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Peer Effects in Financial Decisions: Evidence from Dutch Administrative Data

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Peer Effects in Financial Decisions:
Evidence from Dutch Administrative Data *

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Abstract

We study whether, to what extent, and how a couple's decision to invest into risky assets the first time is affected by their social environment, in particular by their (adult) siblings and their coworkers. We provide causal evidence of peer effects in financial decisions, making use of Dutch administrative data and an IV strategy with partially overlapping peer groups. We find that positive asset market experiences of siblings, as well as of coworkers, generate positive spillover effects in terms of first-time investments in risky assets. These effects are primarily driven by the siblings and coworkers of the male partner in the couple ("receiver" of the signal). However, coworker spillovers are also relevant for full-time employed women. In terms of "sender" of the signal, only male coworkers lead to spillovers, for the couple overall and for female and male partner separately, consistent with men being more likely to talk about their financial successes. Heterogeneity analyses show that peer spillovers are particularly important for highly (financially) educated and more privileged couples, consistent with them having the financial means as well as the (financial) knowledge to be able to evaluate and respond to the signal of positive asset market experiences of peers.

JEL Codes: G11, G53, G51, Z13
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1 Introduction

Financial investment decisions, including the decision to invest in risky assets, are major decisions of a household with long-lasting consequences for the household's (financial) well-being. Despite evidence on the benefits of diversification across different investment types and the historically good performance of the stock market, participation in the risky asset market remains low in many countries (see, e.g., Guiso et al., 2003).[1] For instance, in Europe in 2010, only around 25% of 45-50-year-olds owned assets (ranging from less than 10% in Austria and Italy to just under 40% in Sweden, while the Netherlands, the country studied here in this paper, was close to the European average (see, e.g., Thomas and Spataro, 2018)).

Low participation in the stock and bond market can have severe and enduring consequences for both individuals' financial well-being as well as for society as a whole. From an individual's perspective, non-participation may lead to slower wealth accumulation, fewer opportunities for consumption smoothing, and poorer retirement readiness. Moreover, non-participation can also have important implications for society as a whole, leading to lower aggregate investments and exacerbating inequality, because non-participation and financial mistakes are particularly pronounced among low-income households (e.g. Campbell, 2006; Guiso and Sodini, 2013).

Financial investment decisions, particularly the decisions to invest in risky assets, are challenging due to the complexity of financial instruments and the level of uncertainty involved. The first-entry decision into the risky asset market is particularly critical, due to strong state dependence in asset market participation, which has been shown to stem from high entry costs related, in particular, to informational barriers (Alan, 2006). This raises the question of how and from whom individuals obtain financial information and advice or whether they possibly mimic the behavior of others in their decision to invest in risky assets or not. Descriptive survey evidence suggests that a significant fraction of individuals rely on their peers for financial advice (Lieber and Skimmyhorn, 2018; Von Gaudecker, 2015), consistent with trust playing an important role in financial decisions (Gennaioli et al., 2014). These findings point to a potentially very important role for close and trusted peers, such as family members and coworkers, in the decision to invest in risky assets.

This paper provides causal evidence on family and coworker peer effects in financial investment decisions. We study whether and to what extent a couple's decision to invest in risky assets for the first time (i.e., entry decision) is affected by the financial investments of their (adult) siblings and coworkers. In particular, we explore the effect of siblings' and coworkers' positive experiences in the risky asset market (defined as increases in the value of their risky assets) on a couple's first-time entry decision. We analyze the effect of the couple's joint network as well as of the separate peer

[1] The phenomenon that stock market participation is low despite a substantial risk premium and gains related to diversification is often referred to as the stock market participation or non-participation puzzle (see Guiso and Sodini, 2013, for an overview).

networks of the female and male partner in the couple. Thereby we shed light on whether there are gender differences in the role of the "receiver" of the information.[2] In a second step, we also split the peer groups by gender, to investigate the importance of gender differences by "sender" of the signal. Evidence from the experimental literature suggests that men and women may differ in their likelihood to talk about their financial experiences and, in particular, to boast about their financial successes. Thirdly, we investigate the relevance of gender interaction effects in terms of the receiver and sender of the information on asset market experiences. Lastly, we analyze which couples, based on their educational degrees, financial skills,and on whether the female partner works full-time, are influenced by their siblings or coworkers.

Identifying peer effects is challenging because correlations in peer outcomes can stem from various sources, including the endogenous effect via peer outcomes, the exogenous effect via peer characteristics, and the correlated effect via unobserved shocks affecting peers simultaneously (see, e.g., Manski, 1993). The literature has proposed different strategies to overcome this problem by, e.g., using randomized peer groups (see, e.g. Sacerdote, 2001) or partially overlapping peer groups (see, e.g. Bramoullé et al., 2009; De Giorgi et al., 2020). In this paper, we follow the latter approach using high-quality administrative data from the Netherlands. The data maintained by Statistics Netherlands (CBS) contains detailed demographic and geographic information on the entire Dutch population (including information on whether and at which firm individuals work), thus allowing for the construction of sibling, coworker, and neighborhood peer networks. Specifically, assuming that couples interact with their own neighbors regarding financial investments, but not with the neighbors of their siblings, we exploit the information from these two distinct peer groups in an IV strategy, in which we use as an instrument for siblings' financial outcomes the average outcomes of siblings' neighbors. Similarly, to investigate the effect of coworkers on couples' financial decisions, we instrument coworkers' financial outcomes with the average outcomes of the coworkers' neighbors. Moreover, the administrative data contains detailed information on the history of households' financial wealth based on tax records, including a split between safe assets (bank and savings accounts) and risky assets (shares, bonds, etc.). These data allow us to construct our outcome variable of interest, namely a couple's first-time participation in the risky asset market.

Our results feature five key findings. First, peer effects are important for the decision of households to enter the risky asset market, in that positive experiences of a couple's peers increase the probability of asset market entry. In particular, if the siblings of either spouse/partner in the couple (joint peer network) experience an increase in their risky asset value, the couple is 2.7 percentage points more likely to enter the asset market. This is a sizable effect since it translates to an increase of 23% in the likelihood of ever entering the asset market.

[2]The terminology of "sender" and "receiver" of information has been used previously in other spillover contexts (see, Bosquet et al., 2022).

Second, turning to the peer group of coworkers, we find that the positive experiences of coworkers increase the entry probability on average by 0.5 percentage points. Including both types of peers simultaneously, the effects are nearly identical in magnitude and significance. The effect size of coworker peer effects is substantially smaller than in the case of siblings, consistent with trust and having a close relationship mattering for the relevance of peers in financial investment decisions.[3]

Third, we examine the role of separate peer networks of the male and female partner in the couple to shed light on whether the gender of the "receiver" of information matters. We find that the effects are mainly driven by the peers of the male partner in a couple. Allowing siblings of the female and male partner to have a distinct influence, we find that one additional sibling of the male partner having a positive experience increases the probability of ever entering the asset market by 38%. Also in the case of coworkers, the spillover effect is mainly driven by the peers of the male partner.

Fourth, we split the peer network by gender to shed light on who is more likely to share information about their financial experiences (the "sender"). While spillover effects of sisters and brothers are similar, in the case of coworkers only the experiences of male coworkers are relevant. This is consistent with men being more likely to share ('boast' about) financial successes in the workplace. In fact, when allowing for gender interactions between sender and receiver by splitting the peer group by gender and distinguishing between the network of the male and female partner, we find that again there only the experiences of male coworkers matter, but for both the male and female partner in the couple. In terms of female partner, this effect is driven by women working full-time consistent with them having more time to interact or having a closer relationship with their coworkers in this case. Allowing for gender interactions for siblings, effects are similar for all four combinations (i.e. from sister/brother to male/female partner). This may mean that siblings' likelihood to talk about their financial experiences is independent of their own and their sibling's gender. Alternatively, this may be due to the fact, that not only siblings interact, but also in-laws, i.e. the effects of brothers on the female partner may be due to the woman actually sharing information with her sister-in-law and the effects of sisters on the male partner be due to the man discussing about financial decisions and outcomes with his brother-in-law. Thus, in the case of siblings, there is likely to be more noise in terms of who is actually interacting with whom in terms of gender compared to the situation of coworkers.

Lastly, to shed some light on the potential mechanisms through which peer effects in financial

[3]Of course, in the case of siblings, (regular) interaction (including talking about financial decisions and experiences) is likely (or at least not unlikely, as supported by our results). Instead, the (larger) group of coworkers certainly contains close as well as distant peers, i.e. there may be little interaction between some of them (in particular in terms of sharing experiences in the stock market), even though we aim to capture those coworkers with whom interaction is more likely by giving more weight to coworkers with similar wages (compare De Giorgi et al., 2020).

investments may arise, we present evidence from heterogeneity analyses based on the socioeconomic background of the couple. In particular, we are interested in determining which types of couples are influenced. Our findings suggest that only couples from a higher socioeconomic background and couples who are more (financially) educated are influenced by their peers' experiences in the risky asset market, possibly because they have the financial means (income and wealth) and the (financial) knowledge to evaluate and respond to the signal of positive asset market experiences of peers (see, e.g., Black et al., 2018).

Our paper adds to the following strands of literature. First, our paper is related to the relatively limited literature on peer effects in financial decisions more generally. Evidence from field and natural experiments suggests that peers matter for retirement savings decisions (see, e.g., Beshears et al., 2015; Duflo and Saez, 2003), consumption decisions (see, e.g., Agarwal et al., 2021), insurance take-up (Cai et al., 2015), and charitable giving or public goods provision (see, e.g., Lieber and Skimmyhorn, 2018; Shang and Croson, 2009). In terms of asset purchases, the literature is even more limited (notable exceptions are Bursztyn et al. (2014); Haliassos et al. (2019)). While these papers provide valuable insights into the existence and underlying mechanisms of peer effects in various types of financial decisions, the evidence stemming from experimental settings might not fully reflect the complexity of naturally occurring peer interactions. Few papers investigate financial peer effects in a non-experimental setup. A notable exception is De Giorgi et al. (2020), who provide causal evidence that couples' consumption decisions are influenced by peers by exploiting partially overlapping coworker networks of couples. Building on the same identification strategy, we use naturally occurring peer groups of siblings, coworkers, and neighbors and use administrative data on the entire Dutch population to provide causal evidence on peer effects in financial investment decisions.

Second, the paper relates directly to the growing literature on peer effects in stock market participation. The majority of existing work finds a positive correlation between individuals' and their peers' financial investment outcomes. Among professionals, correlations among same-stock purchases prevail (Hong et al., 2005). Using Norwegian data, Hvide and Östberg (2015) provide evidence of a positive correlation in terms of coworkers' same-stock purchases. The authors show that the quality of stock purchases does not improve and, in some cases, even leads to the propagation of financial mistakes. Similarly, correlations between households' and their neighbors' investments are found in the US population (see, e.g., Ivković and Weisbenner, 2007). While all these findings point towards the importance of peers in financial investment decisions, they are mainly correlational and not fully conclusive in terms of causal influences. A notable exception is Brown et al. (2008), who identify the causal effects of neighbors' stock market participation on individual participation. Conceptually similar to a partially overlapping peer groups strategy as employed in this paper, the authors exploit that some neighbors still reside in their birth community, while others moved away,

to construct instruments for current local peers. They find that a 10 percentage point increase in the average ownership in one's community increases individual participation by 4 percentage points. These findings support our instrument choice, which exploits that siblings' and coworkers' financial decisions are influenced by their immediate neighbors.

We aim to contribute to the very limited literature on peer effects in asset purchases, by analyzing the relevance of two less-explored peer groups, which are characterized by frequent interactions and (at least in the case of siblings) the existence of trust due to family ties. [4] In particular, we focus on the naturally occurring peer groups of (adult) siblings and coworkers, while using neighbors as instruments. Since stock market purchases are not directly observable, we believe that analyzing peer effects among smaller social groups, who interact more frequently and are characterized by a higher level of trust and (likely) more open discussions about financial investments, can provide new insights. Moreover, we focus on the entry decision into the asset market, since the decision to enter the stock market for the first time is likely to be most strongly related to obtaining information from trusted peers. The strong state dependence in asset market participation further underlines the importance of studying the role of peers in the decision to enter the risky asset market for the first time.

The rest of this paper is structured as follows. In the following section, we describe the institutional background. Section 3 discusses the construction of our sample based on Dutch administrative data and presents the empirical strategy. In Section 4, we present the main results of our empirical analysis. Section 5 discusses potential future pathways and concludes.

2 Institutional Background

According to Guiso et al. (2003), direct stock market participation in Europe was not far from that observed in the US in 1998. On average, 14.7% of households invested in stocks, compared to 19% in the US. In the UK, 27% of the households participated directly in the stock market, a proportion that exceeds the US number. In the Netherlands, the country studied in this paper, 14% of households invest in stocks directly, a number close to the European average.[5] Total participation, direct and indirect, rose in the 1990s in all European countries and the US. In the Netherlands, direct participation increased from 11.5% to 15.4% between 1995 and 1998 (and total

[4] Patacchini and Rainone (2017) underline the importance of the peer group definition and the level of trust that comes with it by differentiating between strong and weak ties. They consider smaller-sized peer groups of friends and find only evidence of spillovers in financial activity (an Index based on e.g., having a credit card, savings account, shares, or a student loan) among long-lasting relationships.

[5] However, there is a clear difference between the US and Europe in terms of overall stock ownership. As of 1998, almost half of US households participate in the stock market either directly or indirectly. This proportion is considerably lower in European countries, where around 25% of households participate in the stock market either directly or indirectly.

participation went up from 29% to 35% over the same period). In all European countries as well as in the US, participation is higher in the group with a college education, particularly in Italy and the Netherlands, where the college-educated have direct participation rates of more than 20% compared to less than 10% among those without college degrees. Participation increases with investor resources, measured by income or wealth. At low levels of resources, very few investors hold stock directly, while the fraction increases rapidly and at an increasing rate with income or wealth. The age-participation relation is hump-shaped in all countries, i.e. participation increases for middle-aged households.

According to Flash Eurobarometer 525 (2023), the Netherlands is one of the top performers in terms of financial knowledge. In particular, around 43% of Dutch respondents have a high score in financial knowledge (measured by 4 to 5 correct answers on 5 financial knowledge questions) compared to 32% of German respondents and 25% of French respondents. Despite this, distinguishing between safe assets (bank and savings accounts) and risky assets (shares, funds, bonds), we observe that only 15 to 20% of the population held risky assets over the last ten years.[6] One explanation for low participation in the Netherlands could be that the wealth of a Dutch household is mainly composed of real estate followed by financial assets. In particular, Figure A.1 shows how between 2009 and 2021, around 60% of people's wealth was composed of real estate, 20% of financial assets, and 20% of other assets (e.g., enterprise capital, substantial interest, other).

3 Data and Empirical Strategy

3.1 Data

For the empirical analysis, we use Dutch administrative data maintained by Statistics Netherlands (Centraal Bureau voor de Statistiek, CBS) covering the entire Dutch population. The register includes individual and family characteristics (including household structure, education, and sector of employment) and geographic information, which allow us to construct family, coworker, and neighborhood networks, as well as detailed information on household wealth. Based on information from the Dutch tax authorities, which complement data from tax records with information from financial institutions, annual data on household wealth (including information on different types of assets and debts) are available starting in the year 2006. We use this information to construct our main outcome variable: first-time participation in the risky asset market.

Sample Construction The wealth data is available at the household level from 2006 to 2021. Since it is reported on January 1 of a certain year referring to the preceding year, we assign the

[6] Authors' own calculations based on the "Wealth of households" component on StatLine of Statistics Netherlands.

wealth information to the previous calendar year, i.e., the wealth data from –for example– January 1, 2006, refers to the year 2005. Thus, we have information on households' wealth between 2005 and 2020. However, to account for the potentially disrupting effect of the financial crisis, we only consider the sample period 2009–2020 for our analysis.[7]

Our sample consists of an annual rolling panel of couples who cohabit or are married for at least two years, who are first observed when they are both between 20 and 30 and where at least one of the partners has a sibling.[8] Analogously, we construct a coworker sample in which we consider couples (married or cohabiting for at least two years) who are first observed when they are both between 20 and 30 and where at least one partner has a coworker.

In both, the sibling and coworker samples, we only consider couples where one of the partners is assigned as the head of household in the wealth records. This ensures that the wealth data can be unambiguously attributed to the couple and no other party within the same household. Also, since our main outcome of interest is first-time investments into risky assets, we limit the analytical sample to couples we first observe while both partners are aged 20-30 and follow these couples over our entire observation period for as long as the relationship holds. In the raw data, the average age of entry is 29 years, which is consistent with findings in the literature (see, e.g., Fagereng et al., 2017, for participation rates over the life-cycle). Since we exclude all couples, who already purchased assets before 2009, and thus already made their entry decisions, from our analysis, the age restriction ensures that we capture a couple's first participation in the asset market instead of a re-entry decision.

Outcome Variable Based on information from the Dutch tax authorities, we observe annual household wealth and construct a measure of couples' investment decisions.[9] The CBS data contain detailed information on households' assets allowing us to distinguish between safe assets (bank and savings accounts) and risky assets (shares, bonds, etc.). The main outcome of interest indicates whether, in a given year, a couple invests in risky assets for the first time, which we also refer to as first-time risky asset market participation (or the entry decision). Using the total value of a household's risky assets, we construct an indicator variable that equals one if a couple reports a positive value in risky assets and zero otherwise. Our outcome variable of interest takes the value of one when the couple reports a positive value in risky assets for the first time and zero otherwise.

[7] In robustness checks, we vary the period we consider and show that our findings remain robust.

[8] Since the wealth information is at the household level, movements into and out of marriage/ partnerships substantially complicate the analysis. We therefore focus here on couples in (relatively) stable relationships. Also, we exclude same-sex couples to consider differential effects for the siblings of the male and female partners.

[9] Since information on assets (and income) comes from third-party reports (e.g. from tax records, employers, banks, etc.), this minimizes measurement error.

Peer Networks Using the municipal register data (Gemeentelijke Basis Administratie, GBA), we can identify household structures and link demographic and geographic information of both partners to identify family, coworker, and neighborhood peers. In particular, we define siblings of both partners based on having the same mother. Importantly, for the construction of sibling outcomes and characteristics, we use all siblings irrespective of age and marital status. However, we only consider siblings that make independent financial decisions, i.e., the sibling herself or their cohabiting/married partner must be assigned as the head of household in the wealth records. The purpose is to exclude, e.g., siblings living with their parents or in shared flats (with, e.g., friends, other students, etc.) for whom the household's wealth information cannot be unambiguously attributed to the sibling's decision. For identification purposes, we exclude siblings living in the same neighborhood as the main couple from the construction of sibling variables (see Section 3.5 for a discussion). To identify coworkers we follow both partners' employment histories and consider individuals working for the same employer as coworkers. As described in more detail below, we weigh coworkers by their likelihood of contact to avoid too large networks including distant peers. In line with sibling peer groups, for identification purposes, we exclude coworkers who live in the same neighborhood.

Siblings This paper aims to explore the influence of asset market experiences of a couple's siblings on the decision of the couple to invest in risky assets for the first time. In particular, using the information on the history of investments, we construct a measure of siblings' positive experiences in their asset investments (increase in asset value). To this end, we consider all siblings who invested in risky assets in the previous year and construct a variable that measures the average number of positive experiences siblings experienced since the last period. An increase in the asset value could stem from a combination of gains on past investments and additional investments into risky assets. In either case, an increase in the total asset value is a positive signal of the peer expecting a positive development in the asset market.

Coworkers In addition to sibling spillovers we are interested in whether coworkers, who have been shown to influence various economic decisions (see, e.g., Dahl et al., 2014, for coworker spillovers in paternity leave takeup; Brown and Laschever, 2012, for evidence on spillovers in retirement decisions among coworkers), influence a couple's decision to enter the stock market. Exploiting detailed data on work histories, we consider relevant coworkers for whom we have financial information. Individuals who are employed by the same employer are defined as coworkers. In the data, employers are identified by their tax identification number, which may in some instances include coworkers from different geographic locations. To only consider coworkers in the same local area, we restrict our definition to individuals employed by the same employer within a local labor

market region.[10] Following De Giorgi et al. (2020), we weigh coworkers according to relevance, i.e. likelihood of contact. We group all employees in a given year into six wage groups according to the wage in their sector of employment. Coworkers within the same wage group receive the highest weight, and with increasing distance, the coworkers' weight decreases. The intuition behind this is that those in the same wage group within the same firm are more likely to do comparable tasks and work together.

Neighborhoods Neighbors are defined at the neighborhood level (*"buurt"*)[11], the lowest regional level available to us. The Netherlands is divided into twelve provinces, which are further subdivided into around 350 municipalities (*"gemeenten"*). Municipalities consist of different districts (*"wijk"*), each of which is an aggregation of one or more neighborhoods (*"buurt"*). While this subdivision into neighborhoods may change over time, we use the classification from the year 2019 to define time-invariant neighborhood areas. In our sample, each couple has on average around 947 $(1,064)$ neighbors in the sibling (coworker) sample.

3.2 Summary Statistics

Given our sample restrictions, we end up with a sample of $29,352$ $(66,690)$ couples who have not entered the asset market yet and where at least one of the partners has at least one sibling (coworker) with non-missing information. To allow for differential effects of siblings (coworkers) of the male and female partner, we further restrict the sample to couples who have not entered the asset market yet and where both partners have at least one sibling (coworker) with non-missing information which gives us $21,701$ $(45,559)$ couples in our main sample.

In our empirical analysis, we utilize the main sample of $21,701$ $(45,559)$ couples to study the effect of (i) both partner's siblings (coworker) as a joint peer network and (ii) separate peer networks of the male and female partner's siblings (coworkers). Table 1 reports the summary statistics of the main sample of couples where separate peer networks are considered.

Of the $21,701$ $(45,559)$ couples in the main sample, 84% (78%) are married and have, on average, two children living in the household. The average wealth of households, i.e., the balance of assets and liabilities, is $87,760$ EUR $(44,806$ EUR). The average age of the wife/ female partner over the analysis period is 35 years and of the husband/ male partner 36 years.[12] Around 9 to 11% of male and female partners have a university degree. Defining financial education by the field of study of the highest degree obtained, around 8% of female and 11% of male partners are financially

[10] This is a regional level between municipalities and provinces. For more details on labor market regions, see here.

[11] For more detail on the neighborhood classification by the CBS, see here.

[12] Recall, that while we impose the restriction that couples are aged 20 – 30 when we first observe them, we follow these couples over the years such that our sample also includes them when they are older.

educated. In the main sample, 11.8% (12.7%) of couples enter the risky asset market for the first time during our observation period (see Table 3).

Table 2 summarizes the peer group compositions of the main couple's neighbors, siblings, and coworkers, and Table 3 displays summary statistics of the financial decisions of the main couple, their siblings, and their coworkers. More than 50% of siblings are married. They are on average 38 years old, and have, on average, 1.8 children. Around 16% of siblings hold risky assets, and around 10% of siblings experience a positive change in their risky asset value.Among the coworkers of the main sample, around 65% are married, are on average 47 years old, and have 1 child. Around 22% of coworkers own risky assets and over the observation period on average 13% have a positive experience.

3.3 Empirical Strategy

We model the decision of a household to first enter the risky asset market using an additively separable linear-in-means fixed-effects model that relates the stock market entry decision to a set of household characteristics, average peer characteristics, peer group experiences, as well as household and time fixed effects. Using the samples described in the previous section, we consider (i) a joint peer network of the household, i.e., we average over the peers of both partners and (ii) separate peer networks for the male and female partners' peers (siblings or coworkers), i.e., we allow peer effects to differ between the peers of the male and female partner in a couple.

We model the entry decision in first-differences to control for time-invariant individual and couple-level unobservables. Doing so relates the entry decision of a couple to whether their peers experienced a positive change in asset value in the previous year.

$$Entry_{it} = \beta_1 \Delta X_{it} + \beta_2 \Delta \overline{Experience}^{S}_{-it} + \beta_3 \Delta \bar{X}^{S}_{-it} + \beta_4 \Delta \overline{Experience}^{N}_{-it} + \beta_5 \Delta \bar{X}^{N}_{-it} + \delta_t + \Delta u_{it} \quad (1)$$

where the outcome variable $Entry_{it}$ indicates whether household i entered the asset market in period t (i.e., i having a positive value of risky asset holdings for the first time in t), $\overline{Experience}^{S}_{-it}$ denotes the average number of times siblings had a positive experience in the asset market up until time t and captures the endogenous peer effects (i.e., the number of times the asset value increased, excluding the entry decision) so that $\Delta \overline{Experience}^{S}_{-it}$ captures additional positive experiences between $t-1$ and t, and $\overline{Experience}^{N}_{-it}$ measures the average number of times that couple i's neighborhood-peers had a positive experience in the asset market up until time t (excluding household i). We control for household characteristics, X_{it}, such as a couple's marriage/cohabitation status, the number of children in the household, household wealth, age (in categories), and the couple's employment status, separately for the male and female partner. Similarly, $\bar{X}^{S}_{-it}$ (i.e., the exogenous peer effect)

and $\bar{X}^N_{-it}$ refer to average sibling and neighborhood characteristics, respectively.[13] Moreover, δ_t denotes year fixed-effects to control for different changes in the entry probability over time, and u_{it} is an error term that can contain unobserved time-varying heterogeneity.

As mentioned above, we estimate two different specifications of the model using (i) the sample that considers the joint peer groups of both partners, as well as (ii) separate peer groups (and effects) for the male and female partners' siblings. In the first specification, the relevant sibling variables are defined as $\overline{Experience}^S_{-it} = \frac{1}{N^S_{it}} \sum_{j \in S_{it}} Experience^S_{jt}$ and $\bar{X}^S_{-it} = \left(\frac{1}{N^S_{it}} \sum_{j \in S_{it}} X^S_{jt} \right)$, where the set S_{it} contains the indices of all relevant siblings of couple i in period t and N^S_{it} denotes the cardinality of this set. Analogously, in the second specification, the sibling variables are defined separately for the male and the female partner.

The main parameter of interest is β_2 in Equation (1) measuring a direct effect of siblings' positive experiences, i.e., an increase in the total value of risky assets (endogenous peer effect) on a couple's decision to invest into stocks and bonds for the first time. So we are interested in whether a positive signal sent by siblings (via an increase in risky assets) influences a couple's decision to purchase risky assets for the first time.

Estimating causal peer effects using Equation (1) is not possible due to potential reflection and endogeneity issues. To address these challenges, we follow the literature and exploit the strategy of partially overlapping peer groups (see, e.g., Bramoullé et al., 2009; De Giorgi et al., 2020, 2010; and see, e.g., Nicoletti et al., 2018 for a recent application). This is an instrumental variable strategy exploiting multiple peer networks of an individual. In particular, assuming that a couple may talk about their financial decisions with their siblings and neighbors but not with their siblings' neighbors, we instrument the positive experiences of siblings in the asset market ($\Delta\overline{Experience}^S_{-it}$) with the average positive experience of the siblings' neighbors.

In the first stage, we find, consistent with the literature (see, e.g., Brown et al., 2008), that siblings' asset market experience is influenced by their geographical peers' experiences. The first stage is given by

$$\Delta\overline{Experience}^S_{-it} = \alpha_1 \Delta X_{it} + \alpha_2 \Delta \bar{X}^S_{-it} + \alpha_3 \Delta\overline{Experience}^{N^S}_{-it-1} + \alpha_4 \Delta \bar{X}^N_{-it} + \delta_t + \Delta u_{it} \qquad (2)$$

where $\Delta\overline{Experience}^S_{-it}$ measures the average positive experience siblings had between $t-1$ and t; the instrument $\Delta\overline{Experience}^{N^S}_{-it-1}$ measures the average positive experience of siblings' neighborhood-peers from $t-1$ to t (excluding household i's siblings); X_{it}, $\bar{X}^S_{it}$, $\bar{X}^N_{it}$ δ_t, and u_{it} are

[13] The sibling controls, $\bar{X}^S_{-it}$, contain averages of the same variables used for the household, with the only difference that the average age of the siblings is used instead of categories. We also include dummies for the male and female partners having a sibling, as well as their interaction. The neighborhood controls, $\bar{X}^N_{-it}$, include average wealth in the neighborhood, the (lagged) fraction of neighbors with assets and a very high value of assets, the (lagged) fraction of neighbors with a mortgage, and the marriage rate in the neighborhood.

defined as in Equation (1). In all regressions, standard errors are clustered on the household level.

In our main regressions, we use a conservative approach and consider all observations of the couples, i.e., we leave in couples after they entered the stock market. However, our results are robust to excluding couples after the entry occurred, if anything our estimates get stronger (see A.5).

3.4 Assumptions and Identification

It is well established in the literature that identifying peer effects is challenging due to selection and reflection issues. There is a need to isolate the direct influence of peers' outcomes on the individual. According to the seminal paper by Manski (1993), it is difficult to distinguish between the three potential ways peers can influence each other. In our context, correlations in siblings' financial investment decisions could be due to a direct influence (endogenous effect), i.e., a couple i purchases risky assets because their sibling experienced a change in the value of their risky assets. Second, there could be an influence via sibling characteristics (exogenous effect), e.g., having a sibling with a financial education could lead a couple i to purchase assets. Third, there could be unobserved shocks affecting both the couple and their siblings simultaneously (correlated effects). We are interested in the endogenous peer effect, i.e., whether the decision of a sibling influences a couple directly. To overcome the reflection problem between the main household and their siblings, we use an IV strategy exploiting partially overlapping peer groups.

This approach is a common way of solving the endogeneity problem in the context of peer effects as shown, among others, by Bramoullé et al. (2009), De Giorgi et al. (2010), Blume et al. (2015). Identification is reached using a network structure with intransitive triads, i.e., exploiting peers of peers. Under the assumption that each couple interacts with its siblings and neighbors, but not with the neighbors of its siblings, we use financial decisions and characteristics of siblings' neighbors as instruments for siblings' financial experiences. The instrument exploits that an individual is more likely to purchase (risky) assets with more neighbors experiencing positive returns (see Kaustia and Knüpfer, 2012, who show that high peer returns (on neighborhood or zip-code level) are associated with an increased likelihood of stock market entry).[14] For each regression, we report under-identification and weak identification statistics (see Kleibergen and Paap, 2006, for details) testing the relevance of instruments (via the matrix rank) and – given relevance – testing for weak instruments, respectively.

[14] For further neighborhood effects on financial decisions, see, e.g., Brown et al. (2008), who show that stock market participation increases with the participation in the local community.

3.5 Threats

There are four potential threats to the identification strategy used. First, if siblings (coworkers) have similar residential preferences leading them to sort into similar neighborhoods, observed spillovers could be due to selection and thus lead to an overestimation of the true effect. To solve this potential selection problem, we control for characteristics of the main couple's neighborhood ($\Delta\bar{X}^{N}_{-it}$ and $\Delta\overline{Experience}^{N}_{-it}$ in Equation (1)) so that the estimated effects are net of similarities in residential areas. In particular, we control for "individual IVs", that is we include the analog of the instrument used for peers' financial outcomes for the couple's own neighborhood, which in our case is the fraction of neighbors experiencing an increase in their risky asset holdings (compare Nicoletti et al., 2018). In Table A.4 we show that this is no concern in our estimation.

Second, if a couple knows their siblings' (coworkers') neighbors and talks to them about their financial decisions and outcomes, the instruments will lose their exogeneity. This could occur if couples live in the same neighborhood as their siblings (coworkers) and interact with the same people. We address this concern by excluding siblings (coworkers) living in the same neighborhood as the main couple from the construction of the sibling (coworker) averages.

Third, in principle, in the estimation of peer effects, there could be potential feedback or reversed causality effects, leading to a correlation of the error term with the instruments. However, our main peer measure of interest is whether peers experienced an increase in their asset value from the previous to the current year. The couple's decision to enter the risky asset market, instead, takes place in the current year, thus avoiding the reversed causality between the main couple and her siblings. Also, in our context, we are not worried about feedback effects in the first stage because of the peer group size (on average, over 900 neighbors), which implies that the influence of one peer on his/her neighborhood will be small (see, e.g., Bramoullé et al., 2009, who explain how in a setup with varying group sizes the role of one peer on the average peer outcome diminishes with group size).

Fourth, another reason how exclusion restriction could be violated is correlated shocks affecting both siblings' neighbors and the main couple. For example, if a big firm employing a large group of individuals, introduces a change in some regulation, or experiences some investment profits/losses and siblings live in the same district or municipality in which this firm is largely present, then firm-level changes may confound results (via affecting instruments and couples simultaneously). We investigate such concerns by including different levels of regional fixed effects and show that our findings are robust to aggregate level shocks on the respective levels (see Section 4.4 for a detailed discussion).

4 Results

In this section, we present evidence on peer effects in financial investment decisions, specifically how the entry decision of households in the risky asset market is affected by their peers' positive experiences in the asset market. Estimating the linear-in-means approximation from Equation (1), we first analyze sibling and coworker peer effects when focusing on the joint network of the couple (Section 4.1). In a second step, we analyze the effects of separate networks of the male and the female partner on the couple's decision, both in terms of sibling and coworker peer effects (Section 4.2). Thereby we shed light on whether there are gender differences in the role of the receiver of the information. Moreover, we also split the peer groups by gender to investigate the relevance of gender differences in terms of the sender of the signal (e.g. because of a differential likelihood of talking about financial experiences). In a third step, we investigate the importance of gender interaction effects of the receiver and sender of the information on asset market experiences.

Lastly, we explore in Section 4.3 heterogeneous effects by the couple's background (such as education, financial education, and socioeconomic status) to shed some light on potential mechanisms through which peer effects in financial investments may operate.

4.1 Main Results: Overall Effects of Sibling and Coworker spillovers

In this section, we present the results of sibling and coworker peer effects on couples' decision to invest into risky assets for the first time. We start by imposing a single peer network for each household and analyze the joint effect of both (female and male) partners' peers. In this case, the variable capturing peers' experiences in the asset market ($\Delta\overline{Experience}^{S}_{-it}$) and the control variables ($\Delta\bar{X}^{S}_{-it}$) in Equation (1) pool information of both partners' siblings (coworkers) in a single measure. As discussed in the previous section, we estimate Equation (1) via two-stage least squares (2SLS) using the asset market experience of siblings' (coworkers') neighbors as instruments for their own asset market experiences.[15] To ensure comparability to our analysis of separate peer networks in the next subsection, we consider couples where both partners have at least one sibling in the analysis of sibling spillovers, while for the analysis of coworker spillovers, we consider couples, where both partners have coworkers (i.e. dual-earner couples).[16]

In Table 4, Column [1], we start by exploring the effect of siblings' risky asset market experience on a couple's decision to enter the asset market for the first time. Our findings point to an important role of sibling spillovers in financial investments. In Column [1], the effects of siblings' positive

[15]For all regressions, we report under-identification and weak instrument statistics. The F-statistics are above conventional thresholds, confirming the relevance of our instruments used in the first stage.

[16]Results are very similar when we relax the assumption on each partner having a sibling. In the case of coworkers, focusing on dual-earner couples implies a somewhat more restrictive selection of couples, which however is necessary to investigate separate coworker networks of both partners.

experiences in the asset market on a couple's decision to enter the asset market are positive and strongly significant (at the 1-percent level). The point estimate of 0.027 implies that if every sibling previously engaged in the asset market has a positive experience, i.e. the average sibling experience increases by 1, couples are 2.7 percentage points more likely to enter the risky asset market. Given that on average only 11.8% of couples in our sample ever enter the asset market, this effect translates to a 22.9% increase in the probability of ever entering the asset market. To give a more realistic example, if half of the siblings owning assets experience an increase in their risky asset value, couples are 1.35 percentage points more likely to enter the risky asset market, equivalent to an 11.5% increase in the likelihood of ever entering the asset market.

In Table 4, Column [2], we analyze the importance of coworkers as peers and again focus first on the joint coworker network, i.e. all coworkers of both the male and female partners are considered as a single peer group. Again, we find that positive experiences of coworkers in the asset market lead to positive and significant spillovers. Estimates imply, that if all coworkers previously engaged in the asset market have a positive experience, the couples' likelihood to enter the asset market increases by 0.5 percentage points; this is a considerably smaller effect than we estimated for siblings (it translates to a less than 1% increase in the likelihood to ever enter the asset market). Intuitively, this may be explained by differences in closeness of different types of peers. While it can reasonably be assumed that siblings are close peers, the same does not necessarily hold for all coworkers. For the coworker network, we consider everyone working in the same firm - weighted by their likelihood of contact; on average this yields coworker network sizes of around 125 for women and 78 for men. While the weighting is used to focus more on peers with likely interactions, this still implies that the coworker network consists of close and distant peers, with some of whom there may be no interaction at all, thus potentially explaining the lower peer effect estimate.

In Table 4, Column [3], we combine the analysis of sibling and coworker peer effects to better be able to compare the effect sizes and significance and estimate the effect of both jointly in the same regression. We find very similar effects compared to estimating the role of the two types of peers separately: both sibling and coworker spillover effects are relevant and highly significant (at the 5% level). Moreover, results confirm that siblings are a more important source for peer effects in the asset market participation decision.[17]

4.2 Gender differences

In this section, we analyze the role of gender, both in terms of whether the peers of the female or the male partner in the couple are (more) relevant as well as in terms of whether the gender of the peer matters, and lastly the interaction of both. In particular, we first analyze the role of peer effects

[17]For this table we restrict the couples to those where both partners have at least one sibling and one coworker. Results are robust to considering dual-earner couples with at least one sibling on the household level.

separately for the female and male partner of the couple. To disentangle the effects, we allow the effects of the male partner's peers to differ from the effects of the female partner's peers by entering them as separate regressors (see Table 5).

In Table 5, Column [1], we display the results for the role of sibling peer effects when considering separate networks of the female and male partner in the couple. We find that spillovers from the male partner's siblings have an important and significant effect on the likelihood of the couple entering the asset market for the first time. If the siblings of the male partner have on average one positive experience in terms of their asset value increasing compared to the previous years, this increases the likelihood of asset market entry by 4.7 percentage points (significant at the 5% level). The coefficient on the female partner's siblings is about half in size and insignificant (the difference between coefficients for male and female partner is, however, not significant).

In Table 5, Column [2], we distinguish between the effects from different parts of the coworker networks, allowing for separate effects from the female and male partner's coworkers. Once again, we find that it is primarily the male partners' network that is important. Estimates imply, that if all coworkers of the male previously engaged in the asset market have a positive experience, the couples' likelihood to enter the asset market increases by 0.5 percentage points (significant at the 10% level). The coefficient on the female partner's coworkers is less than half in size compared to the effect on the male partner's coworkers and is not significant (the difference between the coefficient on male/female partner's coworkers is however not significant).

Our results so far suggest that the male partners' networks may be more relevant for the entry decision of a couple, i.e. the male partner appears more relevant in terms of receiving spillovers from his peer network and/or responding to the signal by deciding to enter the risky asset market. A natural question that arises is whether the gender composition of the peer network (i.e. the sender of the information) matters as well. To answer this question, we split both, the sibling and coworker networks of the couple, into male and female siblings/ coworkers (see Table 6).

In Table 6, Column [1], we analyze the role of gender in terms of sibling networks. While the coefficient is slightly larger and only significant for sisters (0.026 versus 0.019), the effect of brothers and sisters on the couple is not significantly different. In the case of the coworker gender, on the other hand, we see a clear pattern. Only the financial experiences of male coworkers matter for the couple's decision to enter the risky asset market. The coefficient on male peers is 0.008 and highly significant at the 1-percent level, compared to an insignificant coefficient of -0.000 for women. This finding is consistent with male coworkers being more likely to talk ('boast') about their financial asset market successes.

Lastly, we investigate whether gender interactions matter, i.e. whether the role of the peer effects depends on the interaction of the peers' gender (sender) and the gender of the partner whose network is under consideration (receiver). With respect to siblings, we find similar effects for the different

gender interactions (see Table 7). When entering all interactions jointly, only the effect of the sisters of the male partner is significant. However, the magnitude of the coefficients on sisters and brothers and on male/female partner are similar and none of the effects are significantly different from each other. This may indicate that siblings share information about financial experiences independently of their own or their sibling's gender. An alternative explanation may be that the lack of gender differences may stem from the fact, that each partner is not only in contact with their siblings but also with the siblings' partners. Thus, in the case of the sibling network, we may measure the gender of who is actually interacting with whom only imperfectly. In the case of coworkers, on the other hand, it is likely that the interaction does indeed take place between the individual in the couple and his/her coworkers (instead of coworkers' spouses/partners or the coworkers of the other partner in the couple). Thus we can more clearly identify the gender interaction of who is interacting with whom.

Therefore, it is particularly interesting, to investigate gender interaction effects in the case of the coworker network. Indeed, when considering the role of gender interactions in the case of the coworker network (see Table 8), we find a very clear pattern. In Table 8 we show that only male coworkers' experiences in the asset market matter for the couple's financial decision and coefficient sizes of male coworkers are substantially larger than for female coworkers (0.007 versus -0.000 for the female partner and 0.006 versus -0.002 for the male partner). In fact, among dual-earner couples, the male coworkers of both the female and male partner significantly influence a couple's entry decision. With an increase of one additional positive experience among all of the male coworkers of either partner, the couple is 0.7 percentage points more likely to enter the asset market (significant at the 5% level).

4.3 Heterogeneous Spillover Effects By Background

What are potential explanations for the observed peer spillovers in financial investment decisions? The literature has primarily focused on two potential explanations: (i) social learning, i.e., peer effects arise due to informational spillovers from sophisticated to unsophisticated peers, and (ii) social utility (see, e.g., Bursztyn et al., 2014). The latter channel encompasses both preferences for possessing similar assets as one's peers as well as a "keeping up with the Joneses" motive. While we cannot directly determine the motivations of couples entering the asset market in response to their peers' experiences, we utilize the rich socio-demographic information in the administrative data to shed some light on likely mechanisms. In particular, we explore possible heterogeneities in sibling peer effects to determine which couples are influenced by their peers' financial experiences.

Sibling network: We start by investigating how sibling spillovers differ by the educational and socioeconomic background of the couple (i.e. the receiver of the signal), focusing on the joint network of the couple (see Table 9). In particular, we analyze heterogeneous effects by education level (whether at least one of the partners in the couple has a university degree or not), by whether the female partner works full-time and by whether any of the partners is financially educated. We define financial education as having attended a degree program that includes some financial basics.[18]

The idea is that a couple's education classification captures their own income and wealth level (i.e., the ability to invest in risky assets), but also to some extent their financial literacy as the latter has been documented to depend on socioeconomic background (see, e.g., Lusardi and Mitchell, 2014). To investigate the role of financial literacy more closely and more directly, we also create a variable based on whether the individual's educational specialization in their highest degree has been in a field related to finance.

In Table 9, Columns [1], we investigate whether the relevance of sibling spillovers differs based on the educational background of the couple. We find that siblings' positive experiences in the asset market are only important for the more educated couples. Coefficients are highly significant for the more educated group (at the 1% level) and substantially (and significantly) larger than for the less educated group (which in turn is not significantly different from zero). This finding is consistent with more educated couples having the means (income and wealth level) and the knowledge (financial literacy) to respond to sibling spillovers by investing in risky assets.

To test the relevance of financial education more directly, we investigate the role of sibling spillovers separately depending on whether at least one partner in the couple is financially educated. Table 9, Column [3], shows that again sibling spillovers are substantially (and significantly) larger for more financially educated couples. However, there is also a significant effect on the less financially educated couples, albeit less than half in magnitude.

Lastly, we split couples by whether the female partner in the couple works full-time or not (see Column [2] of Table 9). This distinction is particularly interesting for the coworker network we show below, but we also report the results here for completeness. Again we find substantially (and significantly) larger effects for couples where the female partner works full-time (effect size is 0.053), but we also find significant effects of 0.019 percentage points for couples where the female partner does not work full-time.

[18]For this definition, we use the highest degree program individuals attended and categorize relevant programs as those in the following ISCED-97 fields: economics; finance, banking, and insurance; accounting and taxation; management and administration. We obtain similar results if we base our financial education/ literacy definition on whether the employment sector is related to finance. In particular, we include employment in the following sectors: banks, insurance and health insurance funds, lending companies, and business services. This variable is predetermined and measured in the last year before each individual enters the rolling sample.

To summarize, sibling spillovers are more important for couples who are more (financially) educated and have a higher socioeconomic status. This may be because they have both the means to respond to the spillovers by entering the risky asset market and the knowledge to evaluate the signal of positive experiences of their siblings.

Coworker network: In Table 10, we conduct the same exercise with the coworker networks, i.e. we investigate whether the relevance of coworker spillovers differs depending on the characteristics of the couple. However, here we show directly the results for separate coworker networks of male and female partner (the pattern is similar when considering the joint network of both partners, see Appendix Table A.6).

Table 10, Columns [1] and [2], show that coworker spillovers are important only for more educated couples (female/male partner has a university education, respectively), and in fact for both the coworkers of the female and of the male partner. Differences between the groups are significant.

In Column [3] we allow spillovers to differ between couples where the female partner is full-time as opposed to only part-time employed. This distinction is particularly interesting for the coworker network. Our underlying assumption is that longer work hours imply more interaction with coworkers, suggesting that for full-time employed women, coworkers should be a more relevant network than for part-time employed ones. Indeed, we find that female partner's coworkers lead to spillovers only for women working full-time. For the role of spillovers on the male partner in the couple, it does instead not make a difference whether his partner works full-time, as would be expected if the explanation is more interaction between the (full-time employed) female partner of the couple with her coworkers).

Lastly, we allow coworker spillovers to differ by the couples' financial education as a more direct measure of financial literacy (Column (3) in Table 10). Similar to the education results, more financially educated couples are more likely to enter the asset market with additional positive signals from the male and female partners' coworkers.

To conclude, results go in the same direction for sibling and coworker networks in that more highly educated and more financially educated couples are more strongly affected by peers' positive experiences in the risky asset market. In terms of financial means (income and wealth), this group is more able to respond to peer spillover by first investing into risky assets. At the same time, this group is also more likely to have the (financial) knowledge to evaluate and use the information contained in the signal.

4.4 Robustness

Financial Crisis When defining the analytical sample, we specifically exclude the period of the financial crisis of 2007-2008, restricting our sample period to the years 2009-2018. In a robustness exercise, we test whether the exact choice of the sampling period affects our main results. Table A.2 reports the estimated effects of siblings' positive experiences in the asset market for different sample periods, starting as early as 2008 or as late as 2012. While the sample size and coefficient estimates vary slightly, the results remain robust to the different sampling periods.

Regional Fixed Effects In Section 3.5 we explained that the exclusion restriction is violated if there are correlated shocks affecting both couples and their siblings at the same time. To mitigate such concerns we test whether correlated shocks on different regional levels confound our results by estimating our main specification including municipality, district, neighborhood, or local labor market fixed effects, respectively. Table A.3 shows only minor changes in coefficient sizes and a slight increase compared to the main findings. This suggests that, if anything, our main findings slightly underestimate spillovers among siblings' financial decisions.

Neighborhood Controls While we chose a conservative specification as our preferred one, we also test whether it is necessary to control for all possible neighborhood characteristics of the main couple. In Table A.4, we report our main results in columns [1]. In column [2], we control for neighborhood characteristics but leave out the "individual IVs", in column [3], we do not control for anything at the neighborhood level, and in column [4], we only include "individual IVs". Hereby "individual IVs" are the fraction of neighbors experiencing a positive change in their risky asset holdings, i.e., the analog of the instruments we use for the siblings. As previously described in Section 3.5, excluding these controls could lead to an overestimation of spillover effects due to siblings' selection into similar neighborhoods. Including them helps us to successfully control for such selection effects in our main specification. Comparing across specifications, we find that average neighborhood characteristics have no sizable impact on the main findings. "Individual IVs" appear somewhat relevant for the coworker specification, since excluding them increases the coefficient size. Altogether, Table A.4 confirms that selection into similar neighborhoods is unlikely to be driving our results.

5 Discussion and Conclusion

In this paper, we provide well-identified causal evidence on sibling and coworker peer effects in households' financial investment decisions. We document the importance of sibling as well as

coworker spillovers for a couple's decision to enter the risky asset market for the first time: Siblings' and coworkers' positive experiences on the asset market raise a couple's likelihood to enter the asset market substantially and significantly. Compared to siblings' relevance, coworkers who constitute a larger peer group with close as well as distant peers have a weaker influence on the entry decision.

Accounting for separate peer networks of the male and female partner in a couple, we find that peer effects are mainly driven by the siblings and coworkers of the male partner. To shed light on who is more likely to share information about their financial experiences (the "sender"), we split the peer network by gender. While spillover effects of sisters and brothers are similar, in the case of coworkers only the experiences of male coworkers are relevant. This is consistent with men being more likely to share ('boast' about) financial successes in the workplace. In fact, when allowing for gender interactions between sender and receiver by splitting the peer group by gender and distinguishing between the network of the male and female partner, we find that again there only the experiences of male coworkers matter, but for both the male and female partner in the couple. In terms of female partner, this effect is driven by women working full-time consistent with them having more time to interact or having a closer relationship with their coworkers in this case. Allowing for gender interactions for siblings, effects are similar for all four combinations (i.e. from sister/brother to male/female partner). This may mean that siblings' likelihood to talk about their financial experiences is independent of their own and their sibling's gender. Alternatively, this may be due to the fact, that not only siblings interact, but also in-laws, so that, in the case of siblings, there is more noise in terms of who is actually interacting with whom in terms of gender compared to the situation of coworkers.

The rich demographic and geographic information in the Dutch administrative data not only allows us to identify peer effects but also enables us to examine the relevance of potential mechanisms through which peer effects in financial investment decisions may operate. In particular, we are interested in determining which types of couples are influenced and by whom. Our findings suggest that only couples who are more (financially) educated are influenced by their peers' experiences in the risky asset market, possibly because they have the financial means (income and wealth) and the (financial) knowledge to evaluate and respond to the signal of positive asset market experiences of peers.

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6 Tables and Figures

Table 1: Characteristics of main households

	Sibling sample			Coworker sample		
	mean	sd	N	mean	sd	N
Household Characteristics						
Married	0.8375	[0.3463]	21701	0.7809	[0.3844]	45559
Number of children	2.2000	[1.0851]	21701	1.8551	[0.8491]	45559
Wealth (in 1,000)	87.760	[518.41]	21701	44.806	[331.04]	45559
Savings/ Bankholdings (in 1,000)	21.608	[35.422]	21701	21.209	[30.109]	45559
Both partners high SES	0.2127	[0.4092]	21138	0.1635	[0.3698]	44243
Any partner university education	0.1351	[0.3419]	18444	0.1516	[0.3586]	41276
Any partner financially educated	0.1366	[0.3434]	17667	0.1500	[0.3570]	39908
Female Partners' Characteristics						
Age	34.993	[2.7389]	21701	34.632	[2.8188]	45559
University education	0.0929	[0.2903]	15851	0.1119	[0.3153]	36340
Financially educated	0.0766	[0.2659]	14682	0.0863	[0.2808]	34047
Full-time employed	0.1381	[0.2734]	19817	0.1794	[0.3018]	45559
Working hours	68.265	[43.684]	21701	87.705	[36.993]	45559
Wage	1315.06	[1108.0]	21701	1713.58	[1100.0]	45559
Male Partners' Characteristics						
Age	36.695	[2.3121]	21701	36.392	[2.427]	45559
University education	0.1114	[0.3147]	14136	0.1149	[0.3189]	32540
Financially educated	0.1100	[0.3129]	13026	0.1137	[0.3174]	30341
Full-time employed	0.7860	[0.3544]	20038	0.8020	[0.3389]	45559
Working hours	130.312	[56.642]	21701	147.826	[36.046]	45559
Wage	3177.23	[2023.8]	21701	3576.31	[1776.6]	45559

Source: Authors' calculations from the CBS data.

Note: This table summarizes the characteristics of the main households in our analysis. Main couples include those who are married/cohabiting for at least two years, did not enter the asset market before 2009, are aged 20-30 at the beginning of the observation period, and each partner has at least one peer (sibling and coworker, respectively). This is an unbalanced sample over the years 2009 -2020.

Table 2: Peer group composition

	Sibling sample			Coworker sample		
	mean	sd	N	mean	sd	N
Neighborhood Characteristics						
Wealth (in 1,000)	224.99	[226.73]	21701	196.26	[155.66]	45559
Fraction married	0.7430	[0.1240]	21701	0.7239	[0.1229]	45559
Peer group		Siblings			Coworkers	
Household level peers						
Fraction married	0.6479	[0.3343]	21701	0.6451	[0.1327]	45559
Wealth (in 1,000)	131.49	[503.52]	21701	167.14	[223.48]	45559
Age	37.975	[4.1822]	21701	46.762	[3.9649]	45559
Number of children	1.7936	[1.0064]	21701	1.1401	[0.2996]	45559
Female partners' peers						
Fraction married	0.5751	[0.4523]	21701	0.5365	[0.1891]	45559
Wealth (in 1,000)	112.06	[540.13]	21701	134.69	[182.93]	45559
Age	35.294	[7.1622]	21701	41.904	[9.6431]	45559
Number of children	1.6068	[1.2954]	21701	0.9808	[0.3766]	45559
Male partners' peers						
Fraction married	0.6348	[0.4356]	21701	0.6657	[0.1907]	45559
Wealth (in 1,000)	131.80	[613.10]	21701	179.60	[334.17]	45559
Age	36.325	[7.3056]	21701	45.921	[7.0201]	45559
Number of children	1.7500	[1.2546]	21701	1.1557	[0.4334]	45559

Source: Authors' calculations from the CBS data.

Note: This table summarizes the characteristics of households in the neighborhood of the main household in the sibling/coworker sample, respectively. There are no restrictions on age or family status for neighborhood households. Characteristics of the siblings (coworkers) of the household (in sibling/coworker sample, respectively), first for the main household pooled and then separately for the female partners' siblings (coworkers) and the male partners' siblings (coworkers). Again there are no restrictions in terms of age and family status of siblings and coworkers, but to investigate the effect of positive shocks on the value of peers' risky assets, we restrict the peers (siblings, coworkers) to those participating in the asset market.

Table 3: Summary Statistics - financial decisions

	Sibling sample			Coworker sample		
	mean	sd	N	mean	sd	N
Main households						
Prob(Ever enter asset market)	0.1184	[0.3231]	21701	0.1270	[0.3329]	45559
Value of financial assets	1071.91	[33343.6]	21701	1084.87	[53553.7]	45559
Asset value (excl. zeros, in 1,000)	20.456	[131.59]	2560	17.974	[168.61]	5761
Peer group		Siblings			Coworkers	
Household level peers						
Fraction with assets	0.1556	[0.2154]	21701	0.2222	[0.0970]	45559
Value of financial assets	5846.0	[88767.1]	21701	10362.7	[22990.6]	45559
Positive experience	0.1001	[0.1780]	21701	0.1308	[0.0985]	45559
Female partners' peers						
Fraction with assets	0.1420	[0.2745]	21701	0.1760	[0.1054]	45559
Value of financial assets	5214.2	[120726.1]	21701	7711.4	[20460.1]	45559
Positive experience	0.0944	[0.2062]	21701	0.0995	[0.1351]	45559
Male partners' peers						
Fraction with assets	0.1550	[0.2856]	21701	0.2115	[0.1337]	45559
Value of financial assets	4945.1	[52852.2]	21701	10485.6	[69146.0]	45559
Positive experience	0.1022	[0.2136]	21701	0.1281	[0.1786]	45559

Source: Authors' calculations from the CBS data.

Note: This table summarizes the financial decisions of the main households in the sibling/coworker sample, respectively. Financial decisions of the siblings (coworkers) of the household (in sibling/coworker sample, respectively), are reported first for the main household pooled and then separately for the female partners' siblings (coworkers) and the male partners' siblings (coworkers). There are no restrictions in terms of age and family status of siblings and coworkers, but to investigate the effect of positive shocks on the value of peers' risky assets, we restrict the peers (siblings, coworkers) to those participating in the asset market.

Table 4: Entry decision - peer spillovers

	[1]	[2]	[3]
Joint peer network			
Positive experience of			
Any partners' siblings	0.027***		0.024**
	[0.008]		[0.011]
Any partners' coworkers		0.005***	0.007**
		[0.002]	[0.003]
p-value of difference			0.1554
N Observations	183402	386193	90705
N Couples	21700	45557	10652
Underid	179.67	1686.92	98.91
p-value	0.0000	0.0000	0.0000
Weakid	185.43	1882.37	50.94

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. Columns [1] and [2] consider couples where each partner has at least one sibling and one coworker, respectively. Column [3] considers only dual-earner couples where both partners have at least one sibling, i.e. where both partners have at least one coworker and one sibling. All columns consider joint peer networks of a couple. For each regression, the dependent variable is first-time risky asset market participation. We instrument peers' positive experiences by the average positive experience of the peers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Entry decision - peer spillovers heterogeneous receivers

Peer group	Siblings [1]	Coworkers [2]
Separate peer networks		
Positive experience of		
Female partners' peers	0.024	0.002
	[0.026]	[0.003]
Male partners' peers	0.047**	0.005*
	[0.019]	[0.003]
p-value of difference	0.5516	0.4908
N Observations	132029	267120
N Couples	21734	45559
Underid	69.17	602.11
p-value	0.0000	0.0000
Weakid	34.00	317.14

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. Column [1] and [2] consider couples where each partner has at least one sibling and one coworker, respectively. Both columns consider separate peer networks for each partner. For each regression, the dependent variable is first-time risky asset market participation. We instrument peers' positive experiences by the average positive experience of the peers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Entry decision - peer spillovers heterogeneous senders

Peer group	Siblings [1]	Coworkers [2]
Joint peer networks		
Positive experience of		
Female peers	0.026**	-0.000
	[0.012]	[0.002]
Male peers	0.019	0.008***
	[0.015]	[0.002]
p-value of difference	0.7367	0.0539
N Observations	93136	442212
N Couples	11510	47659
Underid	83.00	589.24
p-value	0.0000	0.0000
Weakid	32.82	322.12

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. Columns [1] and [2] consider couples where each partner has at least one sibling and one coworker, respectively. Both columns consider joint peer networks for each partner and distinguish by the gender or siblings and coworkers, respectively. For each regression, the dependent variable is first-time risky asset market participation. We instrument peers' positive experiences by the average positive experience of the peers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Entry decision - gendered sibling spillovers

Sample restriction:	Both have a sibling		
	[1]	[2]	[3]
Positive experience of			
Female partners' siblings:			
sisters	0.033*		0.012
	[0.018]		[0.016]
brothers	0.058		0.048
	[0.041]		[0.042]
Male partners' siblings:			
sisters		0.022	0.036*
		[0.015]	[0.019]
brothers		0.036	0.026
		[0.023]	[0.028]
N Observations	75722	78479	61832
N Individuals	11145	11145	11145
Underid	37.43	53.44	39.65
p-value	0.0000	0.0000	0.0000
Weakid	15.91	22.55	8.74
p-value of difference	0.5499	0.6045	

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. All regressions consider a sample of couples where both partners have at least one sibling. All regressions consider separate sibling networks for each partner (split by the gender of the sibling). For each regression, the dependent variable is first-time risky asset market participation. We instrument siblings' positive experiences by the average positive experience of the siblings' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Entry decision - gendered coworker spillovers

Sample restriction:	Both have a coworker		
	[1]	[2]	[3]
Positive experience of			
Female partners' coworkers			
females	0.003		-0.000
	[0.003]		[0.004]
males	0.005***		0.007**
	[0.002]		[0.003]
Male partners' coworkers			
females		-0.001	-0.002
		[0.002]	[0.003]
males		0.004*	0.006**
		[0.002]	[0.003]
N Observations	352355	346434	253428
N Individuals	45659	45659	45659
Underid	456.80	511.76	379.93
p-value	0.0000	0.0000	0.0000
Weakid	248.44	270.24	99.20
p-value of difference	0.5996	0.2140	

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. All regressions consider a sample of couples where both partners have at least one coworker. All regressions consider separate coworker networks for each partner (split by the gender of the coworker). For each regression, the dependent variable is first-time risky asset market participation. We instrument coworkers' positive experiences by the average positive experience of the coworkers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Entry decision - Sibling spillover Heterogeneity

interaction variable d		any partner has university education [1]	female partner works fulltime [2]	any partner financially educated [3]
Siblings' positive experience				
	$d = 0$	0.013	0.019**	0.020**
		[0.009]	[0.009]	[0.009]
	$d = 1$	0.070***	0.053***	0.050***
		[0.010]	[0.012]	[0.009]
p-value of difference		0.0000	0.0000	0.0000
N Observations		388111	361054	372224
N Couples		48361	50203	46500
Underid		252.29	230.56	245.90
p-value		0.000	0.000	0.000
Weakid		125.45	114.26	122.05

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. All regressions are based on a sample of couples where both partners have at least one sibling. We consider a joint sibling network and allow the effect to differ for different subgroups (interaction variable d). University education is defined by whether the highest degree attended was at a university, and financial education is defined by having attended a degree program that includes financial education. For each regression, the dependent variable is first-time risky asset market participation. We instrument siblings' positive experiences by the average positive experience of the siblings' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Entry decision - Coworker spillover Heterogeneity

interaction variable d	university education		female partner works fulltime	any partner financially educated
	female partner	male partner		
	[1]	[2]	[3]	[4]
Female partners' coworkers: Positive experience				
$d = 0$	0.001	0.003	-0.000	0.000
	[0.004]	[0.004]	[0.004]	[0.003]
$d = 1$	0.010*	0.019***	0.018***	0.011**
	[0.005]	[0.006]	[0.005]	[0.005]
p-value of difference	0.0696	0.0046	0.0003	0.0108
Male partners' coworkers: Positive experience				
$d = 0$	0.005	0.004	0.004	0.005
	[0.003]	[0.004]	[0.003]	[0.003]
$d = 1$	0.024***	0.017***	0.009	0.013***
	[0.007]	[0.006]	[0.005]	[0.005]
p-value of difference	0.0019	0.0120	0.3458	0.0426
N Observations	208901	187119	262438	230720
N Couples	36432	32621	44932	40005
Underid	462.91	430.17	805.71	509.23
p-value	0.0000	0.0000	0.0000	0.0000
Weakid	122.12	111.35	214.45	133.98

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. All regressions are based on a sample of couples where both partners have at least one coworker. We consider separate coworker networks for each partner and allow the effect to differ for different subgroups (interaction variable d). University education is defined by whether the highest degree attended was at a university, and financial education is defined by having attended a degree program that includes financial education. For each regression, the dependent variable is first-time risky asset market participation. We instrument coworkers' positive experiences by the average positive experience of the coworkers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Peer Effects in Financial Decisions

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Online Appendix

A Additional Summary Statistics

Table A.1: Peer group sizes

sample restriction:	Sibling sample			
	mean	sd	median	N Couples
Siblings of male	2.6196	[1.9699]	2	21701
Siblings of female	2.6575	[1.9490]	2	21701
Siblings of household	5.2771	[3.3052]	4	21701
Number of neighbours	947.37	[836.33]	716	21701
sample restriction:	Coworker sample			
	mean	sd	median	N Couples
Coworkers of male	78.460	[218.29]	9.0664	45559
Coworkers of female	125.13	[244.01]	22.603	45559
Coworkers of household	179.91	[327.92]	48.00	45559
Number of neighbours	1063.9	[927.65]	805	45559

Table A.2: Robustness to financial crisis

Sample starting date	2008	2010	2011	2012
Panel A	[1]	[2]	[3]	[4]
Joint sibling network				
positive experience	0.027***	0.029***	0.027***	0.026***
	[0.008]	[0.008]	[0.008]	[0.008]
N Observations	183402	178604	177307	176042
N Couples	21700	21136	20986	20838
Underid	179.67	173.93	171.02	169.93
p-value	0.0000	0.0000	0.0000	0.0000
weakid	185.43	178.46	175.52	173.66
Panel B	[1]	[2]	[3]	[4]
Joint coworker network				
positive experience	0.005***	0.005***	0.005***	0.004***
	[0.002]	[0.002]	[0.002]	[0.002]
N Observations	386193	375965	373234	370780
N Couples	45557	44350	44029	43739
Underid	1686.92	1632.71	1621.07	1615.77
p-value	0.0000	0.0000	0.0000	0.0000
weakid	1882.37	1833.67	1813.35	1801.97

Table A.3: Robustness to regional fixed effects

Panel A	[1]	[2]	[3]	[4]
Joint sibling network				
positive experience	0.022***	0.024***	0.027***	0.026***
	[0.008]	[0.008]	[0.007]	[0.008]
Regional Fixed effects				
Neighbourhood level	YES	NO	NO	NO
District level	NO	YES	NO	NO
Municipality level	NO	NO	YES	NO
Labour market region	NO	NO	NO	YES
N Observations	183074	183337	183392	168993
N Couples	21612	21682	21698	20120
Underid	157.23	166.39	170.58	155.96
p-value	0.0000	0.0000	0.0000	0.0000
weakid	156.13	169.38	175.77	161.16
Panel B	[1]	[2]	[3]	[4]
Joint coworker network				
positive experience	0.004**	0.005**	0.006***	0.006***
	[0.002]	[0.002]	[0.002]	[0.002]
Regional Fixed effects				
Neighbourhood level	YES	NO	NO	NO
District level	NO	YES	NO	NO
Municipality level	NO	NO	YES	NO
Labour market region	NO	NO	NO	YES
N Observations	272035	272407	272456	272450
N Couples	45380	45537	45557	45557
Underid	2195.17	2204.97	2199.26	2207.00
p-value	0.0000	0.0000	0.0000	0.0000
weakid	2764.91	2814.35	2812.11	2824.8

Table A.4: Robustness to neighborhood controls

Panel A	[1]	[2]	[3]	[4]
Joint sibling network				
positive experience	0.027***	0.027***	0.026***	0.026***
	[0.008]	[0.008]	[0.007]	[0.007]
Individual IVs	YES	N0	NO	YES
Neighborhood controls	YES	YES	NO	NO
N Observations	183402	183402	204869	204806
N Couples	21700	21700	21701	21701
Underid	179.67	179.88	195.69	195.60
p-value	0.0000	0.0000	0.0000	0.0000
weakid	185.43	185.67	202.27	201.90
Panel B	[1]	[2]	[3]	[4]
Joint coworker network				
positive experience	0.005***	0.007***	0.008***	0.007***
	[0.002]	[0.002]	[0.002]	[0.002]
Individual IVs	YES	N0	NO	YES
Neighborhood controls	YES	YES	NO	NO
N Observations	386193	272457	306059	306002
N Couples	45557	45557	45558	45558
Underid	1686.92	2307.91	2415.81	2399.25
p-value	0.0000	0.0000	0.0000	0.0000
weakid	1882.37	2964.48	3109.82	3089.81

Table A.5: Entry decision - peer spillovers (exclude couples after entry)

Peer group	Siblings [1]	Coworkers [2]
Panel A: Joint peer network		
Average positive experience of		
Any partners' siblings	0.033***	
	[0.008]	
Any partners' coworkers		0.005***
		[0.002]
N Observations	170567	357624
N Couples	20729	43421
Underid	160.64	1546.43
p-value	0.0000	0.0000
weakid	163.77	1693.79
Panel B: Separate peer networks		
Average positive experience of		
Female partners' peers	0.024	0.003
	[0.027]	[0.003]
Male partners' peers	0.057**	0.006*
	[0.022]	[0.003]
N Observations	123620	247840
N Couples	20763	43423
Underid	70.25	559.59
p-value	0.0000	0.0000
weakid	34.43	298.11
p-value of difference	0.4459	0.4800

Source: Authors' calculations from the CBS data.

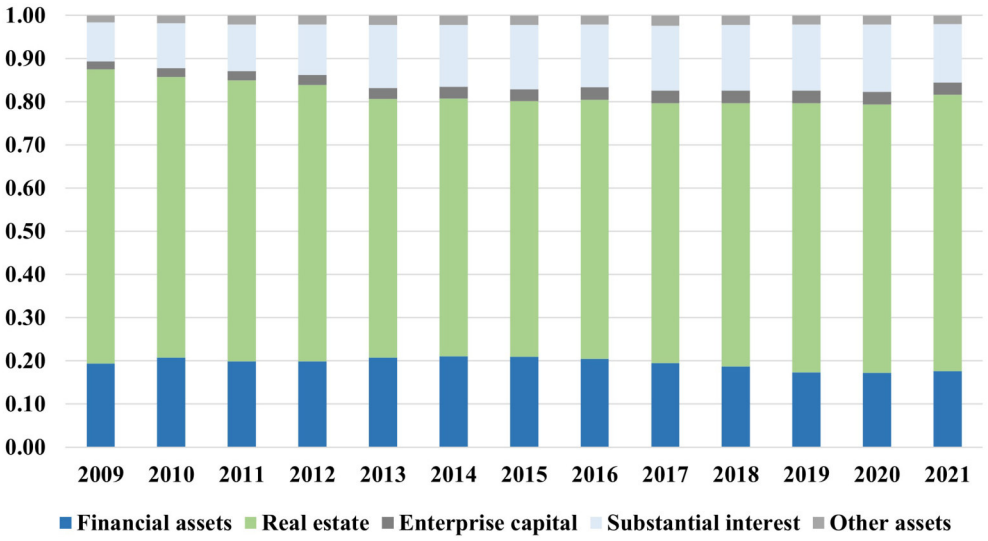
Note: Panel A considers a joint peer network of a couple, and Panel B allows for separate peer networks of each partner in a couple. Each column reports a separate 2SLS regression. Columns [1] and [2] consider couples where each partner has at least one sibling, columns [3] and [4] consider only dual-earner couples, i.e. where both partners have at least one coworker. Columns [1] and [3] consider one joint peer network of a couple, and columns [2] and [4] consider separate peer networks for each partner. For each regression, the dependent variable is first-time risky asset market participation. We instrument peers' positive experiences by the average positive experience of the peers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.6: Entry decision - Coworker spillover Heterogeneity (joint network)

interaction variable d	university education female partner	university education male partner	both partners high SES	female partner works fulltime	any partner financially educated
	[1]	[2]	[3]	[4]	[5]
Any partners' coworkers: Average positive experience					
$d = 0$	0.007**	0.007**	0.010***	0.008***	0.008***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
$d = 1$	0.034***	0.038***	0.026***	0.031***	0.027***
	[0.004]	[0.005]	[0.004]	[0.004]	[0.004]
p-value of difference	0.0000	0.0000	0.0000	0.0000	0.0000
N Observations	242389	217254	300561	303544	267523
N Couples	38534	34525	46826	47506	42301
Underid	1195.19	1168.52	1399.60	1378.15	1249.57
p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Weakid	667.58	639.46	772.97	762.53	687.89

Source: Authors' calculations from the CBS data.

Note: Each column reports a separate 2SLS regression. All regressions are based on a sample of couples where both partners have at least one coworker. We consider a joint coworker network for the couple and allow the effect to differ for different subgroups (interaction variable d). University education is defined by whether the highest degree attended was at a university, high SES is defined by having a parent that is in the 75th percentile of the national wealth distribution, and financial education is defined by having attended a degree program that includes financial education. For each regression, the dependent variable is first-time risky asset market participation. We instrument coworkers' positive experiences by the average positive experience of the coworkers' neighbors. Each regression includes a full set of controls and year fixed effects. Standard errors are clustered on the household level. *** p<0.01, ** p<0.05, * p<0.1.



Source: CBS

Note: Authors' own calculations based on the "Wealth of households; components of wealth" data on StatLine of Statistics Netherlands.

Figure A.1: Dutch households' asset composition