

Loved Ones Matter: Family Effects and Stock Market Participation

by

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ABSTRACT

Recent parental and partner stock market experiences (i.e. one period lagged stock portfolio outcomes) are found to be of significant importance for individuals' entry, participation, as well as for exit from the stock market. Interestingly, community sentiment towards the stock market (based on portfolio outcomes in the community) does not influence individuals' likelihood to enter, while a positive sentiment increases (decreases) the likelihood for participation (exit). Overall, the results stress the importance of accounting for family social influence and highlight potentially important differences between family and community effects in individuals' stock market participation.

JEL Classification: G02, G11, D03, D14, D83

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Social interaction is an important channel through which individuals' financial behavior is influenced. This is, for example, indicated by the survey data reported in Van Rooij et al. (2011), where individuals respond that parents, friends, and acquaintances are one of the most essential sources for advice concerning important financial decisions. For the decision to own stocks a number of papers have confirmed this statement on revealed preference data.¹ For example, Duflo and Saez (2003), Hong et al. (2004), Brown et al. (2008), and Kaustia and Knüpfer (2012), all find that the behavior among peers in an individual's community affect the individual's stock market participation decision.² While there is a growing body of literature studying community effects and stock market participation, less is known about within-family influence.

The objective of the current paper is to enhance the understanding of the role of family in an individual's decision to own stocks. In particular, the focus is to study the social influence of parents and partners on an individual's decision to entry, participate, and to exit from the stock market, in a setting including community social interaction effects.³ This is of interest for a number of reasons. First, little evidence exists concerning the social influence of family on individuals' stock market participation. The only detailed study, to the authors' knowledge, is Li (2014), who studies and finds effects of information sharing within extended families. Second, few prior studies consider the dynamics of individuals' stock market participation, i.e. entry and exit, especially in relation to social interaction effects. Third, no studies, to the authors' knowledge, consider jointly family and community social influence on individuals' participation, allowing for comparative inference of their relative importance.

The main results within the paper do indeed confirm the important role of family for individuals' stock market participation. Past parental and partner stock market experiences (portfolio outcomes) are found to be of significant importance for individuals' entry, participation, as well as for exit from the stock market. In particular, a positive portfolio performance among mothers, fathers, and partners in the previous year, is found to significantly increase the likelihood for individuals' subsequent entry, while participation and exit mainly are affected by negative family

¹ An individual's decision to own stocks has received ample attention, both empirical and theoretical, over the last decade (e.g. Mankiw and Zeldes, 1991; Haliassos and Bertaut, 1995; Cocco et al., 2005; Guiso and Jappelli, 2005; Brown et al., 2008; Kaustia and Knüpfer, 2012; Grinblatt et al., 2011). The so called non-participation puzzle, i.e. the observation that large parts of the population do not own stocks, has been shown to have important implications for individual's welfare (e.g. Cocco et al., 2005) and for the explanation of the equity premium puzzle (e.g. Mankiw and Zeldes, 1991).

² Research have also found evidence for social influence and learning in a number of other areas, e.g. labor market participation of married women (Woittiez and Kapteyn, 1998), use of welfare benefits (Bertrand et al., 2000), pension plan participation (Duflo and Saez, 2002), and stock market trading (Shive, 2010).

³ To clarify, with stock market participation we refer to *all* individuals owning stocks at a given point in time. This is in line with earlier cross-sectional studies, e.g. Duflo and Saez (2002), Hong et al. (2005) and van Rooij et al. (2011). This definition does, however, not separate individuals who have recently entered from those who have owned stocks for many periods. Due to this we analyze entry and exit among individuals separate from participation and based upon separate samples.

sentiments (negative portfolio outcomes).⁴ For community effects, the results indicate a significant influence on the likelihood to participate and to exit, but not on an individuals' likelihood to enter. While the likelihood for participation increases for increasing proportions of peers' with positive portfolio outcomes, there are no significant effects for increasing proportions of peers with negative portfolio outcomes.

Our results are interesting. First, they confirm the findings in Li (2014) concerning the significant role of family social interaction for individuals' stock market participation. The results further extends those in Li, indicating that family experiences from stock market participation may both encourage, as well as discourage individuals subsequent behavior. Li measures the effect of previous stock market entry by extended family members on an individual's likelihood to enter, but do not discriminate between whether family members encounter positive or negative experiences while being participants. Our results point towards the fact that family members' stock market entry alone may not be sufficient in influencing individuals' entry, but it is rather conditioned upon positive family experiences after entry.

Second, our results tentatively indicate two potentially important differences between family and community social influence: (i) while the likelihoods to participate and to exit are affected by family and community social interactions, only family influence seem to matter for entry; This is a captivating result that potentially can be understood by considering differences in how family and peer groups are formed and by differences in attention given by individuals to socially obtained stock market related information as stock owners contra as non-owners.⁵ (ii) while both positive and negative family experiences seem to affect individuals' entry, participation, and exit (mainly positive experiences for entry and mainly negative experiences for participation and exit), mainly positive seem to be shared within communities. This is an interesting result indicating that while peer communication is selective and confined to sharing of mainly positive outcomes (e.g. Kaustia and Knüpfer, 2012; Han and Hirshleifer, 2013), family involves also sharing of negative. This is an intriguing result possibly reflecting that family also has a role as functioning as social support in handling of financial stress (e.g. Cohen and McKay, 1984; Cohen and Wills, 1985).⁶

⁴ Even if the partner effect (correlation) is likely to be driven by a mix of different mechanisms, e.g. matching of partners with similar preferences or financial decisions taken by a partner with a high bargaining power, tentative evidence is found indicating social interaction or information sharing driven effects.

⁵ Community interaction may involve less sharing of stock related information as non-participants, due to homophily (e.g. Lazarsfeld and Merton, 1954; Baccara and Yariv, 2013), i.e. the tendency to interact with similar others (other non-participants), while family influence may involve sharing of information (also as a non-participant) less driven by similarities in interests, for example, due to altruistic concerns or to common household responsibilities. This may then explain a family, but not community, influence on entry. That individuals' are affected by both family and community influence concerning participation and exit may further reflect that as stock owners, with something at stake, individuals may pay more attention to stock related information than as non-owners, with nothing at stake.

⁶ A large literature in psychology suggest that social support "buffers" (protects) individuals from the potentially pathogenic influence of stressful events (e.g. Cohen and McKay, 1984; Cohen and Wills, 1985). In the current context the interpretation is that social support helps lowering the emotional and psychological distress caused by stressful financial situations. Given that losing money is stressful, parental and partner sharing of negative portfolio outcomes within their social support group may then be a way to psychologically deal with stress. That mainly negative family experiences is found to have an impact upon individuals participation and exit is consistent with psychological research

Third, our results that individuals' likelihood to participate and exit, conditional on owning stocks, continue to be influenced by both family and peer experiences indicates that sharing of stock market experiences may be an important input in individuals' formation of beliefs concerning expected returns and risks, even after gaining own stock market experience.

The results within the paper have been obtained from conditional analysis of a unique and extensive data set. The data include two full cohorts of Swedish individuals⁷ and information about their parents, partners, as well as a large number of controls, e.g. detailed information about financial holdings, personal income, wealth, family situation, and education, observed annually over the period 1999 to 2007. To study individuals' likelihood to enter, participate, and to exit three different samples are considered. For participation, we use our full sample and note that at a given point in time a majority of the observed participants pertain to individuals who participated in the previous period. Given that an individuals' decision to continue to participate is likely to differ from their decision to enter, e.g. a participating individual can do nothing and continue to be a stock owner while entry require active actions, we regard this sample to represent individuals' likelihood to participate.⁸ To study an individual's decision to actually enter, we create a sample consisting of individuals becoming participants (conditional on not owning stock before) and non-participating individuals continuing to be non-participants⁹, while to study an individual's decision to actually exit, a sample consisting of participants becoming non-participants combined with a comparison group consisting of stock owners continuing to be stock owners.

In the study, social interaction effects, both in terms of family and community, are identified based on individuals', parents', and partners' holdings of stocks. In the outcome based approach (c.f. Kaustia and Knüpfer, 2012) one-year-lagged portfolio outcomes among family and community members are assumed to form time-varying family and community sentiments towards stock investments, shared or observed by individuals through social interaction.¹⁰ Recent positive experiences (portfolio outcomes) among parents, partners or community members are then assumed to encourage, while negative experiences (portfolio outcomes) discourage, individuals' subsequent participation. Assuming that portfolio outcomes among a majority of family and community members to a large extent are exogenously driven, i.e. that a majority of

indicating that negative events have a greater impact on individuals' than positive events of the same type (e.g. Ito et al., 1998; Baumeister et al. 2001).

⁷ The study is based on the full cohorts of individuals born in 1963 and 1973. Since these are observed during the period 1999-2007, we observe the behavior of individuals in the age interval 27 to 44 years. The choice of this sample is made to ensure that individuals have at least one parent alive during our observational period.

⁸ Including an analysis of individuals participation, in addition to entry and exit, is warranted since it facilitate comparison with earlier studies based on cross-sectional data, e.g. Duflo and Saez (2002), Hong et al. (2005) and van Rooij et al. (2011).

⁹ Given that the number of individuals entering the market in each period is rather small, a random selection of non-participants is drawn as a comparison group.

¹⁰ Outcome-based social learning has theoretically been modeled by e.g. Ellison and Fudenberg (1993, 1995), McFadden and Train (1996), Persons and Warther (1997), Banerjee and Fudenberg (2004), and Cao et al. (2011). Empirical research on the issue is still limited. Munshi (2004) and Kaustia and Knüpfer (2012) are, however, two exceptions.

the portfolio outcomes are a product of stock performance (exogenous to the individual) rather than driven by superior stock picking skills, we consider the portfolio outcome variables as good exogenous instruments to use in identification of contemporaneous within-family and community effects. That individuals, in general, lack superior skills in achieving stock returns are supported by a number of studies providing evidence indicating that individual investors' average performance is poor relative the market and institutional investors. Among other, individuals have been found to trade too much, hold poorly diversified portfolios, and to suffer from a disposition effect, i.e. to sell winners too soon and hold onto losing positions too long, see e.g., Blume and Friend (1975), Ferris et al. (1988), Odean (1998), Odean (1999), Barber and Odean (2000), Grinblatt and Keloharju (2001).¹¹

A number of measures have been taken to eliminate concerns that alternative mechanisms are generating the captured correlations between parental, partner, peer portfolio outcomes, and individuals' likelihood to participate (other than social interaction). The use of lagged portfolio outcomes along with controls for both the lagged and contemporaneous overall stock market development eliminate concerns about effects driven by reactions to general stock market information; controls for parental stock ownership, both contemporaneous and during the individuals' adolescence, and for the total community participation rates, eliminate concerns about results to be driven by inherited similarities in family preferences (e.g. Kimball et al., 2009) or by common community values (e.g. Guiso et al., 2004). Finally, a host of individual and community specific controls, including time-specific fixed effects, community fixed effects, as well as individual specific random effects are included to eliminate concerns about omitted variable bias. Overall, our results are found to be robust towards a number of alternative model specifications.

While our paper contribute to the general understanding of individuals' stock market participation, it is most closely related to studies linking participation to social influence (e.g. Duflo and Saez, 2003; Hong et al., 2004; Brown et al., 2008; Kaustia and Knüpfer, 2012; Li, 2014; Hvide and Östberg, 2013). Among these, our study is closest to Li (2014). In comparison, however, our analysis differs in a number of respects. While Li condition individuals' stock market entry solely on past entry by family members, we consider influence from family sentiment driven by both positive, as well as negative family stock market experiences, include an analysis of social interaction effects also upon participation and exit, and explicitly include controls for community effects. Here we argue that the latter is potentially important since ideas

¹¹ These findings are, however, challenged by recent research. Grinblatt et al. (2011) and Grinblatt et al. (2012) find evidence indicating that high-IQ investors, on average, obtain higher risk adjusted return, suffer from lower disposition effect, exhibits superior market timing and stock picking skills. Due to this recent evidence we challenge the robustness of our results presented within our main analysis on a smaller subsample including a control variable for individuals' cognitive ability. This analysis is presented in Subsection 3.6.

have been put forth that in societies where people are raised to trust their close family networks, they are also taught to distrust people outside the family (Fukuyama, 1995).¹²

In terms of identification, our paper relates to Kaustia and Knüpfer (2012), who also use a portfolio outcome based strategy in order to capture community interaction effects. A main difference, however, apart from our focus on family influence, is that while they measure portfolio outcomes for aggregated community portfolios, we utilize community individuals' portfolio returns to measure the dispersion of stock market sentiments also allowing for controls of within community heterogeneity.

The paper further connects to the recent literature studying how individuals form their beliefs about asset returns. Kaustia and Knüpfer (2008), Choi et al. (2009), and Malmendier and Nagel (2011) indicate that in addition to general statistical information, personally experienced outcomes are an important influence in individuals' investment decisions. This behavior, based on reinforcement learning, imply a repeating behavior driven by good outcomes in the past. The results in our paper indicate that as a non-participant, lacking own personal stock market experiences, investors turn instead to that of family. Interestingly, even as a participant, i.e. when gaining own experience, our results imply that experiences of others (family and peers) continue to be of importance. This is interesting and also broadly contributes to the literature focusing on understanding the formation and heterogeneity in subjective beliefs, e.g. Manski (2004) and Dominitz and Manski (2011).¹³

The rest of the paper is organized as follows. In Section 1 we develop motivations and discuss the empirical identification of family and community effects. In Section 2 the data and details about the measurement of variables are presented along with the empirical model. Section 3 contains our empirical analysis, as well as robustness testing of our results. Section 4 concludes.

1. Social interaction and identification

Social interaction is, in general, thought to serve as a mechanism for information sharing, either by means of word-of-mouth communication or through observational learning (Banerjee, 1992; Bikhchandani et al., 1992; Ellison and Fudenberg, 1993, 1995; Hong et al., 2004). Below we discuss the potential role of family and peer social influence upon individuals stock market behavior, especially focusing on potential differences in impact, along with our approach to identify family and community social interaction effects.

1.1 The potential roles of family and community influence

An individual's social environment consists of family and peers. In considering their potential impact upon individuals' entry, participation, and exit from the stock market a number of

¹² This implies a possible trade-off between within-family and community influence on individuals financial behavior. Studying these effects separately may therefore give a biased view of the different components' relative role in affecting individuals' financial decisions.

¹³ Dominitz and Manski (2011) and related literature therein find substantial heterogeneity in individuals' expectations about equity returns.

reflections can be made. In terms of the parent-child relationship, an individual is born, inherits common genetic features, and are throughout life affected through their role in the social environment. For the partner relationship, individuals meet and form a common household with shared responsibilities, including, for example, investments and savings decisions. Both the parent and partner contemporary relationships may, for an average individual, include sharing of information and experiences, as well as, involve discussions leading to confirmation or rejections of possible actions.

Given that parents and partners, in general, constitute an individual's closest relationships, one way to view family is as functioning as one's closest support group. In psychological research, a large literature on social support, see e.g. Cohen and McKay (1984) and Cohen and Wills (1985), suggest that social support "buffers" (protects) individuals from the potentially pathogenic influence of stressful events. Although little research have focused upon the role of social support for handling of stress associated with financial market participation, one can hypothesize that it also matters in this case. Individuals with access to a higher level of social support may be assumed to be better equipped to handle the emotional and psychological stress associated with owning stocks. Thus, given that parents and partners often constitute an individual's closest confidants (and the other way around), it thus seem likely that stock market experiences, both positive and negative, are shared within family as a way of dealing with stock market related stress. Another argument favoring family sharing of both positive and negative stock market experiences, concern that family relationships also are driven by other considerations than similarities in interests. Altruistic concerns and mutual economic responsibilities make it reasonable to assume that parents and partners sharing also involve both successes and failures.

For community social interaction, previous evidence indicates a possible selective communication at the community level. Kaustia and Knüpfer (2012), studying stock market entry among the entire population of individual investors in Finland, find evidence on that social influence among peers is restricted to sharing of good outcomes. Although the study do not discriminate between whether only positive outcomes are transmitted or whether individuals only take account of positive outcomes (in a situation where peers transmit both positive and negative outcomes) strong arguments favor their selectivity interpretation. Han and Hirshleifer (2013) term the asymmetric sharing of mainly positive outcomes, not fully discounted by receivers of information, a self-enhancing transmission bias, motivated by reputational concern (e.g. Leary and Kowalski, 1990) and by self-enhancing psychological processes (e.g. Bem, 1972; Langer and Roth, 1975).

Thus, in terms of sharing of information, we conclude that while community sharing may be selective and restricted to mainly positive outcomes, family sharing are likely to pertain also to negative outcomes. The above argumentation, viewing the family as a social support group enabling parental and partner sharing of also negative outcomes, may be strengthened by that reputational concerns (used as an argument for mainly sharing of positive outcomes among peers) may be of lower concern within family.

In terms of how individuals are affected by information, a vast literature in psychology suggests, in general, that “bad” is stronger than “good”, i.e. that a bad outcome have a relatively larger impact on individuals than a corresponding good outcome of the same type (e.g. Ito et al., 1998; Baumeister et al. 2001). This greater weighting of negative information over positive is similar as in, for example, Kahneman and Tversky (1984), indicating a larger reported distress, than pleasure, of losing a given quantity of money, than in gain the same amount. Thus, in an environment where both positive and negative information are shared, a dominating effect from negative information upon individuals’ behavior is, in general, expected.

Two final distinctions can be made concerning the impact of social interaction by comparing the situation for an individual without stocks (before an eventual entry) and one owning stocks. The first relates to community sharing of information and to the formation of peer groups. Given the literature concerning the formation of peer groups (e.g. Baccara and Yariv, 2013), indicating that individuals exhibit homophily, i.e. a tendency to form peer groups with similar others (Lazarsfeld and Merton, 1954), it seem, all else equal, more likely that non-participants socialize with other non-participants and participants with other participants. One may take this further to also suggest that even if a non-participant socializes with a participant, it is less likely to be involved in stock market related conversations, given that conversations usually concern mutual interests. This reasoning suggest that community influence potentially are of lower importance for individuals’ entry (since non-participants are less likely to be exposed to community shared stock market related information) but of larger importance for participation and exit.¹⁴

The second distinction between an individual without stock holdings and someone owning stocks concern the attention the individuals will give information obtained through social interaction. Assuming that an individual is exposed to stock related information, the extent to which it will affect its behavior will depend upon the attention the individual places upon this information. As noted by, for example, Hirshleifer and Teoh (2003), attention requires effort. Individuals are therefore likely to select what information to pay attention to. Thus, it seems likely that as a stock owner, with something at stake, the individual is more likely to pay attention to stock related information, than in a situation without ownership of stocks. For example, receiving information about negative parental stock market experiences may mean little for an individual without stocks, but can create tremendous distress among someone already owning stocks, i.e. create anxiety about losing money. Based upon this reasoning, we expect a potentially differing role of both family and community shared information for individuals’ entry (concerning individuals without stocks) compared to for participation and exit (concerning individuals with stocks).

Summarized, we expect sharing of information to be more likely to pertain to both positive and negative experiences within family, while mainly to positive within communities. If both positive

¹⁴ A counter argument against this reasoning is given by Hong et al. (2004), suggesting that non-participants may become owners of stocks driven by the future prospects of being included in a social context of stock owners, i.e. by deriving utility from being able to talk with peers about stock related issues.

and negative experiences are shared, we expect, in general, negative to have a larger impact upon individuals' behavior. Finally, we expect that social influence may be of larger importance for participation and exit (among stock owners), than for entry (among non-owners), especially in regard to community influence.

1.2 Identification of parental social influence

In studying parental social interaction effects it is of key importance to find an identification strategy excluding possible correlations driven by inherited or within family socially learnt behavior. To accomplish this we utilize a portfolio outcome based approach (c.f. Kaustia and Knüpfer, 2012). Changes in parental portfolio values are assumed to capture either positive or negative parental stock market experiences, forming a time-varying family sentiment towards stock investments, assumed to be shared within family.¹⁵ Recent positive experiences (portfolio outcomes) among parents are then assumed to encourage, while negative experiences (portfolio outcomes) to discourage, individuals' subsequent behavior. Assuming that portfolio outcomes among a majority of parents to a large extent are exogenously driven, i.e. that a majority of the portfolio outcomes are a product of stock performance (exogenous to the individual), rather than superior parental stock picking skills, we view the contemporaneous parental stock market sentiment to mainly be exogenously driven.

Furthermore, to strengthen the argumentation for that the parental portfolio outcome variables capture social interaction effects, rather than a correlation between parental and individual stock market participation driven by similarities in preferences, variables pertaining both to whether parents currently are owning stocks (in the previous period) and whether parents held risky assets during the individuals' adolescent are further included. This is important since the existing literature provides ample evidence upon intergenerational relationships between parents and adult children, e.g. Solon (1992), Charles and Hurst (2003) and Charles et al. (2007). Thus, one has to take into account that children can "inherit" their parents' risk preferences both through social and biological influence (e.g. Kimball et al., 2009; Cesarini et al., 2010).

Our inclusion of variables pertaining to the individuals' adolescents is in line with Chiteji and Stafford (1999). They study the cross-generational influence on young adults' portfolio choice and find that the likelihood of young families to hold transaction accounts and stocks is affected by whether parents held these assets or not during the adult child's adolescence. In our study we include variables pertaining to parents' education, salary, as well as, parental financial market participation (stock and/or mutual fund markets) during the individual's youth. In particular, the latter is an important conditioning variable since the likelihood that an individual is familiar and aware of stocks as a financial instrument is higher growing up in a home with actively participating parents. Guiso and Jappelli (2005), in a survey of Italian households, document that

¹⁵ To avoid capturing correlations between parental portfolio outcomes and individuals participation driven by reactions to similar general market information, the one-year lagged parental portfolio outcomes are utilized. This is in line with e.g. Brown et al. (2008) and Kaustia and Knüpfer (2012).

lack of financial awareness is an important factor explaining household investor non-participation, as well as, that proxies for social interaction (in our context within family) are positively correlated with financial awareness.

Since it is possible that unobserved factors, e.g. ability, may be correlated between parents and an individual and ability have been shown to be associated with both higher participation rates and superior (risk-adjusted) portfolio performance (e.g. Christelis et al., 2010; Grinblatt et al., 2011), there is a risk that correlation between positive and negative parental portfolio performance and sequential individual entry may be driven by unobserved factors. To control for this, we include in our main analysis random individual specific effects to capture possibly omitted factors. Given the potential importance of ability in generating a positive correlation between individuals' likelihood to participate and parental portfolio outcomes, we further include in the robustness testing of our results (for a restricted sample) a measure controlling for individuals' cognitive ability.¹⁶ The combined inclusion of parental control variables connected to an individual's adolescence, contemporaneous stock ownership among parents, and the random individual specific effects then enables us to establish that correlations between (lagged) parental portfolio outcomes and an individual's stock market participation are driven by contemporaneous social interaction.

Few studies, to the authors' knowledge, have so far studied parental social interaction effects in the financial context. The only exception is Li (2014), who study the sequential correlation between parental and individuals' entry in the stock market. Parental entry later in life (assumed to be driven by an exogenous factor not affecting individuals' later entry) is then thought to influence individuals' entry through information sharing.¹⁷ The results indicate that the likelihood of stock market entry for a household investor is about 20 to 30 percent higher if their parents or children had entered the stock market during the previous five years. Since stock market experiences acquired by parents after entry may not necessarily be positive, e.g. if parents experience large losses, we hypothesize that the outcome based approach followed in the current study is more informative than parental entry itself.

1.3 Identification of partner social influence

Household financial decision making is often modeled using a unitary framework treating households as a single decision-making unit with a common utility function with pooled income.¹⁸ There is, however, evidence indicating that risk preferences of individual members in a household are heterogeneous between partners, e.g. Barsky et al. (1997), Charles and Hurst (2003),

¹⁶ Our measure for cognitive ability pertains to individuals average GPA upon finishing high-school. This measure has been shown to be highly correlated with more direct measures of cognitive ability, see e.g. Hanes and Norlin (2011). Given that the measure is available only for about half of our main sample (the cohort born 1973), we include this in a robustness analysis of the results.

¹⁷ A similar approach has been tried within the current paper, but since the number of parents entering later in life (in our observational period) is small we did not follow this route.

¹⁸ Alternatively, individuals are modeled separately without concern to other members of the household.

Mazzocco (2004) and Kimball et al. (2008). A large and growing amount of literature in economics further provides evidence that household saving and investment decisions are significantly affected by how bargaining power is allocated within the household, e.g. Thomas (1990), Hoddinott and Haddad (1995), Browning (2000), Duflo (2003). Apart from this, there also exists substantial sociological literature acknowledging the above, but also the role of information and communication in intra-household decision-making (see e.g. Dwyer and Bruce, 1988; Zelizer, 2005). Given the objective of the current paper, this indicates that information sharing between partners may be an important aspect of social interaction which can influence individuals' decision to own stocks.

To study the effect of social information sharing within a household, i.e. between partners, is, however, as indicated above, a complicated task. An observed correlation between individuals' and partners' stock market participation may, apart from information sharing and observational learning, also be driven by a partner with a large bargaining power. Friedberg and Webb (2006) do, for example, find, by analyzing survey data, that households tend to invest more heavily in stocks as the husband's bargaining power increases. Elder and Rudolph (2003) and Friedberg and Webb (2006) further find that bargaining power is positively correlated with financial knowledge, educational level, and wage, irrespective of gender. In lack of direct measures of how decisions are made in a household, proxy measures, such as relative income, is often applied (e.g. Elder and Rudolph, 2003; Lyons and Yilmazer, 2007).

Another main concern in the identification of intra-household information sharing effects, as pointed out by Li (2014), is that unlike families, which are formed by exogenous biological reasons, most households are endogenously formed. An observed positive correlation between individuals' and partners' decisions to own stocks may then be driven by matching of individuals with similar preferences for stock market participation. Given the difficulty in identifying the effect of intra-household information sharing upon participation, we approach this in a practical way. In the main analysis the possible correlation between individuals' decisions to own stocks and the partners' lagged portfolio outcome is modeled. Given that a significant correlation is found, we interpret this to be driven either by intra-household information sharing, a positive matching on preferences, and/or by the behavior of a household member with a dominating bargaining power.

To find some evidence upon whether social interaction within the household is a significant factor in explaining individuals' participation, an extended study, reported in a sub-section, on a smaller sub-sample is performed. This sub-sample consists of non-participating singles in period t becoming partners in the following period ($t+1$). This allows us to study the separate influence of meeting a participating partner on the behavior of a non-participating individual. The focus on non-participating individuals is chosen to avoid matching on similar preferences, i.e. to avoid capturing a correlation driven by a matching of participating individuals. To further separate the effect of information sharing we use an interaction variable between the partner portfolio outcome and an indicator of bargaining power within the household. The indicator variable is based on the

individual's and the partner's disposable incomes, and captures the effect of equal partners, i.e. of a couple with similar disposable incomes.¹⁹ The use of the interaction variable will then separate the correlation (between a participating partner's portfolio outcome and a non-participating individual's likelihood to participate) between households with a dominating partner and households with a non-dominating partner. Evidence of social interaction (information sharing) between the non-participating individual and its partners is then thought to be captured by the later.

1.4 Identification of community social influence

A number of papers (e.g. Hong et al., 2004; Brown et al., 2008; Grinblatt et al., 2011; Kaustia and Knüpfer, 2012; Hvide and Östberg, 2013) have linked the behavior of neighbors and colleges, or more broadly individuals' behavior in one's community, to individuals' participation decision. In this literature, a main concern is the identification of casual community effects, e.g. Manski (1993, 1995) and Brown et al. (2008).

Given our detailed data on stock holdings, community effects are identified (in line with our parental and partner effects) using the portfolio outcomes among peers.²⁰ The return of peer portfolios is thought to generate either positive or negative stock market experiences at the individual level forming, at the aggregate, a community sentiment towards stock market participation. To measure the size of this sentiment exposure within communities, we create two variables capturing the proportion of stock owners with positive and negative portfolio returns, respectively. An increase in the proportion of peers with positive portfolio returns is thus, reflecting a more positive community sentiment towards stock investments.²¹ Given that peer stock returns (in line with our parental and partner portfolio outcome variables) to a large extent are exogenously determined (rather than by stock picking skills), we consider these to be good exogenous measures capturing the contemporaneous time-varying community sentiment towards stock investing.

To ensure that community effects are not driven by similarities in community preferences and by common social values (e.g. Guiso et al., 2004), a number of conditioning variables are included in our model specifications. These variables include a variable measuring the proportion of individuals in the community participating in the stock market, observable community controls, e.g. average community income and education, along with community fixed effects controlling for unobserved community heterogeneity. Given these controls and the sparse evidence indicating stock picking skills among community members, we interpret results as driven by community sharing of information.

¹⁹ A relationship is categorized as equal if the relative income is ranging between 0.9 and 1.1.

²⁰ An approach following Brown et al. (2008) have also been used in the testing of the robustness of our results yielding similar conclusions as in our main analysis.

²¹ An approach using the returns on aggregated community portfolios, in line with Kaustia and Knüpfer (2012), has also been tested to capture community social interaction effects. Results from this analysis gave similar results as those reported within the main analysis of the paper.

One way our study differs to that by Kaustia and Knüpfer (2012), who also study individual investors' entry related to community social influence using an outcome-based approach, is that while they study the number of new participants within communities associated to aggregated community portfolio returns, we perform our study at the individual level modelling the individuals' likelihood for entry, participation, and exit. An advantage with this is that we are able to control for both observable, as well as unobservable heterogeneity between individuals.

2. Data, variable measurement, and empirical methodology

2.1 Data and variable measurement

We use data pertaining to all Swedish residents born in 1963 and 1973, observed between the years 1999 and 2007. Data on individuals' stockholdings are collected both from tax records by Statistics Sweden, as well as from the Nordic Central Securities Depository Group (NCSD).²² The latter maintains an electronic database on the ownership of all Swedish stocks. For each investor, this data set include the ownership records of all stocks owned at the end of December and at the end of June each year, i.e. the data is recorded at 6-month intervals. Ownership is registered at the level of the individual and joint ownership of stocks, for example among couples, is officially not recorded. The high quality of our data is best illustrated by the fact that the NCSD stockholdings data is the (only) official record to prove ownership of the stock of Swedish firms. Data on individuals other wealth (mutual funds, bank holdings, real estate, and investments in debt securities), and taxable income are drawn from the Swedish tax authorities, and are reported on an annual basis from December 1999 to December 2007, while individual characteristics for the same period have been collected from Statistics Sweden.²³ In addition to this, data belonging to individuals' parents, both during the observational period 1999 to 2007, as well as to the individuals' adolescence (age 17-19), along with data for possible partners during 1999 to 2007 has also been collected.

As within-family social interaction effects are being examined, all selected individuals have a partner in the main analysis, and their parents, not necessarily their birth-parents, are observed in the data set.²⁴ Parents are identified as observed adults registered on the same address as the individual between 1980-1982, for individuals' born in 1963, and 1990-1992, for those born in 1973 (when the individual was 17-19 years old). The proportion of individuals with a registered partner, spouse, or cohabitee, increases from 22.9 to 60.6 percent during the observed time period, one potential explanation being the cohorts' relatively young age. Furthermore, a partner is a registered partner with whom the individual live, i.e. including cohabiters. If an individual change

²² As an official securities depository and clearing organization, NCSD (www.ncsd.eu) plays a crucial role in the Nordic financial system. NCSD currently includes VPC and APK, the Swedish and Finnish Central Securities Depositories, to which all actors on the Nordic capital markets are directly or indirectly affiliated. NCSD is responsible for providing services to issuers, intermediaries and investors, as regards the issue and administration of financial instruments as well as clearing and settlement of trades on these markets.

²³ Individual characteristics are collected from the LISA database, Statistics Sweden.

²⁴ The sample with single individuals, i.e. those who lack a partner during the considered period, is analyzed in the robustness testing section at the end of the paper.

marital status to single they are no longer included in the sample, but reenter in a later time period if they later find a partner. In total, the selected sample consists of 366,897 observations, divided on 88,730 individuals, where the older cohort represents 53.89 percent of the observations.

In Table 1 stock market participation, entry and exit rates for our main sample are displayed.

[Table 1 about here.]

The participation rates are fairly stable over the years (around 25%), apart from a slight downturn in 2002 and 2003 coinciding with the burst and aftermath of the dot-com bubble. As a reference, the participation rate in 2002 for the total Swedish population was 22.5% (Statistics Sweden), compared to 24.7% for our sample. Comparing participation over the sample period between our two cohorts, reveal a significantly higher average participation rate among the relatively older individuals (28.9% for those born 1963 compared to 21.2% for those born 1973). In terms of entry, i.e. only counting non-participating individuals becoming participants as a proportion of participating individuals, these rates indicate a slightly falling trend over our sample period. The highest rate is in 2002 (8.8%) and the lowest during 2003 and 2004 (both 2.4%). In terms of exit, i.e. participants becoming non-participants as a proportion of those participating, a reverse pattern is observed with growing exit rates over the sample period. Exit is lowest in 2001 (2.2%), while highest in 2007 (6.5%).

Our main variables of interest, i.e. the measures of parents, partners, and community members stock portfolio outcomes, are retrieved from individuals' actual stock portfolio values. The variables are constructed by taking the difference in percent from one year to another. If parents, partners, or community members are not participating, the values of the outcome variables are set to zero. Thus, individuals with family members owning stocks is thought to be influenced either by a positive or a negative stock market sentiment, while those without participating family members are neither positively nor negatively influenced.²⁵ An important aspect to consider, since we are interested in measuring successful and unsuccessful portfolio outcomes, is that portfolio values may also change due to alterations in the composition of the portfolios. To account for this possibility, we perform our analysis on two separate samples. In the main analysis (denoted Panel 1 in the results section) trading individuals are included, while in the robustness testing of our results, the analysis is repeated on a reduced sample (Panel 2) excluding individuals buying or selling stocks between two observed points in time (individuals who trade are identified using the data from NCSD).

²⁵ Note here that in our regressions we also include a dummy, with the value 1 at time t for those without participating parents and/or partner, to avoid capturing correlations between the parental and partner portfolio outcome variables driven by similarities in preferences, i.e. to avoid capturing correlations driven by the variation in the outcome variables between zero return outcomes (for non-participating parents and/or partner) and non-zero return outcomes (for participating parents and/or partner). Further, in the robustness testing of our results portfolio outcome variables capturing excess return (relative the risk-free rate of return) are also considered.

To measure the impact of community sentiment, we measure the proportions of peers' with positive, respectively, negative portfolio outcomes.²⁶ The use of proportions rather than the average community portfolio returns is motivated since it captures the size of the positive or negative sentiment that an individual faces. Thus, a higher proportion of peers with positive (negative) portfolio outcomes, all else equal, means a higher likelihood that an individual is exposed towards this sentiment. This approach is similar to Kaustia and Knüpfer (2012), in terms of being based on a portfolio outcome based measure, but differs since they use aggregated stock holdings at the zip code level and measure the zip code portfolio returns. Given that community portfolios may be dominated by a smaller number of larger investors, i.e. portfolio outcomes may largely pertain to a restricted number of individuals (restricting the diffusion of the sentiment), we prefer using the proportion based measures.

In Table 2, Panel A (with variable definitions in Appendix A, Table A5) summary statistics for our main parental, partner and community variables are displayed.

[Table 2 about here.]

As seen, the average portfolio outcome over the full sample period is the highest for the partners, followed by that of fathers, then mothers. This is also seen in Figure 1, where the annual averages are displayed.

[Figure 1 about here.]

Notable, the annual variation in mean portfolio returns are the lowest among mothers, followed by that of fathers, then partners. This is indicated both visually in Figure 1, and in terms of standard deviation in Table 2, Panel A. In terms of community proportions with positive and negative portfolio outcomes, the averages over the full sample period indicate higher proportions of positive portfolio outcomes. The distribution of these community proportions are shown in Figure 2.

[Figure 2 about here.]

As indicated from the figure, there seem to be, a priori, a sufficient variation in these community measures to capture possible community social influence.

Alternative mechanisms besides social interaction may affect participation and thus, numerous of control variables are included in the regressions. The richness of our data enables us to add

²⁶ Communities are defined using Swedish municipality codes extracted from individual home addresses. In the main analysis within the paper, community members adhere to those belonging to the same cohort as the individual, as well as all registered partners. This narrows the individuals peer group to mainly individuals belonging to the same generation. Additional categorizations of community peer groups have also been tested based upon similarities in income, wealth, and sector of work. Results did not, however, display any significant differences between specifications. Also worth noting is that communities are of adequate size, likely capturing a majority of individuals social interactions, and of comparable, but smaller size, compared to MSAs (Metropolitan Statistical Areas), often applied in similar studies based on US data (e.g. Brown et al. 2008). The municipality areas also provide well-defined and non-overlapping communities, and contain a sufficient amount of individual observations to give reasonable estimates.

time-variant and time-invariant control variables at the individual level, for example, cohort belonging, disposable income, net wealth, gender, educational attainment, number of children (divided into age groups), and an indicator variable for whether the individual has obtained a higher degree in business administration and/or economics. In Table 2, Panel B, summary statistics for these control variables are reported. As seen, the main sample consist of slightly more females (53%), with about 53% of the individuals belonging to the older cohort, where 66% are married, 51% own mutual funds and 12.4% have an education within economics and/or business administration. The average disposable income is 180,000 Swedish kronor (SEK) (as a comparison, in the total Swedish population it is 231,000 SEK) and the average net wealth is 364,400 SEK (874,157 SEK in the total Swedish population).²⁷ Thus, both the average disposable income and the average net wealth for individuals' in our sample are lower than for the general Swedish population. A likely explanation for these discrepancies is the relatively young age of our sample.

Apart from including controls for individual characteristics, we also include information about the partners' yearly disposable incomes (average over the full sample period is 182,000 SEK) and education level (the average over the full sample is 4.3). To ensure that our portfolio outcome based measures capture effects from contemporaneous social interaction, we control for potential inherited behavior from parents by including average background characteristics for mothers and fathers connected to the individual's adolescence. These parental controls include variables capturing parents' salaries (231,000 SEK for mothers and 453,400 SEK for fathers), as well as financial market participation indicators (0/1) based on whether parents' acquired capital income during individuals' pre-adult years.

A number of community variables are further included in the analysis. Summary statistics of our community control variables are shown in Table 2, Panel C. To ensure that the portfolio outcome based community variables capture effects of social interaction, the proportion of individuals in the community participating in the stock market is included to capture similarities in community values. As seen in Panel C, the average community proportion participating in the stock market (over the full sample period) is 22%. Since the general development of the stock market may affect individuals' behavior through general media, time fixed effects have been added to control for contemporaneous influence. To control for one-year lagged media effects an aggregated average portfolio outcome measure based on the entire sample is included. This average portfolio outcome (over all portfolios for the full sample period) is 4.1%. Also, note here that in addition to this, to avoid capturing spurious correlations between the portfolio outcome variables and the individuals' likelihood to participate driven by reactions to similar information or shocks at time t , all outcome based measures (both family and community) are used with a one

²⁷ Statistics comes from Wealth Statistics and Household economy (HEK) from Statistics Sweden (SCB). The average SEK/US dollar exchange rate during the years 1999 to 2007 is 0.1232 SEK per USD.

year lag.²⁸ Apart from those mentioned, we also include community measures of the average disposable income in the community (192,700 SEK), measures of the proportion with a higher education (29%), as well as variables capturing the work force composition within communities.

2.2 Modeling approach

To model individuals' stock market participation dynamics, we note that at a given point in time, individuals' observed participating can be separated between those that have newly entered and those that have entered in earlier periods. In theory, one could argue that the decisions leading to observed participation at t may be different for these two groups of individuals. For example, individuals' that have never participated in the stock market need to take an active decision to become participants (e.g. acquire knowledge about how to start a brokerage account), while those who already owns stocks (at $t-1$) may be passive (do nothing), and continue to be stock owners. Thus, it is arguably two different processes leading to observed participation at t . Due to this we separately analyze individuals' decision to enter, participate, and to exit.

For the likelihood to participate, i.e. in characterizing differences between participants (both new and continuing) and non-participants, we thus make no distinction between the above two groups, but rather make use of our full sample of individuals. To model individuals' likelihood to enter, we separately analyze the sample of individuals observed becoming participants at each time t , conditionally on previously not owning stocks. Given the relatively small number of individuals entering, a randomly drawn comparison group (of similar size) composed of non-participants is drawn to facilitate analysis.²⁹ For the likelihood to exit a similar approach is followed, where participants observed to exit are compared to a randomly drawn comparison sample of participating individuals.

To capture the effect of social interaction upon an individual's likelihood to participate, a longitudinal logit model with random effects is utilized. The dependent variable takes the value one if an individual, i , participate in the stock market at time t , zero otherwise. The random effects specification is motivated since the within-variance in the dependent variable is not sufficient for a fixed-effects approach and numerous of the control variables are time-invariant, e.g. controls for inherited behavior from parents. Henceforth, stock market participation is analyzed by estimating the following:

$$Participation_{it} = \mathbf{1}(y_{it}^* > 0),$$

where the $\mathbf{1}(\cdot)$ is an indicator function equaling one if the individual's unobserved likelihood to participate, y_{it}^* , takes a value greater than zero. The unobserved likelihood to participate is parameterized as

²⁸ Controlling for the general stock market development is important given that our sample overlaps with the boom and bust of the Dotcom bubble.

²⁹ The analysis has been repeated for a number of different random comparison samples, yielding similar results as those reported within the paper.

$$y_{it}^* = \alpha + \sum \beta_j SPO_{t-2,t-1}^{i,j} + \sum \beta_{ck} CP_{t-2,t-1}^{i,k} + \gamma X_t^i + \omega \Lambda_t^{i,c} + \zeta H^{i,c} + \mu Y_t + c_i + \varepsilon_{it}.$$

The main coefficients of interest are those measuring effects of family and community stock portfolio outcomes β_j and β_{ck} , for $j=mother, father \text{ and } partner$ and $k= positive \text{ and } negative$, where SPO measure parental and partner one-year lagged stock portfolio outcomes and CP the one-year lagged community proportions of positive and negative portfolio outcomes in community c . Individual demographic and economic characteristics, as well as, average background characteristics of the mother and father are found in X_t^i . Time-variant and time-invariant community characteristics are contained in vector $\Lambda_t^{i,c}$ and $H^{i,c}$, and time and community fixed effects in Y_t . The time fixed effects are included to capture potential trends in participation, while community fixed effects control for unobserved community heterogeneity. Random effect is captured by c_i and ε_{it} is the logistically distributed error term. Given that the samples used in analysis of both the likelihood to enter and exit have a repeated cross-sectional structure, i.e. different individuals are observed at each point in time, pooled logit models without individual specific random, but including time and community fixed, effects are utilized for this analysis.

3. Empirical analysis

In this section we report the findings of the empirical analysis. The results are throughout reported in terms of marginal effects (at the mean of the other regressors) for the random effects and the conventional (for entry and exit) logit models, with corresponding standard errors (cluster robust at the household level).³⁰ Results are reported first for individuals' likelihood to participate, then in regard to entry and exit.

3.1 Family social influence on participation

To study the effects from family influence on individuals' participation, we initially estimate a benchmark model excluding family, but including community effects. In Table 3, model 1, the results indicate a positive significant (at the 1% level) impact upon individuals' likelihood to participate for increasing proportions of peers' with positive portfolio outcomes, while for increasing proportions of peers with negative portfolio outcomes, there is no significant effect.³¹

[Table 3 about here.]

These results are consistent with the interpretation that positive portfolio outcomes among peers form a positive community sentiment shared through social interaction, positively affecting individuals' likelihood to participate. In regard to increasing proportions of negative peer portfolio outcomes, results implies that a negative community sentiment either is not formed, i.e.

³⁰ Results are throughout similar for corresponding linear probability models.

³¹ Results for the other individual and community controls, as well as community and time fixed effects are available upon request. A full presentation of results for model 2 in Table 3, i.e. including all control variables, is given in Table A1, in Appendix A, and discussed in a later sub-section. Overall, estimates for these conditioning variables are similar for the other models reported within the paper.

that negative information is not shared, or if formed, that individuals' do not take notion of it in their decision to participate. Given that psychological research on the impact of good versus bad outcomes (e.g. Ito et al., 1998; Baumeister et al. 2001) indicate that individuals, in general, are more affected by negative outcomes, the latter seem less likely. Thus, we interpret this result in line with Kaustia and Knüpfer (2012), who suggest that people communicate selectively, i.e. refrain from discussing bad outcomes. Motivation for this behavior is given by, for example, Han and Hirshleifer, (2013), suggesting a self-enhancing transmission bias favoring the sharing of victories rather than defeats, driven by both rational concern about reputation and psychological bias.

In model 2, results for a corresponding model specification including the lagged parental (separated between mothers and fathers) and partner portfolio outcomes are reported. The results indicate that an individuals' likelihood to participate increases significantly (at the 1% level) with increasing portfolio outcomes among mothers, fathers, as well as partners. In model 3, we scrutinize these results further in a model separating positive and negative lagged portfolio outcomes among parents and partners. Note here that to simplify interpretation we model the absolute value of negative portfolio outcomes. The results indicate that increasing negative portfolio outcomes among mothers, fathers, and partners significantly (at the 1% level) decrease, while positive portfolio outcomes only among fathers significantly (at the 10% level) increase, individuals' likelihood to participate. This indicates that the positive correlations found in model 2 for parents and partners mainly are driven by a decreasing likelihood for participation from increasing negative portfolio outcomes. In terms of size, a 1% increase in negative portfolio returns among mothers, fathers and partners decrease an average individuals likelihood to participate, all else equal, with 1.5%, 1.6%, and 3.5%, respectively.

The results for family social interaction effects imply that mainly negative portfolio outcomes among mothers, fathers, and partners are of importance. This implies that a negative family sentiment towards the stock market is formed, subsequently negatively influencing individuals' likelihood to participate. Given that the results are conditional upon variables included to control for alternative mechanisms, i.e. for similarities in within-family risk preferences and for the underlying general trend in the stock market, and given evidence that parental portfolio returns to a high degree are determined by external factors rather than stock picking skills, we take this as substantial evidence indicating the importance of family social interaction for individuals' stock market participation.

A striking feature of our results is that while community interaction seems restricted to sharing of only positive experiences, family sharing mainly pertains to negative. This result is consistent with the explanation that family functions as a social support group (e.g. Cohen and McKay, 1984; Cohen and Wills, 1985), where parental and partner sharing of negative outcomes works as a way to deal with financial stress (losses). That mainly negative family experiences affect participation is evidence of a loss aversion behavior among individuals (c.f. Kahneman and Tversky, 1984), further in line with psychological evidence that negative events have a greater

impact on individuals' than positive events of the same type (e.g. Ito et al., 1998; Baumeister et al. 2001).

3.2 Family social influence on entry

In the analysis of individuals' likelihood to participate the results pertain to both newly entered, but mainly to already participating individuals (who constitute the main proportion of participants at t in our full sample). Since a main interest in the literature is on non-participating individuals' decision to become participants (or in fact reasons for non-participation), we focus upon their decision to enter. To study entry we consider a sample containing individuals not previously owning stocks entering the market each period ("zeros becoming ones") and a control sample of non-participants ("zeros continuing to be zeros"). Since the number of individuals entering each period is relatively low compared to the control group, a matched sample approach is considered where a corresponding number of non-participants are randomly drawn from the control group. Analysis of this sample then correspond to non-participating individuals decision to enter, excluding already participating individuals' decision to continue to participate. The results from running logistic regressions on this sample are reported in Table 4.

[Table 4 about here.]

The results in Model 1 indicate that increasing portfolio outcomes only among partners significantly (at the 10% level) increase individuals' likelihood to enter. Separating returns between positive and negative portfolio outcomes, in Model 2, do, however, give some more insight. Stock market entry is positively affected by positive lagged portfolio outcomes among mothers, fathers and partners (significant at the 1%, 10%, and 5% level, respectively). Marginal effects from this model indicate that conditional on having a mother, father, and partner with a positive one-year lagged portfolio outcome, a 1% increase in portfolio outcomes increases, all else equal, an average individuals likelihood to participate with 17.4%, 6.2%, and 8.5%, respectively. In contrast, negative one-year lagged portfolio outcomes are only significant in deterring individuals' entry for partners (at the 1% level). Thus, while positive past portfolio outcomes among both parents and partners are positively affecting individuals' entry, only negative portfolio outcomes among partners seem to deter entry. These results are interesting and indicate that positive parental and partner stock market sentiments are important influences on an individual's likelihood to enter. This extends the findings in Li (2014), and imply that parental and partner stock market entry alone (as considered by Li) may not be sufficient in explaining individuals' participation, but it is rather conditioned upon successful parental and partner performance after their entry.

In both models in Table 4, community effects are insignificant for both increasing proportions of peers' with positive, as well as, negative portfolio outcomes. This is an intriguing finding that indicates that community social influence may be of lower importance for individuals' actual stock market entry. This is consistent with the explanation relating to the formation of peer groups,

i.e. that as non-participants individuals are more likely to socialize with other non-participants (c.f. homophily, Lazarsfeld and Merton, 1954), but also consistent with that individuals, as non-participants, may be less attentive towards received stock market information (with nothing at stake). Our results for stock market entry differ from those in Kaustia and Knüpfer (2012), who find significant community effects on individuals' stock market entry for Finnish individual investors. A possible explanation to this difference, apart from our inclusion of family effects, is that, while our study condition the identification of social interaction effects on a large number of individual specific controls - accounting for within community heterogeneity, their study is performed at a more aggregated level using portfolio outcome measures at the zip code level.

3.3 Family social influence on exit

For individuals' decision to exit, no previous evidence, to the authors' knowledge, exists in the current literature in regard to social influence. To study to what extent exit is influenced by social interaction, a sample containing individuals previously owning stocks exiting the stock market each period ("ones becoming zeros") and a control sample of participants continuing to be owners of stocks ("ones continuing to be ones") is considered. Since the number of individuals exiting each period is relatively low compared to the control group, a similar matched sample approach, as for entry, is considered where a corresponding number of participants are randomly drawn from the control group. In Table 5 results from this analysis is presented.

[Table 5 about here.]

The results in Model 1 indicate that increased one-year lagged portfolio returns among fathers and partners, but not mothers, decrease the individuals likelihood to exit (significant at the 1% level). Increasing proportions of peers with positive portfolio outcomes within an individuals' community also significantly (at the 10% level) decrease the likelihood to exit, while there are no significant effects for community proportions of negative portfolios. Increasing own one-year lagged portfolio returns do not influence individuals' likelihood to exit. In Model 2 portfolio outcome variables are split between positive and negative portfolio outcomes. Results from this model indicate that increasing positive outcomes only among mothers lowers the individuals' subsequent likelihood to exit (significant at the 10% level), while increasing negative portfolio outcomes among mothers, fathers, and partners increase the subsequent likelihood to exit (significant at the 5%, 1%, and 1% levels, respectively). In terms of community effects, these indicate weak evidence (significant at the 10% level) on that a positive sentiment lowers, while a negative sentiment increases the likelihood to exit.

These results do to a large extent confirm the earlier findings on participation, in that family effects mainly are confined to sharing of negative portfolio experiences. This is consistent with our earlier explanations, viewing family as functioning as a social support group and by that negative outcomes have a greater impact on individuals than positive outcomes of the same type (e.g. Ito et al., 1998; Baumeister et al. 2001). Our results for community effects collaborates the

story building on that individuals exhibit homophily. That is, once individuals participate, community sharing of information is more likely to occur since as a stock owner individuals are more prone to socialize with other stock owners.

3.4 Evidence on partner social influence

The results for the effect of partner social influence imply a central role for the partner in an individual's decision to enter, participate and to exit. The correlation between partner stock portfolio outcomes and individuals' likelihood to participate is, however, challenging to interpret from a social interaction or information sharing perspective since other within-household mechanisms may equally well generate this outcome. To test for evidence of social interaction and information driven partner effects, an extended study (as outlined in Section 1) on a subsample of non-participating singles becoming partners is performed.

In each period non-participating singles that are observed as partners in the following period are chosen. We then study the effect of meeting a partner with (or without) previous stock ownership on the singles likelihood to participate in the following period. An indicator of the relative strength of household members bargaining power, classifying households as equal or not equal, is constructed based on the partners' disposable incomes. An interaction of this indicator with a dummy indicating the partner's participation status will then split the possible partner effect between households that are likely to have a common financial decision maker (unequal bargaining power) and those likely to have more individual or equal responsibility for financial decisions. The results from the analysis of the non-participating singles decision to participate in light of meeting a partner are presented in Table 6.

[Table 6 about here.]

The results indicate that the likelihood to participate, for a non-participating single meeting a partner in the following period, on average, increases significantly (at the one percent level) if meeting a partner already participating in the stock market. This result holds both for households with equal and unequal bargaining power. This is interesting because it tentatively indicates that both social interaction (information sharing), as well as a common household member with a high bargaining power are part in explaining individuals' observed participation in stock markets. The social interaction effect is further found to be relatively larger for households that are relatively more equal in terms of bargaining power. These results are taken as tentative evidence of that the previously found positive correlation between individuals' likelihood for participation and partners' participation (portfolio outcome) is, at least, partly driven by sharing of information and experiences.

3.5 Alternative mechanisms and control variables

Central for our interpretation of family and community effects as capturing the influence of contemporary social interaction, is the conditioning on other covariates. In Table A1, in Appendix

A, we therefore give a full presentation of the results for model specification 2 in Table 3. For the variables included to capture similarities in family risk preferences, i.e. the dummies for parents and partners not owning stocks during the previous year and the parental variables measured during the individuals' adolescents (salaries and capital incomes), most are significant with expected signs.

For the parental and partner (previous-year) non-participation dummies, the results indicate that individuals with mothers, fathers, and partners not participating the previous year have a significantly lower likelihood for participation (all significant at the 1% level). Individuals growing up with a father with a higher salary and with a mother and father receiving capital income (proxies for capital market participation) during the individuals' adolescent have a significantly (at the 1% level) higher likelihood to participate. These results are reassuring and tentatively indicate that inherited risk preferences are of key importance for individuals' participation.

For our control included to capture similarities in community values, i.e. the lagged proportion of stock market participants within an individual's community, the estimate implies a positive significant effect (at the 1% level). This tentatively indicates that the levels of social capital within communities are important for individuals' decision to participate.

To control for the influence of the general stock market sentiment, the mean lagged portfolio outcome aggregated over all portfolios and communities are included. The estimate for this variable indicates a positive significant (at the 5% level) impact, i.e. an individual's likelihood to participate increase with an improving (more positive) sentiment.

In terms of the other controls, we note that most of these have expected signs. Consistent with theory and previous empirical findings, higher disposable income and net wealth are found to increase an individual's likelihood to participate. For our broad measures of financial literacy and awareness, i.e. dummies for whether individuals have a university education within business administration/economics (dummy = 1) and own mutual funds (dummy = 1), the results indicate an expected positive significant effect on participation. The gender dummy indicates that females participate to a significant lower degree, as do individuals with children older than 7 years. Education (regardless of subject), likely correlated with cognitive ability, has an expected significant positive effect upon participation.

Summarized, variables included to capture key competing mechanisms, potentially offering alternative explanations for our captured family and community social interaction effects, are all significant and of expected signs. This gives credibility to our interpretation of effects as capturing influence of social interaction. Given that most of the other explanatory variables have signs in line with expectations, we conclude that the economic validity of the model seem to be good.

3.6 Robustness of results

To test the robustness of our results a number of issues have been addressed. First, the main analyses have been repeated on the restricted sample (Panel 2), i.e. on the sample excluding

individuals changing their composition of their holdings between observational points in time. The results from these regressions, reported in Appendix A, Table A2, indicate similar results as those reported earlier in the paper with regard to both family and community effects, i.e. negative lagged portfolio outcomes among fathers, mothers and partners decrease, while increasing proportions of positive portfolio outcomes in the community increase, individuals likelihood to participate. This is reassuring and indicates that our results do not seem to be driven by including individuals changing their composition of their portfolios.

Second, in the main analysis in the paper single-person households are excluded to focus upon partner social interaction effects. A potential problem with this selection is that results may not pertain and generalize to all types of households. To verify our results, models based on the sample consisting of single-person households (i.e. excluding the partner effect) have therefore also been estimated.³² The results corresponding to Model 2 reported in Table 3 are shown in Appendix A, Table A3. The results confirm the parental effects, i.e. increasing one-year lagged portfolio outcomes among mothers and fathers both positively affect individuals subsequent likelihood to participate (significant at the 1% level), also on the single-person household sample. Community effects do not, neither the proportion of positive nor negative lagged portfolio outcomes, affect individuals participation. Given our main interest in family social influence, we take this as a verification indicating that parental and partner results also generalize to single-person households.

Third, a central assumption in relation to the identification of family and community social interaction effects concern our view that parental, partner, and peer stock portfolio outcomes to a large extent are exogenous determined, i.e. our assumption that parents, partners and peers lack systematic stock picking skills. Evidence against this assumption is the finding that individuals with higher cognitive ability (higher “IQ”), on average, obtain higher risk adjusted returns, suffer a lower disposition effect, exhibit superior market timing and stock picking skills, see Grinblatt et al. (2011) and Grinblatt et al. (2012). Although, it is unlikely that the average individual share stock portfolio experiences within family on a casual basis in risk adjusted terms³³, one can potentially argue that results on social interaction effects possibly are driven by an omitted control for cognitive ability. For example, a high cognitive ability among parents and the individual imply that parents are, on average, more likely to obtain more positive portfolio outcomes and children, on average, are more likely to participate.³⁴ In this case a positive correlation between parental portfolio outcomes and individuals subsequent participation is driven by a positive correlation between cognitive abilities rather than within-family social interaction. That cognitive abilities are highly correlated between fathers, mothers, and their children is supported by results in Black et al. (2009), Björklund et al. (2010), and Anger (2012). Similar arguments can be made in regard

³² The stock market participation rate is 18.4 percent for the sample of individuals with no partner.

³³ Grinblatt et al. (2011) conclude that high-IQ individuals mainly earn higher risk-adjusted return than low-IQ individuals from superior diversification skills.

³⁴ That cognitive ability (“IQ”) is an important determinant of stock market participation is found by e.g. Grinblatt et al. (2011) and Gyllenram et al. (2014).

to partner matching based upon individuals' cognitive ability and in regard to endogenous formation of communities.

To test to what extent our results are affected by an omitted control for cognitive ability, we have for a sub-sample conditioned our analysis on a proxy for cognitive ability. For the cohort born in 1973, we have available data for individuals' grade point average (GPA) from the ninth year of compulsory education. This GPA measure have been found to be highly correlated with test measures of cognitive ability obtained from enlistment tests to Swedish military service, see e.g. Hanes and Norlin (2011). In Table A4, Appendix A, results for a model specification including GPA as a proxy for cognitive ability are reported. The results indicate that an increase in one-year lagged portfolio outcomes among fathers, mother, and partners, all else equal, increase the individuals' likelihood to participate (all significant at the 1% level). Neither increasing proportions of peers with positive nor negative portfolio outcomes are found to affect individuals' participation. Participation is further found, in line with earlier studies, e.g. Grinblatt et al. (2011) and Gyllenram et al. (2014), to be positively affected by increasing cognitive ability. Thus, these results confirm those presented within the paper in regard to family effects and indicate that the positive correlation found between family portfolio outcomes and individuals' subsequent participation also hold when controlling for individuals' cognitive ability. This then support our interpretation of effects as driven by social interaction.

Fourth, in our main analysis portfolio outcome variables represent positive (negative) family and community sentiments if raw portfolio returns are positive (negative). Given that positive and negative sentiments for investing in stocks most likely are derived in relation to other investment opportunities, we have re-run regressions using instead excess returns (in relation to risk-free alternatives). Reassuring, unreported results are very similar (in terms of size, signs and significance) to those reported within the paper.

Fifth, given that our results for individuals' entry and community effects differs from that reported in Kaustia and Knüpfer (2012), we further scrutinize to what extent this is driven by a different use of portfolio outcomes among peers. In our main analysis, we find no effects of community social interaction upon individuals' entry, while Kaustia and Knüpfer (2012) find effects of sharing of positive community portfolio outcomes. In order to facilitate comparison we have re-estimated our models for individuals' entry also using an aggregated community portfolio outcome variable. Results from this analysis confirm our results within our paper.³⁵ Thus, the difference in results does not seem to be attributed to a different measurement of peer stock portfolio outcomes.

Overall, for community effects our extensions give some mixed indications. Thus, some caution is warranted in interpreting these community results. The robustness extensions of our main analysis, do however, indicate that results pertaining to family (parental and partner) social interaction effects seem to be robust and hold also for single-person households, for alternative

³⁵ Results are available upon request.

specifications of stock portfolio outcome variables (using instead excess return) and controlling for individuals' cognitive abilities.

4. Conclusions

In this paper we study the influence of family social interaction upon individuals' decision to own stocks in a setting including community social interaction. The results are remarkable and contribute with new important insights about the role of social interaction for individuals' entry, participation, and exit from the stock market. In particular, evidence in regard to both family and peer influence indicates important differences.

The main finding indicates that family (parents and partners) social interaction is of central importance for individuals' decision to invest in stocks. Interestingly, by separately analyzing the influence on entry, participation, and exit, we find evidence indicate that entry mainly is affected by positive family experiences, while participation and exit mainly by negative. This is an intriguing finding indicating both a family sharing of positive and negative experiences (considering all stages), as well as an asymmetry in how family social interaction affects individuals' financial behavior. That both positive and negative family outcomes are shared may be understood by viewing the family (including the individual) as constituting its members closest social support group. Sharing of negative experiences may then be viewed as a way to deal with the psychological distress connected to losing money (c.f. the buffering hypothesis, e.g. Cohen and McKay, 1984; Cohen and Wills, 1985), while sharing of positive experience may seem natural since "success is nothing without someone you love to share it with".

As non-participants individuals' are mainly affected by positive family experiences (encouraging entry), but not negative. In contrast, as stock owners negative family experiences have a dominating influence (discouraging individuals' participation, encouraging exit). This may be taken as tentative evidence upon that information is valued differently depending upon whether individuals have something at stake. An individual may pay less attention and be less affected by shared negative experiences as a non-participant, since they lack own experiences of owning stocks and have nothing to lose. Contrary, as stock owners they may start to worry about their own positions hearing about family portfolio losses. That negative family experiences dominate positive, for participating individuals, is generally supported by psychological research (e.g. Ito et al., 1998; Baumeister et al. 2001) and indicative of a loss aversion behavior.

Studying family effects in models accounting for community influence highlights potentially important differences. While family sharing of information has an impact upon entry, community influence does not. This is an interesting finding potentially explained by the formation process of peer groups (c.f. homophily). As a non-participant, individuals are more likely to socialize with other non-participants, or if socializing with participants, are less likely to be engaged in stock market related discussions. Both these arguments favor our finding of no community effects on non-participating individuals' decision to enter. Conditional on participating, individuals are more likely to include participants in their peer group, as well as to be more engaged and interested in

stock market related conversation (c.f. discussion about differences in individuals' attention towards stock related information as owners' contra as non-owners above). Thus, once participating, it is more likely that peers influence the individuals' subsequent stock market behavior.

Another notable difference between family and community influence is that positive community experiences mainly are of concern for individuals' subsequent behavior. This indicate either that communication is selective among peers, i.e. restricted to positive experiences, or that negative experiences are shared, but do not have a significant effect. Given the vast literature in psychology suggesting, in general, that a bad outcome have a relatively larger impact on individuals than a corresponding good outcome of the same type (e.g. Ito et al., 1998; Baumeister et al. 2001), this indicates that in an environment with both positive and negative shared information, a dominating effect from negative information upon individuals' behavior is, in general, expected. Since this is not found, we favor the selective communication interpretation, c.f. Kaustia and Knüpfer (2012), that can be understood as a self-enhancing transmission bias possibly driven by reputational concern and by self-enhancing psychological processes (see Han and Hirshleifer, 2013).

In terms of identification of social interaction effects, the results have been obtained conditioning upon a large number of control variables to exclude alternative mechanisms generating the results. Variables controlling for similarities in both family preferences and community values and for the influence from the general development on the stock market, along with a rich set of both individual and community specific variables, motivate the interpretation of correlations between family and community members stock portfolio outcomes and individuals subsequent behavior as driven by social interaction.

Although the result has proven robust towards a number of additional challenges, some caution is, however, warranted. While our measures for family members are based on rather precise and detailed data, the definition of peers is rather broad. Future studies comparing the relative importance of family and peer influence with sharper measures for peer groups are therefore of interest to challenge the robustness of the findings within the paper.

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TABLES

Table 1: Stock market participation, entry and exit rates

The table display participation, entry and exit rates based on our main sample (Panel 1). The total number of individuals in the sample is 88,730 and the number of individual-year observations 366,897. 53.89 percent of the observations belong to the cohort born in 1963, and 46.11 percent belong to the cohort born in 1973. Entry and exit rates pertain to the proportion of individuals' entering and exiting the stock market as a proportion of participating individuals during 2000-2007. The total number of individuals for this sample is 27,319 and the number of individual-year observations 109,804.

Year	Stock market participation ^a	Stock market entry	Stock market exit
<i>2001</i>	25.6%	5.1%	2.2%
<i>2002</i>	24.7%	8.8%	2.4%
<i>2003</i>	23.1%	2.4%	3.4%
<i>2004</i>	25.4%	2.4%	3.7%
<i>2005</i>	24.5%	2.6%	6.1%
<i>2006</i>	26.1%	4.7%	4.4%
<i>2007</i>	25.7%	3.0%	6.5%
<i>Overall</i>	25.2%	4.0%	4.4%
<i>Cohort: 1963</i>	28.9 %	3.6%	4.1%
<i>Cohort: 1973</i>	21.2 %	4.6%	4.9%

Table 2: Descriptive statistics

Panel A reports summary statistics for our main stock portfolio outcome variables, i.e. annual outcomes for mothers, fathers and partners, as well as community proportions of positive and negative portfolio outcomes, as averages over the full sample period, 2000-2007. Panel B display summary statistics for individual, parental and partner, while Panel C, community based control variables. Disposable income, net wealth, mother and father salaries, partner disposable income, and community average disposable income, are all measured in hundreds of SEK.

Variable	Mean	SD	Min	Max
Panel A:				
<i>Mother, portfolio outcome</i>	0.016	0.153	-1	1.484
<i>Father, portfolio outcome</i>	0.031	0.230	-1	2.837
<i>Partner, portfolio outcome</i>	0.060	0.381	-1	5.398
<i>Community proportion of positive portfolio change</i>	0.114	0.062	0	0.214
<i>Community proportion of negative portfolio change</i>	0.065	0.043	0	0.173
Panel B:				
<i>Disposable income*</i>	1800	1887	0	1086052
<i>Gender</i>	0.526	0.500	0	1
<i>Born 1973</i>	0.473	0.499	0	1
<i>Educational attainment</i>	4.154	1.311	1	7
<i>Education within economics and/or business</i>	0.124	0.330	0	1
<i>Children, age 0-3</i>	0.515	0.664	0	4
<i>Children, age 4-6</i>	0.351	0.541	0	4
<i>Children, age 7-10</i>	0.410	0.615	0	4
<i>Children, age 11 or older</i>	0.603	0.869	0	6
<i>Mutual funds</i>	0.512	0.500	0	1
<i>Net Wealth*</i>	3644	15986	-306221	2801000
<i>Negative net wealth</i>	0.309	0.462	0	1
<i>Married</i>	0.665	0.472	0	1
<i>Equal relationship</i>	0.208	0.406	0	1
<i>Mother, salary*</i>	2310	3030	0	35963
<i>Father, salary*</i>	4534	4535	0	11940
<i>Mother, indicator for capital income</i>	0.431	0.495	0	1
<i>Father, indicator for capital income</i>	0.286	0.452	0	1
<i>Partner, disposable income*</i>	1820	0.883	0	1076762
<i>Partner, educational attainment</i>	4.339	1.332	1	7
<i>Mother, not participating in the stock market</i>	0.866	0.340	0	1
<i>Father, not participating in the stock market</i>	0.797	0.402	0	1
<i>Partner, not participating in the stock market</i>	0.742	0.438	0	1
Panel C:				
<i>Community proportion participating in the stock market</i>	0.223	0.194	0.091	0.478
<i>Lagged mean portfolio outcome</i>	0.041	0.032	-0.020	0.096
<i>Community proportion trading</i>	0.113	0.044	0.012	0.436
<i>Community average disposable income*</i>	1927	1.171	1282	5966
<i>Community average high educational level</i>	0.293	0.081	0.089	0.554
<i>Community proportion working in sector 1</i>	0.020	0.021	0	0.210
<i>Community proportion working in sector 2</i>	0.098	0.059	0	0.404
<i>Community proportion working in sector 3</i>	0.056	0.041	0	0.320
<i>Community proportion working in sector 4</i>	0.061	0.019	0.013	0.166
<i>Community proportion working in sector 5</i>	0.125	0.026	0.031	0.243
<i>Community proportion working in sector 6</i>	0.067	0.023	0.007	0.198
<i>Community proportion working in sector 7</i>	0.138	0.050	0.023	0.295
<i>Community proportion working in sector 8</i>	0.220	0.032	0.125	0.362
<i>Community proportion working in sector 9</i>	0.038	0.011	0.006	0.155

Table 3: Stock market participation

The table report marginal effects for our main variables of interest based on the random effects logit models. Model (1) report effects corresponding to a specification excluding family, i.e. parental and partner, effects. Model (2) report marginal effects for a model including both family and community variables, while model (3) marginal effects separating positive and negative parental and partner portfolio outcomes. Negative portfolio outcomes are reported in absolute terms. In Appendix A, Table A-1, marginal effects for a full model specification in regard to model 2 are reported as a reference. The dependent variable in all regressions is a binary indicator variable of stock market participation (participation=1; non-participation=0). Cluster robust standard errors at household level are reported in parentheses. Significance levels: *** $p < 0.01$ ** $p < 0.05$ * $p < 0.10$.

	(1) Excluding family effects	(2) Family and community effects	(3) Separating positive and negative portfolio outcomes
Variable	Marginal Effect	Marginal Effect	Marginal Effect
<i>Mother, lagged portfolio outcome</i>	-	0.008*** (0.002)	-
<i>Mother, positive lagged portfolio outcome</i>	-	-	0.001 (0.003)
<i>Mother, negative lagged portfolio outcome (absolute value)</i>	-	-	-0.015*** (0.004)
<i>Father, lagged portfolio outcome</i>	-	0.006*** (0.001)	-
<i>Father, positive lagged portfolio outcome</i>	-	-	0.004* (0.002)
<i>Father, negative lagged portfolio outcome (absolute value)</i>	-	-	-0.016*** (0.003)
<i>Partner, lagged portfolio outcome</i>	-	0.012*** (0.001)	-
<i>Partner, positive lagged portfolio outcome</i>	-	-	0.001 (0.001)
<i>Partner, negative lagged portfolio outcome (absolute value)</i>	-	-	-0.035*** (0.002)
<i>Community proportion of positive portfolio outcomes</i>	0.082*** (0.023)	0.053** (0.027)	0.058** (0.027)
<i>Community proportion of negative portfolio outcomes</i>	-0.040 (0.030)	0.014 (0.036)	0.022 (0.036)
<i>Individual controls</i>	Y	Y	Y
<i>Partner and parental controls</i>	Y	Y	Y
<i>Community fixed effects</i>	Y	Y	Y
<i>Community controls</i>	Y	Y	Y
<i>Time fixed effects</i>	Y	Y	Y
<i>Memo</i>	N= 366,897; n= 88,730; Pseudo R ² =0.519	N= 366,897; n= 88,730; Pseudo R ² = 0.506	N= 366,897; n= 88,730; Pseudo R ² =0.506

Table 4: Stock market entry

In the table marginal effects for logit models concerning individuals' likelihood to enter the stock market are presented. The models are estimated on a sample containing individuals not previously owning stocks entering the stock market each period ("zeros becoming ones") and a control sample of non-participants ("zeros continuing to be zeros"). The dependent variable is a binary indicator for stock market entry (entry=1; non-participation=0). Negative portfolio outcomes are reported in absolute terms. Cluster robust standard errors at household level in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

	(1) Family and community effects	(2) Separating positive and negative portfolio outcomes
Variable	Marginal Effect	Marginal Effect
<i>Mother, lagged portfolio outcome</i>	0.055 (0.039)	-
<i>Mother, <u>positive</u> lagged portfolio outcome</i>	-	0.174*** (0.066)
<i>Mother, <u>negative</u> lagged portfolio outcome</i>	-	0.064 (0.075)
<i>Father, lagged portfolio outcome</i>	0.005 (0.026)	-
<i>Father, <u>positive</u> lagged portfolio outcome</i>	-	0.062* (0.030)
<i>Father, <u>negative</u> lagged portfolio outcome</i>	-	0.083 (0.056)
<i>Partner, lagged portfolio outcome</i>	0.037* (0.023)	-
<i>Partner, <u>positive</u> lagged portfolio outcome</i>	-	0.085** (0.036)
<i>Partner, <u>negative</u> lagged portfolio outcome</i>	-	-0.208 *** (0.044)
<i>Community proportion of <u>positive</u> portfolio outcomes</i>	0.890 (0.630)	0.903 (0.632)
<i>Community proportion of <u>negative</u> portfolio outcomes</i>	-0.328 (0.803)	-0.413 (0.804)
<i>Individual controls</i>	Y	Y
<i>Partner and parental controls</i>	Y	Y
<i>Community fixed effects</i>	Y	Y
<i>Community controls</i>	Y	Y
<i>Time fixed effects</i>	Y	Y
<i>Memo</i>	N= 8,917; n= 8,453; Pseudo R ² =0.128	N= 8,917; n= 8,453; Pseudo R ² =0.130

Table 5: Stock market exit

In the table marginal effects for logit models concerning individuals' likelihood to exit the stock market is presented. The models are estimated on a sample containing individuals exiting the stock market each period ("ones becoming zeros") and a control sample of participants ("ones continuing to be ones"). In Model 1 both family and community effects are included, while in Model 2 with outcome variable separated between positive and negative portfolio outcomes. Negative portfolio outcomes are reported in absolute terms. In both models the individuals' one-year lagged own portfolio outcome is included. The dependent variable is a binary indicator for stock market exit (exit=1; participation=0) Cluster robust standard errors at household level in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

Variable	(1) Family and community effects Marginal Effect	(2) Separating positive and negative portfolio outcomes Marginal Effect
<i>Individual, lagged portfolio outcome</i>	0.002 (0.001)	-
<i>Individual, <u>positive</u> lagged portfolio outcome</i>	-	0.002 (0.001)
<i>Individual, <u>negative</u> lagged portfolio outcome</i>	-	0.074 (0.050)
<i>Mother, lagged portfolio outcome</i>	-0.001 (0.028)	-
<i>Mother, <u>positive</u> lagged portfolio outcome</i>	-	-0.084* (0.047)
<i>Mother, <u>negative</u> lagged portfolio outcome</i>	-	0.106** (0.054)
<i>Father, lagged portfolio outcome</i>	-0.075*** (0.021)	-
<i>Father, <u>positive</u> lagged portfolio outcome</i>	-	-0.028 (0.029)
<i>Father, <u>negative</u> lagged portfolio outcome</i>	-	0.159*** (0.044)
<i>Partner, lagged portfolio outcome</i>	-0.050*** (0.015)	-
<i>Partner, <u>positive</u> lagged portfolio outcome</i>	-	0.021 (0.020)
<i>Partner, <u>negative</u> lagged portfolio outcome</i>	-	0.190*** (0.033)
<i>Community proportion of <u>positive</u> portfolio outcomes</i>	-0.863* (0.501)	-0.879* (0.500)
<i>Community proportion of <u>negative</u> portfolio outcomes</i>	1.106 (0.691)	1.242* (0.690)
<i>Individual controls</i>	Y	Y
<i>Partner and parental controls</i>	Y	Y
<i>Community fixed effects</i>	Y	Y
<i>Community controls</i>	Y	Y
<i>Time fixed effects</i>	Y	Y
<i>Memo</i>	N= 12,837; n= 11,090; Pseudo R ² =0.100	N= 12,837; n= 11,090; Pseudo R ² =0.101

Table 6: Stock market participation by non-participating singles meeting a partner

The table report marginal effects for individuals' likelihood to participate on a sample of non-participating singles meeting a partner in the subsequent period. Thus, the effect of meeting a partner with (or without) previous stock ownership on the singles likelihood for participation in the following period is studied. An indicator of the relative strength of household members bargaining power, classifying households as equal or not equal, is constructed based on the partners' disposable incomes. The interaction of this indicator with a dummy indicating the partner's participation status will then split the possible partner effect between households that are likely to have a common financial decision maker (unequal bargaining power) and those likely to have more individual or equal responsibility for financial decisions. Cluster robust standard errors at household level in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

Variable	Marginal Effect
<i>Partner participate in stock market</i>	0.006*** (0.001)
<i>Equal relationship* Partner participate in stock market</i>	0.010*** (0.002)
<i>Individual controls</i>	Y
<i>Partner and parental controls</i>	Y
<i>Community fixed effects</i>	Y
<i>Community controls</i>	Y
<i>Time fixed effects</i>	Y
<i>Memo</i>	N= 61,850; n= 59,028; Pseudo R ² =0.023

FIGURES

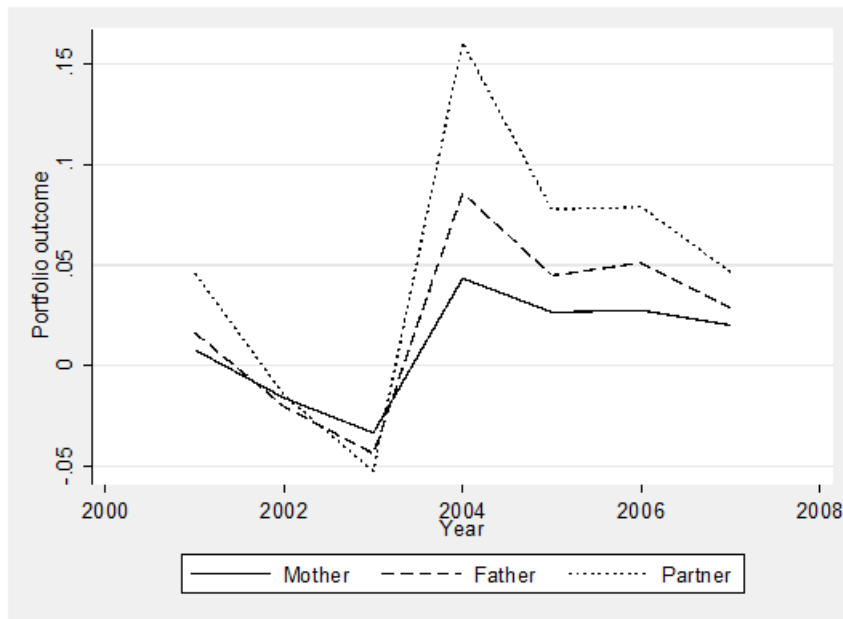


Figure 1. Average portfolio outcomes over family members. Figure 1 plots the annual average stock portfolio returns (outcomes) for mothers, fathers and partners, respectively. The returns are the percentage change in stock portfolio value from one year to another based on individual level data obtained from Swedish tax records.

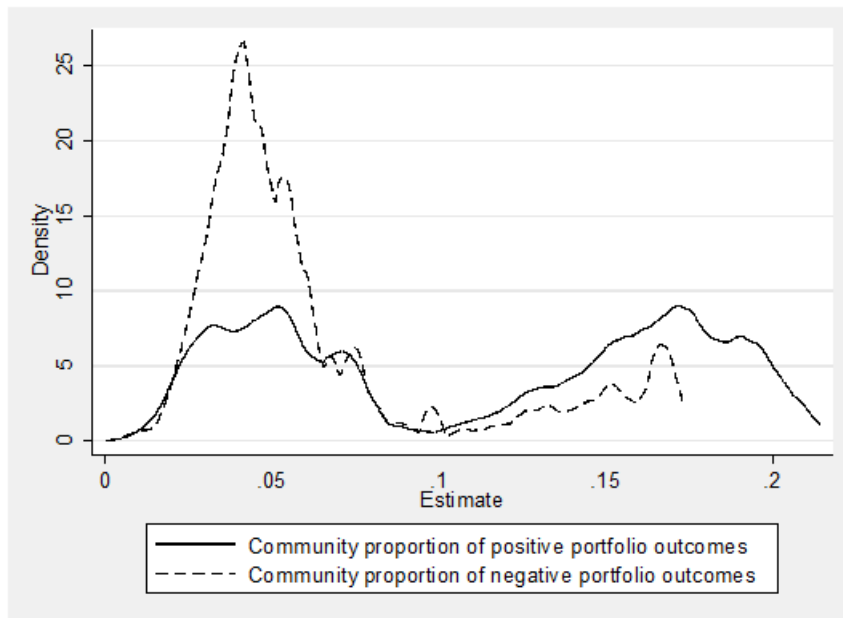


Figure 2. Distributions of community proportions of portfolio outcomes. Figure 2 plots the distributions (over all communities and years 2000-2007) of the proportions of peers' within an individuals' community with positive, respectively, negative, stock portfolio returns.

APPENDIX A

Table A1: Stock market participation (Panel 1)

The table report marginal effects for the full random effects logit specification. Results pertain to Model 2 reported in Table 3 within the paper. The dependent variable is a binary indicator variable of stock market participation. Cluster robust standard errors at household level in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

Variable	Marginal Effect	Standard error
<i>Mother, lagged portfolio outcome</i>	0.008***	0.002
<i>Father, lagged portfolio outcome</i>	0.006***	0.001
<i>Partner, lagged portfolio outcome</i>	0.012***	0.001
<i>Mother, not participating in the stock market</i>	-0.055***	0.003
<i>Father, not participating in the stock market</i>	-0.034***	0.002
<i>Partner, not participating in the stock market</i>	-0.050***	0.002
<i>Community proportion of positive portfolio outcomes</i>	0.053**	0.027
<i>Community proportion of negative portfolio outcomes</i>	0.014	0.036
<i>Mother, average salary</i>	-0.00001	0.00003
<i>Father, average salary</i>	0.0003***	0.00003
<i>Mother, capital income</i>	0.025***	0.002
<i>Father, capital income</i>	0.031***	0.002
<i>Partner, income</i>	-0.001***	0.0004
<i>Partner, educational attainment</i>	0.008***	0.001
<i>Log net wealth</i>	0.036***	0.001
<i>Negative net wealth</i>	0.007***	0.001
<i>Born 1973</i>	-0.068***	0.005
<i>Log disposable income</i>	0.008***	0.001
<i>Female</i>	-0.107***	0.004
<i>Educational attainment</i>	0.023***	0.001
<i>Education within business administration/economics</i>	0.035***	0.002
<i>Children, age 0-3</i>	-0.002**	0.001
<i>Children, age 4-6</i>	-0.003***	0.001
<i>Children, age 7-10</i>	-0.005***	0.001
<i>Children, age 11 or older</i>	-0.006***	0.001
<i>Married</i>	-0.004***	0.001
<i>Mutual funds</i>	0.040***	0.002
<i>Log community average disposable income</i>	-0.019*	0.010
<i>Community proportion with high educational level</i>	-0.102**	0.045
<i>Lagged mean portfolio outcome</i>	0.014**	0.005
<i>Lagged log community proportion of stock market participants</i>	0.071***	0.009
<i>Community proportion working in sector 1</i>	-0.066	0.094
<i>Community proportion working in sector 2</i>	-0.140**	0.065
<i>Community proportion working in sector 3</i>	-0.225***	0.056
<i>Community proportion working in sector 4</i>	-0.131	0.081
<i>Community proportion working in sector 5</i>	-0.115*	0.066
<i>Community proportion working in sector 6</i>	-0.006	0.080
<i>Community proportion working in sector 7</i>	-0.184***	0.060
<i>Community proportion working in sector 8</i>	-0.123*	0.064
<i>Community proportion working in sector 9</i>	-0.178*	0.095
<i>Community and time fixed effects</i>	Y	
<i>Memo</i>	N= 366,897; n= 88,730; Pseudo R ² =0.522	

Table A2: Stock market participation (Panel 2)

The table report marginal effects for our main variables of interest based on the random effects logit models using the restricted sample (Panel 2), i.e. the sample excluding individuals changing their portfolio composition between observational points in time. Model (1) report marginal effects for a model including both family and community variables, while model (2) marginal effects separating positive and negative parental and partner portfolio outcomes. Negative portfolio outcomes are reported in absolute terms. The dependent variable in all regressions is a binary indicator variable of stock market participation (participation=1; non-participation=0). Cluster robust standard errors at household level are reported in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

Variable	(1) Family and community effects Marginal Effect	(2) Separating positive and negative portfolio outcomes Marginal Effect
<i>Mother, lagged portfolio outcome</i>	0.011 (0.010)	-
<i>Mother, positive lagged portfolio outcome</i>	-	0.052 (0.041)
<i>Mother, negative lagged portfolio outcome</i>	-	-0.034** (0.017)
<i>Father, lagged portfolio outcome</i>	0.013*** (0.004)	
<i>Father, positive lagged portfolio outcome</i>	-	0.013* (0.007)
<i>Father, negative lagged portfolio outcome</i>	-	-0.015*** (0.003)
<i>Partner, lagged portfolio outcome</i>	0.016*** (0.004)	
<i>Partner, positive lagged portfolio outcome</i>	-	0.007 (0.010)
<i>Partner, negative lagged portfolio outcome</i>	-	-0.025*** (0.009)
<i>Community proportion of positive portfolio outcomes</i>	0.037* (0.021)	0.039* (0.022)
<i>Community proportion of negative portfolio outcomes</i>	-0.002 (0.029)	-0.0003 (0.031)
<i>Individual controls</i>	Y	Y
<i>Partner and parental controls</i>	Y	Y
<i>Community fixed effects</i>	Y	Y
<i>Community controls</i>	Y	Y
<i>Time fixed effects</i>	Y	Y
<i>Memo</i>	N= 226,702; n= 70,274; Pseudo R ² = 0.500	N= 226,702; n= 70,274; Pseudo R ² = 0.500

Table A3: Stock market participation for single-person households

The table report marginal effects for our main variables of interest for the random effects logit model based on the sample consisting of single-person households. The model specification corresponds to Model 2 reported in Table 3. Results for other model specifications are available upon request. The dependent variable in the regression is a binary indicator variable of stock market participation (participation=1; non-participation=0). Cluster robust standard errors at household level are reported in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

Variable	Marginal Effect
<i>Mother, lagged portfolio outcome</i>	0.009*** (0.002)
<i>Father, lagged portfolio outcome</i>	0.007*** (0.002)
<i>Community proportion of positive portfolio outcomes</i>	0.039 (0.038)
<i>Community proportion of negative portfolio outcomes</i>	0.013 (0.046)
<i>Individual controls</i>	Y
<i>Partner and parental controls</i>	Y
<i>Community fixed effects</i>	Y
<i>Community controls</i>	Y
<i>Time fixed effects</i>	Y
<i>Memo</i>	N=303,705; n= 80,366; Pseudo R ² =0.467

Table A4: Stock market participation controlling for cognitive ability

The table report marginal effects for our main variables of interest for the random effects logit model based on the sub-sample of individuals born in 1973. The model specification corresponds to Model 2, reported in Table 3, extended with individuals GPA (only available for the cohort born in 1973) as a proxy for individuals' cognitive ability. Results for other model specifications including individuals average GPA are available upon request. The dependent variable in the regression is a binary indicator variable of stock market participation (participation=1; non-participation=0). Cluster robust standard errors at household level are reported in parentheses. Significance levels: ***p<0.01 **p<0.05 *p<0.10.

Variable	Marginal Effect
<i>Cognitive ability (average GPA)</i>	0.036*** (0.002)
<i>Mother, lagged portfolio outcome</i>	0.007*** (0.002)
<i>Father, lagged portfolio outcome</i>	0.005*** (0.001)
<i>Partner, lagged portfolio outcome</i>	0.012*** (0.001)
<i>Community proportion of positive portfolio outcomes</i>	0.050 (0.040)
<i>Community proportion of negative portfolio outcomes</i>	0.037 (0.015)
<i>Individual controls</i>	Y
<i>Partner and parental controls</i>	Y
<i>Community fixed effects</i>	Y
<i>Community controls</i>	Y
<i>Time fixed effects</i>	Y
<i>Memo</i>	N= 165,936; n= 43,869; Pseudo R ² =0.476

Table A5: Variable definitions

The table gives the definitions for the main variables used within the analysis.

Variable	Variable definition
Dependent	
<i>Stock market participation</i>	1=participate in stock market, 0=otherwise
Controls	
<i>Disposable income</i>	Yearly disposable income, hundreds of SEK
<i>Gender</i>	Gender, 1= female, 0= male
<i>Born 1973</i>	1= born 1973, 0= born 1963
<i>Educational attainment</i>	Educational attainment (level 1-7)
<i>Education within business administration/economics</i>	1= Education within economics or business administration (upper secondary and/or higher education)
<i>Children, age 0-3</i>	Nr of children, age 0-3
<i>Children, age 4-6</i>	Nr of children, age 4-6
<i>Children, age 7-10</i>	Nr of children, age 7-10
<i>Children, age 11 or older</i>	Nr of children, age 11 or older
<i>Mutual funds</i>	1= participate in mutual fund market, 0= otherwise
<i>Net wealth</i>	Net wealth, hundreds of SEK
<i>Married</i>	1= if married, 0= otherwise
<i>Equal relationship</i>	Indicator variable for equal partners, i.e. relative income is between 0.9-1.1. 1= if equal partners, 0= otherwise.
<i>Partner, income</i>	Partners' yearly disposable income, hundreds of SEK
<i>Partner, educational attainment</i>	Partners' educational attainment (level 1-7)
<i>Mother, salary</i>	Mother, average yearly salary during individuals' adolescence, hundreds of SEK
<i>Father, salary</i>	Father, average yearly salary during individuals' adolescence, hundreds of SEK
<i>Mother, capital income</i>	Mother, 1= received capital income during individuals' adolescence, 0= otherwise
<i>Father, capital income</i>	Father, 1= received capital income during individuals' adolescence, 0= otherwise
<i>Mother, lagged portfolio outcome</i>	Stock portfolio outcome of mother between time period t-2 and t-1, raw ratio
<i>Father, lagged portfolio outcome</i>	Stock portfolio outcome of father between time period t-2 and t-1, raw ratio
<i>Partner, lagged portfolio outcome</i>	Stock portfolio outcome of partner between time period t-2 and t-1, raw ratio
<i>Mother, not participating in stock market</i>	1= not participating in the stock market, 0=participating in the stock market
<i>Father, not participating in stock market</i>	1= not participating in the stock market, 0=participating in the stock market
<i>Partner, not participating in stock market</i>	1= not participating in the stock market, 0=participating in the stock market
<i>Community proportion of positive portfolio outcome</i>	Community, log share of community inhabitants with a positive stock portfolio change between t-2 and t-1
<i>Community proportion of negative portfolio outcome</i>	Community, log share of community inhabitants with a negative stock portfolio change between t-2 and t-1
<i>Community average disposable income</i>	Community, average disposable income, hundreds of SEK
<i>Community proportion with high educational level</i>	Community, share of highly educated individuals, raw ratio
<i>Lagged community proportion participating in the stock market</i>	Community, share of community inhabitants that participate in the stock market
<i>Community proportion working in sector 1</i>	Community, proportion working within sector 1 (farming, hunting)
<i>Community proportion working in sector 2</i>	Community, proportion working within sector 2 (forestry and service to forestry)
<i>Community proportion working in sector 3</i>	Community, proportion working within sector 3 (manufacturing of electric and optics products)
<i>Community proportion working in sector 4</i>	Community, proportion working within sector 4 (electricity, gas, heating and water supply)
<i>Community proportion working in sector 5</i>	Community, proportion working within sector 5 (wholesale trade and retail, repair of vehicles, and other personal equipment)
<i>Community proportion working in sector 6</i>	Community, proportion working within sector 6 (transportation, storage and communication)
<i>Community proportion working in sector 7</i>	Community, proportion working within sector 7 (real estate and renting, business service)
<i>Community proportion working in sector 8</i>	Community, proportion working within sector 8 (education)
<i>Community proportion working in sector 9</i>	Community, proportion working within sector 9 (societal and personal service)
<i>Community proportion with low trust</i>	Community, proportion of individuals which are experiencing low trust in their surrounding community
<i>Lagged mean portfolio outcome</i>	Aggregated average portfolio outcome based on the whole sample