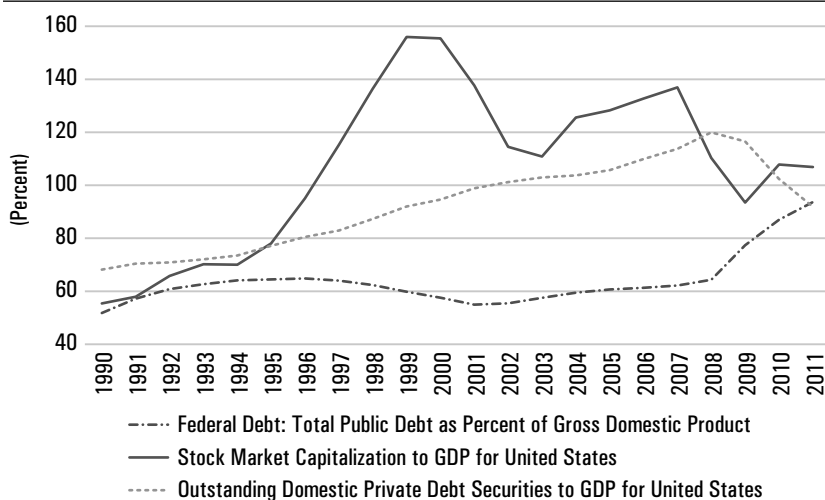
As Figure 1 below illustrates, it is only very recently that financial markets in India amounted to any significant fraction of GDP, so it should not come as a surprise that this is mirrored in the balance sheets of the households.

In contrast, in developed economies, financial assets are a substantially larger multiple of GDP. In the US, for example, they have averaged about 250 percent of GDP over the past 25 years. See Figure 2 below.

FIGURE 1. Evolution of the Financial Sector in India: 1990-2011



Source: 2015 research.stloiusfed.org

FIGURE 2. Evolution of the Financial Sector in the United States: 1990–2011

Source: 2015 research.stlouisfed.org

Household Borrowing and Lending

For every borrower, there must be a lender. In equilibrium, the total amount lent by households (D_L) is equal to the total amount borrowed by households, (D_B) plus Government debt (D_G)³ since household lending (D_L) is a subset of financial assets held by households (FA_H). It follows that $FA_H > D_B$. However, in Table 1, the mean financial assets are listed as ₹24,681 while the mean household debt (D_B) is listed as ₹120,845. This needs to be clarified.

Life Cycle Effects

I find the lack of any significant life cycle effects in Figure 8 in the paper to be somewhat anomalous. Historically, the static one-period mean–variance model has been the basis of portfolio advice. In this setting, the appropriate objective is end-of-period wealth maximization, and the only risk management tool that needs to be employed is diversification. However, recent advances in portfolio theory suggest that this objective may be inappropriate. As the correlation of asset returns with wage income changes over the life

3. Corporate debt in India is insignificant. However, since households own corporations, corporate borrowings show up as both assets and liabilities of households and hence nets out.

cycle, this is likely to lead to significant differences in portfolio allocations over the life cycle.⁴

Allocations may also differ due to differing objectives over the life cycle, such as wealth accumulation (while young) versus wealth preservation (nearing retirement) and different preferences for bequests. In the absence of a bequest motive, the optimal strategy for a household is to buy a life annuity rather than maximize wealth at retirement. In a recent paper, Mehra, Piguillem, and Prescott (2011) show that even with a 2 percent lower rate of return, it is welfare-enhancing for households that derive little or no utility from bequests to invest in annuities, to insure against outliving their savings.

Cross-country Comparisons

While it is illuminating to document portfolio allocations of households in China, Australia, the UK, Germany and the US, these statistics add little to the key message of the paper, especially since the authors provide no justification for their selection.⁵ Do these countries represent a benchmark or ideal that Indian households should mimic? If so, why? The paper is silent on this issue.

Angus Deaton (1990) starts his paper, “Saving in Developing Countries: Theory and Evidence” with the sentence, “I can think of four good reasons for studying savings in developing countries separately from saving behavior in developed countries.” I think the same applies to the composition of savings, especially since portfolio allocations in developed countries are likely to be drawn from a stationary distribution along a balanced growth path.⁶

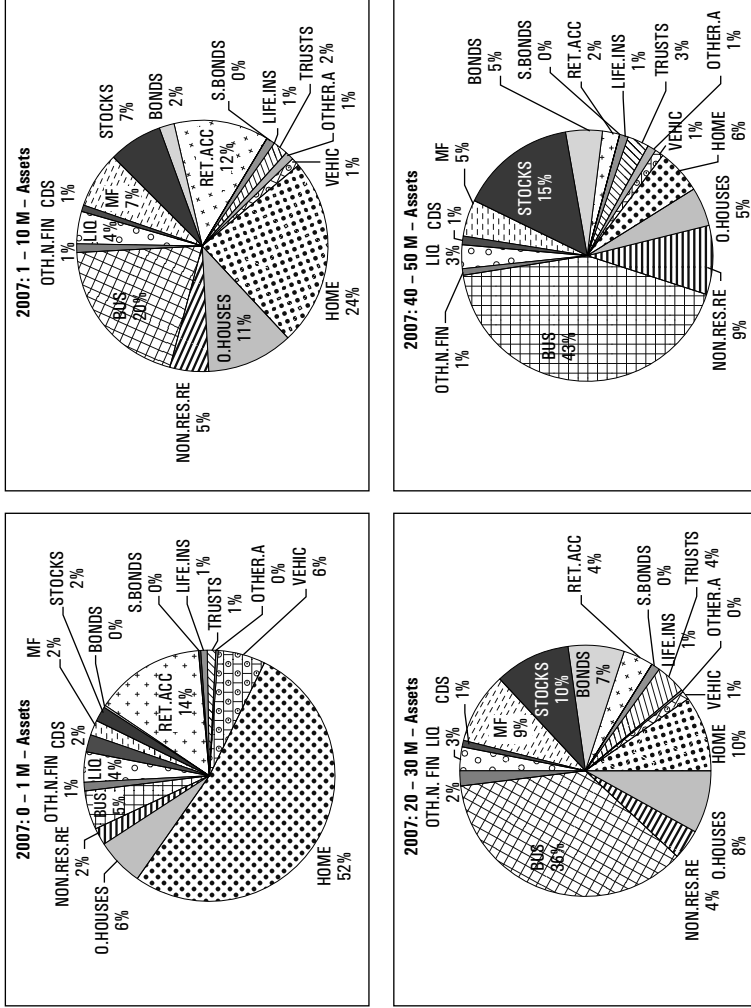
There is another, orthogonal observation that questions the relevance of these cross-country comparisons. Portfolio allocations across households vary considerably with the wealth level. For the US, this is illustrated in Figure 3 below. Given the extreme skewness in wealth distribution in India, is it appropriate to compare the “averages” in India with average portfolio holdings in countries where the wealth distribution is less skewed? If indeed a comparison must be made, a more appropriate comparison set would be the holdings of the ultrarich in various countries (see Ravina, Viceira, and Walter 2016).

4. See, for example, Constantinides, Donaldson, and Mehra (2002) or Davis and Mehra (2001).

5. Why not look at household portfolios in economies in transition such as Taiwan, Korea, Indonesia, Malaysia, Thailand, Brazil, or Argentina?

6. See my earlier comment.

FIGURE 3. Snapshot of Asset Portfolios of US Households in the 2007 US Survey of Consumer Finances



Notes: OTH.N.FIN = Other misc. non-financial assets. LIO = All types of transaction accounts (cash holdings). CDS = certificates of deposits. MF = mutual funds. STOCKS = directly held stocks. BONDS = directly held bonds. RET.ACC = retirement accounts. S.BONDS = savings bonds. LIFE.INS = cash value of whole life insurance. TRUSTS = other managed assets. OTHER.A = other miscellaneous financial assets. VEHIC = vehicles. HOME = primary residence(s). O.HOUSES = residential houses excluding primary residence(s). NON.RES.RE = net equity in non-residential real estate. BUS = businesses.

Holding Gold: An Optimal Response to Expropriation?

India has a history of “expropriation”⁷ going back to at least the Mughal era (Eraly 2007). Examples in the post-Independence era include bank nationalization, land reforms, the abolition of “privy purses,” and the recent demonetization. Holding gold may be a cultural norm that developed as an optimal response to expropriation.

The travelogues of Jean-Baptiste Tavernier and François Bernier provide a detailed description of life in the Mughal court. The Mughals employed the “Mansabdari System.” A feature of this system was that the property and title of a *mansabdar* was confiscated after his death. His widow and children had to start life from scratch. This practice led to perverse incentives, and *mansabdars* became experts in the art of concealing wealth, largely in the form of gold and precious stones.

Until the mid-1990s, the only viable financial asset that could be used for savings by the vast majority of Indians was that of bank time deposits. As Figure 7 in the paper clearly illustrates, the nominal returns on these deposits were dominated by returns on gold. So it should come as no surprise that gold features prominently in Indian household portfolios.⁸

Gold holdings in India are less of an anomaly if one recognizes that internationally too, households indirectly hold gold in the form of exchange-traded funds (ETFs) and other financial assets backed by physical gold. Although the paper characterizes gold as a non-financial asset, it could easily be characterized as a financial asset. I conjecture that substantial gold holdings in the portfolios of households in developed countries are probably classified as financial assets whereas the holdings of Indian households are classified as non-financial assets.

Prescription for Growth

The authors seem to imply that a change in the composition of the portfolio of savings will lead to a higher growth rate,⁹ specifically, reducing the holdings of gold and increasing the holdings of financial assets. However, this cannot be addressed without a model linking investment and growth. Perhaps the authors have in mind a Harrod–Domar model of the type $g_y = i_y/k_y$, where g_y is the growth rate of output y , i_y the investment as fraction of output (equal to the savings rate s), and k_y the capital output ratio. If the capital output ratio is

7. This is not a value judgment but a documentation of facts.

8. The low correlation with equity returns further enhances its appeal.

9. See their discussion in Section 1.

“assumed to be constant,” then presumably increasing “productive” investment by reducing gold holdings in household portfolios will increase the growth rate. A key feature of “neoclassical” growth models (Cass 1966; Koopmans 1965; Solow 1956) is that the steady state growth rate of an economy is independent of the savings rate and largely dependent on the growth rate of total factor productivity. From the perspective of neoclassical economic theory, gold is a “consumption good,” like jewelry. A shift out of gold would represent an increase in the Indian equilibrium savings as a fraction of GDP; however, the long-run growth in output per worker will not increase, without improvements in the growth rate of total factor productivity. These improvements are more likely to occur via technological improvements and the modernization of Indian labor laws than through “portfolio rebalancing.”

Another complicating factor is that India is transitioning toward an open economy regime. In open economies, as is well known, there is no direct link between domestic savings and investment as investments can be financed by capital inflows.

I think that this and other policy recommendations are best addressed in the context of well-specified models. Perhaps the authors should pursue them in a subsequent paper.

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This is an important paper for the obvious reason that savings and investment are critical for economic growth. The current version of the paper is considerably expanded from the draft presented at the IPF in July 2016, and I will take both versions into account in my comments. A major and welcome new analysis compared to the earlier version is the inclusion of the liabilities side of household balance sheets, which has also led to a change in the name of the original paper, which referred only to the “savings landscape.”

The well-known phenomenon of “home bias” means that domestic savings are vital for growth: foreign savings are a relatively small source of funds for investment. Furthermore, household savings comprise 70–80 percent of domestic savings in India. It is important to understand where these savings go. In particular, the answer to this question has implications for whether and how savings are channeled into productive investment. The current paper, by considering the liabilities side of household balance sheets, also gives a sense of whether and how Indian households can access others’ savings, whether for household investment or for consumption smoothing and risk management (in conjunction with the savings side). Indeed, high savings rates in fast-growing countries have been explained by precautionary motives, and this motivates the authors’ exploration of the Indian propensity to hold a relatively high fraction of savings in gold as a possible inflation hedge.

On the macroeconomic front, there has been prior work on the relationship of household savings to growth in India. For example, Samantaraya and Patra (2014) find that

... in the long run, one percentage increase in GDP leads to 2.56 percent increase in household savings, while one percentage increase in age dependency, raises household

savings by close to one-fifth percentage point. Similarly, one percentage increase in interest rate and inflation reduces household savings by 0.07 percent each.

These results are somewhat contrary to a precautionary motive for savings, but they do not tell us anything about the composition of savings. This is something that the current paper focuses on, in examining savings in gold. Other macroeconomic data tallies the split between physical and financial assets for household savings in India. Physical savings, in property as well as gold, have tended to dominate, but there has been a long-run trend toward increased financial savings (for example, Goyal 2015). On the other hand, there was at least a temporary reversal of this trend in 2011–13 (Kant 2014, Chart 1) associated with higher inflation.

The current paper uses detailed household level data from June 2012, from National Sample Survey Office's (NSSO's) AIDIS, with over 100,000 households sampled, and this allows for a much more in-depth analysis of patterns of household saving and borrowing, not just across different types of saving and borrowing but also across different types of households and different parts of India. This has not been attempted before and is impossible to achieve with aggregate data at the national or state level. Of course, the cost of this is that the analysis is cross-sectional only, so one cannot say anything about changes over time in the patterns analyzed here.

The paper begins with an extensive comparison of India to several other countries. For me, the main takeaways from this section are that India and China have similar levels of non-financial household assets, but differing patterns. Chinese households hold higher proportions of assets in durable goods and less in gold and real estate, though they have more mortgage debt. Indian households also stand out in having a high proportion of unsecured debt. Broadly, India and China both differ from the four advanced countries considered (the US, the UK, Australia, and Germany), reflecting their lower financial development.

The authors go on to compare India to other countries along the life cycle and across the wealth distribution. In India, lower proportions of younger households hold financial assets, in contrast to China. India is atypical in several other respects: Indian households do not reduce real estate holdings as they cross retirement age, there is no drop-off in mortgage loan participation at these ages, and unsecured debt is more significant in all age groups. Similar differences are reflected in comparisons across the wealth distribution. Another noteworthy feature of the Indian data is a "near absence of savings in retirement accounts." Overall, the differences in India seem to reflect its relative poverty (even compared to China), its underdeveloped

financial markets, and perhaps its family structures as well.¹⁰ The lack of financial development is also illustrated by the authors' presentation of aggregate data on returns to different asset classes: they suggest that there is an indication of under-participation in financial products connected to the stock market and inefficient diversification. This is a reasonable suggestion, though it is conjectural, as they acknowledge.

The paper then documents regional variations in household balance sheets. There is considerable variation across states and Union Territories in the proportions of financial assets and in patterns of holdings of non-financial assets. State-level income and urbanization are both relevant for explaining these variations, but unspecified cultural factors may also matter, especially for gold holdings. Cross-section regressions to explain heterogeneity in wealth allocation and credit choice across households yield a variety of results on patterns, some not that different from those observed with the univariate tabulations presented earlier in the paper.¹¹ It would have been helpful to include some interaction terms in the regressions. As specified in the paper, they assume, for example, that education effects are the same for different ages and wealth levels, and for rural and urban households. The estimations do not allow one to answer reasonable questions such as the following:

- Is the age variation in asset holding and borrowing patterns the same for rural and urban households?
- Are the education effects the same for younger and older households?
- Does education matter in the same way for the wealthy as for the less well-off for their asset holding and borrowing patterns?¹²

10. In the earlier version of the paper, the authors did not have the comparisons across countries, but included information on variation by education, family size, and whether urban or rural. For example, more educated households, urban households, and those with no children tended to hold higher proportions of financial assets. These relationships are explored in greater detail in the regression analysis, discussed later.

11. Some of these are not in the revised version. The revised version also adds retirement accounts on the asset side in the regressions in Table 3, but does not appear to discuss the results for this variable in the text accompanying the table.

12. One issue, for which there is no real solution, is that the authors refer to the top wealth category as the "rich" and "very rich." In fact, wealth over ₹1.7 million is not rich by the standards of many politicians and industrialists. These people are likely not included in the sample. Even for those included in the sample, under-reporting is likely to be very severe at this upper end. Furthermore, the wealthy may hold assets in trusts, corporations, societies, and so on, off the household balance sheet. All these factors must temper the conclusions that the authors reach about patterns of financialization and other asset holdings.

Another useful modification to the regressions would have been to use the middle category for wealth, age, and education as the omitted category—this would have made it easier to see the significance in differences across categories. For example, for real estate (Table 3 in the paper), the coefficients on the wealth categories are all positive and significant relative to the poorest households. Omitting the middle wealth level would have allowed one to see directly whether the adjacent wealth level categories had significantly different coefficients.

The authors present state-fixed effects from the regressions in Figures 9 and 10 of the paper. These fixed effects vary considerably across the states and Union Territories, and there is no obvious pattern to the differences in magnitudes.¹³ The labeling of the figures and the discussion are a bit inaccurate, since they refer to residual or unexplained variation. Since these are fixed effects and not the actual residuals, the discussion is potentially misleading, although one can infer what the authors are referring to with appropriate corrections in the wording.¹⁴ Finally, the authors do not provide information on the assumptions they made with respect to the properties of the error terms, in particular, whether they allowed for clustered standard errors.

Some of the most striking results of the paper are with respect to gold holdings and inflation experience. Using simple regressions of state-fixed effects on a measure of historical inflation volatility, as well as the previous household-level regressions with an inflation experience measure added in, the authors show that experiences of higher past inflation volatility or of higher past levels of inflation are associated with higher proportions of gold holdings. Other assets show negative or insignificant relationships, suggesting that gold is indeed viewed as an inflation hedge by Indian households. These regressions might have benefited from additional state-level controls, such as state domestic product per capita, or degree of urbanization. Although in the state-level regressions, there are relatively few degrees of freedom, this is not a problem in the household-level regressions.

13. The authors could also have explored possible geographical patterns, or correlations across fixed effects from different regressions, to get a sense of whether some economically interesting and identifiable phenomena are lurking behind the fixed effects.

14. The same problem of wording occurs in Section 5, which refers to residual cross-state variation. Of course, at the state level, household residuals should average out, and one can think of state-fixed effects as “residuals” in that they are unexplained, but the issue is partly with the statistical properties being assumed. For example, one could have assumed random effects at the state level and tested between the two specifications.

Another interesting exercise performed by the authors is to relate state-level fixed effects derived from a household-level regression to state-level public sector employment shares. The simple regression yields a positive and significant coefficient, although the authors acknowledge that the explanatory power is low. They note that organized sector employment as a whole should matter, and they offer some conjectures about households' inability or lack of recognition of long-term financial needs. As the authors acknowledge, this is a large and complex topic, and even in developed countries, there is evidence of myopia or other absences of full rationality in long-term financial planning. Hence, the results in the paper can be seen as merely an initial exploration.

Another very useful analysis provided by the paper is to consider the impact of the supply of formal finance.¹⁵ In particular, they regress the state-fixed effects estimated from a household-level regression of the share of non-institutional liabilities on the state-level density of bank branches and find a negative relationship. The authors are careful not to ascribe causality, but again point out that the results bear further investigation.¹⁶

While this paper represents a pioneering empirical analysis, deals with an extraordinary amount of data from multiple sources, and has a rich set of empirical results, I think it would have been useful to consider additional data. It seems the authors did take my earlier suggestion and incorporated data on bank branches, but there is also data on credit–deposit ratios¹⁷ and other economic data that could have been used. While the household survey is a cross-section for a single year (and it is unclear whether that year was “typical” or not), household balance sheets are the result of accumulated decisions over many years. Just as the authors used past inflation data to test for the impacts of inflation experiences on patterns of asset holdings, other variables from the past could have been used, either in state-level regressions or as state-level controls in the household regressions. I realize that this would have lengthened an already substantial paper and added considerable effort, but it is something to be kept in mind for the future.

The importance of examining trends in the data, wherever possible, is highlighted in the context of the authors' concluding section, which ventures into discussion of several policy options with respect to the demand and supply of financial services. To some extent, the recommendations in the

15. This analysis, and the previous one, are important additions to the first draft of the paper.

16. In this and the previous analysis, the authors do not report R-squareds, so the precise explanatory power of the regression remains unclear.

17. See, for example, Singh et al. (2014).

paper are generic and innocuous (for example, “investment in education, and in particular financial education”), but going beyond these to specifics, and prioritizing and designing policy interventions, will require much more detailed analysis of all the data we have. Policymaking also has to consider the functioning of India’s existing institutions for financial intermediation, in terms of factors such as internal organization, competition, and systemic risk. All that being said, this paper can really be a seminal one for a relatively neglected aspect of India’s financial policymaking, and is likely to take on that role.

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General Discussion

Barry Bosworth (chair) pointed out that in the US, surveys to identify the savings of the rich end up missing a huge proportion of their wealth. These US surveys used the same representative sampling approach as the Indian All India Debt and Investment Survey (AIDIS) did. He was surprised, therefore, that the Indian survey was assumed to have captured the savings of the wealthy. It would be important to validate this with some other control measure or total. Second, he pointed to the confusion between using “saving” and “savings” interchangeably in this paper. He noted that the simple rule followed in years past was that “saving” always referred

to the flow and “savings” to the stock. He suggested that the confusion could be avoided by using the word “wealth” for savings to measure the stock of savings.

T. N. Srinivasan noted that the RBI aggregate data on household saving was a residual from the national accounts after deducting corporate saving from the total. He was concerned about comparing that aggregate data with information from the National Sample Survey (NSS) of individual households. He asked for greater clarity in the paper on whether the NSS survey represented a steady state or a point on a transition path and whether causality was implied or not. This would need a closer link to economic theory. Without that he felt it was unclear what one learns from the paper, particularly relating to policy.

Andreas Bauer commended the paper’s focus on the quality of asset holdings. He noted the low share of financial assets in the total assets holdings across the income spectrum and suggested that while limited access might be a reasonable explanation for low-income households, tax avoidance would be the right explanation for upper income households.

Dilip Mookherjee suggested that the distinction between productive and non-productive assets might be of greater importance than financial versus non-financial savings. Real estate is one of the most important assets for Indian households. If the definition of real estate includes agricultural land, then the relevant measure might be the distinction between agricultural and non-agricultural investments, but it is not clear from the paper how real estate is measured. Even for capital assets, previous research by Larry Summers and others has stressed the differences in the rates of return between investments in building and in equipment, and their different impacts.

Mookherjee also emphasized that one of the most important assets for poor households is children and their relationship to old age security. This is tied to the demographic transition. There is earlier research, such as by Jeff Williamson for 19th-century UK, which associates increased household saving rates with declines in fertility and the migration of sons to the US. Mookherjee also pointed to evidence from China where the one-child policy has had a strong impact on saving rates. He suggested that fertility and migration may be important factors in determining household saving. The paper could be confusing the impact of education on saving with that of fertility and migration. He reinforced Nirvikar Singh’s comments about caution in drawing policy conclusions.

Surjit Bhalla expressed some surprise that low-income households were investing in financial assets, as opposed to gold. He suggested looking at

this much more closely. He expressed surprise on the small estimated value of the effect of inflation on saving.

Suman Bery, picking up on an earlier comment made by T. N. Srinivasan, remarked that in considering the allocation of assets when liabilities are in a sense pre-ordained, it would be helpful to have some sense of the behavioral model underlying the analysis of the AIDIS data. He also noted that while there may be a legal distinction between financial and non-financial assets that considers gold as the latter, for the purposes of monetary policy, gold is better seen as a financial asset.

Taking up Dilip Mookherjee's point on the importance of real estate, Devesh Kapur asked if the definition of wealth included farm animals like cattle, which are extremely important assets for rural farming households.