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Social Finance

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Abstract

We review an empirical literature that studies the role of social interactions in driving economic and financial decision-making. We first summarize recent work that documents an important role of social interactions in explaining household decisions in housing and mortgage markets. This evidence shows, for example, that there are large peer effects in mortgage refinancing decisions and that individuals' beliefs about the attractiveness of housing market investments are affected by the recent house price experiences of their friends. We also summarize recent work showing that social interactions affect the stock market investments of both retail and professional investors as well as household financial decisions such as retirement savings, borrowing, and default. Along the way, we describe a number of easily accessible recent data sets for the study of social interactions in finance, including the Social Connectedness Index, which measures the frequency of Facebook friendship links across geographies. We conclude by outlining several promising directions for further research in the field of social finance.

1. INTRODUCTION

Researchers have long understood that social interactions shape many aspects of economic activity. Yet, in most models of economics and finance, agents make financial decisions in a social vacuum in which prices are the only mechanism through which the actions of other agents affect beliefs and behaviors. This is likely to change substantially over the coming years. Indeed, the availability of new data has facilitated a recent surge of empirical research documenting large effects of social interactions and processes on the economic and financial decisions of households and firms. Many of the documented effects are too large for theory to ignore, and early progress has been made in incorporating social interactions into equilibrium models of economic decision-making. This trend is only going to accelerate as novel data sets on the social structure of society become increasingly available to researchers.

In this article, we review a number of recent contributions to the field of social finance, a term popularized by Hirshleifer (2015, 2020) for the study of how social processes shape economic and financial outcomes. In this agenda, researchers study a range of mechanisms such as social learning, social utility, and social influences in belief formation that can lead to social phenomena such as peer effects—instances where the behavior of a peer affects an agent's own behavior through nonmarket mechanisms. In the spirit of the *Annual Review of Financial Economics*, we do not provide an encyclopedic overview of this quickly growing literature. Instead, our objective is to provide interested readers with a starting point to conduct their own work at the intersection of social finance and household finance. To that end, we describe several recent and primarily empirical studies at the frontier of social finance. We largely focus on research studying the role of social processes in explaining the financial decisions of households, though we also review work that explores how social processes influence professional investors.

Some of the earliest work studying the role of social influence in household finance explored how the savings decisions and financial investments of individuals were influenced by their families, friends, and acquaintances. More recently, the focus of research has expanded to cover household financial behavior across a wider range of settings and questions. First, following the Global Financial Crisis of 2008, an emerging research priority has been to better understand how households make decisions in housing and mortgage markets, and a number of recent studies have shown that social interactions play an important role in shaping these decisions. Given the recent research focus on this area, we begin our review below by summarizing some of the key findings from that body of work. Second, the literature that first documented the existence of peer effects for investment decisions has evolved to (*a*) studying the mechanisms behind these peer effects and (*b*) exploring the impact of peer effects on equilibrium market level outcomes. We review this expansion of earlier work before turning our attention to households' savings and debt accumulation decisions outside of the housing and mortgage market. Along the way, we point out useful data sets for the study of social finance. We focus particularly on the publicly available Social Connectedness Index (SCI), which captures the social connectedness between geographic regions based on friendship links on Facebook, the world's largest social networking site. We conclude by highlighting interesting directions for future work.

Before reviewing recent contributions to the social finance literature, we next characterize the broad mechanisms through which social phenomena can influence individual behavior. We also describe a number of common challenges in most of the empirical research in social finance as well as some techniques to deal with these challenges.

1.1. Possible Mechanisms Behind Social Phenomena in Economics and Finance

Social interactions can influence people's economic and financial decisions through several channels, with three mechanisms featuring particularly prominently in narratives of social finance. We

find that they provide a useful organizing framework for thinking about the range of relevant social effects, even if not all such effects can be neatly mapped to these broad categories, and some observed peer effects or social dynamics might be the result of multiple mechanisms operating at the same time.

First, social networks can serve as a source of actual or perceived information, and people might thus be influenced by their peers through a social learning channel, which can include the spread of both actual information as well as sentiments and beliefs (e.g., Bikhchandani, Hirshleifer & Welch 1992; Jackson 2010; Bailey et al. 2018a). The importance of social interactions in transmitting information and beliefs in the household finance space is hardly surprising. Indeed, most people do not have much experience making important financial decisions such as buying a home, taking out a mortgage, or purchasing stocks. In addition, many possible sources of information, such as mortgage brokers and investment advisers, often have real or perceived conflicts of interest. As a result, it seems natural that individuals would turn to friends, colleagues, and family members—especially those with experiences relevant to the decision at hand—as trusted sources of advice.

Second, social networks and social interactions can serve as a tool for the enforcement of norms, rules, and agreements through mechanisms such as social shaming, social stigma, and threats of ostracizing. Such mechanisms are behind the definition of social capital presented by Coleman (1988), who highlights that the extent to which two individuals have common friends—a feature Coleman refers to as network closure—affects whether cooperation and social norms can be sustained between these individuals. As we discuss below, in the household finance space, the degree of social stigma associated with, for example, credit default can help explain household borrowing behavior. Similarly, researchers have found that individuals are more likely to save when their progress toward goals is regularly reported to outside parties such as a savings monitor (see Breza & Chandrasekhar 2019), suggesting that individuals' behavior is affected by how they are perceived by their friends.

Third, peers' actions can directly enter individuals' utility functions, allowing peer effects to also operate through a social utility channel. For example, individuals may have preferences that weight relative differences between their own consumption and the consumption of their peers (e.g., Duesenberry 1949, Abel 1990). Such preferences may then cause individuals to mimic the consumption patterns of others to keep up with the Joneses. Alternatively, individuals might copy the investment decisions of their friends due to a fear of missing out (FOMO), defined in the social psychology literature as the pervasive apprehension that others might be having rewarding experiences from which one is absent (Przybylski et al. 2013).

We discuss below how each of these three mechanisms—social learning, social perception, and social utility—can help explain why individuals' social interactions affect their financial decisions across a range of settings.

1.2. Common Empirical Challenges

There are substantial empirical challenges to documenting a causal effect of social interactions on economic decision-making, with problems of both measurement and identification looming large. Since these challenges are common to much of the empirical work we discuss below, we next review the most prevalent problems and approaches to solving them.

1.2.1. Measurement. On the measurement side, it is usually necessary to observe both the outcome variable of interest as well as a peer group within the same data set. To overcome this hurdle, researchers often rely on definitions of peer groups that include geographic neighbors,

work colleagues, or family members, in part because location of residence and employer are regularly collected in administrative data (for examples in the household finance literature, see Brown et al. 2008; Kaustia & Knüpfer 2012; Ouimet & Tate 2020; Bayer, Mangum & Roberts 2021). As we discuss in more detail below, recent research has also used information from social networking platforms such as Facebook and LinkedIn to measure social networks (see Bailey et al. 2018a, 2019a; Chetty et al. 2021). This expansion of data availability allows researchers to substantially expand the set of social processes and peer interactions that can be studied.

1.2.2. Identification. A pervasive identification challenge in the empirical literature on social influence is to separate the influence of peers on choices from the effects of selection in friendship groups and the exposure to common shocks (see Manski 1993). One reason for these challenges, which are described in detail by Angrist (2014), is that endogenously formed peer groups often contain people with similar characteristics and preferences—a feature often referred to as homophily (McPherson, Smith-Lovin & Cook 2001). As a result, correlated behavior across friends does not necessarily imply the presence of peer effects. For example, when two friends purchase a new iPhone at the same time, this could be due to peer effects, with one friend influencing the purchasing decision of the other. However, such correlated purchasing could also occur if two tech-savvy individuals, both of whom independently want the iPhone, are more likely to be friends with one other. Similarly, peers often face correlated shocks. For example, two neighbors who are friends might be exposed to similar local iPhone advertising campaigns, providing yet another channel that could explain an observed correlation in their phone purchases (Bailey et al. 2019b).

The literature has proposed at least two types of research designs to overcome this identification challenge from homophily in endogenously formed peer groups: random peer group assignment and random shocks to an existing peer group.

The first approach involves exploiting randomized assignments of individuals to peer group settings, for example, through random allocation to military units or college dorms (e.g., Sacerdote 2001; Glaeser, Sacerdote & Scheinkman 2003; Shue 2013; Lieber & Skimmyhorn 2018), through moving to opportunity experiments (e.g., Katz, Kling & Liebman 2001) or through quasi-random allocation to high school cohorts based on arbitrary age cutoffs (e.g., Hoxby 2000, Chetty et al. 2021). Alternatively, laboratory experiments allow researchers to vary group composition randomly (e.g., see Falk & Ichino 2006). The common idea behind these research designs is that assigning individuals to settings at random eliminates any excessive within-setting correlation in preferences and characteristics resulting from homophily. However, even when friendship groups are randomly assigned, correlated behavior across individuals could still be the result of common shocks that affect all members of the group. For example, two college roommates purchasing new phones at the same time could in part be explained by both of them remembering the same television ad they viewed together, even if the initial room assignment was random. As a result, researchers using research designs with random group assignment usually need to argue that correlated shocks cannot explain their findings.

An alternative research design exploits random shocks to the behavior of friends in an endogenously formed peer group. In this case, researchers need to argue that the random shock should not affect an individual's own behavior except through peer effects from her friends who receive the shock. For example, if my friend breaks her phone, this should only influence my own desire to buy a new phone through the peer effects from her replacement purchase (see Bailey et al. 2019b). These random shocks to a subset of friends can also be induced experimentally, as a number of researchers have done (e.g., Mobius, Niehaus & Rosenblat 2005).

2. SOCIAL INFLUENCE IN HOUSING AND MORTGAGE MARKETS

The Global Financial Crisis of 2008 has sparked a large research effort in economics and finance that aims to better understand housing and mortgage markets and the potential role of social contagion in both the run-up and aftermath of the crisis. The housing market is a natural place where social interactions might be important. Housing decisions involve large amounts of money, are infrequent, and are conducted in markets that are localized, segmented, and subject to multiple dimensions of information asymmetries (see Kurlat & Stroebel 2015; Stroebel 2016; Piazzesi, Schneider & Stroebel 2020). As a result, it seems natural for individuals to consult with members of their social networks about questions such as: What should I pay for this house?; Is this a good neighborhood for kids?; Which broker should I use?; What type of mortgage should I take?; and Should I default on my mortgage? Similarly, given the salient nature of individuals' housing consumption, a desire to keep up with the Joneses could be an important motivation in the housing market. In this section, we review several recent papers in a growing literature that indeed documents an important role for various social interactions in explaining a wide range of housing and mortgage market decisions.

2.1. Belief Contagion in the Housing Market

One important channel through which social interactions can affect housing market decisions is the influence of people's perceptions of whether buying a house is a good idea from an investment perspective. For example, Robert Shiller has long argued that house prices are, to a substantial extent, driven by belief fluctuations that are the result of social interactions: "Many people seem to be accepting that the recent home price experience is at least in part the result of a social epidemic of optimism for real estate" (Shiller 2007, p. 12). In this narrative, which often borrows language from the epidemiology literature, individuals who observe recent price increases and become more optimistic about future house price growth subsequently infect their friends with this optimism. However, while the idea of social dynamics in housing markets has been around for some time, little empirical evidence has been found that optimism and pessimism are truly contagious in the way proposed by Shiller and others.

Bailey et al. (2018a) were among the first to provide direct empirical evidence for belief contagion in the housing market. They document that individuals whose far-away friends experienced higher recent house price growth are indeed more optimistic about future local house price growth. This increased optimism translates into actual changes in their housing market behavior. Specifically, people whose friends experienced larger recent house price gains are more likely to buy a house and more likely to buy a larger house. They are also willing to pay more for a given house.

To measure an individual's social network, Bailey et al. (2018a) collaborate with Facebook, the world's largest online social networking service with 2.6 billion users worldwide and 253 million users in the United States and Canada. The empirical analysis begins by documenting that, at any point in time, different people in the same local housing market have friends who have experienced vastly different recent house price movements. This variation is driven by heterogeneity in the location of individuals' friends, combined with variation in regional house price changes. Bailey et al. (2018a) then provide evidence for an important effect of social interactions on an individual's assessment of the attractiveness of local property investments. For this analysis, they field a survey among Los Angeles–based Facebook users. Over half of the survey respondents report that they regularly talk to their friends about investing in the housing market. The survey also asked respondents to assess the attractiveness of property investments in their own zip codes.

The authors find a strong positive relationship between the recent house price experiences of a respondent's friends and whether that respondent believes that local real estate is a good investment. Importantly, this relationship is stronger for individuals who report that they regularly talk with their friends about investing in real estate. For individuals who report to never talk to their friends about investing in the housing market, no relationship was found between friends' house price experiences and the individual's own evaluations of the attractiveness of housing investments. These results suggest that social interactions provide a natural link between friends' house price experiences and an individual's own housing market expectations.

Bailey et al. (2018a) then show that friends' house price experiences affect not only an individual's housing market expectations but also her actual housing market investments. To conduct this analysis, the authors combine deidentified Facebook social network data with anonymized public record information on individuals' housing transactions. The economic magnitudes of the effects of friends' experiences on one's own behavior are large. In particular, a 5 percentage point higher average house price growth between 2008 and 2010 in the counties where an individual has friends leads to a 3 percentage point increase in the probability of that individual transitioning from being a renter in 2010 to being a homeowner in 2012. This is more than half the effect size of adding a family member and is a large effect relative to a baseline transition probability of 18%. Conditional on an individual buying a house, a 5 percentage point increase in friends' house price experiences over the 24 months prior to the purchase is associated with the individual buying a 1.6% larger property. And finally, conditional on observable property characteristics, a 5 percentage point increase in the house price experiences in an individual's social network is associated with that individual paying 2.3% more for the same property. Bailey et al. (2018a) then provide evidence that the relationships between the house price experiences in an individual's social network and her housing market behavior capture a causal mechanism that works through the influence on beliefs.

Overall, the evidence from the work by Bailey et al. (2018a) highlights that friends' house price experiences can affect an individual's own housing market assessments enough to substantially influence his housing market activity. This conclusion is consistent with the findings by Bayer, Mangum & Roberts (2021), who argue that many new housing market investors entered the market as a result of observing various forms of investment activity in their own neighborhoods. While these authors do not have access to survey data, one possible channel for this behavior is belief contagion, though other explanations, such as learning about the ease of investing in real estate, are also possible.

In related theoretical work, Burnside, Eichenbaum & Rebelo (2016) explore how social dynamics at the individual level, such as those documented by Bailey et al. (2018a), can affect equilibrium housing market outcomes. In particular, Burnside, Eichenbaum & Rebelo (2016) propose a model in which agents have heterogeneous expectations about long-run market fundamentals. The central ingredient of their model is that agents change their views as a result of social dynamics: They meet randomly, and those with tighter priors are more likely to convert other agents to their beliefs. The mechanism thus closely resembles epidemiological models of disease spread, whereby optimists can infect their peers with their optimism. The model can generate a fad, in the sense that the fraction of the population with a particular view can rise and then fall without additional shocks. These fads can lead to boom-busts or protracted booms in house prices. This paper thus highlights that social dynamics can have a large effect on equilibrium housing market outcomes.

Importantly, the mechanism of belief adjustment proposed by Burnside, Eichenbaum & Rebelo (2016) is far from the standard Bayesian or otherwise rational models of belief updating

commonly found in the literature. Nevertheless, based on the evidence reviewed above, we believe that, in many markets, thinking of beliefs as spreading through a contagion-like process may be an appropriate description of reality. As the economics profession becomes more comfortable with modeling such deviations from rational behavior, we suspect that models enriched with social dynamics will have substantial success in explaining price and quantity movements across a large number of markets.

2.2. Keeping Up in the Housing Market

In addition to belief contagion, a second channel through which social interactions can affect housing market outcomes is through generating positional externalities. Bellet (2019) explores this mechanism and shows that the housing consumption of others lowers the utility that individuals derive from their own homes. Specifically, he finds that new construction at the top of the house size distribution in a neighborhood lowers the satisfaction that other residents derive from their own homes, an example of a social utility channel affecting individuals' housing market experiences. The effect is quantitatively large: a 1% increase in the size of newly built houses at the top of the distribution almost offsets the satisfaction gains from a 1% increase in own home size. Similarly, Bellet (2019) finds that the construction of large homes after a household has moved lowers the market value that homeowners ascribe to the size of their own houses. He also shows that existing owners of large houses strive to keep up with their neighbors and increase the size of their own homes in response to new large construction. These results provide strong evidence that individuals do not just evaluate their housing situation in a social vacuum but instead judge their own property relative to those of others. This finding allows us to rationalize the observed Easterlin paradox in housing consumption, whereby US homeowners' satisfaction with their own homes has remained steady over time, despite a substantial increase in average home size in the past decades.

2.3. Social Influence in Mortgage Choice

As with buying a house, taking out a mortgage is a rare and complicated procedure for many people. It is thus natural that individuals would rely on their social networks to obtain information that helps them make that decision. Two recent papers in particular have found evidence for such peer effects in influencing individuals' mortgage choices.

Maturana & Nickerson (2019) explore the role of workplace peers in providing information about mortgage refinancing. They study a sample of teachers from Texas, for which they are able to observe quasi-random variation in peer groups. Specifically, the authors exploit that different teacher pairs within the same school are more likely to interact when they share the same off periods. Maturana & Nickerson (2019) use this variation to document a strong effect of peer behavior on mortgage refinancing decisions. In particular, a teacher is 20.7% more likely to refinance their own mortgage following a one standard deviation increase in the refinancing activity among her peers. The effect of peer behavior increases with the potential savings realized upon refinancing and is stronger among younger teachers. Peers also affect a teacher's choice of lender.

In related work, McCartney & Shah (2019) also provide evidence that households' refinancing decisions as well as the choice of lender and loan type are influenced by a peer group of their hyperlocal neighbors. Consistent with a word-of-mouth mechanism, households moving to new areas are not initially influenced by their immediate neighbors but increasingly become so over time. In addition, non-occupant owners (who have less opportunity to interact with neighbors) are significantly less influenced than owner-occupants.

Both of these papers suggest that peer interactions can substantially affect households' decisions in the mortgage market, most likely by reducing the cost of acquiring and processing financial information. In other words, these studies show that neighbors and colleagues can be a crucial source of information for households' mortgage decisions. In many ways, this is not surprising, since many other potential sources of information, such as mortgage brokers, are not disinterested parties to the transaction. This leaves friends, colleagues, and family as sources of information without a direct financial interest in the eventual decision.

Bailey et al. (2019a) highlight that another way through which social interactions can influence mortgage choices is through influencing house price expectations. The authors introduce a simple model to describe how leverage choice is affected by beliefs about future house price growth. From a theoretical perspective, the relationship between house price expectations and leverage choice is ambiguous and depends on pessimistic households' ability to reduce their housing market exposure by renting or buying a smaller house. Specifically, one way for pessimistic households to reduce their housing market exposure could be through buying a smaller house or renting; all else equal, households would usually purchase the smaller home with less leverage to reduce their interest payments. However, they might not be able to do so for a variety of constraints, such as family size or job location. Instead, these pessimistic households could reduce their exposure to the housing market by making a smaller down payment (and thereby increasing their leverage) and anticipating to default in the case of large house price declines. In their empirical work, Bailey et al. (2019a) show that friends' house price experiences do indeed influence equilibrium leverage choices through their effects on house price beliefs. They document that individuals with friends in states with recent house price declines become more pessimistic themselves. They consequently use more leverage to buy their homes, allowing them to reduce their direct financial exposure to future house price changes in their own neighborhoods. This effect is particularly large in states where default costs are relatively low as well as in housing markets with few rental options, where even relatively pessimistic households wanting to live there may be forced to buy. Importantly, in addition to the average house price experience across friends, other moments of the experience distribution also affect leverage choices. Specifically, Bailey et al. (2019a) show that individuals with friends from counties with a wider variety of house price experiences report wider distributions of expected house price changes. These wider belief distributions—which also correspond to larger probability weights placed on large house price declines—are also associated with smaller down payments and increased leverage.

2.4. Social Influence in Mortgage Default

Several recent papers have also highlighted sizable social influence in mortgage default behavior. Peer default can affect a person's own default probability through a number of channels, for example, by providing information about the cost of default or by changing the perceived social stigma of default.[1]

[1]A related literature studies a number of other channels through which mortgage defaults and foreclosures can have spillover effects to neighboring properties. For example, Campbell, Giglio & Pathak (2011) show that foreclosures will lead to declines in neighboring house prices, providing a market-based mechanism for foreclosure contagion. Similarly, Gerardi et al. (2015) show that a property in distress affects the value of neighboring properties from the time when the borrower becomes seriously delinquent on the mortgage until well after the bank sells the property to a new owner. Both papers argue that these price spillovers from foreclosures are the result of physical externalities caused by a lack of property maintenance for distressed properties. We view this channel as conceptually different from the social influence channels for foreclosure contagion that we discuss here.

In this literature, Guiso, Sapienza & Zingales (2013) use survey data to show that individuals appear more willing to default strategically if they are exposed to other people who strategically default. They find evidence that this is at least partly driven by information flows: Knowing someone who strategically defaulted reduces the perceived probability that a bank would go after a borrower who defaults; the other channel that contributes to their finding is that the social stigma from mortgage default is likely declining when the overall number of people that are defaulting is larger.

Consistent with this survey-based evidence, Gupta (2019) also finds social dynamics in foreclosures. He shows that each foreclosure filing leads to an additional 0.3–0.6 completed foreclosures within a 0.1-mile radius. He attributes this observed relationship partly to borrower responses arising from peer effects (in addition to price effects and bank-supply responses). This conclusion is also consistent with the evidence in Towe & Lawley (2013), who study foreclosures in Maryland between 2006 and 2009. They show that a neighbor in foreclosure increases the hazard of additional defaults by 18%. They argue that this effect goes beyond a temporary reduction in local house prices and implies a negative social multiplier effect of foreclosures.

3. SOCIAL INFLUENCE AND RETAIL INVESTORS

Some of the earliest work on social influence in financial decisions has shown the existence of peer effects in investment choices. Indeed, both the extensive margin decision to participate in the stock market and the portfolio allocation decision appear to be influenced by similar decisions of a person's peers.

The fact that retail investors base their investment decisions at least partially on advice from their friends seems hardly surprising given the high-stakes and potentially intimidating nature of stock market investing. In fact, like most economists, we are frequently asked for investment advice from family and friends. We believe that this is, at least in part, because most other potential information sources have perceived or real conflicts of interest in the advice they provide. In addition to such an information-based story, peer effects in investing could also arise through mechanisms similar to the belief contagion in the housing market described above. Such a channel is aptly characterized by Shiller's (2016) description of Ponzi schemes: "That others have made a lot of money appears to many people as the most persuasive evidence in support of the investment story . . . evidence that outweighs even the most carefully reasoned argument" (p. 91). In addition, an investment version of FOMO might drive individuals to invest when they see their friends doing well in the stock market.

A thorough review of the entire literature in this area is beyond the scope of this review, so we briefly describe early work that established the existence of peer effects in investing, before focusing on more recent work on underlying mechanisms. In early work studying the role of social networks in explaining retail investors' behavior, Ivković & Weisbenner (2007) document a correlation in the stock purchasing behavior of retail investors that live near each other. Specifically, the authors find that a 10 percentage point increase in neighbors' purchases of stocks from a certain industry is associated with a 2 percentage point increase in households' own purchases of stocks from that industry. Similarly, Feng & Seasholes (2004) find that the behavior of Chinese retail investors is correlated with that of other nearby investors. Brown et al. (2008) and Hong, Kubik & Stein (2004) find evidence suggesting that the stock market participation decision is also influenced by social interactions with geographically close individuals: both papers document that individuals with more neighbors that participate in the stock market are also more likely to participate themselves. The authors argue that this geographic correlation in investment decisions is the result of peer effects and not the result of correlated preferences or correlated shocks. In more

recent work on this question, Kaustia & Knüpfer (2012) show that higher recent stock returns experienced by a person's local peers increase that individual's own likelihood of entering the stock market. In other words, it is not just the peers' participation decision but also their subsequent investment performance that has an effect on people's own entry decisions. Interestingly, while higher peer returns increase an individual's own participation, the effect diminishes for negative returns, suggesting that people do not share as much information about investments with inferior outcomes.

In addition to these papers, which focus on the effects on investing of geographically defined peer groups, several researchers have found correlations in the investment behaviors of work peers. For example, Hvide & Östberg (2015) document a strong influence of coworkers on investment choices. They also conclude that following the trading behavior of a peer does not improve the quality of investment decisions, suggesting that work peers are not generally a source of unpriced information about stocks. Similarly, Ouimet & Tate (2020) find that the choices of individuals to participate in an employee stock purchase plan influence their local coworkers' own decisions to participate in the program. In addition, local coworkers' trading patterns also affect individuals' own decisions to sell.

Beyond documenting the role of peer interactions in explaining individual investment choices, a number of recent studies have attempted to understand the reasons for this behavior. Bursztyn et al. (2014) design a field experiment to separately identify the effects of social learning and social utility from asset purchases by investors; they find that both channels play an important role. Arrondel et al. (2019) explore survey data to conclude that peer effects in investing are largely driven by individuals obtaining information about investing from their social circle and less by mindless imitation. In related work, Frydman (2015) constructs an experimental asset market to investigate the mechanism behind peer effects in portfolio choice. He first confirms that a peer's portfolio allocation has a causal effect on a subject's own portfolio choice. Importantly, Frydman (2015) also collects data on the neural activity of his experimental subjects. He concludes that these neural data are consistent with a world in which relative wealth preferences play an important role in explaining the observed peer effects. In particular, he finds that neural activity in reward-related regions of the brain increases with a subject's own wealth but decreases with a peer's wealth. He also finds that individual differences in the strength of observed neural activity can explain cross-sectional variation in portfolio choices, whereby the subjects with the strongest neural sensitivity to a peer's change in wealth are most influenced by a peer's investment decisions.

In a related line of work, Heimer (2016) shows that social interaction contributes to retail traders' disposition effect—the tendency to sell winning assets while holding onto losers. He links data from an investment-specific social network to individual-level trading records. To estimate causal peer effects, he exploits the staggered entry of retail brokerages into partnerships with the social trading platform. He finds that access to the social network nearly doubles the magnitude of a trader's disposition effect, suggesting that social interactions contribute to the disposition effect: Selling winners allows retail traders to brag about their gains, while not selling losers avoids having to "admit to your peers that you're wrong," a channel proposed for the disposition effect at least as early as 1985 by Shefrin & Statman (1985, p. 783).

4. SOCIAL INFLUENCE AND PROFESSIONAL INVESTORS

We next review research that documents an important role of social interactions on investment decisions by professional investors. This research agenda follows early survey-based work by Shiller & Pound (1989), who find that a sizable number of institutional investors report that their portfolio choices are driven in part by interpersonal communication. As with the retail investors described

above, this is hardly surprising: Friends and colleagues can be a welcome source of information or rumor for professionals trying to identify stocks that are likely to outperform. For example, given the size of the overall universe of assets, social interactions can make investors more aware of some stocks than they would otherwise be, particularly for small and otherwise opaque stocks.

A growing literature has since explored the effect of social interactions on the actual investment behavior of professional investors. Cohen, Frazzini & Malloy (2008) study connections between mutual fund managers and corporate board members via shared education networks. They find that portfolio managers place larger bets on firms they are socially connected to and perform significantly better on these holdings relative to their non-connected holdings. This second finding suggests that these education networks can be a source of useful information.

Similarly, Hong, Kubik & Stein (2005) show that the holdings and trades of mutual fund managers who work in the same city are correlated; however, while the evidence is highly suggestive, they cannot conclusively pin down social interactions as the source of the correlation. Pool, Stoffman & Yonker (2015) build on this work to show that the investment overlap between funds whose managers reside in the same neighborhood is considerably higher than that of funds whose managers live in the same city but in different neighborhoods. These correlations are also larger when managers share a similar ethnic background and are therefore more likely to interact with each other due to well-documented homophily in social networks. These additional findings allow Pool, Stoffman & Yonker (2015) to rule out a number of alternative interpretations for the observed correlation in investment behavior. Pool, Stoffman & Yonker (2015) also conclude that valuable information is transmitted through these peer networks, allowing investors to outperform when investing in stocks they hear about through their local professional networks.

Kuchler et al. (2020) further explore the role of social connections in explaining the investment behavior of professional investors. They use social network data from Facebook to show that institutional investors are more likely to invest in firms from regions to which they have stronger social ties. This effect of social proximity on investment behavior is distinct from the effect of geographic proximity that has been documented in the home bias or local bias literature. To measure social connectedness between firm and investor locations, they use the SCI, which is based on friendship links on Facebook. In Section 6, we provide a detailed description of the SCI data, which are publicly available to researchers interested in studying social networks. Kuchler et al. (2020) show that social connections have the largest influence on investments of small investors with concentrated holdings and on investments in firms with a low market capitalization and little analyst coverage. This finding is consistent with small investors having fewer resources for systematic analysis and therefore relying more on word-of-mouth effects, in particular for investments in small stocks that might not be well known to all investors. Kuchler et al. (2020) find no evidence that investors generate differential returns from investments in locations to which they are socially connected. Together, these findings suggest that social networks influence investment choices by improving investors' awareness of informationally opaque firms—not by providing them with an information advantage.

Kuchler et al. (2020) also find that the response of investment decisions to social connectedness affects equilibrium capital market outcomes: Firms in locations with stronger social ties to places with substantial institutional capital have higher institutional ownership, higher valuations, and higher liquidity. These effects of social proximity to capital on capital market outcomes are largest for small firms with little analyst coverage. These findings provide the first evidence that social interactions in investment decisions can be important enough to affect equilibrium asset market outcomes. These results suggest that the social structure of regions affects firms' access to capital and contributes to geographic differences in economic outcomes.

One interesting contrast between the findings of Kuchler et al. (2020) and those of Pool, Stoffman & Yonker (2015) is that, while both papers find that professional investors are affected by parts of their social networks, only Pool, Stoffman & Yonker (2015) find evidence that this behavior allows the investors to outperform. These findings are consistent with a story in which only some social connections convey useful information—in this case, the professional network measured by Pool, Stoffman & Yonker (2015) but not the friend network measured by Kuchler et al. (2020)—even though investment behavior responds to both.

5. SOCIAL INFLUENCE IN HOUSEHOLD SAVINGS AND BORROWING

In this section, we review a number of research papers that have studied social influence across a range of other household financial decisions, ranging from retirement savings decisions to the decision of defaulting on unsecured credit. As before, we focus on more recent work.

5.1. Social Influence in Retirement Savings

A large literature explores how peer effects affect retirement savings—a decision at the intersection of households' saving decisions and their choices as individual investors in capital markets. This work has examined how peers influence coworkers' choices to participate in retirement savings plans as well as their allocation decisions within these plans. Since these decisions usually involve choices that are common among a set of work peers, one might naturally expect those choices to be a topic of discussion at work.

In this literature, Duflo & Saez (2002) were among the first to establish evidence of peer influence on enrollment decisions in tax-advantaged retirement savings plans among university employees. In follow-on work, the same authors conducted a randomized experiment to confirm the presence of positive social effects on enrollment choices within a large university's retirement savings plan (Duflo & Saez 2003).

However, the overall evidence for the magnitude and direction of peer effects in retirement savings decisions is somewhat mixed. For example, Beshears et al. (2015) find that individuals actually decrease their retirement plan contributions when given information about the contributions of their peers. The authors attribute this (perhaps surprising) negative effect to discouragement from upward social comparisons (a mechanism that would fall into the social utility category). In particular, the authors speculate that information about peers' savings choices discourages low-income employees by making their relative economic status more salient. In a different setting, Lieber & Skimmyhorn (2018) do not find strong evidence of peer effects in the retirement investment decisions of soldiers. These authors exploit the randomization of individuals into different military units (and thus social settings) to provide credible identification; they conclude that the lack of noticeable peer effects may be due to the limited observability of peers' retirement decisions.

5.2. Social Influence in Household Borrowing and Default

Several recent studies have also documented an important role of peer behavior in explaining household borrowing and default decisions beyond the effects on mortgage default, which we have reviewed above.

A first strand of the literature shows how a desire to keep up with the Joneses can induce households to take on additional consumer debt to finance consumption. For example, Georgarakos, Haliassos & Pasini (2014) use survey data to establish that individuals who perceive themselves as earning less than the average of their peers have a higher probability of borrowing. They also have

larger outstanding debt amounts conditional on borrowing and a greater likelihood of running into financial distress. Similarly, Agarwal, Mikhed & Scholnick (2016) explore data from Canada and find that an individual's lottery win increases subsequent borrowing and bankruptcies among the lottery winner's neighbors, with the effects increasing as the size of the lottery win increases. The authors also provide evidence that suggests that the increased debt is used to finance conspicuous consumption. This finding is consistent with the evidence in work by Bertrand & Morse (2016), who show that poorer households consume a larger share of their current income when exposed to higher income at the top of the local income distribution. It also aligns with the findings of Kuhn et al. (2011), who explore a Dutch lottery setting to show that a neighbor winning the lottery increases the car purchases of non-winning neighbors.

In addition to these papers exploring the effect of a person's positive income shock on the behavior of her peers, a related literature explores the effects of peer financial distress on individuals' own behaviors. For example, Agarwal, Qian & Zou (2017) analyze data from Singapore to show that an individual's spending declines when a neighbor living in the same building experiences bankruptcy. They find that most of the reduction in spending is happening in less conspicuous categories, suggesting that the effects are at least in part explained by the neighbor learning about the cost of default, rather than by reduced status competition with the neighbor. Similarly, Kalda (2020) shows that peer financial distress leads to a decline in individual leverage and debt on average. This decline occurs as individuals borrow less on the intensive margin, pay higher fractions of their debt, and save more while their income remains unchanged. As a result, individuals are less likely to default during the period following peer distress. The heterogeneity in responses suggests the role of changes in beliefs and preferences as part of the underlying mechanism. In related work using data from a Chinese online lender, Li et al. (2019) show that the default decision of an individual can predict subsequent defaults of his peers.

6. NEW DATA: THE SOCIAL CONNECTEDNESS INDEX

Data from online social networking services such as Facebook and LinkedIn can substantially advance our understanding of the economic and financial effects of social networks. However, working with deidentified micro data involves substantial legal and administrative constraints. To widen access to useful social network data, Bailey et al. (2018b) introduced the SCI, which is publicly available.

The *SCI* measures social connectedness across any two locations. It is based on deidentified administrative data on Facebook's social graph—which captures the network of friendship links on the platform—with users matched to their geographic locations. The *SCI* between regions i and j corresponds to the total number of connections between individuals living in region i and individuals living in region j, given by $FB\_Connections_{i,j}$, divided by the product of the number of eligible Facebook users in those zip codes, as in Equation 1. This measure captures the relative probability of a Facebook friendship link between a given user in zip code i and a given user in zip code j:

$$SCI_{i,j} = \frac{FB\_Connections_{i,j}}{FB\_Users_i \times FB\_Users_j}. \quad 1.$$

As an example, the heat maps in **Figure 1** show the *SCI* of San Francisco County, California, and Kern County, California. For both counties, a significant proportion of friendship links are to geographically close counties across the West Coast. Bailey et al. (2018b) show that this is a consistent pattern across the United States, with the median county having 63.9% of all friends living within 100 miles. However, there are also substantial differences in the social networks of

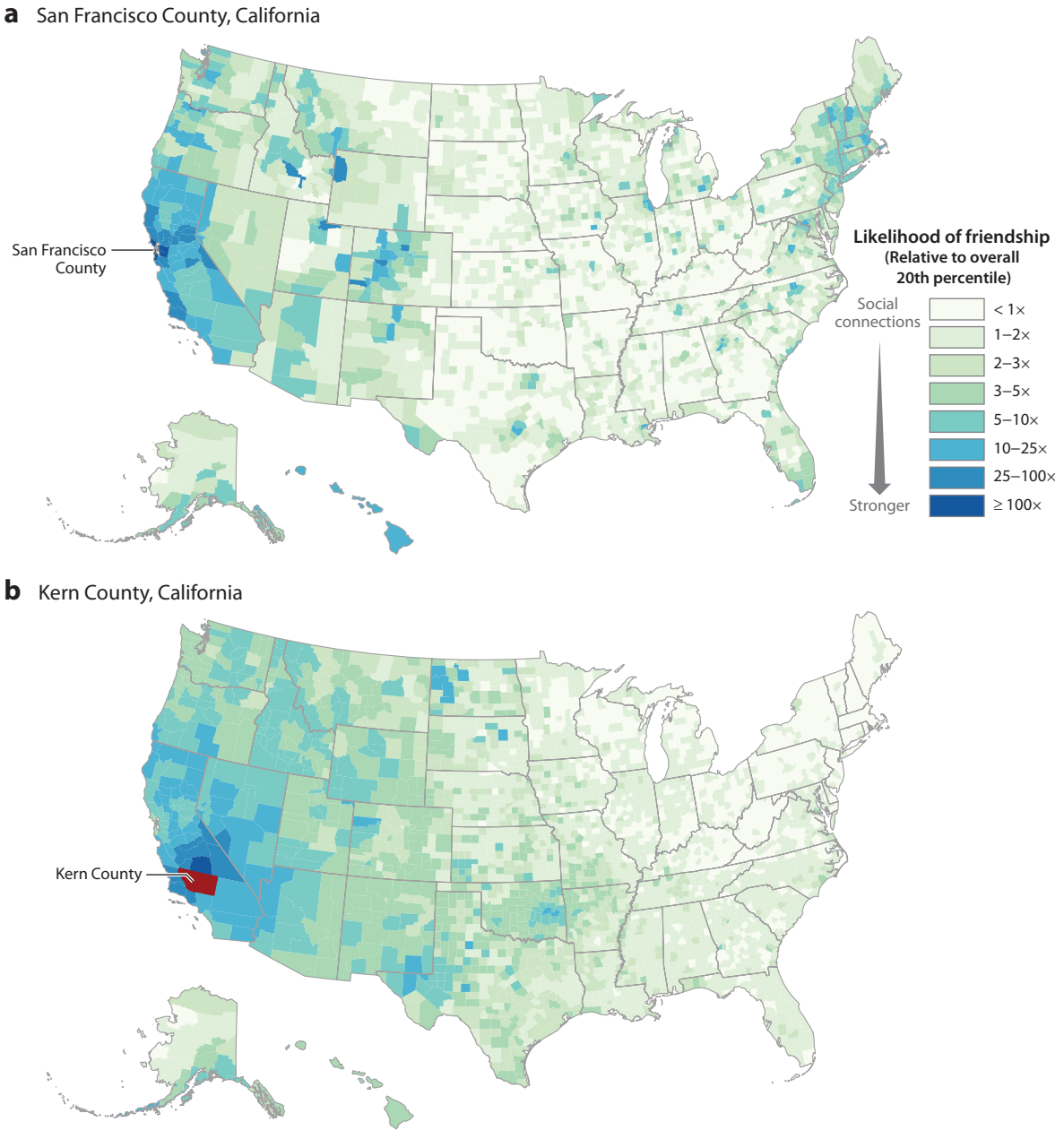

Figure 1

Heat maps of the social connectedness of (*a*) San Francisco County, California, and (*b*) Kern County, California. The Social Connectedness Index is based on data from Facebook and was initially introduced by Bailey et al. (2018b); the underlying data are publicly accessible at **https://data.humdata.org/dataset/social-connectedness-index**. Darker colors correspond to stronger social connections to the focal county. Quantitatively, when the index is twice as large, this means that any given two individuals across a pair of counties are twice as likely to be friends with each other on Facebook. As an example, the heat map for Kern County shows a cluster of particularly strong social links to western North Dakota, which has recently attracted population flows from oil-rich Kern County to work in the Bakken oil fields.

the two counties. San Francisco is strongly connected to counties located in the Northeastern United States, while Kern County has fewer of these friendship links. Instead, Kern County's friendship network is concentrated in the West Coast and mountain states, except for a pocket of strong connections to individuals living in Oklahoma and Arkansas as well as links to North Dakota. The links to Oklahoma and Arkansas are likely related to past migration patterns, because Kern County was a major destination for migrants fleeing the Dust Bowl in the 1930s. The links to North Dakota are primarily to the Bakken oil fields, perhaps not surprising given that Kern County produces more oil than any other county in the United States.

The SCI is currently available for measuring social networks between the following sets of location types:

1. US county to US county
2. US county to country
3. Country to country
4. GADM1–GADM1 regions
5. GADM1–GADM2 regions for selected locations

The SCI data are freely and openly available to all interested researchers and policy makers at **https://data.humdata.org/dataset/social-connectedness-index**.

In addition to the papers discussed in this article, the SCI has been widely used by researchers across the social sciences. For example, Bailey et al. (2021) show that social connectedness between regions and countries leads to higher trade and financial flows; Bailey et al. (2020a) analyze the role of transportation infrastructure in shaping urban social connectedness; Wilson (2021) studies the effects of social networks on earned income tax credit claiming behavior; Enke, Rodríguez-Padilla & Zimmermann (2019) use the SCI to study the formation of ideology; and Bailey et al. (2020c) explore how intra-European connectedness relates to anti-European Union sentiment. Bali et al. (2018) use the SCI data to argue that retail investors' attraction to lottery stocks is amplified by social interactions. Researchers have also used the SCI data to study the role of social interactions in credit markets: Rehbein & Rother (2020) study bank lending, while Allen, Peng & Shan (2020) explore credit allocation on FinTech platforms. The SCI has also been used to study the spread of and behavioral response to the coronavirus disease 2019 (COVID-19) (e.g., Bailey et al. 2020b; Coven & Gupta 2020; Holtz et al. 2020; Kuchler, Russel & Stroebel 2021; Milani 2020).

7. SOCIAL FINANCE: A RESEARCH AGENDA

Classic models of economic behavior have not traditionally featured a role for social interactions between individuals. But, as Aristotle famously noted, humans are, by nature, social animals. As a result, interactions with other individuals are likely to influence most decisions we make through a variety of channels beyond market prices. In this article, we have reviewed a large and growing literature that explores the role of social interactions and peer effects in household financial decision-making. Many of these advances have been facilitated by an increasing accessibility of novel data sets that allow researchers to overcome the measurement and identification challenges inherent in empirical work in the field of social finance. The overall conclusion from this review is that social influences in household financial decisions are pervasive, large in magnitude, and come through several channels, including social information, social perception, and social utility channels. We expect researchers to continue to add to this body of evidence over the coming years.

With a few notable exceptions, less work has been done to integrate social interactions into our theoretical modeling efforts. As social scientists, we should aim to write models that capture important features of the world, and the accumulation of evidence on the importance of social

interactions suggests that an increased focus on these mechanisms might improve modeling efforts in a number of areas. While this may be challenging and will come at the cost of some tractability, recent work has shown, for example, how incorporating epidemiological models of disease spread into a general equilibrium framework can help overcome some of the associated computational challenges (Burnside, Eichenbaum & Rebelo 2016). We expect the inclusion of social dynamics into equilibrium models to be a fruitful area of research.

FUTURE ISSUES

1. As highlighted above, peers can both provide useful information and distort investment and borrowing decisions due to social comparisons, belief contagion, and investment/consumption due to fear of missing out (FOMO). As more evidence on the possibly distortive dimensions of social influence accumulates, a natural question is to what extent consumer financial regulation can and should attempt to counteract those distortive effects (Agarwal et al. 2015). We view the recent regulatory attention to the r/wallstreetbets forum on the social media site Reddit, which served as a coordination device for many retail investors purchasing stocks in companies such as GME (Pedersen 2021), as evidence of this shift in regulatory focus.
2. Most of the research reviewed in this article focuses on studying a particular peer group, such as work colleagues or geographic neighbors. An interesting next step for empirical research is to explore which types of peers are most important in which settings. Am I more likely to listen to stock market tips from my family members, my college friends, or my work colleagues? Am I more affected by individuals my age or by older individuals? Am I more likely to trust the advice of peers who are more educated than I am? This research direction can build on extensive work in the marketing literature attempting to identify socially influential individuals, for example, to exploit them in seed marketing or influencer campaigns (e.g., Tucker 2008, Bakshy et al. 2011, Aral & Walker 2012, Bailey et al. 2019b).
3. While a number of studies have shown the presence of social influence in individual behavior, most of this work has not explored the effects of this behavior on aggregate quantities and prices (for an exception, see Kuchler et al. 2020). Does social influence wash out when aggregating, or does it lead to large cyclical movements in asset prices? How much can asset price bubbles, such as the Chinese warrant bubble, or bubbles in meme stocks, such as GME and AMC, be explained by social dynamics? Additional evidence on the aggregate implications of social influence will help to encourage other economists to incorporate these peer effects in their modeling efforts.

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Both authors have been research consultants at Facebook, a social networking company, to work with anonymized data on research topics in the social finance space.

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