Household Finance in Retrospect and Prospect

John Y. Campbell   Tarun Ramadorai[*]

September 29, 2025

Abstract

Household finance research has come of age during the early 21st Century by exploiting computational advances for solving complex optimization problems, the availability of large administrative datasets, the development of microeconometrics for causal inference, and new paradigms in behavioral economics. We discuss the distinctive concerns of household finance in relation to other fields of financial economics, and we outline directions for the future growth of the field.

1 A Look Back: Household Finance in Retrospect

In retrospect, it seems obvious that financial economists should study the financial decisions made by individuals and households—just as they have long done for nonfinancial corporations, financial intermediaries, and governments. Yet until the early years of this century, there was surprisingly little research in this area. Campbell (2006) directed attention to the topic and helped standardize the name of the field as "household finance". Around the same time leading professional associations began to organize sessions on household finance at their annual meetings. In 2009 the National Bureau of Economic Research set up a household finance working group, and in 2015 the Centre for Economic Policy Research established a network on household finance. In the early 2020s the American Economic Association changed its Journal of Economic Literature field classification system to include a new code G50 for household finance within the G code for financial economics.[1] Household finance is now securely established as a major field within financial economics, complementary to corporate finance and the study of financial intermediation.

1.1 What Took So Long?

The relatively late emergence of household finance may reflect the demanding prerequisites for research in this area. To establish a normative benchmark for household finance, one must extend classical models of saving and portfolio choice to handle realistic complications such as borrowing constraints, nontradable and uncertain labor income, flexible labor supply, endogenous and irreversible retirement, and time-varying interest rates and equity risk premia.[2] Embedding these considerations in a life-cycle model is computationally challenging because such a model has a rich state space.[3] Matters become even more complicated if one considers indivisible housing, mortgages with embedded options, health and longevity risks with associated insurance products, progressive taxation, tax-favored retirement accounts, or tax-exempt fixed-income securities.

---

[1]Code G50 includes subcodes G51 (Household Saving, Borrowing, Debt and Wealth), G52 (Insurance), G53 (Financial Literacy), and G59 (Other). See Heikkila (2022) for details.

[2]The now standard model of consumption and savings with borrowing constraints and uncertain income was developed in the late 1980s and early 1990s by Zeldes (1989) and Deaton (1991) among others. It was extended to handle portfolio choice by Viceira (2001), Storesletten et al. (2007) and others. Bodie et al. (1992) and Swanson (2012) emphasize that the ability to adjust labor supply increases households' willingness to take financial risk, and Farhi and Panageas (2007) models the retirement decision. Campbell and Viceira (2002) summarizes research from the late 1990s and early 2000s that operationalizes the insights of Merton (1973) about portfolio choice with time-varying investment opportunities.

[3]Cocco et al. (2005) is an early reference that illustrates the challenges. We discuss recent progress on the computational front later in this paper.

Positive research in household finance makes different but equally daunting demands. The most obvious one is to obtain data on household decisions. In the last century, surveys such as the US Federal Reserve Board's Survey of Consumer Finances were the standard data source, but surveys have small samples and are limited in the detail they can acquire without jeopardizing response rates. In this century, large administrative datasets have become available and they make possible a far more ambitious style of empirical research.[4] Many of these datasets come from countries other than the US, including emerging as well as developed economies, and this has encouraged a global perspective in the household finance literature.[5]

To make effective use of administrative data, it is important to use suitable econometric methods with proper attention to the challenges of causal inference. Advances in applied microeconometrics since the mid-1990s, specifically to answer causal questions, also help to explain the rapid progress of household finance in recent years.[6] Today it is common to study the financial responses of households to policy changes that alter the prices they face, exploiting both time variation and cross-sectional variation in those prices.[7]

With a normative benchmark in hand and data available to measure household financial decisions, it quickly becomes apparent that many households behave in ways that are radically different from the prescriptions of any reasonable normative model. Campbell (2006) calls these "mistakes", and an important question in household finance is how to interpret them. From the earliest days of the field, household finance has drawn on behavioral finance to provide parameterized non-normative models of consumer behavior that can be used to summarize household financial data in a parsimonious manner. Examples include the prospect theory of Kahneman and Tversky (1979), frequently applied

---

[4]Odean (1998) is an early study of household stock trading using administrative data provided by a US discount brokerage firm. Many other studies have used the same dataset as neither that firm nor others have seen fit to provide more recent data on equity trading. Bank account transactions data from the JPMorgan Chase Institute have been used by Ganong and Noel (2019) and others to study the spending decisions of JPMorgan Chase customers. Technology platforms used by financial advisers provide data on the portfolios of these advisers' customers and have been used by Foerster et al. (2017) and Gabaix et al. (2023) among others.

[5]Scandinavian countries have excellent data on household decisions, sometimes obtained in connection with wealth taxation: see for example Calvet et al. (2007) or Andersen et al. (2020). Electronic records of equity ownership are available in several countries including Finland, Norway, India, and China: see for example Grinblatt and Keloharju (2000), Døskeland and Hvide (2011), Campbell et al. (2019), or Chen et al. (2022). Badarinza et al. (2016) reviews the international comparative literature in household finance.

[6]Seminal references are Card and Krueger (1994) and Imbens and Angrist (1994).

[7]Canonical examples include Chetty et al. (2014) on retirement saving and Agarwal et al. (2015) on credit cards; a recent example is de Silva (2023) on student loan repayment. These papers look at government policy changes, but large financial institutions also change their policies in ways that can be exploited by household finance researchers. As we later discuss, researchers can sometimes create such changes by working with financial institutions to run field experiments.

to explain the disposition effect (Shefrin and Statman (1985)); the beta-delta model of present bias (Laibson (1997)), useful for understanding household borrowing; theories of overconfidence and biased self-attribution (Daniel et al. (1998)); models of inertia, driven by inattention or fixed costs of taking action (Gabaix and Laibson (2001), Handel (2013), Andersen et al. (2020)); models in which investor responses to information are mediated by its salience (Bordalo et al. (2012)); models in which people judge the future on the basis of their personal experiences rather than all available historical information (Malmendier and Nagel (2011); Anagol et al. (2021)); and memory-based models in which the events people recall are influenced by the context in which the recall occurs (Bordalo et al. (2020a), Wachter and Kahana (2024)). The availability of such models is another factor that has allowed household finance to flourish in the early 21st Century.

1.2   What Is Distinctive About Household Finance?

Although household finance draws on models and insights from behavioral finance, it is distinct in several respects. While behavioral finance focuses on individual decision-making, household finance is equally concerned with market equilibrium that results from the responses of financial firms to consumer behavior. Often these responses exploit consumer biases rather than correcting them. As one obvious example, competitive firms respond to market demands and therefore oversupply products and services with salient benefits and hidden costs. Also, because consumers are often reluctant to shop for financial products, financial firms have market power which allows them to charge markups over marginal cost; but free entry can lead to an inefficient equilibrium with an excessive number of product providers competing through advertising and branding rather than quality or price. Firms may also bundle products in a way that makes it harder for consumers to compare prices across providers.

Many financial products are hard to manage, and this can also lead to a problematic equilibrium. Errors made by some customers generate revenue for the financial industry that is often partly passed on to all product purchasers in the form of lower up-front prices. The end result is that sophisticated consumers who manage their products properly are subsidized by less sophisticated consumers, who are often poorer and less educated; and these cross-subsidies make it hard for simpler financial products to gain a foothold in the marketplace (Gabaix and Laibson (2006)).[8]

---

[8]Financial examples include checking accounts, which are cheaper because some customers pay overdraft fees; credit cards, which offer rewards paid for in part by late fees (Agarwal et al. (2023)); mortgages, which are cheaper because some borrowers fail to refinance promptly (Campbell (2006)); and life insurance policies, which are cheaper because many customers allow their policies to lapse after a few years

The concern of household finance with market equilibrium gives the field a strong connection with industrial organization. These concerns also connect household finance with public policy, specifically in the area of consumer financial protection (Campbell et al. (2011); Ramadorai et al. (2017)). Early enthusiasm for gentle intervention in financial markets through "nudges" (suggestions or default choices that are easy for consumers to opt out of if they wish, and that do not alter the prices people face, as in Thaler and Sunstein (2009)) has been followed by recent skepticism about the effectiveness of nudges and interest in more muscular intervention in financial markets.[9]

Certain aspects of behavioral finance are particularly relevant to household finance, while others are of less interest. For example, behavioral finance economists often focus on cognitive biases that can be cleanly identified in an experimental setting, while household finance values empirical models that capture decision making "in the wild". These models may have reduced-form parameters whose interpretation is somewhat unclear: for example, the parameter that captures the arrival of an opportunity to make a decision in a Calvo (1983) model. Household finance economists are often willing to live with such ambiguity. As another example, household finance is particularly interested in social influences on decision making—from life partners, family, co-workers, community, culture, and friends—because these can drive broad trends in financial outcomes.[10] Finally, household finance is more likely to incorporate behavioral factors when these can be tractably included in the life-cycle model that is a widely used framework for household finance. Present bias, for example, now satisfies this condition and may therefore become more widely considered by household finance researchers.[11]

Household finance shares its interest in market equilibrium with asset pricing, another major field of financial economics. However, household finance is distinct from asset pricing in its interest in the allocations of wealth and consumption across people, rather than in the financial market prices that guide those allocations. One important consequence is that the natural weighting scheme across households is equal weighting in household finance, and wealth weighting in asset pricing (since wealthier people have a greater influence on asset prices). Similarly, risk-tolerant investors are disproportionately important in asset pricing but not so in household finance.

It might seem obvious that household finance is distinct from corporate finance since

---

(Gottlieb and Smetters (2021)).

[9]For skeptical assessments of nudge effectiveness, see DellaVigna and Linos (2022), Choi et al. (2024), and Choukhmane (2025). For advocacy of consumer financial protection regulation, see Campbell (2016) and Campbell and Ramadorai (2025).

[10]For the influences of friends, see Bailey et al. (2018). For co-workers, see Maturana and Nickerson (2019). For a general review, see Kuchler and Stroebel (2021).

[11]See, e.g., Laibson et al. (2024).

these fields study the financial decisions of very different entities: households and corporations have different objectives and constraints, deal with different financial intermediaries, and are active in different financial markets. However, household finance and corporate finance share common interests. A particularly important example is the impact of financial constraints on behavior. Rampini and Viswanathan (2010) emphasizes how constrained firms may eschew risk management because it uses scarce borrowing capacity; a similar effect deters constrained households from buying insurance (Cole et al. (2013)). Financial constraints have broad effects on many household decisions, from labor market participation (Del Boca and Lusardi (2003)) to home purchases (Aiello et al. (2024)) to investments in green technology for home heating (Berg et al. (2024)).

1.3   The Influence of Household Finance on Economics

Household finance has influenced a number of fields in economics more broadly, most obviously macroeconomics. While traditional macroeconomic models work with a representative agent, there has been growing interest in models with heterogeneous agents. Within New Keynesian macroeconomics these models are known as RANK and HANK respectively, and HANK models have become increasingly popular. The focus of the HANK literature is on heterogeneity in the marginal propensity to consume, derived from the concavity of the consumption function in models with borrowing constraints and uncertainty (Zeldes (1989), Carroll and Kimball (1996)). While at first glance many households seem to have sufficient assets to make borrowing constraints of minor concern, this picture changes when one takes into account the difficulty in accessing illiquid assets such as housing equity and retirement savings accounts. Kaplan and Violante (2014) call households with ample illiquid assets but inadequate liquid assets the "wealthy hand-to-mouth".

Heterogeneity in the marginal propensity to consume (MPC) has important implications for macroeconomic policy. The effect of any policy on aggregate consumption depends on which households are affected; and pure redistributive policies, which would have no impact on aggregate consumption in a homogeneous-MPC world, can now have aggregate effects. One important consequence is that monetary policy may operate not only through intertemporal substitution, as in a RANK model, but also by redistribution between borrowers and lenders—most importantly, in the mortgage market (Auclert (2019)).

Household finance contributes to heterogeneous-agent macroeconomics in several ways. Most obviously, it offers a more detailed understanding of borrowing constraints. Lee and Maxted (2023), for example, consider the implications of unused credit card borrowing

capacity for models of hand-to-mouth consumers. Household finance also clarifies the relative impact of debt forbearance policies, often used in recessions such as the global financial crisis or the COVID-19 pandemic, that provide current liquidity versus those that offer long-term debt relief (Ganong and Noel (2020), Katz (2023)).

The mortgage market is one area of great interest to both household finance and macroeconomics. Some mortgages (FRMs) carry fixed interest rates that adjust only when the mortgage is refinanced, while others (ARMs) have rates that adjust with market conditions. ARMs increase the effectiveness of stimulative monetary policy that cuts the short-term interest rate.[12] There are three reasons for this. First, a stimulative reduction in interest rates is temporary so it moves short-term ARM rates more than it moves long-term FRM rates. Second, the MPC is more likely to be different across mortgage lenders and borrowers when the mortgages are ARMs than when they are FRMs.[13] Third, FRM borrowers only experience budget relief if they refinance, but this will not be possible if they have negative home equity or a low credit score, and even if they can refinance some of them will fail to do so.

The failure to refinance when it is possible and advantageous to do so is an example of household inertia, a phenomenon that has been intensively studied in household finance. There is evidence that mortgage refinancing failures are more common among poorer and less financially sophisticated households, implying that monetary policy has a weakened ability to support the consumption of those people who could benefit the most from it in a recession.[14] Beyond the contributions household finance has already made to macroeconomics, it can now usefully encourage macroeconomists to consider not only heterogeneity in the MPC, but also heterogeneity in inertia.[15]

More generally, household attention to incentives seems to vary systematically across the population. This has implications not only for macroeconomics, but also for public finance. For example, there is evidence that wealthy households with a high propensity to save are more likely to respond to tax incentives for retirement savings (Chetty et al.

---

[12]Di Maggio et al. (2017). This implies that monetary policy has heterogeneous effects across US regions with different shares of ARMs vs FRMs (Beraja et al. (2019)), and that time-variation in the ARM share causes time-variation in the effectiveness of monetary policy (Berger et al. (2021)).

[13]ARM rates decline temporarily, whereas any decline in FRM rates is long-lasting. Mortgage lenders are likely to be unconstrained permanent-income consumers, but faced with a long-lasting reduction in income they will cut their consumption substantially, offsetting the increase in consumption by borrowers and dampening the transmission of monetary policy to aggregate consumption in a FRM-dominated mortgage market.

[14]See Andersen et al. (2020) and Gerardi et al. (2023).

[15]Other types of heterogeneity are also relevant for macroeconomics. Luetticke (2021), for example, emphasizes the macroeconomic implications of heterogeneity in liquidity preference, and Kekre and Lenel (2022) study heterogeneity in the marginal propensity to take risk.

(2014)) and to wealth taxes (Jakobsen et al. (2020)). This may substantially alter the cost-benefit analysis of tax policy.

Household finance also has implications for the study of wealth inequality. There are substantial differences across the wealth distribution in the returns households earn on their assets and the interest rates they pay when they borrow (Bach et al. (2020); Campbell et al. (2019)). These differences contribute to the evolution of wealth inequality, and an important topic for household finance research is to understand the magnitude of this effect, the causes of return differences, and the ways they can be mitigated.

2   New Frontiers: Household Finance in Prospect

While much has been accomplished, household finance is just beginning to hit its stride. Household finance data are ever more abundant, and economists are rapidly improving their ability to solve complicated household optimization problems and models of financial market equilibrium. We believe that data and models are complements rather than substitutes, so these trends reinforce one another and we expect them to generate meaningful research in the years to come.

Such research does not add complexity for complexity's sake. The availability of new administrative and survey data and the ease of setting up and solving more complex models allow economists to move beyond a simple characterization of household "mistakes" to a detailed analysis of the influences of preferences, beliefs, financial constraints, and limited attention on household decisions. This requires a rich understanding of the environment in which households operate, so the incentives of suppliers and the industrial organization of financial markets also become key factors to study.

Since its inception, the field of household finance has been very close to practice. This proximity means that new academic insights can stimulate retail financial innovation, reveal poor outcomes in specific markets, and support the design and fine-tuning of consumer financial regulation.

In the remainder of this section we discuss some of the salient issues facing the field and highlight important themes in the recent literature.

2.1   The Promise and Problems of Big Data

It is easy to be impressed by the size of administrative datasets available today. Banking transactions data or payments data, for example, can span billions of transactions from millions of accounts (Price et al., 2017; Argyle et al., 2025). However, the number of

observations is not a sufficient statistic for the quality of a dataset.

While vast datasets have enabled substantial progress on important questions in household finance, there are limitations on the inferences that can be drawn from certain types of data. First, there are often spillover effects across financial margins that are relevant for a particular household decision. This means that if a particular dataset does not capture such spillover margins, the conclusions reached from it can be limited. This is obviously challenging in the case of retirement saving, where increased saving in a retirement account may be associated with reduced saving in other accounts, increased borrowing using credit cards or mortgages, altered labor supply, and so forth. But even in an apparently self-contained decision such as the choice of an employer-provided health insurance plan, it is important to measure related activity in health savings accounts. This problem becomes more acute when a dataset that does not capture all the relevant margins is used to evaluate the impact of an intervention, say, for example, the effects of a nudge (see, e.g., Beshears et al. (2024)).

Second, since households are often slow to make decisions and adjust their financial strategies only gradually, it is important for data to track the same people over extended periods of time. Once again retirement saving is a compelling example. Early research on retirement nudges (auto-enrollment and default asset allocation in 401(k) plans) showed impressive results (Madrian and Shea, 2001; Choi et al., 2004), but subsequent research has highlighted that some of the initial effects fade over time as auto-enrolled people change jobs and draw on retirement assets and as those who were not auto-enrolled catch up with those who were (Beshears et al., 2022; Choukhmane, 2025; Choi et al., 2024).

Third, while useful insights can be derived from administrative data provided by financial services firms, selection bias can limit the generalizability of inferences drawn from such data. These datasets only tell us about the clients of the institution that is providing the data, and there is a risk that these clients are not representative of the whole population. For example, clients of the discount brokerage firm that provided data to Odean (1998) may have been unusually active traders, while clients of Vanguard surveyed by Giglio et al. (2021) are probably more committed than other investors to passive investment strategies charging low fees, and the high-net-worth individuals studied by Gabaix et al. (2023) appear in their Addepar dataset because they employ wealth managers so investment strategies favored by self-directed wealthy people may be underrepresented.

A further challenge with administrative data obtained from private sources is that it can be difficult or even impossible to test the replicability of published research. The robustness of economic insights drawn from such data should ultimately be confirmed over time as researchers replicate findings on other data or eventually obtain access to

9

the original private source. However, this process can take many years, creating the risk that inaccurate results send the profession off on unproductive tangents in the interim. Economics and finance journals have evolved practices to handle this issue, such as extensive robustness checks requested by referees, the posting of code and pseudo-data, the employment of data editors who replicate results prior to publication, and retractions of published papers that egregiously fail replication tests. However, these practices are costly and unlikely to catch all problems with this type of research.[16]

In response to these challenges, household finance is making significant progress by linking datasets so that multiple decisions can be studied for large numbers of people over time, and by building infrastructure that allows multiple research projects to use common data. For example, many papers exploit the linked administrative data constructed by Scandinavian governments (see for example Calvet et al. (2007), Døskeland and Hvide (2011), Grinblatt et al. (2012), Andersen et al. (2020), Bach et al. (2020), or Calvet et al. (2025)). More recently, researchers have linked US census data to credit bureau records, opening up new possibilities for research on US household behavior in credit markets (Bakker et al., 2025). And in countries such as Brazil, Mexico, and South Africa with fast-growing financial systems, detailed electronic record-keeping unencumbered by legacy systems permits easy connections between multiple datasources, resulting in a more complete picture (see, e.g., Van Doornik et al. (2024); Higgins (2024b)).

Another approach that is becoming increasingly important is to generate data by running field experiments with public or private sector partners. Such data are particularly good for establishing causal effects, although there are as always concerns about external validity, including not only the extent to which experimental results can be extrapolated from one population to another, but also the extent to which results obtained in one particular context can be extrapolated to other contexts of interest. Recent examples include Byrne et al. (2023) and Daminato et al. (2024).

2.2 Preferences, Beliefs, and Narratives

Household finance cannot progress without understanding the factors that drive the financial decisions of households. The natural starting point for economists is the assumption that households optimize conditional on their preferences and their beliefs about the financial environment. That environment includes constraints, which households are normally assumed to understand, and unknown parameters such as the expected returns on risky

---

[16]An extreme recent example that was fortunately detected before publication is Toner-Rodgers (2024). While this might be regarded as a success for the economics profession's quality control procedures, the paper received extensive publicity before being retracted.

assets. A canonical example is the Merton (1969) model of portfolio choice between a safe and a risky asset, whose return is iid with mean excess return μ and variance σ^2, by an investor with constant relative risk aversion γ. This yields the classic formula for the risky portfolio share, α:

$$\alpha = \frac{\mu}{\gamma\sigma^2}. \tag{1}$$

This equation makes it clear that any heterogeneity in household investment strategies can be explained equally well by heterogeneity in risk aversion γ, or by heterogeneity in beliefs about the equity premium μ or risk σ^2.[17] Identification of these drivers of financial risktaking requires additional assumptions; and this identification challenge carries over to richer models that include labor income risk, more complex preferences, and so forth.

One way to proceed is to assume that all households have common expectations based on historical average returns. Calvet et al. (2025) use this assumption to estimate heterogeneity in the parameters of an Epstein-Zin preference function among middle-aged Swedish households saving for retirement, finding modest heterogeneity in risk aversion and greater heterogeneity in the rate of time preference and the elasticity of intertemporal substitution, parameters which are identified from savings behavior.

An alternative assumption, following a seminal paper by Malmendier and Nagel (2011), is that investors' beliefs are based on a weighted average of the returns they have themselves experienced. This assumption implies that beliefs will be heterogeneous across investors of different ages. It fits the fact that younger investors have higher risky shares than older ones in the aftermath of bull markets, but lower risky shares in the aftermath of bear markets. An extension of this idea is that beliefs are influenced by the experiences of people's friends. Bailey et al. (2018), for example, shows that people whose Facebook friends have experienced rising house prices are more likely to buy houses themselves, buy larger houses, and pay more for houses.

This work attempts to separate the influences of beliefs from those of preferences by making an assumption about the relative mutability of beliefs relative to preferences. Put differently, these strategies identify the effects of variation in beliefs by assuming that we can broadly characterize preferences as immutable and beliefs as mutable. Applying this logic, some patterns in household decision-making are more easily explained by non-standard preferences than by non-standard beliefs. For example, the distributions of house sale prices in many countries around the world show sharp bunching precisely

---

[17]In a model with only Brownian risk, such as the Merton model, beliefs about risk must be relatively accurate given that households can observe high-frequency fluctuations in asset prices. However, models in which asset prices are subject to rare disasters, such as Barro (2006), or have arbitrary fat-tailed distributions, such as Martin (2013), allow more room for heterogeneity in beliefs about risk.

at the original purchase prices of the houses, even many years following the original transactions (Andersen et al., 2022; Badarinza et al., 2024b). Reference-dependent and loss-averse preferences around the original nominal purchase price readily explain this pattern; it is more difficult to explain this high-stakes household decision using beliefs without assuming that households doggedly persist in the belief that their house is worth precisely the nominal purchase price even many years after they purchased it. This raises several questions. What are the components of a "standard model" of household decision-making? Are there some contexts in which preferences come to the fore, and others in which beliefs are more relevant? And do different types of belief distortions show up in different financial decision-making environments?

A straightforward approach that has recently been popular, in the broader economics literature as well as in finance, is to use surveys to ask investors what they believe (Bordalo et al., 2020b; Weber et al., 2022; Colarieti et al., 2024). Greenwood and Shleifer (2014), for example, documents the fact that the equity premium beliefs reported in several investment surveys are extrapolative, increasing after stock prices have risen and decreasing after they have fallen. D'Acunto et al. (2021) relates the self-reported inflation expectations of consumers to the prices they have been exposed to in grocery stores, an interesting application of the Malmendier and Nagel (2011) model of belief formation based on experiences.

A challenge to this approach is that investors' decisions do not seem to respond as strongly to their self-reported beliefs as one would expect. Giglio et al. (2021) surveys investors in Vanguard mutual funds and shows that their equity allocations vary much less with self-reported beliefs than would be implied by the Merton formula (1). In the cross section that could be explained by heterogeneity in risk aversion such that more optimistic investors are also more risk averse; but equity allocations are also insensitive to changes in investors' self-reported beliefs, a pattern that is inconsistent with stable risk aversion within a Merton framework.

Enke and Graeber (2023) argues that when people are faced with complex decision or forecasting problems, they shrink their beliefs towards a default value that is appropriate for a typical example of the problem they face.[18] Shrinkage of this sort can explain various biases in decisions and forecasts that have been observed in experimental settings in the behavioral economics literature. An important question for household finance is whether the beliefs that investors report in surveys correspond to beliefs before or after shrinkage in

---

[18]A variation of this idea is developed by Augenblick et al. (2025), who argue that when processing new information, people are often uncertain of its relevance and update their beliefs by an amount appropriate for a typical degree of relevance. By doing so they underreact to highly relevant information, but overreact to minimally relevant information.

the Enke-Graeber model. The weak response of equity allocations to self-reported beliefs in Giglio et al. (2021) can be explained by shrinkage if Vanguard investors report unshrunk beliefs but then act on shrunk beliefs. In that case, the beliefs measured in surveys do not directly drive decisions but instead are merely an input to decisions. Clarifying this issue is an important topic for household finance research.

Another interesting question is what determines the default value towards which beliefs are shrunk. We have already mentioned the possibility that social influences serve to aggregate experience effects across groups of friends. The importance of culture is suggested by research such as Haliassos et al. (2017) showing that immigrants carry with them financial behaviors typical of their home countries, which gradually diminish over time. These patterns can be explained by shrinkage of household beliefs towards a norm which adjusts gradually over time to the surrounding culture.[19]

A further challenge to models of belief formation is the observation that people sometimes make choices that are dominated in the sense that no realization of a random variable leads to a superior outcome. Such choices cannot be rationalized by any beliefs about the distribution of the random variable. Examples include purchases of low-deductible health insurance plans that are dominated by high-deductible plans with much lower premia (Handel, 2013; Bhargava et al., 2017; Liu and Sydnor, 2022), and purchases of bank CD's that are dominated by CD's with other maturities offered by the same bank (Fleckenstein and Longstaff, 2024). A belief-based explanation of such decisions must involve some deeper failure to understand the structure of the problem, such as assigning a positive probability to a scenario that is impossible given contract terms, or a zero probability to a possible scenario.

Some work in household finance takes the perspective that people do not actually solve optimization problems using subjective beliefs, but just repeat actions that have worked well for them in the past. Barberis and Jin (2023) describe this as "model-free learning" and present evidence that it helps to explain many common financial behaviors. Since human beings are social, there is also the possibility that people take actions that have worked well for other people they know. Maturana and Nickerson (2019), for example, show that public school teachers in Texas are more likely to refinance their mortgages when other teachers with whom they share free time in the teachers' lounge have refinanced theirs. This may not reflect belief updating so much as copying of an action based on its results for others.

---

[19]A related idea in the political economy literature is that people adopt socially acceptable views, or at least report such views. Kuran (1997) calls this "preference falsification", although this is a different use of the word preference than is standard in the finance literature.

When people describe investment strategies to others, they often use narratives to describe them. People talk about strategies such as "buy the dips", "climb the housing ladder", or "HODL" and it is not clear that they have, or are able to articulate, beliefs that would justify these strategies. A theoretical literature on social finance asks how such narratives spread through the investor community (Shiller, 2017). Hirshleifer (2020) stresses that social transmission may exaggerate the successes and hide the failures of investment strategies, allowing narratives to spread even if they are not associated with objectively successful results.

The recent development of large language models (LLMs) makes it much easier to scale up empirical research on this topic, and we expect to see many papers using LLMs to analyze financial narratives in the coming years. One interesting question is the extent to which assets that are similarly described in financial news also tend to be held together in the portfolios of institutional or individual investors, and to have prices that move together over time. Put another way, do financial narratives, asset holdings, and asset returns share a common factor structure? (Balasubramaniam et al., 2023; Gabaix et al., 2024; Sarkar, 2025).

2.3   Understanding Inaction

One of the most striking features of household financial behavior is that households take action infrequently, even though interest rates, asset prices, their own financial circumstances, and the terms of financial contracts evolve continuously.

For economists, it is natural to attribute such inertia to fixed costs that households pay when they take action. These may include financial costs charged by counterparties, the value of time spent analyzing and implementing transactions, and broader psychological costs summarized by the word "hassle". Models of optimization in the presence of fixed costs generically imply that actions are only taken when benefits exceed a threshold that justifies the cost of action.

Importantly, when benefits evolve randomly the position of the threshold reflects the option value of delaying action. Analytical solutions for "real option" problems are notoriously difficult to obtain (Dixit and Pindyck, 1994), and only approximate solutions are available for some important household finance problems such as optimal mortgage refinancing (Agarwal et al., 2013). This problem has been the focus of a large literature studying both the refinancing of fixed-rate mortgages to benefit from lower market interest rates and the refinancing of adjustable-rate mortgages to renew advantageous teaser rates.

The main conclusions of this literature are as follows. First, the threshold benefits that trigger action are typically larger than can be justified by fixed financial costs charged by counterparties.[20] Thus private costs—the value of time and the psychological reluctance to enter financial transactions—must be large. Second, the thresholds vary across households and are typically larger for less educated households with lower income and wealth. These households give up more benefits: for example, Andersen et al. (2020) finds that Danish households in the lowest quintiles of income and education realize only about half the interest savings achievable by refinancing their mortgages optimally, while those in the highest quintiles realize over three-quarters of those savings.

Third, households often take action at times when benefits are lower than they were in earlier periods when the same households did not take any action. This implies that fixed costs cannot be constant for each household, but must vary over time. This is often captured by a simple model in which fixed costs vary discretely between two levels, the higher of which may either be infinite as in Calvo (1983) (e.g. Andersen et al. (2020)) or finite but large (e.g. Fisher et al. (2024), or de Silva (2023) in the context of adjustments to labor supply). Fourth, there are aggregate shocks to the frequency of action ("refinancing waves" in the mortgage context) that are not fully explained by aggregate movements in the level of benefits (interest rate movements in the case of fixed-rate mortgages).[21] Thus shocks to fixed costs are not idiosyncratic but correlated across households.

While models of time-varying fixed costs can be made sufficiently rich to provide a good empirical characterization of inaction, they leave some important questions unanswered. Why do households act as if the fixed costs of taking action are so high, why do these fixed costs seem higher for people with lower income and education, and why do they vary over time? Do people have naive present bias that leads them to procrastinate, putting off costly actions today in the belief that they will be patient enough to take care of business tomorrow? Do people place a high value on their time when they are busy? (If so, income should raise fixed costs rather than lowering them.) Or are fixed costs merely a reduced-form representation of some other factor? For example, do households pay only intermittent attention to mortgage markets and often remain unaware of the benefits of refinancing? If so, what aggregate shocks cause fluctuations in awareness, and what policy interventions might increase awareness?[22] We expect to see more empirical research that

---

[20]See, for example, Andersen et al. (2020), Fisher et al. (2024), and Berger et al. (2024). On the other hand Agarwal et al. (2013) argues that some US mortgage borrowers ignore the option value of delaying refinancing when interest rates are random, and therefore refinance too fast rather than too slowly.

[21]This fact is the reason why mortgage-backed securities have prepayment risk that cannot be perfectly hedged using interest-rate derivatives.

[22]These questions relate to the distinction made by Handel and Schwartzstein (2018) between "frictions"—fixed costs of taking action—and "mental gaps"—the use of incorrect models of the world

measures households' time allocation and attention directly, and more field experiments on awareness along the lines of Byrne et al. (2023).

An important question is how inertia affects the prices of financial contracts offered by suppliers. Refinancing failures generate additional revenue to mortgage investors. In a competitive market for mortgage origination, this revenue should lower mortgage rates ex ante. If the same mortgage rates are offered to all borrowers, the result is a cross-subsidy from slow refinancers with high fixed costs to fast refinancers with low fixed costs.[23] Fisher et al. (2024) quantify this cross-subsidy in the context of UK adjustable-rate mortgages which should be refinanced to renew teaser rates. They do so by structurally modelling the current system and contrasting it with a counterfactual (higher) single-rate world with no need for refinancing, showing that cross-subsidies are large, and regressive along both income and regional dimensions. In the United States, Berger et al. (2024) conduct a similar exercise, also finding regressive cross-subsidies.

Similar cross-subsidies exist in other markets where households are heterogeneous in their ability to manage financial products. For example, Gottlieb and Smetters (2021) show that most individual life insurance policies lapse, creating perverse cross subsidies in which more forgetful consumers effectively create savings for more attentive consumers. In consumer credit markets, Agarwal et al. (2023) show that banks incentivize the use of "reward" credit cards which embed substantial cross-subsidies, and which are primarily exploited by the wealthy and better-educated at the expense of the poorer and less-educated.

A puzzle about this phenomenon is why financial service providers don't compete for the business of the most inertial consumers by offering them lower prices up front, thereby reducing or even eliminating the cross-subsidy to attentive consumers. While inertia is imperfectly observable, it can be proxied both by household characteristics and by contract features such as the use of "points" in the US mortgage market (Zhang, 2022). Some mortgages are packaged into "specified MBS" whose prices reflect borrower characteristics that predict prepayment speed. Yet the rates borrowers pay do not seem to reflect their inertia. This is an unresolved issue at the interface between household finance and industrial organization.

Another important question on which more work is needed pertains to optimal regulatory policy in household finance when a large fraction of consumers is inert. As we have discussed, nudges—especially in retirement savings—have had mixed results that reflect gradual household adjustment on sometimes unobserved margins. It is natural then to

---

that prevent households from appreciating the benefits of taking action.

[23]This is an example of the "shrouded equilibrium" of Gabaix and Laibson (2006).

consider more aggressive regulation, but this must be carefully designed when suppliers can respond by changing their product mix and the complexity of their products. As one example, Coen et al. (2025) documents that UK regulation to ban "price walking" in auto insurance—the practice of offering low prices to new insurance purchasers while raising prices charged to existing holders of the same insurance products—has been ineffective because insurance companies have increased the variety of products they offer so that they can steer new customers to new products, while continuing to raise prices over time on previously introduced products.

2.4 Search, Negotiation, and Matching

Fixed costs are also important in another context, which is the search for the best prices available in a financial market. While price dispersion is limited by regulation in a few contexts, such as the requirement that brokers should execute stock trades at the National Best Bid and Offer (NBBO) price, in many household finance contexts there is considerable price dispersion implying high rewards to search.[24] Despite this, it appears that households often pay higher prices to counterparties than those offered by competitors, implying that they do limited search and—in a model that explains this with fixed costs—also implying that they must have high search costs.[25]

Once again the mortgage market provides a compelling example. Bhutta et al. (2024) report that half of US mortgage borrowers report seriously considering only one mortgage lender, and less than 3% of borrowers report considering more than three lenders. This paper compares mortgage rates locked in by borrowers with data from lender rate sheets on the mortgage rates that were available to observably similar borrowers on the same day. It calculates the expected rate saving from obtaining one more mortgage quote, and finds that it ranges from a modest 4 basis points for jumbo mortgage borrowers (who typically have higher income) to 28 basis points for FHA borrowers (who typically have lower income and are likely to be less financially sophisticated). At the average FHA mortgage size of $222,000, this corresponds to a dollar saving of $621 per year.

Search costs vary not only at the borrower level but also because of geographical variation in the level of competition. In rural areas, for example, there may be few lenders within a given travel time of a borrower, raising the cost of obtaining an additional quote

---

[24]A well known example is the price dispersion documented by Hortaçsu and Syverson (2004) across index mutual funds holding almost identical portfolios.

[25]In reaching this conclusion it is important to be sure that alternative offers are truly available to households. Agarwal et al. (2024) emphasize that accepting a high-priced credit offer is rational if a borrower anticipates that they will be rejected for credit by other lenders.

if this requires a physical interaction between a borrower and a lender. Argyle et al. (2023) study this phenomenon in the market for automobile credit and show that search costs have real effects: borrowers in areas with high search costs accept high-markup loan offers, take smaller loans, and end up owning older and less expensive cars.

In many search markets, including those for mortgages and automobiles, search involves not only locating different sellers but also negotiating with them. In the Canadian mortgage market, for example, Canadian banks post almost uniform national prices but transaction prices have considerable cross-sectional dispersion, reflecting negotiations between borrowers and bank mortgage officers (Allen et al., 2014)). Similarly, it is well known that many cars are sold below their posted prices and that skilled negotiation can lower transaction prices. Buyer characteristics, such as race and gender, have measurable implications for the distribution of these transaction prices (Ayres and Siegelman, 1995; Goldberg, 1996). Search costs should then be interpreted broadly to include the willingness to negotiate, skill at negotiation, and even the beliefs of sellers about these characteristics (since sellers may lower prices more readily when faced with a counterparty whom they believe to be a skilled negotiator).

Developing a fuller understanding of the implications of costly search in personal finance markets requires modeling the incentives and market power of suppliers. In this vein, Allen et al. (2019) model interactions between households and banks in the Canadian mortgage market. They find footprints of strong brand loyalty, in the sense that 80% of consumers get a quote from their main banking service provider, and roughly 70% end up taking banking and mortgage services from the same provider. They structurally estimate a material loss in consumer surplus from search frictions, roughly half of which is attributed to the direct costs of searching, while much of the remainder comes from the ability of incumbent banks to price discriminate between high and low cost consumers. In this framework, competitive offers from other mortgage providers provide the outside option for consumers, and in support of this, Allen et al. (2014) show that mergers of mortgage providers increase the markups that borrowers pay. Strikingly, the effect is concentrated on those borrowers who would otherwise pay the lowest rates, in other words borrowers who are willing to search and negotiate but whose ability to do so is reduced when mergers remove competitors from the marketplace.

It is not surprising that households with high search costs pay higher prices. In fact, if search costs are correlated with other drivers of inertia, this may help to explain why financial service providers do not compete more aggressively for the business of inertial consumers, the puzzle discussed at the end of the last section.[26] But many interesting

---

[26]Abel (2024) presents an equilibrium model of the mortgage market in which this effect explains the

research questions remain in this area of household finance and the practical issue of how to reduce price dispersion is first-order important.

So far we have discussed markets in which households interact with businesses that provide financial services. But search and matching models are also useful to understand how households buy and sell houses, the largest asset on most household balance sheets. In housing markets, households are both buyers and sellers. As buyers, households have idiosyncratic preferences for particular houses and engage in a complex search process involving online search, physical viewings, and price negotiations (Badarinza et al., 2024a). As sellers, many households strongly anchor on achieving at least the original price at which they purchased their houses even if this price is unrealistic given current market conditions (Andersen et al., 2022; Badarinza et al., 2024b). This behavior reduces the liquidity of the housing market when house prices fall, an example of the implications that household finance can have for the macroeconomy.

The housing market is also special because buyers and sellers may have preferences over the identity of their counterparties. Badarinza et al. (2022) shows this to be the case for international transactions in commercial real estate, where buyers and sellers prefer to transact with fellow nationals. In the residential real estate market, buyers of a given nationality or ethnicity often cluster together, behavior that can influence neighborhood house prices (Badarinza and Ramadorai, 2018). In the US housing market, a related, troubling issue is racial discrimination, a notorious problem that deserves continuing research attention.[27]

2.5 Wealth Inequality

Wealth inequality is a continuing contemporary concern, driven by evidence that the global wealth distribution is extremely unequal, as well as by apparent increases in wealth inequality within many countries including particularly the US.[28]

While there are many influences on wealth inequality, the financial system plays a role because poorer households tend to pay higher borrowing costs and earn lower returns on

---

dominance of refinanceable fixed-rate mortgages over other contract forms. In the model, refinanceable FRMs allow mortgage lenders to offer lower expected mortgage costs to sophisticated borrowers who both have low search costs and know when to refinance, even while quoting the same mortgage rate to all borrowers.

[27]Ewens et al. (2014) and Christensen et al. (2021) document racial discrimination in US rental markets, but there is less evidence for owner-occupied housing.

[28]Piketty (2014) is a seminal modern reference. Saez and Zucman (2016) and Smith et al. (2023) debate the extent to which US wealth inequality has increased. At the global level, wealth inequality has decreased because of wealth accumulation in large, formerly poor countries—most notably China and India—but the level of wealth inequality remains extremely high.

their investments.[29] Bach et al. (2020), for example, study Swedish households in the period 2000–2007 and find that the poorest households earn only the safe interest rate on their net wealth, whereas the richest households earn 8 percentage points more on average. While it is challenging to estimate how much of the level of Swedish wealth inequality is due to this effect, the return difference is large enough to explain the change in wealth inequality during the sample period, even without any differences in savings rates between the poor and the rich.

Returns and borrowing costs vary with wealth for many reasons. There are fixed costs in financial service provision (although technology is driving these down), and this naturally leads to higher proportional costs for smaller accounts and transactions. Poorer people often have unstable income that forces them to prioritize liquidity over return in their asset holdings and builds a credit risk premium into their cost of borrowing. Poorer people often lack assets such as housing that can be used as collateral to reduce borrowing costs.

Poorer people also typically have lower financial education, in part because the costs of financial education are fixed while the benefits are proportional to wealth, in part because social learning is less effective in a poorer community, and in part because high-quality education is itself unequally available. Limited education can deter participation in risky asset markets, discourage people from shopping aggressively, and lead to mistakes in managing financial products. Lusardi et al. (2017) calibrate a model of endogenous financial learning and estimate that return differences driven by educational inequality account for 30-40% of the level of wealth inequality in the US.

It is also possible that common factors, such as cognitive ability and skills acquired through education, affect both the growth rate of income and the returns that people earn on their wealth. To the extent that this is important, wealth inequality is increased by the positive correlation between income and returns, an effect emphasized by Daminato and Pistaferri (2024).[30]

A subtle but important point is that the growth rate of wealth is highest on average for people whose portfolios have the highest geometric average return, not the highest arithmetic average return. This is the reason why, in theoretical models with heterogeneous risk aversion, people with log utility, who maximize geometric average return, dominate the wealth distribution in the long run (Markowitz, 1976). Richer people can diversify

---

[29]Piketty (2014), Chapter 12, emphasizes this fact.

[30]A related effect is that tax incentives for retirement saving, which increase returns, accrue to those who make large contributions to retirement accounts. To the extent that higher-income and better educated people make larger contributions, the tax code contributes to wealth inequality (Choukhmane et al., 2023).

more easily, which reduces portfolio variance and thereby increases the geometric average return corresponding to any arithmetic average return. Within the stock market, this effect is weaker than it used to be given the widespread availability of diversified mutual funds in developed countries, but it remains important in some emerging markets where direct stock ownership is widespread.[31] And even in developed countries, richer people are more likely to diversify across asset classes.

One reason for this is that regulation fences off some investments from poorer people, notably private equity and venture capital. In periods where these asset classes do well, such restrictions can increase wealth inequality, an effect recently emphasized by Gocmen et al. (2025). There is an active debate about whether private equity and venture capital should be made more readily available to people who do not meet the current wealth and income standards to be considered accredited investors, and should be allowed to be held in 401(k) and other tax-favored retirement accounts. On the one hand, private equity is a component of wealth so the standard arguments for holding the market portfolio of all wealth imply that private equity should be included; on the other hand, the risks of private equity are obscured by valuation smoothing, many private equity funds charge high fees, and private equity managers can select low-quality assets for inclusion in funds offered to retail investors. The evaluation of this issue is an important topic for household finance research.

Aggregate market conditions—specifically the levels of bond, stock, and house prices—also influence wealth inequality. Greenwald et al. (2021) emphasize that richer households tend to hold longer-duration financial assets than poorer households do, so they benefited more from the decline in interest rates between the early 1980s and the early 2020s. Understanding the reasons for these duration differences is another interesting topic for further research.

An important question is how to interpret a change in inequality that is driven by an increase in prices relative to cash flows. For example, if house prices increase relative to rents, homeowners have higher measured wealth but the future rents they can earn (from tenants, or the implicit rents from owner occupancy) are unchanged. Homeowners become richer, but does this mean they are better off? Fagereng et al. (2024) make the point that the redistributive effects of such a change depend on households' trading behavior. Rising asset prices benefit sellers at the expense of buyers, which leads them to conclude that in Norway between 1994 and 2019, older households benefited at the expense of the young.

---

[31]Campbell et al. (2019) show that the increase in geometric average return made possible by diversification accounts for increasing inequality in the value of directly held stock portfolios in India in the period 2002–2011.

Changes in price-cash flow ratios driven by discount rates also affect the valuation of unmeasured components of wealth. If interest rates decline, claims to future earning power (human capital) and claims to future defined benefit pension income (sometimes called Social Security wealth in the US) become more valuable. Younger people have lower financial wealth and more human capital, and poorer Americans have higher Social Security wealth relative to their income because of the progressivity of the Social Security system. Greenwald et al. (2021) and Catherine et al. (2025) argue that in the period of generally declining US interest rates since 1980, these effects imply a smaller increase in total wealth inequality, taking human capital and Social Security wealth into account, than in conventionally measured financial wealth inequality.

2.6 International Comparisons

Household finance data have become increasingly available around the world. Comparative studies using these data reveal striking cross-country differences in household finance systems. Such differences span contractual form and regulatory frameworks, as well as differences in household behavior even when contractual environments are similar.

A leading example is mortgage markets, where the prevalence of ARMs (adjustable-rate mortgages) and FRMs (fixed-rate mortgages) varies considerably across countries. In the UK, for example, almost all mortgages have rates that adjust after the first one or two years, whereas in the US most mortgages have rates that are fixed for the life of the mortgage—up to thirty years—and many other countries have fixation periods that lie between these two extremes (Badarinza et al., 2016).

What explains this cross-country variation, and how does the design of household finance institutions affect household outcomes? One category of explanations emphasizes variation in current macroeconomic fundamentals, financial system structure, or cultural predispositions (Gomes et al., 2021). For example, the structure of mortgage funding can at least partly explain differences in preferred contractual form (Campbell, 2013). FRMs are best funded by mortgage-backed securities, as in the US, or by covered bonds, as in Denmark and Germany, while ARMs can be funded by short-term deposits through the banking system, as in the UK and most southern European countries. The mortgage funding system may in turn be influenced by the nature of a country's pension system (Scharfstein, 2018).

A second category of explanations emphasizes that past fundamentals may have a long-lasting effect because innovation is slow in the retail financial system. Households are typically more willing to buy financial products they are familiar with, so new products

are expensive for financial innovators to market. Thus the history of macroeconomic fundamentals, for example the history of inflation volatility, can affect the mortgage system today. Since FRMs fix payments in nominal terms, volatile inflation destabilizes their real payments and increases the cost of refinancing options, which may lead both borrowers and lenders to prefer ARMs. Consistent with this, southern European countries with a history of volatile inflation rely more heavily on ARMs than Germany does, even though all these countries are now members of the eurozone and likely to have similar inflation experiences in the future (Campbell, 2013, Botsch and Malmendier, 2023).

A third category of explanations also relies on institutional inertia but stresses the role of historical accident. For example, Danish covered bonds became the principal means of funding for mortgages following the Great Fire of Copenhagen in 1795, when there was an urgent need to source large volumes of credit to quickly finance the rebuilding process. When (possibly accidental) innovation works in one country, it may be slow to percolate across countries because of institutional inertia.

Ironically, the slow pace of international transmission may result in rapid advances in countries where new technology has unusually large benefits—such as in emerging economies unencumbered by legacy IT systems. Thus, recently adopted innovations such as emerging-economy digital payment systems (see, for example, Crouzet et al. (2023), Brunnermeier et al. (2023), and Higgins (2024a)) can, perhaps surprisingly, serve as templates for more advanced economies.

Rooting out the underlying causes of cross-country variation in household finance arrangements can help inform market design choices. To the extent that such differences are fundamental, this limits the external validity of studies in one country being applied to another. For example, while much research in household finance studies US or Scandinavian households, it is not clear whether the findings can be applied to emerging markets given the evidence that WEIRD (white, educated, from industrialized rich democracies) households are psychologically unusual in a global context (Henrich et al., 2010, Badarinza et al., 2019b). Conversely, to the extent that institutional arrangements arise accidentally, we can hope to carry best practices from one country to another if bureaucratic impediments can be overcome.

How might such best practices be measured? One approach is to compare outcomes across countries with similar fundamentals. To take a currently relevant example, there is evidence that interest-rate lock-in—the reluctance of homeowners to sell houses when doing so requires them to refinance a fixed-rate mortgage to a new, higher rate—has reduced the liquidity of the US housing market since mortgage rates rose in 2022–23

(Fonseca and Liu, 2024, Liebersohn and Rothstein, 2025).[32] Interest-rate lock-in can be avoided through several means, even within a FRM system. Mortgages can be assumable (associated with a house and transferred to a new buyer, which is common in Canada and Denmark), portable (associated with a borrower and transferred to a new house, which is common in Canada and the UK), or refinanceable at market value (which is standard in Denmark). Comparing the housing-market response to rising interest rates across these countries can be informative about the relative merits of these different mortgage features.

The main difficulty with this strategy is that it is hard to be sure one has adequately controlled for fundamental differences across countries. If an outcome is strongly correlated with an observable country characteristic such as income per capita, one is naturally cautious about extrapolating across countries with very different income levels; but even if there is no such strong correlation, unobserved fundamental differences may explain cross-country variation in outcomes.

An alternative approach is to study household finance reforms that have taken place around the world. Two recent examples discussed in Campbell and Ramadorai (2025) are the reform of the Israeli mortgage market instituted by Bank of Israel Governor Amir Yaron to require banks to post standardized mortgage offers, and the reform of the Indian mortgage market to require banks to state mortgage rates in comparable units.[33] If reforms are followed by measurable improvements in a short period of time, this is unlikely to be driven by fundamentals which change only slowly: such reforms are natural candidates for best practices that can be applied elsewhere. Even here, however, one must be aware of the possibility that fundamental differences across countries will alter the impact of institutional reforms.

Beyond the practical motivation to identify best practices, a scientific motivation for international household finance research is that, unlike the study of asset pricing where wealth-weighting is most natural, household finance is concerned with individual-level or equal-weighted outcomes. Such equal-weighting requires a broad focus both within countries and across the globe.[34] This is added justification to study personal finance markets in emerging economies, where the largest numbers of households reside and where these households are rapidly acquiring wealth with the attendant need to manage it appropriately (see, e.g., Badarinza et al. (2019a)).

---

[32]Interest-rate lock-in is distinct from equity lock-in, the reluctance of homeowners to sell at a price lower than their purchase price discussed in section 2.4.

[33]Recent academic studies that follow this approach include Campbell et al. (2015), Gross et al. (2021), and Tzur-Ilan (2023).

[34]Intra-country differences in outcomes such as financial distress in countries as vast as the US can be very large given regional differences in legal systems such as bankruptcy protection. See, for example, Keys et al. (2023).

2.7   Fintech

Advances in technology not only aid academic researchers studying household finance, but also change the financial products and services available to households. Fintech—the application of technology to personal finance—in turn raises new questions for household finance research to address.

Financial circumstances such as the level and volatility of income, family spending needs, and the tightness of financial constraints vary greatly across households as well as over the life cycle. These circumstances affect optimal financial decisions over liabilities (e.g., mortgage choice) as well as assets (e.g., asset allocation in retirement accounts). Lifecycle models are the workhorse approach to solving such problems, but their application has been limited by the number of state variables required to realistically approximate the decisions households face, and the difficulty of solving models with a high-dimensional state space. Machine learning methods are beginning to relax this limitation (see, e.g., Duarte et al. (2024a) and Duarte et al. (2024b)). Such developments will assist academic researchers, but more importantly they create the possibility that households will rely on algorithmic financial planners: bespoke personal finance solutions that match households' heterogeneous and constantly evolving circumstances.[35]

An interesting question is to what extent households will delegate financial decision-making to algorithms. Research in behavioral finance has often focused on people's beliefs and decisions, taking as given that people have beliefs and use them to make decisions. But in many domains of life, people make only a single decision—to give up control—and by doing so avoid the need to form a sequence of beliefs or make a sequence of decisions. For example, a driver who navigates using Google Maps or Waze avoids the need to form beliefs about likely traffic patterns or make decisions about which route to follow. Similarly, a retirement saver who buys a target date fund gives up discretion over portfolio rebalancing, and this can alter the dynamics of stock and bond returns (Parker et al., 2023). Understanding the decision to delegate financial decisions will be one of the most important topics in household finance.

Technology can not only create customized solutions but also deploy them to many households at low cost; the flip side is that such large-scale tech-enabled deployment opens the door to new risks. A recent example is fintech firms, which have quickly grown market share in personal lending markets. In a recent survey, Berg et al. (2022) conclude that fintech firms are both faster and easier to deal with than traditional lenders, though they

---

[35]Current examples of life-cycle financial planners include MaxiFi (www.maxifi.com) and TPAW Planner (tpawplanner.com). We expect to see rapid progress in this space.

note that these lenders haven't made great improvements in screening or monitoring relative to traditional lenders. The lack of technological innovation in credit screening may be a blessing in disguise: Fuster et al. (2022) highlight that the use of machine learning in mortgage credit screening can have unequally distributed benefits, relatively disadvantaging minority populations. Blattner and Nelson (2021) discuss one potential source of tech-enabled credit misallocation, namely, data sparsity among minority applicants. They conclude that disparities in access to credit can be perpetuated as machine learning models inherit the historical biases of the data used to train them.

The "dual-use" nature of technology in personal finance also shows up in the management of households' risky asset portfolios. The proliferation of low-cost "roboadvisers" enables low-cost access to sophisticated portfolio management approaches: Rossi and Utkus (2024), who study wealthy investors, show that roboadvised portfolios exhibit less home bias, lower fees, and increased indexation, consistent with sensible investment behavior. On the other hand, Kalda et al. (2021) show causal evidence that access to smartphone trading increases purchases of lottery-like stocks and return-chasing behavior, and Hong et al. (2025) report similar evidence for smartphone purchases of Chinese mutual funds. An interesting question given these contrasting findings is whether wealth disparities are increased by technology if investors with higher wealth levels self-select into more beneficial wealth-management technologies.

Another impediment to rolling out customized household finance solutions at scale is the "Marmite" nature of technology, which some people readily adopt while others shy away.[36] Recent work suggests there may be natural limits to the adoption of tech-enabled solutions arising from human aversion or skepticism. Choi et al. (2025) show that AI callers are significantly less effective than humans at getting delinquent borrowers to repay loans, and attribute at least part of the gap to AI callers being worse than humans at extracting binding promises from borrowers. Greig et al. (2024) study "hybrid" roboadvising in which the same underlying automated portfolio management technology is offered to clients, paired randomly with human counsellors that vary in quality. They find that the quality of human interaction significantly affects client retention in the service, and attribute this result to humans expediting client learning about the underlying technology as well as alleviating discomfort with the technological solution. And Jiang et al. (2025) use the rollout of 3G networks to study digital banking service provision, positing that older, lower-income, and less-educated households may face higher risks of

---

[36]The British yeast-based spread Marmite is known to polarize opinion, generating a popular advertising campaign "either love it or hate it." A recent IPSOS poll suggests that this characterization is apt: https://www.ipsos.com/sites/default/files/ct/news/documents/2022-12/ipsos-poll-marmite-love-it-or-hate-it-2022.pdf

financial exclusion on account of their relatively greater discomfort with digital platforms.

The recent development of large language models (LLMs) that can closely mimic human responses may offer a more palatable client interface. LLMs also open up many new possibilities for academic household finance. Recent work (e.g., Bybee (2023)) finds that expectations generated from LLMs closely match existing survey measures of expectations, and exhibit similar deviations from full-information rational expectations. Given this similarity, "surveying" LLMs could offer a less costly way to study consumer preferences (Brand et al., 2023). Moreover, by using LLMs to analyze data from sources such as online forums, researchers can analyze how individuals talk and write about financial matters, gaining insights into investors' sentiment, confidence, and understanding of personal finance markets in a manner that complements traditional survey-based research.

Technological innovation in the broader economy has implications for household labor income as well as for wealth inequality. Moll et al. (2022) point out that technological innovation in the form of automation can translate into higher capital incomes, and Gomes et al. (2024) argue that such automation can also increase the risk of human capital for lower-income households, which translates into lower optimal risky asset shares and wealth accumulation. Both effects exacerbate wealth inequality. Many questions remain unanswered, including whether technology-induced financial innovation can help to alleviate these trends by encouraging broader or more efficient participation in risky assets, and the appropriate design of capital income taxation in the face of these trends.

3   Conclusion

This survey of household finance at the end of the first quarter of the 21st Century has inevitably omitted many interesting research topics. To mention just four examples, we have not discussed work on gender, demography, the application of financial modeling to labor market decisions, or the structural modeling of consumer default.[37] Despite the many omissions, we hope that we have conveyed the excitement and the breadth of this field. Because so many economic decisions involve time and uncertainty, and are therefore inherently financial, household finance is integral to understanding the behavior of households in general: the people and families who populate the economy and whose welfare should be our ultimate concern.

---

[37]For gender in household finance, see Guiso and Zaccaria (2023) or Bacher (2024). For household finance and demography, see Cumming and Dettling (2024) or van Doornik et al. (2024). For the financial approach to the labor market, see Meeuwis et al. (2025). For the structural modeling of consumer default, see Fay et al. (2002), Gross and Souleles (2002), Livshits et al. (2007), or Low (2023).

References

J. Abel. Equilibrium mortgage design with heterogeneous borrowers. Technical report, Working Paper, 2024.

S. Agarwal, J. C. Driscoll, and D. I. Laibson. Optimal mortgage refinancing: a closed-form solution. *Journal of Money, Credit and Banking*, 45(4):591–622, 2013.

S. Agarwal, S. Chomsisengphet, N. Mahoney, and J. Stroebel. Regulating consumer financial products: Evidence from credit cards. *The Quarterly Journal of Economics*, 130(1):111–164, 2015.

S. Agarwal, A. Presbitero, M. A. F. Presbitero, A. Silva, and C. Wix. *Who Pays for Your Rewards? Redistribution of the Credit Card Market*. International Monetary Fund, 2023.

S. Agarwal, J. Grigsby, A. Hortaçsu, G. Matvos, A. Seru, and V. Yao. Searching for approval. *Econometrica*, 92(4):1195–1231, 2024.

D. Aiello, J. Kotter, and G. Schubert. The real effects of household financial constraints: When money moves in. Technical report, SSRN Working Paper, 2024.

J. Allen, R. Clark, and J.-F. Houde. The effect of mergers in search markets: Evidence from the canadian mortgage industry. *American Economic Review*, 104(10):3365–3396, 2014.

J. Allen, R. Clark, and J.-F. Houde. Search frictions and market power in negotiated-price markets. *Journal of Political Economy*, 127(4):1550–1598, 2019.

S. Anagol, V. Balasubramaniam, and T. Ramadorai. Learning from noise: Evidence from india's ipo lotteries. *Journal of Financial Economics*, 140(3):965–986, 2021.

S. Andersen, J. Y. Campbell, K. M. Nielsen, and T. Ramadorai. Sources of inaction in household finance: Evidence from the Danish mortgage market. *American Economic Review*, 110(10): 3184–3230, 2020.

S. Andersen, C. Badarinza, L. Liu, J. Marx, and T. Ramadorai. Reference dependence in the housing market. *American Economic Review*, 112:3398–3440, 2022.

B. Argyle, T. Nadauld, and C. Palmer. Real effects of search frictions in consumer credit markets. *The Review of Financial Studies*, 36(7):2685–2720, 2023.

B. Argyle, B. C. Iverson, J. D. Kotter, T. Nadauld, and C. Palmer. Sticky deposits, not depositors. *Available at SSRN 5208272*, 2025.

A. Auclert. Monetary policy and the redistribution channel. *American Economic Review*, 109 (6):2333–2367, 2019.

N. Augenblick, E. Lazarus, and M. Thaler. Overinference from weak signals and underinference from strong signals. *The Quarterly Journal of Economics*, 140(1):335–401, 2025.

I. Ayres and P. Siegelman. Race and gender discrimination in bargaining for a new car. *The American Economic Review*, pages 304–321, 1995.

L. Bach, L. E. Calvet, and P. Sodini. Rich pickings? risk, return, and skill in household wealth. *American Economic Review*, 110(9):2703–2747, 2020.

A. Bacher. The gender investment gap over the life cycle. *The Review of Financial Studies*, page hhae068, 2024.

C. Badarinza and T. Ramadorai. Home away from home? foreign demand and london house prices. *Journal of Financial Economics*, 130(3):532–555, 2018.

C. Badarinza, J. Y. Campbell, and T. Ramadorai. International comparative household finance. *Annual Review of Economics*, 8(1):111–144, 2016.

C. Badarinza, V. Balasubramaniam, and T. Ramadorai. The household finance landscape in emerging economies. *Annual Review of Financial Economics*, 11(1):109–129, Dec. 2019a. doi: 10.1146/annurev-financial-110118-123106.

C. Badarinza, V. Balasubramaniam, and T. Ramadorai. The household finance landscape in emerging economies. *Annual Review of Financial Economics*, 11(1):109–129, 2019b.

C. Badarinza, T. Ramadorai, and C. Shimizu. Gravity, counterparties, and foreign investment. *Journal of financial economics*, 145(2):132–152, 2022.

C. Badarinza, V. Balasubramaniam, and T. Ramadorai. In search of the matching function in the housing market. Technical report, Working Paper, 2024a.

C. Badarinza, T. Ramadorai, J. Siljander, and J. Tripathy. Behavioral lock-in: Housing market taxation with reference dependent agents. *Available at SSRN 4693047*, 2024b.

M. Bailey, R. Cao, T. Kuchler, and J. Stroebel. The economic effects of social networks: Evidence from the housing market. *Journal of Political Economy*, 126(6):2224–2276, 2018.

T. J. Bakker, S. DeLuca, E. A. English, J. S. Fogel, N. Hendren, and D. Herbst. Credit access in the united states. Technical report, National Bureau of Economic Research, 2025.

V. Balasubramaniam, J. Y. Campbell, T. Ramadorai, and B. Ranish. Who owns what? a factor model for direct stockholding. *The Journal of Finance*, 78(3):1545–1591, 2023.

N. C. Barberis and L. J. Jin. Model-free and model-based learning as joint drivers of investor behavior. Technical report, National Bureau of Economic Research, 2023.

R. J. Barro. Rare disasters and asset markets in the twentieth century. *The Quarterly Journal of Economics*, 121(3):823–866, 2006.

M. Beraja, A. Fuster, E. Hurst, and J. Vavra. Regional heterogeneity and the refinancing channel of monetary policy. *The Quarterly Journal of Economics*, 134(1):109–183, 2019.

T. Berg, A. Fuster, and M. Puri. Fintech lending. *Annual Review of Financial Economics*, 14 (1):187–207, 2022.

T. Berg, U. Nielsson, and D. Streitz. Too poor to be green? the effects of wealth on the residential heating transformation. *The effects of wealth on the residential heating transformation (May 29, 2024)*, 2024.

D. Berger, K. Milbradt, F. Tourre, and J. Vavra. Mortgage prepayment and path-dependent effects of monetary policy. *American Economic Review*, 111(9):2829–2878, 2021.

D. W. Berger, K. Milbradt, F. Tourre, and J. S. Vavra. Refinancing frictions, mortgage pricing and redistribution. Technical report, National Bureau of Economic Research, 2024.

J. Beshears, J. Choi, D. Laibson, and P. Maxted. Present bias causes and then dissipates auto-enrollment savings effects. In *AEA Papers and Proceedings*, volume 112, pages 136–141. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203, 2022.

J. Beshears, M. Blakstad, J. J. Choi, C. Firth, J. Gathergood, D. Laibson, R. Notley, J. D. Sheth, W. Sandbrook, and N. Stewart. Does pension automatic enrollment increase debt? evidence from a large-scale natural experiment. Technical report, National Bureau of Economic Research, 2024.

S. Bhargava, G. Loewenstein, and J. Sydnor. Choose to lose: Health plan choices from a menu with dominated options. *Quarterly Journal of Economics*, 132(3):1319–1372, 2017.

N. Bhutta, A. Fuster, and A. Hizmo. Paying too much? Borrower sophistication and overpayment in the us mortgage market. 2024.

L. Blattner and S. Nelson. How costly is noise? data and disparities in consumer credit. *arXiv preprint arXiv:2105.07554*, 2021.

Z. Bodie, R. C. Merton, and W. F. Samuelson. Labor supply flexibility and portfolio choice in a life cycle model. *Journal of economic dynamics and control*, 16(3-4):427–449, 1992.

P. Bordalo, N. Gennaioli, and A. Shleifer. Salience theory of choice under risk. *The Quarterly journal of economics*, 127(3):1243–1285, 2012.

P. Bordalo, N. Gennaioli, and A. Shleifer. Memory, attention, and choice. *The Quarterly journal of economics*, 135(3):1399–1442, 2020a.

P. Bordalo, N. Gennaioli, and A. Shleifer. Overreaction in macroeconomic expectations. *American Economic Review*, 110(10):2748–2782, 2020b.

M. J. Botsch and U. Malmendier. The long shadows of the great inflation: Evidence from residential mortgages. *Available at SSRN 3888762*, 2023.

J. Brand, A. Israeli, and D. Ngwe. Using llms for market research. *Harvard business school marketing unit working paper*, (23-062), 2023.

M. K. Brunnermeier, N. Limodio, and L. Spadavecchia. Mobile money, interoperability, and financial inclusion. NBER Working Paper w31696, National Bureau of Economic Research, Apr. 2023. URL https://www.nber.org/papers/w31696. Also circulated as IGIER Working Paper No. 696.

J. L. Bybee. The ghost in the machine: Generating beliefs with large language models. *arXiv preprint arXiv:2305.02823*, pages 349–389, 2023.

S. Byrne, K. Devine, M. King, Y. McCarthy, and C. J. Palmer. The last mile of monetary policy: Inattention, reminders, and the refinancing channel. Technical report, National Bureau of Economic Research, 2023.

L. E. Calvet, J. Y. Campbell, and P. Sodini. Down or out: Assessing the welfare costs of household investment mistakes. *Journal of political economy*, 115(5):707–747, 2007.

L. E. Calvet, J. Y. Campbell, F. Gomes, and P. Sodini. The cross-section of household preferences. *Journal of Finance, forthcoming*, 2025.

G. A. Calvo. Staggered prices in a utility-maximizing framework. *Journal of monetary Economics*, 12(3):383–398, 1983.

J. Y. Campbell. Household finance. *The journal of finance*, 61(4):1553–1604, 2006.

J. Y. Campbell. Mortgage market design. *Review of finance*, 17(1):1–33, 2013.

J. Y. Campbell. Restoring rational choice: The challenge of consumer financial regulation. *American Economic Review*, 106(5):1–30, 2016.

J. Y. Campbell and T. Ramadorai. *Fixed: Why Personal Finance is Broken and How to Make It Work for Everyone.* Princeton University Press, 2025.

J. Y. Campbell and L. M. Viceira. *Strategic asset allocation: portfolio choice for long-term investors.* Oxford University Press, Clarendon Lectures in Economics, 2002.

J. Y. Campbell, H. E. Jackson, B. C. Madrian, and P. Tufano. Consumer financial protection. *Journal of Economic Perspectives*, 25(1):91–114, 2011.

J. Y. Campbell, T. Ramadorai, and B. Ranish. The impact of regulation on mortgage risk: Evidence from india. *American Economic Journal: Economic Policy*, 7(4):71–102, 2015.

J. Y. Campbell, T. Ramadorai, and B. Ranish. Do the rich get richer in the stock market? evidence from india. *American Economic Review: Insights*, 1(2):225–240, 2019.

D. Card and A. B. Krueger. Minimum wages and employment: A case study of the fast-food lndustry in New Jersey and Pennsylvania. *The American Economic Review*, 84(4):772–793, 1994.

C. D. Carroll and M. S. Kimball. On the concavity of the consumption function. *Econometrica: Journal of the Econometric Society*, pages 981–992, 1996.

S. Catherine, M. Miller, J. D. Paron, and N. Sarin. Who gains when interest rates fall? *unpublished working paper*, 2025.

W. Chen, S. Liang, and D. Shi. Who chases returns? evidence from the Chinese stock market. Technical report, Working Paper, 2022.

R. Chetty, J. N. Friedman, S. Leth-Petersen, T. H. Nielsen, and T. Olsen. Active vs. passive decisions and crowd-out in retirement savings accounts: Evidence from Denmark. *The Quarterly Journal of Economics*, 129(3):1141–1219, 2014.

J. J. Choi, D. Laibson, B. C. Madrian, and A. Metrick. For better or for worse: Default effects and 401 (k) savings behavior. In *Perspectives on the Economics of Aging*, pages 81–126. University of Chicago Press, 2004.

J. J. Choi, D. Laibson, J. Cammarota, R. Lombardo, and J. Beshears. Smaller than we thought? the effect of automatic savings policies. Technical report, National Bureau of Economic Research, 2024.

J. J. Choi, D. Huang, Z. Yang, and Q. Zhang. How good is ai at twisting arms? experiments in debt collection. Technical report, National Bureau of Economic Research, 2025.

T. Choukhmane. Default options and retirement saving dynamics. *forthcoming American Economic Review*, 2025.

T. Choukhmane, J. Colmenares, C. O'Dea, J. Rothbaum, and L. Schmidt. Who benefits from retirement saving incentives in the us? evidence on racial gaps in retirement wealth accumulation. 2023.

P. Christensen, I. Sarmiento-Barbieri, and C. Timmins. Racial discrimination and housing outcomes in the united states rental market. Technical report, National Bureau of Economic Research, 2021.

J. F. Cocco, F. J. Gomes, and P. J. Maenhout. Consumption and portfolio choice over the life cycle. *The Review of Financial Studies*, 18(2):491–533, 2005.

J. Coen, D. Gottlieb, A. Gavazza, and T. Ramadorai. Regulating inaction: The case of price walking. *Unpublished working paper*, 2025.

R. Colarieti, P. Mei, and S. Stantcheva. The how and why of household reactions to income shocks. Technical report, National Bureau of Economic Research, 2024.

S. Cole, X. Giné, J. Tobacman, P. Topalova, R. Townsend, and J. Vickery. Barriers to household risk management: Evidence from India. *American Economic Journal: Applied Economics*, 5 (1):104–135, 2013.

N. Crouzet, A. Gupta, and F. Mezzanotti. Shocks and technology adoption: Evidence from electronic payment systems. *Journal of Political Economy*, 131(11):3003–3065, 2023. doi: 10.1086/724847.

F. Cumming and L. Dettling. Monetary policy and birth rates: the effect of mortgage rate pass-through on fertility. *Review of Economic Studies*, 91(1):229–258, 2024.

C. Daminato and L. Pistaferri. Returns heterogeneity and consumption inequality over the life cycle. Technical report, National Bureau of Economic Research, 2024.

C. Daminato, M. Filippini, and F. Haufler. Digitalization and retirement contribution behavior: evidence from administrative data. *The Review of Financial Studies*, 37(8):2510–2549, 2024.

K. Daniel, D. Hirshleifer, and A. Subrahmanyam. Investor psychology and security market under-and overreactions. *the Journal of Finance*, 53(6):1839–1885, 1998.

T. de Silva. Insurance versus moral hazard in income-contingent student loan repayment. *Available at SSRN*, 4614108, 2023.

A. S. Deaton. Saving and liquidity constraints. *Econometrica*, 59(5):1221–1248, 1991.

D. Del Boca and A. Lusardi. Credit market constraints and labor market decisions. *Labour Economics*, 10(6):681–703, 2003.

S. DellaVigna and E. Linos. Rcts to scale: Comprehensive evidence from two nudge units. *Econometrica*, 90(1):81–116, 2022.

M. Di Maggio, A. Kermani, B. J. Keys, T. Piskorski, R. Ramcharan, A. Seru, and V. Yao. Interest rate pass-through: Mortgage rates, household consumption, and voluntary deleveraging. *American Economic Review*, 107(11):3550–3588, 2017.

A. K. Dixit and R. S. Pindyck. *Investment under uncertainty*. Princeton university press, 1994.

T. M. Døskeland and H. K. Hvide. Do individual investors have asymmetric information based on work experience? *The Journal of Finance*, 66(3):1011–1041, 2011.

V. Duarte, D. Duarte, and D. H. Silva. Machine learning for continuous-time finance. *The Review of Financial Studies*, 37(11):3217–3271, 2024a.

V. Duarte, J. Fonseca, A. S. Goodman, and J. A. Parker. Simple allocation rules and optimal portfolio choice over the lifecycle. Technical report, National Bureau of Economic Research, 2024b.

F. D'Acunto, U. Malmendier, J. Ospina, and M. Weber. Exposure to grocery prices and inflation expectations. *Journal of Political Economy*, 129(5):1615–1639, 2021.

B. Enke and T. Graeber. Cognitive uncertainty. *The Quarterly Journal of Economics*, 138(4): 2021–2067, 2023.

M. Ewens, B. Tomlin, and L. C. Wang. Statistical discrimination or prejudice? a large sample field experiment. *Review of Economics and Statistics*, 96(1):119–134, 2014.

A. Fagereng, M. Gomez, E. Gouin-Bonenfant, M. Holm, B. Moll, and G. Natvik. Asset-price redistribution. *Journal of Political Economy, forthcoming.*, 2024.

E. Farhi and S. Panageas. Saving and investing for early retirement: A theoretical analysis. *Journal of Financial Economics*, 83(1):87–121, 2007.

S. Fay, E. Hurst, and M. J. White. The household bankruptcy decision. *American Economic Review*, 92(3):706–718, 2002.

J. Fisher, A. Gavazza, L. Liu, T. Ramadorai, and J. Tripathy. Refinancing cross-subsidies in the mortgage market. *Journal of Financial Economics*, 158:103876, 2024.

M. Fleckenstein and F. A. Longstaff. Financial sophistication and bank market power. Technical report, National Bureau of Economic Research, 2024.

S. Foerster, J. T. Linnainmaa, B. T. Melzer, and A. Previtero. Retail financial advice: does one size fit all? *The Journal of Finance*, 72(4):1441–1482, 2017.

J. Fonseca and L. Liu. Mortgage lock-in, mobility, and labor reallocation. *The Journal of Finance*, 79(6):3729–3772, 2024.

A. Fuster, P. Goldsmith-Pinkham, T. Ramadorai, and A. Walther. Predictably unequal? the effects of machine learning on credit markets. *The Journal of Finance*, 77(1):5–47, 2022.

X. Gabaix and D. Laibson. The 6d bias and the equity-premium puzzle. *NBER macroeconomics annual*, 16:257–312, 2001.

X. Gabaix and D. Laibson. Shrouded attributes, consumer myopia, and information suppression in competitive markets. *The Quarterly Journal of Economics*, 121(2):505–540, 2006.

X. Gabaix, R. S. Koijen, F. Mainardi, S. Oh, and M. Yogo. Asset demand of us households. *Available at SSRN 4251972*, 2023.

X. Gabaix, R. S. Koijen, R. Richmond, and M. Yogo. Asset embeddings. *Available at SSRN 4507511*, 2024.

P. Ganong and P. Noel. Consumer spending during unemployment: Positive and normative implications. *American economic review*, 109(7):2383–2424, 2019.

P. Ganong and P. Noel. Liquidity versus wealth in household debt obligations: Evidence from housing policy in the great recession. *American Economic Review*, 110(10):3100–3138, 2020.

K. Gerardi, P. S. Willen, and D. H. Zhang. Mortgage prepayment, race, and monetary policy. *Journal of Financial Economics*, 147(3):498–524, 2023.

S. Giglio, M. Maggiori, J. Stroebel, and S. Utkus. Five facts about beliefs and portfolios. *American Economic Review*, 111(5):1481–1522, 2021.

A. Gocmen, C. Martínez-Toledano, and V. Mittal. Private capital markets and inequality. *Available at SSRN 5166981*, 2025.

P. K. Goldberg. Dealer price discrimination in new car purchases: Evidence from the consumer expenditure survey. *Journal of Political Economy*, 104(3):622–654, 1996.

F. Gomes, M. Haliassos, and T. Ramadorai. Household finance. *Journal of Economic Literature*, 59(3):919–1000, 2021.

F. Gomes, T. Jansson, and Y. Karabulut. Do robots increase wealth dispersion? *The Review of Financial Studies*, 37(1):119–160, 2024.

D. Gottlieb and K. Smetters. Lapse-based insurance. *American Economic Review*, 111(8):2377–2416, 2021.

D. L. Greenwald, M. Leombroni, H. Lustig, and S. Van Nieuwerburgh. Financial and total wealth inequality with declining interest rates. Technical report, National Bureau of Economic Research, 2021.

R. Greenwood and A. Shleifer. Expectations of returns and expected returns. *The Review of Financial Studies*, 27(3):714–746, 2014.

F. Greig, T. Ramadorai, A. G. Rossi, S. P. Utkus, and A. Walther. Human financial advice in the age of automation. *Available at SSRN 4301514*, 2024.

M. Grinblatt and M. Keloharju. The investment behavior and performance of various investor types: a study of finland's unique data set. *Journal of financial economics*, 55(1):43–67, 2000.

M. Grinblatt, M. Keloharju, and J. T. Linnainmaa. Iq, trading behavior, and performance. *Journal of Financial Economics*, 104(2):339–362, 2012.

D. B. Gross and N. S. Souleles. An empirical analysis of personal bankruptcy and delinquency. *The Review of Financial Studies*, 15(1):319–347, 2002.

T. Gross, R. Kluender, F. Liu, M. J. Notowidigdo, and J. Wang. The economic consequences of bankruptcy reform. *American Economic Review*, 111(7):2309–2341, 2021.

L. Guiso and L. Zaccaria. From patriarchy to partnership: Gender equality and household finance. *Journal of Financial Economics*, 147(3):573–595, 2023.

M. Haliassos, T. Jansson, and Y. Karabulut. Incompatible european partners? cultural predispositions and household financial behavior. *Management Science*, 63(11):3780–3808, 2017.

B. Handel and J. Schwartzstein. Frictions or mental gaps: what's behind the information we (don't) use and when do we care? *Journal of Economic Perspectives*, 32(1):155–178, 2018.

B. R. Handel. Adverse selection and inertia in health insurance markets: When nudging hurts. *American Economic Review*, 103(7):2643–2682, 2013.

J. T. Heikkila. Journal of economic literature codes classification system (jel). *arXiv preprint arXiv:2207.06076*, 2022.

J. Henrich, S. J. Heine, and A. Norenzayan. Most people are not weird. *Nature*, 466(7302):29–29, 2010.

S. Higgins. Financial technology adoption: Network externalities of cashless payments in mexico. *American Economic Review*, 114(11):3469–3512, Nov. 2024a. doi: 10.1257/aer.20201952.

S. Higgins. Financial technology adoption: Network externalities of cashless payments in mexico. *American Economic Review*, 114(11):3469–3512, 2024b.

D. Hirshleifer. Presidential address: Social transmission bias in economics and finance. *The Journal of Finance*, 75(4):1779–1831, 2020.

C. Y. Hong, X. Lu, and J. Pan. Fintech platforms and mutual fund distribution. *Management Science*, 71(1):488–517, 2025.

A. Hortaçsu and C. Syverson. Product differentiation, search costs, and competition in the mutual fund industry: A case study of s&p 500 index funds. *The Quarterly journal of economics*, 119(2):403–456, 2004.

G. W. Imbens and J. D. Angrist. Identification and estimation of local average treatment effects. *Econometrica*, 62(2):467–475, 1994.

K. Jakobsen, K. Jakobsen, H. Kleven, and G. Zucman. Wealth taxation and wealth accumulation: Theory and evidence from denmark. *The quarterly journal of economics*, 135(1):329–388, 2020.

E. X. Jiang, Y. G. YU, and J. Zhang. Bank competition amid digital disruption: Implications for financial inclusion. 2025.

D. Kahneman and A. Tversky. Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2):263–291, 1979.

A. Kalda, B. Loos, A. Previtero, and A. Hackethal. Smart (phone) investing? a within investor-time analysis of new technologies and trading behavior. Technical report, National Bureau of Economic Research, 2021.

G. Kaplan and G. L. Violante. A model of the consumption response to fiscal stimulus payments. *Econometrica*, 82(4):1199–1239, 2014.

J. Katz. Saving and consumption responses to student loan forbearance. *Available at SSRN 4344262*, 2023.

R. Kekre and M. Lenel. Monetary policy, redistribution, and risk premia. *Econometrica*, 90(5): 2249–2282, 2022.

B. J. Keys, N. Mahoney, and H. Yang. What determines consumer financial distress? place-and person-based factors. *The Review of Financial Studies*, 36(1):42–69, 2023.

T. Kuchler and J. Stroebel. Social finance. *Annual Review of Financial Economics*, 13(1):37–55, 2021.

T. Kuran. *Private truths, public lies: The social consequences of preference falsification*. Harvard University Press, 1997.

D. Laibson. Golden eggs and hyperbolic discounting. *The Quarterly Journal of Economics*, 112 (2):443–478, 1997.

D. Laibson, S. C. Lee, P. Maxted, A. Repetto, and J. Tobacman. Estimating discount functions with consumption choices over the lifecycle. *The Review of Financial Studies*, page hhae035, 2024.

S. C. Lee and P. Maxted. Credit card borrowing in heterogeneous-agent models: Reconciling theory and data. *Available at SSRN 4389878*, 2023.

J. Liebersohn and J. Rothstein. Household mobility and mortgage rate lock. *Journal of Financial Economics*, 164:103973, 2025.

C. Liu and J. Sydnor. Dominated options in health insurance plans. *American Economic Journal: Economic Policy*, 14(1):277–300, 2022.

I. Livshits, J. MacGee, and M. Tertilt. Consumer bankruptcy: A fresh start. *American Economic Review*, 97(1):402–418, 2007.

D. Low. An empirically-disciplined theory of mortgage default. *Consumer Financial Protection Bureau Office of Research Working Paper*, (2021-01), 2023.

R. Luetticke. Transmission of monetary policy with heterogeneity in household portfolios. *American Economic Journal: Macroeconomics*, 13(2):1–25, 2021.

A. Lusardi, P.-C. Michaud, and O. S. Mitchell. Optimal financial knowledge and wealth inequality. *Journal of political Economy*, 125(2):431–477, 2017.

B. C. Madrian and D. F. Shea. The power of suggestion: Inertia in 401 (k) participation and savings behavior. *The Quarterly journal of economics*, 116(4):1149–1187, 2001.

U. Malmendier and S. Nagel. Depression babies: Do macroeconomic experiences affect risk taking? *The quarterly journal of economics*, 126(1):373–416, 2011.

H. M. Markowitz. Investment for the long run: New evidence for an old rule. *The Journal of Finance*, 31(5):1273–1286, 1976.

I. W. Martin. Consumption-based asset pricing with higher cumulants. *Review of Economic Studies*, 80(2):745–773, 2013.

G. Maturana and J. Nickerson. Teachers teaching teachers: The role of workplace peer effects in financial decisions. *The Review of Financial Studies*, 32(10):3920–3957, 2019.

M. Meeuwis, D. Papanikolaou, J. L. Rothbaum, and L. D. Schmidt. Time-varying risk premia and heterogeneous labor market dynamics. Technical report, National Bureau of Economic Research, 2025.

R. C. Merton. Lifetime portfolio selection under uncertainty: The continuous-time case. *The review of Economics and Statistics*, pages 247–257, 1969.

R. C. Merton. An intertemporal capital asset pricing model. *Econometrica: Journal of the Econometric Society*, pages 867–887, 1973.

B. Moll, L. Rachel, and P. Restrepo. Uneven growth: automation's impact on income and wealth inequality. *Econometrica*, 90(6):2645–2683, 2022.

T. Odean. Are investors reluctant to realize their losses? *The Journal of finance*, 53(5):1775–1798, 1998.

J. A. Parker, A. Schoar, and Y. Sun. Retail financial innovation and stock market dynamics: The case of target date funds. *The Journal of Finance*, 78(5):2673–2723, 2023.

T. Piketty. *Capital in the twenty-first century*. Harvard University Press, 2014.

D. A. Price, Z. Wang, and A. L. Wolman. What two billion retail transactions reveal about consumers' choice of payments. *Richmond Fed Economic Brief*, (April), 2017.

T. Ramadorai, P. Gopalakrishnan, S. Mathur, P. Rath, and A. Vats. Indian household finance: Report of the household finance committee. *Reserve Bank of India, committee report*, 2017.

A. A. Rampini and S. Viswanathan. Collateral, risk management, and the distribution of debt capacity. *The Journal of Finance*, 65(6):2293–2322, 2010.

A. G. Rossi and S. Utkus. The diversification and welfare effects of robo-advising. *Journal of Financial Economics*, 157:103869, 2024.

E. Saez and G. Zucman. Wealth inequality in the united states since 1913: Evidence from capitalized income tax data. *The Quarterly Journal of Economics*, 131(2):519–578, 2016.

S. K. Sarkar. Economic representations, 2025.

D. S. Scharfstein. Presidential address: Pension policy and the financial system. *The Journal of Finance*, 73(4):1463–1512, 2018.

H. Shefrin and M. Statman. The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of finance*, 40(3):777–790, 1985.

R. Shiller. Narrative economics. *American Economic Review*, 107(4):967–1004, 2017.

M. Smith, O. Zidar, and E. Zwick. Top wealth in america: New estimates under heterogeneous returns. *The Quarterly Journal of Economics*, 138(1):515–573, 2023.

K. Storesletten, C. I. Telmer, and A. Yaron. Asset pricing with idiosyncratic risk and overlapping generations. *Review of Economic Dynamics*, 10(4):519–548, 2007.

E. T. Swanson. Risk aversion and the labor margin in dynamic equilibrium models. *American Economic Review*, 102(4):1663–1691, 2012.

R. H. Thaler and C. R. Sunstein. *Nudge: Improving decisions about health, wealth, and happiness*. Penguin, 2009.

A. Toner-Rodgers. Artificial intelligence, scientific discovery, and product innovation. *arXiv preprint arXiv:2412.17866*, 2024.

N. Tzur-Ilan. Adjusting to macroprudential policies: Loan-to-value limits and housing choice. *The Review of Financial Studies*, 36(10):3999–4044, 2023.

B. Van Doornik, A. Gomes, D. Schoenherr, and J. Skrastins. Financial access and labor market outcomes: Evidence from credit lotteries. *American Economic Review*, 114(6):1854–1881, 2024.

B. F. N. van Doornik, D. Fazio, T. Ramadorai, and J. Skrastins. Housing and fertility. *Available at SSRN 5046571*, 2024.

L. M. Viceira. Optimal portfolio choice for long-horizon investors with nontradable labor income. *The Journal of Finance*, 56(2):433–470, 2001.

J. A. Wachter and M. J. Kahana. A retrieved-context theory of financial decisions. *The Quarterly Journal of Economics*, 139(2):1095–1147, 2024.

M. Weber, F. D'Acunto, Y. Gorodnichenko, and O. Coibion. The subjective inflation expectations of households and firms: Measurement, determinants, and implications. *Journal of Economic Perspectives*, 36(3):157–184, summer 2022. doi: 10.1257/jep.36.3.157.

S. P. Zeldes. Optimal consumption with stochastic income: Deviations from certainty equivalence. *The Quarterly Journal of Economics*, 104(2):275–298, 1989.

D. Zhang. Closing costs, refinancing, and inefficiencies in the mortgage market. Technical report, Working paper, 2022.