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Are Some Angels Better than Others?

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### **ABSTRACT**

We explore how the returns to angel investing relate to the financial, human, and social capital of the individual investors. Better-performing angels earn their higher returns through greater access to right-tail outcomes, not by avoiding losses. Wealthier and better financially connected angels invest in larger firms, but the returns to nonfinancial capital are substantial. Angels with relevant business experience earn higher returns than others in the same firm, especially when they take board seats. Social connections to founders and outside investors are also important. These findings have important implications for household finance and entrepreneurship policy.

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Angel investments—pre-seed and seed funding from largely non-institutional sources—are a growing and important source of early-stage capital for startups. Despite their prominence, we lack a clear understanding of why some angel investors systematically outperform others, or of the economic mechanisms through which differences in investor characteristics translate into differences in investment outcomes. Existing evidence comes largely from organized angel groups, accredited investors, or voluntary surveys, making it difficult to distinguish whether superior performance reflects investor skill, better investment opportunities, or the selected nature of the samples themselves. In this paper, we draw on comprehensive administrative and tax records from Norway, covering every equity transaction between private individuals and the entire population of private firms from 2003 to 2018, to develop a more complete picture of these issues.

A key theoretical motivation for our analysis comes from Denes, Howell, Mezzanotti, Wang, and Xu (2023). Their model of angel investor tax credits assumes that investors differ in quality and face power-law return distributions. This, in turn, implies that higher-quality investors do not simply avoid losers more often; they access extreme right-tail outcomes more frequently. Our paper brings population-level evidence to bear on this modeling framework. Around one-third of the variance in investment-level returns is attributable to persistent, time-invariant investor differences—a share identified from investors we observe making multiple investments—and this component is stable across a range of specifications and return measures. Furthermore, we not only confirm that the return distribution in angel investing is profoundly right-skewed, we also show that better-performing investors are disproportionately represented in the extreme right tail of outcomes, in direct support of their modeling assumptions. Simply put, some angels systematically outperform others, and they do so by accessing home-run outcomes rather than by merely avoiding losses. This evidence establishes the empirical foundation for the remainder of the paper, which asks

what characteristics distinguish these systematically better investors.

Why do some angels hit home runs more often than others? We bring data to bear on this question that connect investor identities, equity transaction records, board seats, firm accounting, and connections in the corporate universe between investors and between investors and founders. The richness of our data allows us to explore three channels that prior work has suggested are important in early-stage investing: wealth, startup-relevant skills obtained through prior experience, and personal connections. These three channels correspond to an investor’s financial, human, and social capital; our analysis asks which forms of capital are compensated in equilibrium, and through what mechanisms. (We discuss specific testable hypotheses related to these channels in Section I.) It is natural to think that these channels operate through both selection and treatment: that is, some angels may be better at selecting firms, or are somehow matched to better firms, while some angels may earn better returns because they disproportionately provide inputs that are critical to a firm’s success. We do not observe investments that were considered but passed over. Nevertheless, because we observe multiple investors in the same firm, we can use the panel structure of our data to decompose overall return differences into between- and within-firm components, in the spirit of Mundlak (1978). This allows us to understand how wealth, experience, and connections operate through matching with different types of firms, versus different investors in the same firm earning different returns because of the rents they earn on specific inputs that they bring to the firm.

The distinction is important because many policies aimed at stimulating entrepreneurship implicitly assume that financial capital is the bottleneck resource. Angel tax credits, public co-investment programs, and reforms to investor eligibility rules seek to increase the amount of capital available to young firms, or to reduce its cost. If financial capital is the scarce input that distinguishes effective angels, wealth should account for performance dif-

ferences, and investor experience and networks should account for little. However, as we summarize below, social and human capital are in fact critical for understanding why some angels are better than others.

First, financial capital primarily operates through access to investment opportunities rather than superior performance within firms. Wealthy investors match with firms that earn higher returns, but they do not earn higher returns than other investors financing the same company. Wealthier investors disproportionately sort into larger firms with greater capital requirements, and the cross-sectional differences between high- and low-wealth investors disappear once we control for investment amounts. These findings support a deep-pockets interpretation: wealth affects performance because innovative firms with greater capital needs require investors capable of financing them, not because wealthier investors obtain systematically better terms within the same investment.

Second, startup-relevant experience is associated with earning higher returns relative to other investors in the same firm. We measure startup-relevant experience through prior board service, particularly in firms operating in the same industry as the focal investment, and through whether the investor subsequently serves on the focal firm's board. Investors who take board seats earn higher returns than other investors financing the same company. Prior industry-specific board experience strongly predicts taking a board seat, and prior business connections to the founder also increase the likelihood of active governance. Together, these findings suggest that investors possessing relevant and observable experience earn returns on those skills through active involvement in the companies they finance. Consistent with this interpretation, much of the board-seat return premium is reflected in the more favorable entry terms that board-taking investors receive, as if compensating them in advance for their expected involvement.

To explore this further we examine firm operating outcomes. Firms financed by in-

vestors with relevant same-industry board experience generate substantially higher five-year revenues and are less likely to enter bankruptcy or liquidation. These effects are strongest when the investor serves on the firm’s board, reinforcing the interpretation that startup-specific expertise creates value through active governance rather than merely through superior investment selection.

Third, for social connections we measure how many times an investor is connected to another equity investor in the data through common ownership of the same company in a prior investment or prior board connection. We also measure whether an investor is connected to a VC-backed firm through previous investment. In general, investors with prior links to VC-backed firms match with better performing firms, but neither form of connectedness predicts higher returns relative to other investors in the same firm. Nevertheless, their social connections appear to play an important role for future fundraising. When an investor with more connections to other investors makes an investment, those connected investors are more likely to become later investors in the same firm. This effect is stronger when the focal investor takes a board seat in the firm in question. We also measure whether the investor is connected to the focal firm’s founder through prior investment or board overlaps. Investors with a prior link to the firm founder earn higher returns than others in the same firm, but this occurs because they enter earlier and pay lower purchase prices: the return difference vanishes when we control for firm age at time of investment.

Because our data include every equity purchase by individuals in every private firm in Norway, they necessarily include both professional angels and one-time retail investors, as well as insiders such as family members and employees. For a large portion of our sample we can separate insiders from outsiders and distinguish professional angels—investors who make repeat investments or commit economically meaningful capital—from one-time, small-stakes retail participants. Retail investors earn lower average returns primarily because they sort

into firms that receive smaller amounts of capital rather than because they systematically underperform other investors financing the same firms. Family members and employees, although arguably the most closely connected investors to the firm’s founder, do not exhibit the same patterns that we see with outside angel investors.

Our findings show that scarce business management or entrepreneurial management skills are being rewarded at the earliest stages of a firm’s life, just as they are in the broader venture capital market (see, for example, Gompers, Kovner, Lerner, and Scharfstein, 2008, 2010; Bottazzi, Da Rin, and Hellmann, 2008, among others). This contributes to a growing literature on angel investing, including Mason and Harrison (2002), Kerr, Lerner, and Schoar (2014), DeGennaro and Dwyer (2014), Lerner, Schoar, Sokolinski, and Wilson (2018), Denes, Howell, Mezzanotti, Wang, and Xu (2023), Bach, Baghai, Strömberg, and Warg (2022), and Lindsey and Stein (2026). The findings imply that investor quality hinges on connections and experience as well as financial resources. Better angels are not simply investors with more money. These results are a caution for policies that aim simply to increase the supply of early-stage investment capital in the market. This in turn suggests that intermediaries with relevant startup experience and connections are likely to be an important ingredient in stimulating entrepreneurship or increasing household wealth.

The balance of the paper proceeds as follows. Section I develops the theoretical motivation and hypotheses. Section II describes the data and sample construction. Section III establishes persistent investor heterogeneity and documents the distributional evidence supporting the Denes, Howell, Mezzanotti, Wang, and Xu (2023) framework. Section IV investigates the mechanisms through which wealth, experience, and connections generate differences in returns, including their association with subsequent firm financing and operating outcomes. Section V discusses the implications of our findings for policy debates around expanding retail access to early-stage investments, and Section VI concludes.

# I Related Literature and Hypothesis Development

The theoretical framework for our analysis builds directly from recent work by Denes, Howell, Mezzanotti, Wang, and Xu (2023). Their model rests on two key assumptions. The first is that angel investors differ in terms of skill. The second is that investors face power-law return distributions. As a consequence, higher-skill investors do not simply earn higher returns, they earn higher returns *because* they disproportionately sample from the right tail of a skewed returns distribution.

Our first step empirically is to provide large-sample evidence in support of these assumptions. To do this, we first document persistent differences among investors, and then we show that these differences in part arise through differences in exposure to the right tail of the returns distribution.

The next step in our analysis is to provide evidence on which economic channels are responsible for these differences. Prior work points to three mechanisms: differences in wealth, differences in startup-relevant experience, and differences in personal or business connections—in effect, differences in the investor’s financial, human, and social capital. Each of these channels has the potential to operate through an investment-selection channel, whereby better investors choose—or are matched with—better firms, or through what might be called a treatment channel, whereby some investors earn better returns than others in the same firm because they bring relevant skills to the transaction that are complementary to the capital they invest, as in Hellmann and Puri (2002).

Our data do not allow us to observe investments that were available to investors but not chosen, and therefore we cannot completely isolate selection effects from treatment effects. Nevertheless, the panel structure of our data allows us to separate cross-sectional and within-firm differences in investor outcomes, and the richness of our data allows us to develop distinct empirical measures for the mechanisms we explore. These measures capture spe-

cific, startup-relevant components of each form of capital—taxable gross wealth for financial capital, prior board experience (particularly in the same industry) for human capital, and prior co-investment and board ties for social capital—rather than the broader constructs in their entirety. In the remainder of this section we offer specific hypotheses related to wealth, experience and connections that operate through cross-sectional and within-firm differences.

**Wealth.** A large literature links household wealth to risk-taking capacity, tolerance for illiquidity, and willingness to hold concentrated private-business positions (Moskowitz and Vissing-Jørgensen, 2002; Fagereng, Guiso, Malacrino, and Pistaferri, 2020). Wealth can also shape an investor’s ability to absorb early losses or provide follow-on financing (Nanda and Rhodes-Kropf, 2013, 2017). Recent work also shows that investment projects with greater capital needs (i.e., steeper j-curves) generate higher returns (Hellmann, Montag, and Tåg, 2024). Thus, one hypothesis pertaining to wealth differences could be called the *deep pockets hypothesis*: deep-pocketed investors earn higher returns than others because only they are able to finance firms with greater capital requirements, which in turn generate higher returns.

At the same time, Hsu (2004) shows that entrepreneurs sometimes accept lower valuations to partner with prominent investors, which would predict that wealthier or more prominent investors earn higher returns within the same deal through this affiliation premium. Thus, an alternative hypothesis behind the wealth channel might be labeled the *privileged access hypothesis*: wealthier investors earn higher returns not because they are exposed to firms requiring more capital, but because their wealth opens the door to certain types of investment opportunities to which less wealthy investors are not exposed.

To contrast these two hypotheses, we relate investor wealth to firm characteristics, including the amount of capital they receive and other measures of firm size. We also examine within-firm differences between wealthier and less wealthy investors to see if they

invest earlier or receive better terms than other investors, in support of a privileged access channel.

**Experience and startup-relevant skills.** A large body of venture capital research shows that beyond providing mere cash, experienced investors provide many critical inputs important to the success of a firm. Investors professionalize nascent firms, influence managerial decisions, and shape outcomes through screening, monitoring, and advisory roles (Hellmann and Puri, 2002; Sorensen, 2007; Ewens and Rhodes-Kropf, 2015). They do this through the exercise of governance rights and through the staging of investment (Kaplan and Strömberg, 2003; Lerner, 1995; Gompers, 1995). Thus, a natural hypothesis to test in this regard is whether investors with more startup-relevant skills earn higher returns than other investors in the same firm because they earn skill-specific rents. We label this the *skill hypothesis*. This hypothesis is distinct from one operating through a selection channel, whereby investors with more startup-relevant skills select stronger firms because their skills allow them to better discern stronger investment opportunities. We label this the *discernment hypothesis*.

To separate these hypotheses we first examine differences between cross-sectional, firm-level average performance and within-firm differences in performance across investors. We measure startup-relevant experience by observing an investor’s prior board membership, with particular attention to whether that experience is in the same industry as the focal investment, on the grounds that the relevant knowledge in early-stage investing is likely to be domain-specific rather than generic (Hellmann and Thiele, 2015; Hellmann, Schure, and Vo, 2021). The skill hypothesis predicts that skilled investors earn higher returns within the same firm, whereas the discernment hypothesis makes no such prediction.<sup>1</sup>

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<sup>1</sup>Identifying the skill hypothesis through within-firm variation in investor outcomes could potentially be complicated by the fact that an investor’s skill may generate positive spillovers for other investors. Nevertheless, as long as there are sufficient differences in investment timing (so that pre-money valuations reflect value creation by earlier investors) and differences in investment terms, the skill hypothesis can be

To further explore the skill hypothesis, we observe whether investors with relevant past experience actually take board seats in the focal firm receiving investment. Lerner (1995) finds that board seats offer VC investors the opportunity to directly assert governance rights. Presumably the same logic would apply to any early-stage investor with business-relevant skills. Testing for differences in returns based on whether the investor holds an active board seat in the focal investment allows us to further distinguish the skill hypothesis from the discernment channel, because the former predicts that relevant experience should be compensated precisely when it is being applied by the firm in question, whereas a discernment channel would not predict that more active investors earn better returns.

**Connections.** Networks shape access to information, bargaining power, and contracting conditions in venture settings (Hochberg, Ljungqvist, and Lu, 2007, 2010), and founder-investor relationships affect valuations and selection (Hsu, 2004; Garfinkel, Mayer, Strebulaev, and Yimfor, 2025). Within informal angel markets, personal connections may facilitate early involvement in promising ventures, reduce information asymmetries, or influence the allocation of investment terms. These effects are conceptually important but empirically underexplored, largely because typical datasets do not observe connected and unconnected investors within the same firm. We hypothesize that two types of connections are important sources of variation in performance: ties to the focal founder, formed through prior board overlap or shared investment experience, and ties to other investors. To test this we examine whether investors’ prior connections to the focal firm’s founder result in better returns relative to other investors in the same firm.

An alternative channel through which social connections might operate is that an investor’s better connections allow them to marshal valuable resources for the company, such as introductions to other investors, including institutional capital sources like venture

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identified through within-firm variation.

investors. We test this separately by directly measuring whether an investor is connected to other equity investors in our data through prior investments, and whether the investor has prior investment links to venture-backed firms. We specifically test whether a prior investment connection between focal investor  $i$  and related investor  $j$  makes it more likely that  $j$  becomes a later investor in the same firm, and whether focal investor  $i$ 's prior investments in VC-backed companies make it more likely that a VC later invests in the focal firm. We further distinguish between connections formed through these prior co-investment and those formed through prior board service. This distinction allows us to test whether network effects reflect connectedness generally or the economic function of a particular relationship.

In the next section we discuss how we construct data and create variables to test the hypotheses related to these specific mechanisms.

## II Data and Sample Construction

### A Data

Norwegian administrative data are widely recognized for their quality and detail and have been used prominently in research on labor economics, finance, and innovation (for recent examples, see Hvide and Jones, 2018; Fagereng, Mogstad, and Rønning, 2021; Ring, 2023). Our main data come from the annual tax declarations of all Norwegian public and private limited liability companies and their shareholders for the time period 2003–2018. The declarations identify firms' shareholders, their shareholdings, and all equity purchase, sale, and liquidation transactions. Appendix A describes the data in more detail and provides a complete list of variables used in the paper and their precise definitions. The use of administrative prices diminishes the reporting bias typical in survey studies (Mason and Harrison, 2002). It also captures failures and liquidations, mitigating survivorship bias that often inflates mean

returns in commercial datasets (Brown, Harris, Jenkinson, Kaplan, and Robinson, 2015) or in surveys biased toward successful investors willing to participate (DeGennaro and Dwyer, 2014).

We merge tax declarations with a panel of firm financial statement data, business registry data, bankruptcy registry data, firm incorporation documents, and data on CEOs and board members. We identify board members and executives among all individuals in the tax declarations by fuzzy matching on full names and exact matching on dates of birth. In addition, we obtain individual-level wealth and income data for 2011–2018 from tax returns for a subset of investors who invest in potentially innovative firms (as defined in Kisseleva, Mjøs, and Robinson (2026)).

## **B Sample Selection**

We begin by identifying all newly established limited-liability companies (analogous to C-corporations in the US) that incorporated between 2004 and 2017 in Norway. We remove financial services and real estate firms, newly formed subsidiaries of established companies, holding structures, and firms in industries that are heavily regulated or that have high governmental involvement. During this period, there were 124,348 newly established firms in Norway. Because our focus is on angel investment activity, we restrict the sample to those firms that raised outside equity at any point during our sample period, following the methodology in Kisseleva, Mjøs, and Robinson (2026). Of the 124,348 newly established firms in our sample, 59,272 (47.7%) have at least one outside equity financing round. These include investments from individual investors, but also could include venture investments, government investments, investments from other corporations or financial institutions, or investments from foreigners.

Figure 1 plots annual early-stage equity financing for the population of Norwegian

startups founded between 2004 and 2017. The bars decompose investment amounts into financing provided by entrepreneurs, non-entrepreneur individual investors, and institutional venture capital (VC) investors. Other outside investor types, such as corporations and financial institutions, are omitted from the figure to focus on the comparison between individual investors and institutional VC as sources of early-stage outside capital. The figure shows that non-entrepreneur individual investors provide a large and persistent share of early-stage financing throughout the sample period, often exceeding institutional VC. This magnitude motivates our focus on heterogeneity within the individual-investor class. Over the sample period, non-entrepreneur individual investors account for approximately 10% of all early-stage outside equity financing, compared with 8% from institutional VC, corresponding to an average of USD 587 million per year.

Insert Figure 1 here.

There is no standardized definition of an angel investor across various settings and previous research. Many studies impose wealth restrictions on the set of investors (Lindsey and Stein, 2026; Bach, Baghai, Strömberg, and Warg, 2022; Denes, Howell, Mezzanotti, Wang, and Xu, 2023; Xu, 2023). Other studies focus exclusively on organized angel investor groups as a basis for forming the sample (Mason and Harrison, 2002; DeGennaro and Dwyer, 2014; Kerr, Lerner, and Schoar, 2014; Lerner, Schoar, Sokolinski, and Wilson, 2018). While each of these approaches has certain advantages, our data allow us to examine the entire population of individual investors, which gives us insight into how key results in the literature vary across groups.

Accordingly, we begin from a simple and broad definition of the individual-investor universe: we include any non-founder individual who purchases an equity stake during a financing round of any private firm, provided that the investment is at least NOK 10,000

(approximately USD 1,667). We identify founders as a firm’s CEO and/or contact person in the year of firm inception and the two consecutive years. For firms that do not report a CEO or a contact person, we treat the chair of the board as the founder (this applies to only 2% of our sample). In Norway, many wealthy investors use personal holding companies for tax reasons. Whenever an investment occurs through a holding company, we trace that investment back to the individual behind the holding company. This approach results in a deliberately broad individual-investor sample and does not hinge on any ex ante or ex post classification rules. Of the 59,272 startups with some outside equity, a total of 49,229 firms receive at least one such individual investment from one of 76,338 distinct individual investors.<sup>2</sup> These investors comprise 11.6% of all Norwegian direct equityholders and 1.6% (2.5%) of the entire (working age) Norwegian population.<sup>3</sup> As a benchmark, 21.1% of all individual investors in our sample with wealth data meet US accreditation criteria (USD 1 million net worth or USD 200,000 annual income, measured in the year of investment), very similar to the fraction of US households satisfying these criteria. The fraction satisfying US accreditation criteria rises to 36.8% for investors who make more than one investment in our sample.

A concern with this broad definition is that the individual-investor sample may include investors who are not angels in the economic sense, such as one-time small investors, family members, employees, or other insiders. In a subsample of our data, we can separate family members and employees from outside investors. This sub-sample comprises firms that belong to innovative industries and either possess an English-language name, operate in one of

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<sup>2</sup>Our sample period is 2003–2018, with 2003 being the first investment year, 2018 being the last valuation year, and 2004–2017 being incorporation years. Our analysis focuses on investments up until and including 2017, but utilizes data until 2018, on valuations and investment realizations, to determine investment outcomes.

<sup>3</sup>Sources: Data for the year 2010 from the shareholder registry published by the *Norwegian tax authorities* and population data from *Statistics Norway (SSB)*. Shareholders younger than 18 years are not included in the shareholder registry.

four Norwegian innovation clusters (Oslo, Stavanger, Bergen or Trondheim), or have board members who lives far from the location of the firm. These flags operate in the spirit of Guzman and Stern (2015) and Guzman and Stern (2020), and are shown in Kisseleva, Mjøs, and Robinson (2026) to be highly predictive of innovative outcomes in our setting.<sup>4</sup> We call this the HIP (high innovation potential) sample.<sup>5</sup> In this subsample, we can also identify co-founders when they are employed by the firm.

Furthermore, we define retail investors as non-founder individual investors who make only one investment and invest less than USD 20,000 over the sample period. We classify all remaining individual investors as professional angels. This classification is available for the full sample. Throughout the paper, we reserve the term angel for these non-retail (professional) investors and use individual investors for the broad population.

Appendix Figure C1 shows that the HIP and outside-investor samples are concentrated in industries where early-stage, high-growth financing is most relevant, especially research and development and information technology. At the same time, these samples are not confined to a single sector and retain meaningful industry dispersion. Panel A also shows that firms with multiple outside investors, which identify our within-firm estimates, have an industry composition close to the broader HIP outside-investor sample. They are somewhat more concentrated in research and development and information technology, but they do not represent a fundamentally different industry segment. Panel B shows that professional angel-backed and retail-backed HIP firms have broadly similar industry distributions, with both groups concentrated in research and development and information technology. Retail-backed firms are somewhat more represented in trade and retail, while professional angel-backed firms are somewhat more represented in information technology. Overall, the

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<sup>4</sup>Kisseleva, Mjøs, and Robinson (2026) show that these flags predict VC fundraising, future patenting, receiving innovation grants, realizing an M&A or IPO, and achieving higher-than-average revenue growth.

<sup>5</sup>Due to data privacy concerns, the tax authorities provided information that allows us to identify family members and employees only for this subsample after 2010.

figure helps address the concern that our results are driven by narrow industry composition or by comparing investor types that operate in entirely different sectors.

## C Sample Description

### C.1 Investor and Firm Types

Our sample comprises startups incorporated between 2004 and 2017 and investments observed during 2003–2017, with outcomes measured through December 31, 2018. Table I reports descriptive statistics for individual investors and is organized in two blocks. The first three columns use the full sample of individual investments and separate individual investors into professional angels and retail investors (without being able to observe who are outside investors and who are insiders). The remaining columns focus on investments in HIP firms and distinguish outside professional angels, outside retail investors, and insiders.

In the full sample, we observe 20,915 professional angels making 31,162 investments in 18,645 firms and 55,423 retail investors making 55,423 investments in 36,472 firms. Retail investors are therefore numerous, but by definition each appears only once in the sample. Professional angels are fewer, but invest more often. This distinction is sharper in the HIP post-2010 sample, where we observe 5,253 professional angels, 7,322 outside retail investors, and 5,235 insiders. The share of multi-investor firms is also economically meaningful. In the full sample, 29.3% of angel-backed firms and 26.7% of retail-backed firms have multiple investors. In the HIP sample, these shares rise to 33.6% for professional angels and 24.3% for retail investors, compared with 18.1% for insiders. These multi-investor firms are important for our identification because they allow us to compare investors within the same firm and to separate common firm-level outcomes from investor-specific outcomes.

Appendix Table CI compares HIP firms with one versus multiple outside investors.

Multi-outside-investor firms are larger and more professionally financed: they raise more total equity, are more likely to be VC-backed, and have investors who are wealthier, more repeat-oriented, and more connected to VC-backed firms and investor networks. At the same time, their ultimate outcomes are similar to those of one-outside-investor firms: roughly 74% remain independently operating, about 18% enter bankruptcy or liquidation, and about 8% experience M&A. Appendix Table CII further shows that multi-outside-investor firms have a thicker upper tail of firm-level returns and lower total-loss rates than the broader HIP outsider sample. Thus, the within-firm sample is not random: it consists of larger, more professionally financed firms with greater right-tail potential. This selection affects the external validity of the within-firm estimates, which are most informative about firms with multiple outside investors. It does not mechanically explain the within-firm coefficients, because those specifications include firm fixed effects and compare heterogeneously positioned investors within the same firm.

## **C.2 Investment and Investor Characteristics**

The investment-characteristics rows in Table I show that professional angels and retail investors differ sharply in scale. In the HIP post-2010 outsider sample, the mean professional angel investment is USD 104.6 thousand, compared with USD 4.7 thousand for retail investors. Professional angels are also much wealthier: average gross wealth is USD 2.74 million, compared with USD 0.39 million for retail investors. Almost half of professional angels in the HIP sample are repeat investors. Professional angels also have substantially stronger professional networks and experience. They are more likely to have prior links to VC-backed firms, prior board experience, same-industry board experience, and larger investor and board networks. For example, 18.8% of professional angels have prior links to VC-backed firms, compared with 3.4% of retail investors; 81.3% have prior board experience,

compared with 47.1%; and 47.6% of professional angels have board experience in the same industry as the focal firm they invest in, compared with 24.1%. Retail investors are therefore not simply smaller versions of professional angels. They are smaller, less wealthy, and less embedded in the professional networks that define angel investing in our hypotheses.<sup>6</sup> These patterns support the idea that retail investors and professional angels are economically different investor types. This distinction is important for interpreting the evidence through the lens of Denes, Howell, Mezzanotti, Wang, and Xu (2023). However, some retail investors may have professional attributes, while some repeat investors may have limited access or expertise. The relevant economic distinction is therefore whether the investor has the access, experience, and networks associated with professional investing.

Insiders form a separate comparison group. In the HIP sample, insiders invest smaller amounts than professional angels but larger amounts than retail investors. Their wealth, prior VC-backed-firm links, board experience, same-industry board experience, and network measures are much closer to retail investors than to professional angels. At the same time, insiders have founder links similar to professional angels. This pattern is important for interpretation. Insider returns may reflect founder proximity, employment ties, private information, or nonfinancial motives. We therefore separate insiders from outside investors throughout the analysis rather than pooling them with professional angels or retail investors.

The HIP post-2010 sample is not intended to be a random subsample of all private capital markets. It is the theoretically relevant setting for our tests because the mechanisms we study—access to high-upside opportunities, professional networks, board experience, and follow-on financing—are most likely to matter among firms with high innovation potential. At the same time, comparing the full-sample and HIP columns is useful for assessing external validity. The ordering of investor types is stable across samples. Professional angels

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<sup>6</sup>This holds in a multivariate regression framework as shown in Appendix Table CVI Columns (1) and (2).

are larger, wealthier, more repeat-oriented, and more professionally connected than retail investors in both the full sample and the HIP sample. Retail investors in the HIP sample look broadly similar to retail investors in the full sample. They remain investors with weaker networks than professional angels and their average investment amount is even smaller in the HIP sample than in the full sample, USD 4.7 thousand versus USD 6.1 thousand, while their average wealth and professional-network measures remain low relative to professional angels. This similarity helps address the concern that the HIP sample represents an entirely different retail-investor population: The HIP sample changes the type of firms being financed more than it changes the basic characteristics of retail investors.

### C.3 Investment Performance

Table I also reports investment performance measured by realized *buy-and-hold annualized returns (BHAR)*, adjusted BHAR, and full BHAR. Realized BHAR is based on observed realization transactions. Adjusted BHAR additionally treats investments as total losses when firms have no revenues for five consecutive years after investment and no subsequent equity financing. Full BHAR assigns unrealized shares the most recent observed share price from the latest financing round. The return statistics connect to the previous literature on the return skewness (Mason and Harrison, 2002; DeGennaro and Dwyer, 2014; Korteweg and Sorensen, 2017). Despite our sample being in a small country, and despite using a particular definition of angel/startup, we still observe skewness patterns consistent with previous literature. In the HIP sample, professional angels have higher mean realized, adjusted, and full BHAR than retail investors. They also have fewer total losses and higher rates of large outcomes. Professional angels have a total-loss rate of 13.8%, compared with 15.6% for retail investors. Their investments are also more likely to exceed a *Total-Value-to-Paid-In-Capital* (TVPI)<sup>7</sup> of

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<sup>7</sup>Appendix B describes in detail our returns measurement.

two: 13.4% of professional angel investments do so, compared with 8.7% of retail investments. At the same time, the probability of very large outcomes is similar across the two groups: 5.6% of professional angel investments and 5.2% of retail investments exceed a TVPI of five. Thus, the descriptive statistics do not imply that retail investors never participate in home-run outcomes. Instead, they show that professional angels combine larger capital commitments, stronger professional networks, fewer losses, and somewhat better upper-tail outcomes, while retail investors can still appear in the extreme right tail.

Appendix Tables CIII–CV provide additional detail on the return distribution. Returns are highly skewed under all measures. In the full sample, median realized BHAR is negative, while the 95th and 99th percentiles are very large. Including unrealized positions under full BHAR creates a mass at zero because many investments are held at cost, but the right tail remains substantial. In the HIP outsider sample, professional angel investments have a thicker upper tail than retail investments: the 90th and 95th percentiles of full BHAR are higher for professional angels than for retail investors (while the p99 values are similar). Alternative return measures lead to the same conclusion. Full TVPI has a median of one but a large upper tail, and several alternative public-market-equivalent (PME) measures show that the typical individual investment underperforms broad public equity benchmarks while market-adjusted returns in the upper tail remain economically large.

Overall, Table I establishes three facts that guide the analysis. First, individual investors represent a heterogeneous source of startup finance. Second, professional angels, retail investors, and insiders differ sharply in invested capital, experience, networks, and investment behavior. Third, investment returns are strongly right-skewed, so investor heterogeneity should be evaluated not only through average returns but also through exposure to home-run outcomes.

### III Are Some Angels Better than Others?

First, we quantify how much of the variation in investment returns is attributable to persistent differences across investors as opposed to investment-specific factors. We estimate the following regression model:

$$\begin{aligned} \text{BHAR}_{ijk} = & \alpha_j + \delta_k + \sum_{s=2003}^{2017} \gamma_s \times \mathbf{I}(\text{Entry year} = s) \\ & + \sum_{q=0}^{55} \psi_q \times \mathbf{I}(\text{Entry age} = q) + \varepsilon_{ijk}, \end{aligned} \quad (1)$$

where  $i$  denotes firm,  $j$  denotes investor, and  $k$  denotes industry. The dependent variable is one of the three gross BHAR measures: realized BHAR, adjusted BHAR, and full BHAR, all winsorized at the 0.5th and 99.5th percentiles. The investor fixed effect  $\alpha_j$  captures time-invariant, unobserved investor-specific characteristics, while  $\delta_k$  denotes industry fixed effects. The variable  $\psi_q$  captures firm-age dummies, in quarters, while  $\gamma_s$  denotes fixed effects for the investment calendar year. The variable  $\varepsilon_{ijk}$  is the idiosyncratic error term.

Figure 2 reports the key statistic,  $\rho$  (rho), which is the fraction of the residual variance that is absorbed by variance across investors<sup>8</sup>. Formally,  $\rho = \frac{\sigma_\alpha^2}{\sigma_\alpha^2 + \sigma_\varepsilon^2}$ , where  $\sigma_\alpha^2$  is the variance of investor-specific effects, capturing persistent differences across investors, and  $\sigma_\varepsilon^2$  is the variance of idiosyncratic error, capturing within-investor variation. A higher  $\rho$  indicates that most return variation stems from investor-level heterogeneity; a lower  $\rho$  indicates that variation is driven primarily by firm- or deal-specific factors.

Insert Figure 2 here.

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<sup>8</sup>The full sample consists of 86,585 firm-investor observations. Within-investor variation is driven by 7,592 unique investors with multiple investments, who account for 17,839 of the total firm-investor observations. The remaining 68,746 observations represent singleton investors (those with only one investment) who contribute to the overall variance components but do not identify the within-investor coefficients. This investor-level count is distinct from the investment-level *Repeat investor* indicator in Table I, which flags investments preceded by an earlier investment by the same investor.

Across all measures, the estimates show that, among investors observed in more than one investment, roughly one-third of return variation is associated with persistent differences across investors, and that this component is stable after controlling for calendar time, firm age, and industry composition.<sup>9</sup> In other words, one-third of the overall variation in investment returns can be attributed to systematic differences across investors. The remaining two-thirds reflect investment-specific idiosyncratic variation stemming from within-investor differences across different investments, reflecting luck, deal-specific factors, or time-varying investor behavior. This evidence suggests that investor heterogeneity, whether driven by skill, preferences, or other stable characteristics, plays a substantial role in explaining performance differences.

We now turn to the channels through which investor heterogeneity may arise. To do so, we construct a predicted investment-performance measure. Specifically, predicted investment performance is the fitted value from the pooled OLS regression estimated as follows:

$$\text{Full BHAR}_{ij} = \alpha + X'_{ij}\beta + \sum_s \gamma_s \mathbf{I}(\text{Entry year} = s) + \sum_q \psi_q \mathbf{I}(\text{Entry age} = q) + \epsilon_{ij}, \quad (2)$$

where  $i$  denotes firm and  $j$  denotes investor. The dependent variable is (gross) full BHAR winsorized at the 0.5th and 99.5th percentiles. The vector  $X$  includes pre-investment investor characteristics. Wealth is proxied by *Public investment* in the domestic public stock market.<sup>10</sup> Our main experience measures are *Prior board experience*, which indicates whether the investor held a board position prior to the angel investment<sup>11</sup>, and the interaction with

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<sup>9</sup>Slightly increasing up to 36% when considering full BHAR.

<sup>10</sup>In the further analyses when restricting observations to the HIP post-2010 sample, we can directly measure gross wealth, which is the investor's taxable gross wealth net of tax-related value discounts but before any debt deduction.

<sup>11</sup>We use annual data on board and CEO-positions in all Norwegian firms starting in 1998.

*Same industry* which indicates a prior board position in a firm in the same industry as the focal investment. *Prior focal founder link* indicates whether the investor was connected to the focal startup founder, either through a board or joint investments in another firm, prior to the observed angel investment. *Prior VC-backed firm link* indicates whether the investor was similarly connected to a VC-backed firm prior to the angel investment. *Prior investor links* and *Prior board links* control for the number of individuals the investor was connected to through joint investments or board positions, respectively, and are equal to one for at least five such connections. The fixed effects  $\gamma_s$  and  $\psi_q$  denote investment calendar-year fixed effects and firm age-at-investment (in quarters) fixed effects, respectively.

Predicted investment performance is defined as the fitted value from Equation 2. The estimates used to construct this measure are reported in Column (5) of Appendix Table CVI. We then sort investments into three groups based on this predicted performance: at or below the median, above the median and at or below the 75th percentile, and above the 75th percentile. This construction allows us to ask whether investors whose observable attributes predict higher performance are disproportionately represented in the right tail of startup returns.<sup>12</sup>

Table II reports linear probability models in which the dependent variables indicate mutually exclusive intervals of the BHAR distribution. Panel A focuses on outside individual investors in the sample of HIP firms. The results show that predicted performance is not associated with a broad shift across the middle of the return distribution. Instead, the top predicted-performance group is concentrated in the right tail. Relative to the omitted low predicted-performance group, the top group is 1.6 percentage points more likely to fall

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<sup>12</sup>Appendix Table CVI Columns (3)–(8) reveal that the explanatory power of these average-return OLS-regressions is low. This is not surprising in a setting where startup returns are highly skewed. The central prediction in Denes, Howell, Mezzanotti, Wang, and Xu (2023) is not that professional investors earn slightly higher average returns, but that professional investors have access to investment opportunities with fatter right tails. We therefore turn from average returns to the full return distribution.

between the 90th and 95th percentiles and 2.4 percentage points more likely to exceed the 95th percentile. Importantly, this right-tail exposure does not come with a higher probability of losses: the loss coefficient for the top group is small and statistically insignificant. The middle group, by contrast, is more likely to appear between the 90th and 95th percentiles, but it is also 4.0 percentage points more likely to experience a negative return and shows no statistically significant increase above the 95th percentile. Thus, among outsiders, the professionalization-based performance measure identifies investors with home-run exposure: better outside investors earn higher overall returns by disproportionately accessing right-tail investment outcomes, not by taking on more downside risk.

Insert Table II here.

Panel B shows a different pattern for insiders in the HIP firms. The top predicted-performance group is also more likely to exceed the 95th percentile, by 3.3 percentage points. However, this group is also 3.6 percentage points more likely to experience a loss, and the increase in losses is larger than the increase in home-run outcomes. Rather than facing a right-skewed distribution, top predicted-performance insiders simply face a higher-variance distribution. This contrast reinforces the interpretation that better *outside* investors disproportionately access right-tail returns: investors who are connected to the founder by family or employment ties presumably are not applying the same investment criteria that an outside investor would apply to an arm’s-length investment.<sup>13</sup>

The evidence thus far indicates that some angels systematically outperform others. The decomposition in Figure 2 illustrates that around 30-35% of the overall variation in returns is attributable to time-invariant investor fixed effects. The regression evidence demonstrates that they do this by disproportionately participating in right-skewed outcomes. They

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<sup>13</sup>Appendix Table CVII reports analogous distributional regressions in the full sample and the restricted sample of HIP firms. The broader-sample results show the same shift away from zero returns and toward the upper tail, but they also load on negative returns, because they pool both investor types.

are more likely to hit home runs, not less likely to strike out. In the remainder of our analysis we explore why this occurs.

## IV Why are Some Angels Better than Others?

### A Decomposing the Overall Variation in Returns

Table III allows us to relate investor characteristics to two channels that could affect return differences: differential selection into high-performing firms, and better investment outcomes relative to other investors in the same firm. To do this, we decompose our panel into between-firm and within-firm differences in outcomes in a manner reminiscent of Mundlak (1978).<sup>14</sup>

In columns (1)–(4), the dependent variable is a dummy variable that takes on the value one if the firm-level return is in the top decile of firm-level returns. To compute a firm-level return across a range of investors who are potentially purchasing and selling at different points of time and at different prices, we take the investment-amount-weighted average of the individual investor BHARs. On the right-hand side, we collapse the investor characteristics to the firm level by averaging the amount of retail participation and by taking the max of the indicator variables; the interpretation is then whether the firm has *any* investor with those characteristics. To capture the idea that a wealthy investor may dominate a particular investment, we take the max of investor wealth when we aggregate, so that the interpretation of the variable is the wealth of the richest investor in the firm.<sup>15</sup>

The loadings on the retail investor variable and the wealth measure give us a first test of the deep pockets hypothesis discussed in Section I. In column (1), firms with greater retail

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<sup>14</sup>Strictly speaking, ours is not a Mundlak (1978) decomposition because of the way we collapse some of the independent variables, as we explain below.

<sup>15</sup>Because we are not simply taking firm-level averages, we depart slightly from the strict implementation of the Mundlak decomposition.

participation are less likely to have top-decile firm-level returns, while firms with wealthier investors are more likely to do so. Column (2) adds fixed effects for the firm age at the time of the first investment to control for time-series variation in fundraising, and the results are largely unaffected. Wealth differences vanish entirely when we control for investment size in column (3), which supports the deep-pockets hypothesis because it suggests that wealth effects operate primarily through a check-size effect. These results are unaffected when we further add firm controls: an indicator for firms in the top quartile of total equity raised during the sample period (i.e., whether it is a capital-intensive firm), an indicator for whether the firm had positive assets in the year before the earliest investment, an indicator for experienced founders and an indicator for whether the firm receives VC investment during the sample period. (We explore these in more detail below.) Indeed, when we look at within-firm regressions in columns (5)–(7) we see that retail investors perform better, and wealthier investors perform worse, but this vanishes when we control for investment amount. The within-firm results speak against a privileged access channel, inasmuch as that channel predicts that wealthier investors would do better than other investors in the same firm. Taken together, this suggests that the wealth channel primarily operates through a deep pockets effect rather than privileged access, and that retail investors earn higher returns because they receive small-stakes allocations early in a firm’s life.

The between- and within-firm loadings on measures of prior board experience allow us to contrast the skills hypothesis and the discernment hypothesis. Measures of prior business experience are muted in the cross-section (columns 1-4), although same-industry prior board experience is weakly associated with better performing firms, and the effect is about ten times larger than that of having any prior board experience. This evidence provides perhaps modest support for the discernment hypothesis because it suggests that firms which receive investment from at least one investor with same-industry board experience are somewhat

more likely to experience top-decile returns, but the evidence is weak. Adding firm controls in column (4) does not change the interpretation, while the investment amount coefficient itself is absorbed by the firm controls.

In contrast, the within-firm estimates (columns 5–7) provide much stronger evidence in favor of the skills hypothesis. The loading on prior board experience in the same industry is highly statistically significant in all specifications. In these specifications, the investment timing fixed effects hold constant the firm-age quarter in which the investor made the equity purchase, therefore the loadings in columns (6) and (7) account for the fact that earlier-round investments may be more likely to have board seats (see, e.g., Kaplan and Strömberg, 2003).

Insert Table III here.

The remaining variables in Table III allow us to explore the role of connections in explaining differences in returns. Firms with at least one investor connected to a VC-backed firm are significantly more likely to experience top-decile firm returns, but no other measures of business connections are robustly associated with cross-sectional differences in firm-level outcomes. Given that the presence of an investor with prior connections to VC-backed firms could also merely reflect characteristics of the focal firm itself, we interpret this as only weak evidence in favor of business connections. Prior business linkages in general have little ability to explain within-firm differences in investor returns. The only exception is whether the investor has a prior connection to the focal firm founder. In this case, investors are significantly more likely to experience top-decile returns than others in the same firm, but this effect is largely driven by time-of-entry. In other words, comparing columns (5) and (6) suggests that investors who are connected to firm founders are early investors in the firm—relative to other investors in the same firm, their performance is similar, but they are more likely than later investors to experience top-decile returns.<sup>16</sup>

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<sup>16</sup>Appendix Tables CVIII and CIX repeat the between- and within-firm analysis separately for two groups

Table IV examines this directly. The evidence strongly supports a timing-and-pricing interpretation for founder ties. Founder-connected investors enter about 0.7 quarters earlier and pay about 9.8% lower purchase prices than unconnected co-investors in the same firm. The founder-tie advantage therefore arises at entry rather than exit. This explains why the founder-link coefficient in Table III attenuates once firm-age-at-investment fixed effects are included: founder-connected investors do not select firms that perform better on average, but they obtain more favorable entry timing and prices inside the same firm. Unlike direct founder ties, neither broad network measure (board or investor links) provides preferential investment terms.

The wealth channel displays the opposite pattern. Wealthier investors enter later, pay higher purchase prices, and are less likely to realize their positions during the sample period. A one-log-point increase in gross wealth is associated with a 5.2% higher purchase price. Thus, wealth does not generate better investor-specific terms; if anything, wealthier investors enter at less favorable percentage-return terms. This reinforces the deep-pockets interpretation: wealth matters because it allows investors to finance larger and more capital-intensive firms, not because wealthier investors bargain for better terms within a firm.

Insert Table IV here.

Finally, timing and pricing do not explain the same-industry experience premium. Investors with same-industry board experience do not enter at lower prices, and their within-firm return premium is not absorbed by the purchase-price channel. Taken together, the evidence shows that wealth operates through capital supply and firm selection; VC links through firm-level access and financing; founder ties through preferential timing and pricing; and same-industry experience through governance and business input.

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of identified insiders: family members and employees. The estimates do not reproduce our central results for outside angel investors.

At the same time, Table IV also reveals a pronounced association between board participation and entry terms. Investors who take a board seat enter approximately 0.7 quarters earlier and pay about 22.9% lower purchase prices than other investors in the same firm. Because this pricing difference is not explained solely by board members investing at an earlier stage of the firm’s life, board participation appears to represent a distinct margin.

Appendix Table CX replicates the analysis for the full sample of individual investments. The results are qualitatively similar to the main estimates and Appendix Table CXI shows that the principal entry-side patterns extend to the full population, which helps rule out the concern that the findings are an artifact of the HIP post-2010 sample construction. Instead, the evidence suggests that the mechanisms we identify operate more broadly in private capital markets. Because the full sample does not allow us to separate outsiders from insiders, and because gross wealth is not observed for all investors, we rely on the HIP outsider sample for the main tests. In the remainder of the paper we analyze our channels in greater detail.

## **B Monitoring, Control, and the Returns to Prior Experience**

The results in Table III indicate that measures of prior experience are important for understanding why some investors earn higher returns than other investors in the same firms. To dig deeper into this phenomenon, Table V explores how measures of prior experience are related to engagement in the focal firm.

In the first three columns of Table V, the dependent variable is a dummy variable for whether the investor holds a board seat in the focal investment. The regressions include firm fixed effects, so the comparison is between investors in the same firm. All right-hand side variables are measured at the individual investor level as of the time of their investment.

In column (1) we see that retail (i.e., one-time, small-stakes) investors are significantly

less likely to take a board seat, but this disappears in columns (2) and (3) when we control for the size of the investment amount. This indicates that large investors receive monitoring and control rights associated with their investment, and that retail investors are (by construction) unlikely to be large investors in the firm.

Insert Table V here.

Controlling for investment amount, wealthier investors are significantly less likely to receive board seats than others. This further reinforces the deep pockets hypothesis, because it provides further evidence that the main role of wealth is simply to facilitate large capital injections. There is no evidence that these wealthier investors are more likely to receive additional control rights associated with their investment.

Columns (1) and (2) show that prior board experience in the same industry, on the other hand, is highly predictive of holding a board seat in the focal firm. In column (3) we decompose the broader measure of holding a prior board seat in the same industry based on whether the seat is still active, and whether it is in a public, private or newly founded business. The public board seat variable is statistically weaker, but all measures are positively associated with holding a board seat in the focal firm. The broader board-network measure has an additional association with governance participation. Investors with at least five prior board connections are approximately 5.5 to 6.4 percentage points more likely to take a board seat in the focal firm, even after controlling for investment amount and detailed measures of prior board experience. Prior co-investment links do not show a comparable positive association. Thus, board links appear to capture access to or suitability for governance roles, whereas investor links capture a different form of professional connectedness.

How does holding a board seat relate to right-tail investment realizations? Columns (4)–(6) explore this question. Across each of the columns, there is a positive and statistically

significant relationship between holding a board seat and realizing top-decile returns. Because we include firm fixed effects, the interpretation of the point estimate is that investors who hold board seats are considerably more likely than non-board members to earn top-decile returns. This comparison holds relative to all other investors (column 4), it is robust to including the investment amount (column 5), and it holds relative to other investors in the same round (column 6). In addition, the prior board seat variables, which predicted greater within-firm likelihood of a top-decile return in Table III, become insignificant when the variable for holding a board seat in the focal firm is included. This suggests that an important reason why some angel investors are better than others is that some possess industry- and startup-relevant business management skills and earn rents on applying those skills to the firms in which they invest.

When Column (7) controls for purchase price, the board-seat coefficient becomes small and statistically insignificant, indicating that the board-associated return premium is concentrated in more favorable entry terms; this is consistent with those terms compensating investors for the skills and involvement they are expected to provide. Appendix Table CXII shows that the determinants of board participation and their association with top-decile returns are highly similar in the full population.

To push this analysis further, Tables VI and VII examine post-investment firm outcomes. The unit of observation is the firm-investment-round level, where an investment round comprises all investments in a firm occurring in a given calendar quarter. Table VI focuses on subsequent financing outcomes: whether the firm raises a follow-on round, whether later financing comes from investors connected to the focal-round investors, and whether the firm receives subsequent VC financing. Table VII focuses on firm operational and exit outcomes: bankruptcy or liquidation, M&A or IPO, and five-year revenues. The odd-numbered columns measure whether at least one investor in the focal round has the relevant attribute.

The even-numbered columns ask whether the investor attribute is paired with a board seat in the focal firm.

Table VI shows that wealth is related to subsequent financing, consistent with the deep-pockets interpretation that wealthy investors are matched to firms with greater capital demand. However, when the wealthiest investor also holds a board seat, the association with follow-on financing is negative, and there is no corresponding increase in subsequent VC financing. Thus, investor wealth appears to operate by matching investors to firms with high capital demand. There is no evidence that an investor’s wealth adds value to the firm in any other way.

Insert Table VI here.

Founder-linked investors are associated with a lower probability of any follow-on financing. Conditional on a follow-on round occurring, however, founder ties strongly predict participation by connected individual investors. Prior links to VC-backed firms predict whether the firm raises another round, but they do not independently predict subsequent VC financing after controlling for whether the firm was already VC-backed in the focal or an earlier round. The corresponding indicator for a VC-linked investor who also holds a board seat is positively associated with both follow-on financing and subsequent VC investment. This pattern is consistent with VC-ecosystem connections being most closely associated with institutional financing access when paired with active governance participation.

Finally, the evidence shows that the two broader network measures operate through different financing margins. Prior co-investment links predict follow-on financing and connected follow-on investors, especially when the connected investor takes a board seat, but they do not predict subsequent VC financing. Prior board links do not predict the occurrence of a follow-on round, but they do predict connected-investor participation conditional

on a later round. Thus, Table VI shows that different connection types map into different financing margins.

Table VII examines whether these same investor attributes are associated with operating and exit outcomes. Wealth again shows little evidence of a positive treatment channel. Neither the wealth of the wealthiest investor nor the presence of the wealthiest investor on the board is significantly associated with bankruptcy or liquidation, M&A/IPO, or five-year revenues. This reinforces the interpretation that wealth matters primarily through financing capacity and selection into capital-intensive firms rather than through post-investment operating value-added.

Insert Table VII here.

The clearest evidence on operating outcomes comes from same-industry board experience. Rounds with an investor who has prior board experience in the same industry are followed by a significantly lower probability of bankruptcy or liquidation and substantially higher five-year revenues (among firms with positive revenues). The same pattern appears when the same-industry experienced investor holds a board seat. These results are consistent with the skill hypothesis: industry-relevant experience is most closely associated with real outcomes when it is paired with a governance role in the focal firm.

The remaining network variables point to different outcome margins. Founder-linked investors are associated with higher five-year revenues, especially when the founder-linked investor also holds a board seat, but they are not significantly associated with bankruptcy or M&A/IPO. Prior VC-backed-firm links show no improvement in operating or exit outcomes; if anything, VC-linked rounds are associated with lower M&A/IPO probabilities and lower five-year revenues. This pattern can be indicative of VC-linked investors being involved in firms with longer gestation periods or greater financing needs, rather than firms with

immediate operating or exit improvements. Broad investor links display yet another pattern: they predict positive M&A/IPO outcomes, especially when the connected investor holds a board seat. In contrast, prior board links show no significant relationship with failure or exit, whether or not the board-connected investor takes a seat in the focal firm. The exit association is therefore specific to the capital-provider network rather than a consequence of network breadth generally.

Taken together, Tables VI and VII provide further evidence on the specific mechanisms by which wealth, experience and social connections affect firm outcomes. Wealth is associated with financing scale but not with post-investment value-added. Same-industry prior board experience is associated with lower failure risk and stronger operating outcomes, especially when the investor in question takes a board seat in the focal firm. VC ecosystem links are associated with subsequent financing access, but not with better operating or exit outcomes. Founder and broader investor links operate through relationship-based follow-on financing and, for broader investor links, exit outcomes. The fact that the results are generally stronger when investors take board seats speaks to an active ownership channel, whereby investors affect firm outcomes through their involvement in the organization. Appendix Tables CXIII and CXIV replicate the analyses in the full sample. The main financing–network and operating outcomes–experience results generalize strongly. These results show that investor attributes are not interchangeable. Wealth supplies financing capacity, relevant experience is most closely associated with operating performance, and networks help mobilize and sequence additional capital.

## **C More Evidence on Wealth and Social Connections**

The results in Table III also suggest that wealth differences play a role in explaining returns, but that these primarily arise through a deep-pockets mechanism, whereby greater wealth

allows investors to write checks to firms with larger capital requirements. To explore this channel in more detail, Table VIII correlates investor characteristics and firm characteristics.

Retail investor status is defined by making one-time, small-stakes investments in our data, but in Table I we see that they are considerably less wealthy, on average, than professional angel investors. In keeping with the idea that their lower wealth makes them a poor match for firms with higher capital requirements, we find that they sort into firms with smaller investment round sizes, firms that require less overall equity, firms with no assets, and firms founded by inexperienced founders. They are unlikely to invest in firms that receive VC funding. In contrast, the richer the wealthiest investor, the more likely the firm is to have higher capital requirements, larger round sizes, and to have VCs as co-investors. Wealthier investors participate in larger rounds, more capital-intensive firms, and firms with assets and salary expenses; they are also more likely to have VC co-investors.

Insert Table VIII here.

The two broader network measures are associated with different types of firms. Investors with many prior investor connections participate in larger rounds and in firms that raise more equity over the sample period, consistent with these links capturing access to a capital-provider network. Investors with many prior board links also participate in somewhat larger rounds, but they are not significantly more likely to invest in capital-intensive firms. Instead, board-connected investors match with firms that already report assets or revenues and with wealthier founders. Board networks therefore appear to capture relationships within a more established professional and governance environment, rather than access to capital providers alone. These patterns reinforce the distinction between capital-provider connections and governance connections.

In general, firms with greater capital requirements have investors with deeper pockets and better investor-related connections. These are generally firms that are founded by ex-

perienced founders. Appendix Table CXV also shows that the principal matching patterns are not confined to HIP firms. Table VIII therefore clarifies why wealth appears related to performance in the cross-section. The evidence is thus not that financial capital is unimportant. Rather, its role is narrower: it relaxes financing constraints and determines matching to capital-intensive firms, while human and social capital operate through margins that additional dollars alone do not reproduce.

## V Policy Implications

Although the evidence in this paper cannot be interpreted in terms of policy counterfactuals, our findings nevertheless offer perspectives on a number of policy discussions connected both to household finance and to entrepreneurship. We briefly discuss these here.

Private firms have become increasingly able to raise substantial amounts of capital while remaining private, shifting a larger share of firm value creation to the period before public listing (Ewens and Farre-Mensa, 2020). This development has generated interest in expanding household access to private markets. Gocmen, Martinez-Toledano, and Mittal (2026) document the growing participation of high-net-worth individuals in early-stage private markets and show that unequal access to private investment opportunities can contribute to income and wealth inequality. They also emphasize that broader participation does not necessarily equalize outcomes: the distributional effects depend on whether new investors obtain access to comparable investments, terms, and net returns.

Our findings highlight the importance of distinguishing between formal eligibility to make an investment and effective access to investments. In our data, retail investors sometimes participate in extreme right-tail outcomes, but professional angels invest more capital, have stronger professional networks and more relevant business experience, experience fewer

total losses, and are more likely to earn high returns. The mechanisms behind these results further suggest that wealth is only one component of professional angel investing; experience and connections are also important. Lowering wealth or accreditation thresholds changes who is eligible to invest, but makes no distinction as to whether investors possess the skills or background associated with the investment performance differences we demonstrate. Put differently, accreditation rules screen on financial capital alone, while the returns we document accrue largely to human and social capital, which eligibility rules neither require nor confer. Moreover, because our estimates are cross-sectional correlations among current market participants, they cannot predict the characteristics or performance of the counterfactual investors who would enter the market under lower thresholds.

Our findings also speak to policy efforts to stimulate early-stage investment activity. These efforts are global in scope.<sup>17</sup> Policy initiatives that work by subsidizing the ex ante cost of a dollar of investment seem to have limited success, while policies, like qualified small business stock (QSBS) exemptions, that operate by reducing the ex post tax-burden of positive returns show stronger effects. For example, the evidence in Denes, Howell, Mezzanotti, Wang, and Xu (2023) indicates that investment subsidies to early-stage investors increase the quantity of angel investing but do not improve entrepreneurial outcomes, while Chen and Farre-Mensa (2026) show that QSBS exemptions generate increases in new business formation and patenting. Our findings bridge this gap by illustrating the importance of non-financial investor traits. Given that the active involvement of investors with startup-specific skills and connections is an important determinant of returns, a natural concern is that increasing access to investors who do not necessarily possess specific skills or experience would be associated with the low average returns we document here, not the home-runs that

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<sup>17</sup>See, e.g., the Draghi Report on EU Competitiveness [https://commission.europa.eu/topics/competitiveness/draghi-report\\_en](https://commission.europa.eu/topics/competitiveness/draghi-report_en) for European efforts, or OECD (2020), OECD (2010), U.S. Small Business Administration (2019), U.S. Congress (2012). Lerner (2009) provides a critical review.

better angels are able to generate.

This in turn suggests that skilled intermediaries could well play an important role in policy objectives aimed at stimulating entrepreneurship and increasing household wealth. Balloch, Mainardi, Oh, and Vokata (2025) find that individuals investing through private-equity funds perform similarly to institutional investors on average, but also document substantial performance differences across the wealth distribution related to advisor quality and intermediary fees. The consequences of broader private-market participation therefore depend not only on eligibility, but also on the investments actually available to households, the terms and fees they face, and the net returns they receive.<sup>18</sup>

## VI Conclusion

This paper provides large-scale evidence on the returns to angel investing. We assemble detailed, investment-level, time-series data from Norwegian equity transaction records, linking private company investments to individual investors and connecting those investors to firm financial statements, board seats, and the broader corporate network. Using effectively the full universe of angel investments in Norway from 2003 to 2017, with outcomes measured through 2018, we first show that there are pronounced investor-level differences in average returns, and that differences in average outcomes arise through a greater likelihood of experiencing return realizations in the far right-tail of outcomes. Better average returns are a manifestation of better access to outlier returns. To use a baseball metaphor, some angels are better than others, and better angels are better at hitting home runs, not better at hitting singles and doubles or avoiding strike-outs.

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<sup>18</sup>The crowdfunding literature similarly emphasizes that broad investor participation can expand financing and generate information, but that its efficiency depends on screening, information aggregation, and agency problems; see, for example, Strausz (2017) and Brown and Davies (2020).

The main contribution of the paper is to provide evidence for why this happens. We explore three main channels: wealth, experience and connections. Wealthy investors invest in firms that generate higher returns; this mostly occurs because their deeper pockets allow them to invest in firms that have greater financing needs, which in turn perform better on average than firms with more modest financing needs. Like wealthier investors, investors with prior connections to VC-backed firms also tend to match with better performing firms, especially those with greater financing needs. Their affiliations predict subsequent fundraising when they take an active governance role in the firm in question. In this sense, connections also matter. Among broader professional networks, prior co-investment links are associated with later individual financing and exit outcomes, whereas prior board links are associated primarily with governance participation and matching to more established founders and firms.

These findings offer a cautionary perspective on policy efforts to expand retail access to investments in early-stage innovation. While policy levers can alter who is eligible to invest, they do not alter the set of skills and business experiences that investors bring with them when they make these investments. Policy can relax the financial-capital constraint, but it cannot endow new entrants with the human and social capital that earn the rents we document. To the extent that these mechanisms persist among new entrants, broadening the investor base to include small-stakes investors with limited business-relevant prior experience would increase the supply of early-stage capital without a corresponding increase in the complementary inputs associated with successful outcomes—though we emphasize that cross-sectional evidence on current market participants cannot predict the characteristics or performance of counterfactual entrants. The findings also carry an implication for household finance: in an asset class in which total losses are common and the median investment loses money, and in which outsized returns accrue disproportionately to investors with industry

expertise, governance involvement, and professional networks, direct angel investing is unlikely to offer a reliable path to wealth accumulation for the typical affluent household. This in turn raises a number of important questions for future research related to the role that intermediation plays in these settings.

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Figure 1: Sources of Early-stage Financing

Figure 1 plots the total amount of early-stage equity financing by investor type for the population of Norwegian startups founded between 2004 and 2017. The bars decompose annual investment amounts into financing provided by entrepreneurs, non-entrepreneur individual investors, and institutional venture capital (VC) investors. Other outside investor categories—including corporations, financial institutions, government investors, and foreign investors—are omitted from the bars but remain included in the denominator used to calculate aggregate financing shares. Amounts are reported in million USD.

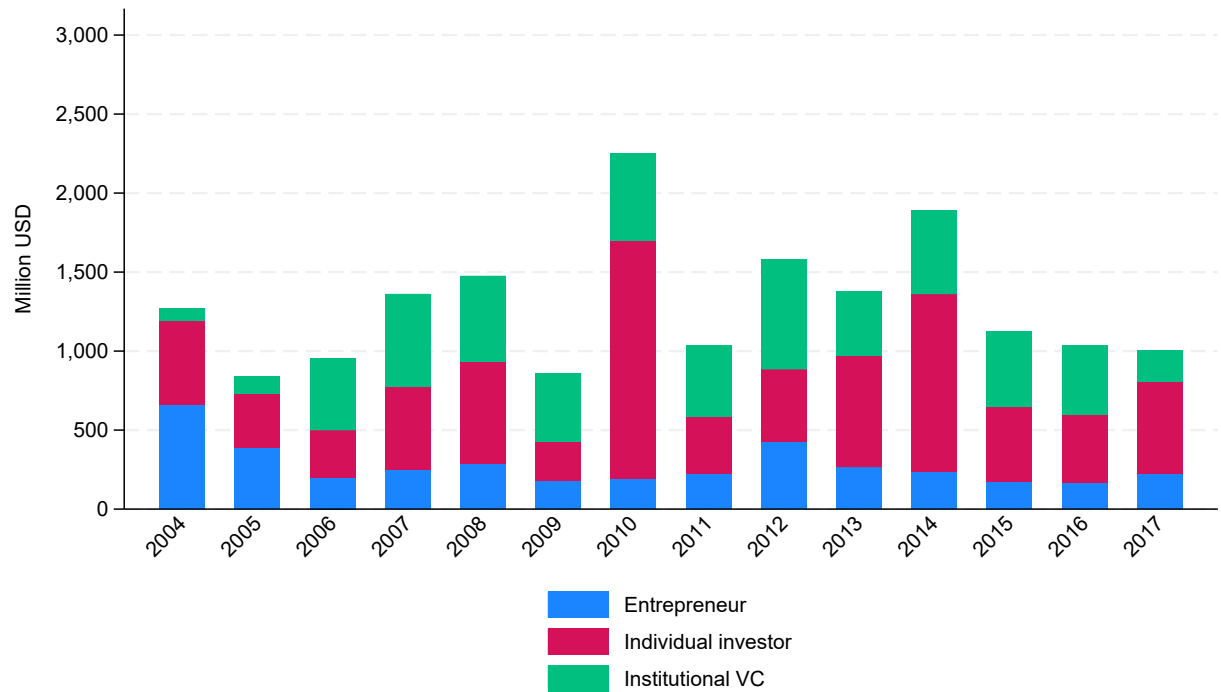


Figure 2: Persistent Investor Heterogeneity in Returns

Figure 2 plots the proportion of total variance in investment returns attributable to persistent, time-invariant differences between investors ( $\rho$ ).  $\rho$  is estimated from investor fixed-effects regressions as shown in Equation 1 using three different (gross) return measures: *realized BHAR*, *adjusted BHAR*, and *full BHAR*, all winsorized at the 0.5th and 99.5th percentiles. For each return measure, the bars add controls sequentially. Black bars include investor fixed effects only; blue bars add investment calendar-year fixed effects; red bars add firm age-at-investment fixed effects; and orange bars add industry fixed effects.

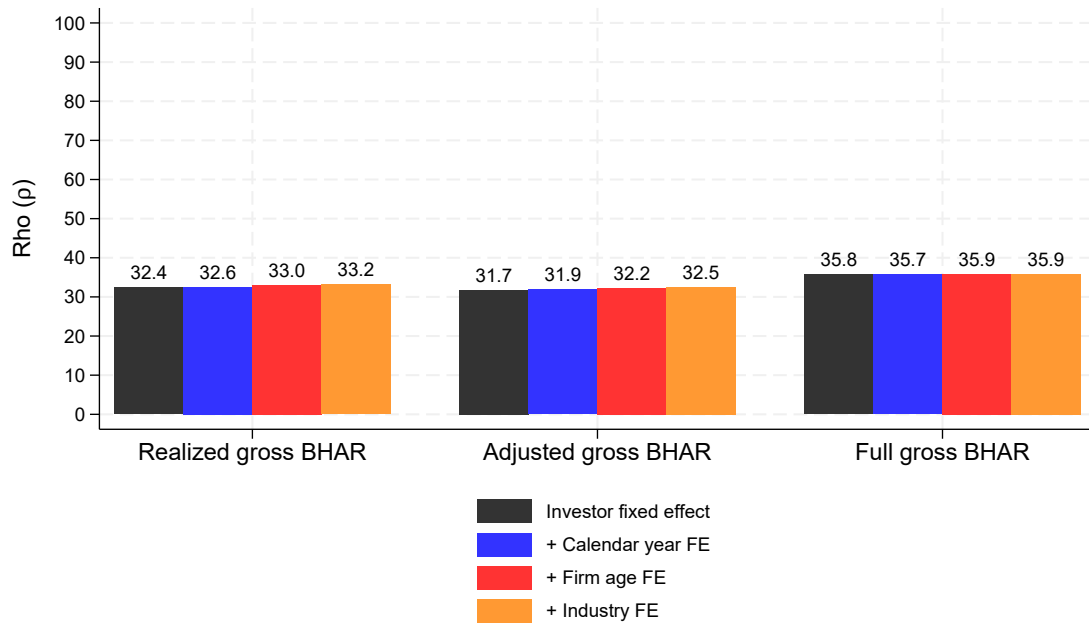


Table I: Descriptive Statistics

The first three columns are based on the full sample of investments in all startups from 2004 to 2017. The remaining columns restrict the sample to investments in ex ante high-innovation-potential (HIP) firms after 2010; we refer to this HIP post-2010 sample as the restricted sample. For both samples, a retail investor is an individual who makes only one investment for less than \$20,000 over the sample period. In the restricted sample, we can identify whether an investor is a family member of the founder or an employee of the firm at the time of investment. We use the term angel for a non-retail investor in the full sample, or a non-retail outside investor in the restricted sample. Investor and firm categories are not mutually exclusive because the same individual can be an insider in one firm and an outsider in another, and a firm can contain multiple investor types. Investment returns and monetary amounts are winsorized at the 0.5th and 99.5th percentiles. Monetary amounts are in thousands of USD, converted from NOK using each investment date's interbank mid-market exchange rates from Norges Bank.

|                                                                |                | Full Sample |        |        | Restricted Sample |          |           |         |        |
|----------------------------------------------------------------|----------------|-------------|--------|--------|-------------------|----------|-----------|---------|--------|
|                                                                |                | Overall     | Angel  | Retail | Overall           | Insiders | Outsiders | Angel   | Retail |
| N of investors                                                 |                | 76,338      | 20,915 | 55,423 | 17,576            | 5,235    | 12,575    | 5,253   | 7,322  |
| N of firms                                                     |                | 49,229      | 18,645 | 36,472 | 10,640            | 3,993    | 7,494     | 3,333   | 5,037  |
| % multi-investor firms                                         |                | 33.8%       | 29.3%  | 26.7%  | 32.6%             | 18.1%    | 34.0%     | 33.6%   | 24.3%  |
| N of investments                                               |                | 86,585      | 31,162 | 55,423 | 19,257            | 5,317    | 13,940    | 6,618   | 7,322  |
| <b>Investment characteristics</b>                              |                |             |        |        |                   |          |           |         |        |
| Investment amount                                              | <i>Average</i> | 33.5        | 82.2   | 6.1    | 44.1              | 22.9     | 52.2      | 104.6   | 4.7    |
|                                                                | <i>Median</i>  | 7.2         | 27.6   | 4.5    | 5.4               | 4.1      | 6.0       | 32.9    | 2.6    |
| Ownership stake                                                | <i>Average</i> | 29.5%       | 27.2%  | 30.9%  | 27.0%             | 31.9%    | 25.2%     | 19.6%   | 30.3%  |
|                                                                | <i>Median</i>  | 30.0%       | 25.0%  | 33.3%  | 25.0%             | 33.3%    | 24.7%     | 11.1%   | 33.3%  |
| Share of invested capital                                      | <i>Average</i> | 27.7%       | 25.2%  | 29.2%  | 26.0%             | 31.0%    | 24.1%     | 18.9%   | 28.8%  |
|                                                                | <i>Median</i>  | 25.0%       | 20.4%  | 30.0%  | 25.0%             | 33.3%    | 20.0%     | 10.1%   | 33.3%  |
| Holding period (yrs)                                           | <i>Average</i> | 5.3         | 5.5    | 5.2    | 3.5               | 3.8      | 3.3       | 3.4     | 3.2    |
|                                                                | <i>Median</i>  | 4.2         | 4.4    | 4.1    | 3.0               | 3.5      | 2.9       | 3.0     | 2.8    |
| Takes board seat (1/0)                                         |                | 73.9%       | 68.0%  | 77.3%  | 64.7%             | 73.6%    | 61.3%     | 48.2%   | 73.1%  |
| Average firm age (yrs)                                         |                | 0.4         | 0.7    | 0.2    | 0.7               | 0.7      | 0.7       | 1.1     | 0.3    |
| Investment realized (1/0)                                      |                | 52.2%       | 54.6%  | 50.8%  | 40.8%             | 37.5%    | 42.1%     | 41.0%   | 43.0%  |
| <b>Investor characteristics</b>                                |                |             |        |        |                   |          |           |         |        |
| Gross wealth                                                   | <i>Average</i> |             |        |        | 1,200.0           | 398.8    | 1,505.0   | 2,741.0 | 388.2  |
|                                                                | <i>Median</i>  |             |        |        | 195.4             | 135.6    | 240.0     | 560.3   | 135.4  |
| # of prior board links                                         | <i>Average</i> | 6.2         | 11.9   | 3.1    | 9.7               | 4.3      | 11.8      | 19.5    | 4.8    |
|                                                                | <i>Median</i>  | 0.0         | 3.0    | 0.0    | 2.0               | 0.0      | 2.0       | 7.0     | 0.0    |
| # of prior investor links                                      | <i>Average</i> | 4.2         | 8.6    | 1.7    | 7.8               | 2.9      | 9.6       | 17.2    | 2.8    |
|                                                                | <i>Median</i>  | 0.0         | 2.0    | 0.0    | 0.0               | 0.0      | 1.0       | 5.0     | 0.0    |
| Repeat investor (1/0)                                          |                | 12.2%       | 33.8%  | 0.0%   | 20.3%             | 10.9%    | 23.8%     | 50.2%   | 0.0%   |
| Prior focal founder link (1/0)                                 |                | 17.0%       | 24.8%  | 12.7%  | 19.4%             | 23.2%    | 18.0%     | 24.9%   | 11.7%  |
| Prior VC-backed firm link (1/0)                                |                | 3.9%        | 8.8%   | 1.2%   | 8.7%              | 3.5%     | 10.7%     | 18.8%   | 3.4%   |
| Prior board experience (1/0)                                   |                | 50.6%       | 69.6%  | 40.0%  | 58.0%             | 43.9%    | 63.4%     | 81.3%   | 47.1%  |
| Prior board in same industry (1/0)                             |                | 28.3%       | 41.9%  | 20.6%  | 32.2%             | 24.3%    | 35.2%     | 47.6%   | 24.1%  |
| <b>Investment-level Buy-and-Hold Annualized Returns (BHAR)</b> |                |             |        |        |                   |          |           |         |        |
| Realized return                                                | <i>Average</i> | 48.9%       | 83.7%  | 27.8%  | 152.1%            | 165.8%   | 147.5%    | 185.2%  | 115.0% |
|                                                                | <i>Median</i>  | -41.0%      | -37.7% | -44.2% | -20.6%            | -11.1%   | -25.0%    | -20.6%  | -28.4% |
| Adjusted return                                                | <i>Average</i> | 26.6%       | 54.3%  | 9.9%   | 104.8%            | 118.8%   | 100.0%    | 131.0%  | 73.2%  |
|                                                                | <i>Median</i>  | -60.9%      | -53.4% | -66.6% | -41.0%            | -28.8%   | -45.8%    | -40.7%  | -49.6% |
| Full return                                                    | <i>Average</i> | -10.2%      | -6.2%  | -12.5% | 7.6%              | 9.5%     | 6.8%      | 8.7%    | 5.1%   |
|                                                                | <i>Median</i>  | 0.0%        | 0.0%   | 0.0%   | 0.0%              | 0.0%     | 0.0%      | 0.0%    | 0.0%   |
| Total loss (1/0)                                               |                | 20.9%       | 19.7%  | 21.6%  | 14.5%             | 13.7%    | 14.7%     | 13.8%   | 15.6%  |
| TVPI <1 (1/0)                                                  |                | 43.8%       | 48.6%  | 41.1%  | 34.7%             | 30.8%    | 36.1%     | 38.3%   | 34.2%  |
| TVPI >2 (1/0)                                                  |                | 9.6%        | 11.6%  | 8.5%   | 11.1%             | 11.4%    | 10.9%     | 13.4%   | 8.7%   |
| TVPI >5 (1/0)                                                  |                | 4.9%        | 5.4%   | 4.6%   | 5.6%              | 6.2%     | 5.4%      | 5.6%    | 5.2%   |

Table II: Investor's Predicted Performance and the Tail(s) of Returns

Table II reports estimates from linear probability models examining whether predicted investment performance is associated with a higher probability of obtaining returns from different quantiles of the full BHAR distribution. The dependent variables are indicators for mutually exclusive return intervals: investments held at cost (zero returns), negative returns, returns between the 50th and 85th percentiles, returns between the 85th and 90th percentiles, returns between the 90th and 95th percentiles, and returns above the 95th percentile. Panel A is based on outside individual investments in HIP firms after 2010, while Panel B is based on insider investments in those firms. Predicted investment performance is computed as the fitted value from the pooled OLS return regression as shown in Equation 2. The results are presented in Appendix Table CVI. Based on the distribution of these fitted values, we classify investments into three predicted-performance groups: at or below the median, above the median and at or below the 75th percentile, and above the 75th percentile. The first group is omitted; the table reports coefficients for the middle and top predicted-performance groups. All specifications include fixed effects for the investment calendar year and firm age at investment measured in quarters. Standard errors are double-clustered at the firm and investor level. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

| Panel A: Outsiders    |                      |                     |                   |                  |                     |                     |
|-----------------------|----------------------|---------------------|-------------------|------------------|---------------------|---------------------|
|                       | Full BHAR (r) (1/0)  |                     |                   |                  |                     |                     |
|                       | Held at              | $r < 0\%$           | $p50 < r$         | $p85 < r$        | $p90 < r$           | $p95 < r$           |
|                       | cost                 |                     | $\leq p85$        | $\leq p90$       | $\leq p95$          |                     |
|                       | (1)                  | (2)                 | (3)               | (4)              | (5)                 | (6)                 |
| Predicted performance |                      |                     |                   |                  |                     |                     |
| Middle group (1/0)    | -0.071***<br>(0.013) | 0.040***<br>(0.013) | -0.000<br>(0.004) | 0.003<br>(0.006) | 0.017***<br>(0.006) | 0.013<br>(0.008)    |
| Top group (1/0)       | -0.071***<br>(0.013) | 0.020<br>(0.012)    | 0.000<br>(0.004)  | 0.010<br>(0.006) | 0.016***<br>(0.006) | 0.024***<br>(0.007) |
| Observations          | 13,939               | 13,939              | 13,939            | 13,939           | 13,939              | 13,939              |
| Adjusted R-squared    | 15.2%                | 9.2%                | 2.6%              | 4.6%             | 2.9%                | 1.5%                |
| Panel B: Insiders     |                      |                     |                   |                  |                     |                     |
|                       | Full BHAR (r) (1/0)  |                     |                   |                  |                     |                     |
|                       | Held at              | $r < 0\%$           | $p50 < r$         | $p85 < r$        | $p90 < r$           | $p95 < r$           |
|                       | cost                 |                     | $\leq p85$        | $\leq p90$       | $\leq p95$          |                     |
|                       | (1)                  | (2)                 | (3)               | (4)              | (5)                 | (6)                 |
| Predicted performance |                      |                     |                   |                  |                     |                     |
| Middle group (1/0)    | -0.042**<br>(0.019)  | 0.023<br>(0.018)    | 0.000<br>(0.006)  | 0.001<br>(0.006) | -0.004<br>(0.008)   | 0.023**<br>(0.010)  |
| Top group (1/0)       | -0.079***<br>(0.018) | 0.036**<br>(0.017)  | -0.000<br>(0.005) | 0.006<br>(0.007) | 0.004<br>(0.009)    | 0.033***<br>(0.010) |
| Observations          | 5,313                | 5,313               | 5,313             | 5,313            | 5,313               | 5,313               |
| Adjusted R-squared    | 14.8%                | 8.7%                | 2.4%              | 3.5%             | 5.2%                | 2.8%                |

Table III: Why are Some Angels Better than Others?

Table III reports linear probability model estimates relating pre-investment investor attributes to the probability of a top-decile return. In columns (1)–(4), the dependent variable equals one if the firm-level full BHAR, computed as the investment-weighted average of the full sample of investments by individual investors, falls above the 90th percentile of the firm-level return distribution. In columns (5)–(7), the dependent variable equals one for investments with full BHAR above the 90th percentile of the investment-level return distribution. The sample includes outside individual investments in HIP firms after 2010. Columns (1)–(4) report between-firm estimates. In these columns, the data are collapsed to the firm level by averaging retail participation and taking the sum of investment amount across outside individual investors in the firm. The other investor attributes are measured as the maximum value among investors. Investment timing fixed effects in these columns absorb the firm age (in quarters) at the time of the earliest investment. Firm controls in Column (4) include an indicator for firms in the top quartile of total equity raised during the sample period (i.e., whether it is a capital-intensive firm), an indicator for whether the firm had positive assets in the year before the earliest investment, an indicator for experienced founders and an indicator for whether the firm receives VC investment during the sample period. Columns (5)–(7) report within-firm estimates at the investment level. Investment timing fixed effects in these columns absorb firm age (in quarters) at time of the investor's equity purchase. Standard errors are robust in Columns (1)–(4) and double-clustered at the firm and investor level in Columns (5)–(7). One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                    | Between-firm         |                      |                     |                   | Within-firm          |                      |                      |
|------------------------------------|----------------------|----------------------|---------------------|-------------------|----------------------|----------------------|----------------------|
|                                    | (1)                  | (2)                  | (3)                 | (4)               | (5)                  | (6)                  | (7)                  |
| Retail investor (1/0)              | -0.042***<br>(0.010) | -0.032***<br>(0.010) | -0.007<br>(0.011)   | 0.007<br>(0.011)  | 0.048***<br>(0.010)  | 0.039***<br>(0.009)  | 0.006<br>(0.009)     |
| Ln (gross wealth)                  | 0.006***<br>(0.002)  | 0.005**<br>(0.002)   | -0.000<br>(0.002)   | -0.001<br>(0.002) | -0.010***<br>(0.003) | -0.007***<br>(0.002) | -0.001<br>(0.002)    |
| Prior board experience (1/0)       | 0.001<br>(0.011)     | 0.002<br>(0.011)     | 0.008<br>(0.011)    | 0.003<br>(0.011)  | -0.008<br>(0.009)    | -0.001<br>(0.009)    | -0.002<br>(0.009)    |
| Prior board in same industry (1/0) | 0.020*<br>(0.010)    | 0.019*<br>(0.010)    | 0.018*<br>(0.010)   | 0.019*<br>(0.010) | 0.025***<br>(0.009)  | 0.021**<br>(0.009)   | 0.021**<br>(0.009)   |
| Prior focal founder link (1/0)     | -0.001<br>(0.011)    | -0.000<br>(0.011)    | -0.003<br>(0.011)   | -0.006<br>(0.011) | 0.035**<br>(0.014)   | 0.016<br>(0.013)     | 0.018<br>(0.013)     |
| Prior VC-backed firm link (1/0)    | 0.063***<br>(0.016)  | 0.060***<br>(0.016)  | 0.047***<br>(0.016) | 0.031*<br>(0.016) | -0.009<br>(0.012)    | -0.003<br>(0.012)    | 0.002<br>(0.012)     |
| Prior investor links >= 5 (1/0)    | 0.020*<br>(0.012)    | 0.019*<br>(0.012)    | 0.015<br>(0.012)    | 0.011<br>(0.012)  | -0.008<br>(0.009)    | -0.007<br>(0.008)    | -0.003<br>(0.008)    |
| Prior board links >= 5 (1/0)       | -0.003<br>(0.012)    | -0.005<br>(0.012)    | -0.008<br>(0.012)   | -0.005<br>(0.012) | -0.002<br>(0.009)    | -0.003<br>(0.009)    | -0.003<br>(0.009)    |
| Ln (Investment amount)             |                      |                      | 0.021***<br>(0.003) | 0.003<br>(0.004)  |                      |                      | -0.045***<br>(0.007) |
| Observations                       | 7,494                | 7,488                | 7,488               | 7,377             | 8,994                | 8,989                | 8,989                |
| Adjusted R-squared                 | 2.4%                 | 3.0%                 | 3.6%                | 5.8%              | 63.2%                | 65.4%                | 66.1%                |
| Firm clusters                      |                      |                      |                     |                   | 2,548                | 2,547                | 2,547                |
| Investor clusters                  |                      |                      |                     |                   | 8,152                | 8,150                | 8,150                |
| Firm FE                            | No                   | No                   | No                  | No                | Yes                  | Yes                  | Yes                  |
| Investment timing FE               | No                   | Yes                  | Yes                 | Yes               | No                   | Yes                  | Yes                  |
| Firm controls                      | No                   | No                   | No                  | Yes               | No                   | No                   | No                   |

Table IV: Investor-specific Pricing and Timing

Table IV reports within-firm estimates examining investor-specific channels that may explain return differences among co-investors in the same firm. The sample includes outside individual investments in HIP firms after 2010. In Column (1), the dependent variable is an indicator equal to one if the investor purchases shares in the firm in multiple financing rounds. The 8,994 observations are investor-firm pairs. In the remaining columns, the unit of observation is an equity transaction with 12,372 share purchases and 5,480 share realizations, of which 3,657 are share sales. Standard errors are double-clustered at the firm and investor level. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                     | Multi-round<br>investor (1/0)<br>(1) | Firm Age @<br>Investment<br>(2) | Ln(Purchase<br>price)<br>(3) | Realized<br>Exit (1/0)<br>(4) | Exit<br>firm age<br>(5) | Ln(Exit<br>price)<br>(6) |
|-------------------------------------|--------------------------------------|---------------------------------|------------------------------|-------------------------------|-------------------------|--------------------------|
| Takes board seat (1/0)              | 0.109***<br>(0.012)                  | -0.701***<br>(0.135)            | -0.229***<br>(0.030)         | -0.002<br>(0.011)             | 0.153<br>(0.224)        | 0.029<br>(0.121)         |
| Retail investor (1/0)               | -0.095***<br>(0.010)                 | -0.627***<br>(0.130)            | -0.231***<br>(0.032)         | -0.006<br>(0.011)             | 0.057<br>(0.239)        | -0.050<br>(0.144)        |
| Ln (gross wealth)                   | 0.012***<br>(0.003)                  | 0.254***<br>(0.035)             | 0.052***<br>(0.009)          | -0.010***<br>(0.003)          | 0.073<br>(0.057)        | -0.034<br>(0.033)        |
| Prior board in same industry (1/0)  | -0.006<br>(0.009)                    | 0.115<br>(0.113)                | 0.015<br>(0.026)             | 0.013<br>(0.011)              | -0.080<br>(0.210)       | 0.175<br>(0.108)         |
| Prior focal founder link (1/0)      | 0.008<br>(0.015)                     | -0.678***<br>(0.169)            | -0.098***<br>(0.036)         | -0.006<br>(0.016)             | -0.483<br>(0.319)       | 0.138<br>(0.177)         |
| Prior VC-backed firm link (1/0)     | -0.005<br>(0.014)                    | 0.397**<br>(0.175)              | 0.040<br>(0.039)             | 0.012<br>(0.013)              | -0.154<br>(0.303)       | 0.062<br>(0.148)         |
| Prior investor links $\geq 5$ (1/0) | -0.001<br>(0.009)                    | 0.095<br>(0.107)                | 0.037<br>(0.023)             | 0.001<br>(0.011)              | -0.057<br>(0.211)       | -0.057<br>(0.107)        |
| Prior board links $\geq 5$ (1/0)    | 0.003<br>(0.009)                     | 0.186*<br>(0.101)               | -0.012<br>(0.028)            | 0.001<br>(0.011)              | 0.034<br>(0.198)        | -0.083<br>(0.109)        |
| Observations                        | 8,994                                | 12,372                          | 12,372                       | 12,372                        | 5,480                   | 3,657                    |
| Adjusted R-squared                  | 38.4%                                | 81.1%                           | 93.2%                        | 66.8%                         | 83.5%                   | 85.6%                    |
| Firm clusters                       | 2,548                                | 2,962                           | 2,962                        | 2,962                         | 1,422                   | 1,006                    |
| Investor clusters                   | 8,152                                | 8,496                           | 8,496                        | 8,496                         | 3,407                   | 2,298                    |
| Firm FE                             | Yes                                  | Yes                             | Yes                          | Yes                           | Yes                     | Yes                      |
| Investment firm age quarters FE     | No                                   | No                              | Yes                          | Yes                           | Yes                     | Yes                      |
| Exit firm age quarters FE           | No                                   | No                              | No                           | No                            | No                      | Yes                      |

Table V: The Importance of Board Seats for Investor Returns

Table V reports within-firm estimates examining whether holding a board seat is correlated with investor-specific differences in top-tail returns. The sample includes outside individual investments in HIP firms after 2010, corresponding to the outside-investor columns of Table I. The dependent variable in Columns (1)–(3) equals one if the investor takes a board seat in the firm with the investment. The dependent variable in Columns (4)–(7) equals one for investments with full BHAR above the 90th percentile of the investment-level return distribution. The variable “Still active prior board seat” is a dummy equaling one if the investor holds an active board seat in another firm at the time of the focal investment. Public, non-startup, and startup same-industry board indicators capture whether the investor previously held a board seat in the same industry in a public firm, a non-startup private firm, or a startup, respectively. Standard errors are double-clustered at the firm and investor level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                          | Takes board seat (1/0) |                      |                      |                     | Earns Top Decile Return |                      |                      |
|------------------------------------------|------------------------|----------------------|----------------------|---------------------|-------------------------|----------------------|----------------------|
|                                          | (1)                    | (2)                  | (3)                  | (4)                 | (5)                     | (6)                  | (7)                  |
| Takes board seat (1/0)                   |                        |                      |                      | 0.043***<br>(0.011) | 0.057***<br>(0.010)     | 0.024**<br>(0.010)   | 0.000<br>(0.010)     |
| Retail investor (1/0)                    | -0.026*<br>(0.014)     | 0.010<br>(0.014)     | 0.014<br>(0.014)     |                     | 0.005<br>(0.009)        | 0.004<br>(0.009)     | 0.002<br>(0.009)     |
| Ln (gross wealth)                        | -0.007*<br>(0.004)     | -0.014***<br>(0.004) | -0.015***<br>(0.004) |                     | -0.002<br>(0.002)       | -0.001<br>(0.002)    | -0.001<br>(0.002)    |
| Prior focal founder link (1/0)           | 0.090***<br>(0.018)    | 0.090***<br>(0.018)  | 0.088***<br>(0.018)  |                     | 0.032**<br>(0.014)      | 0.018<br>(0.013)     | 0.009<br>(0.012)     |
| Prior VC-backed firm link (1/0)          | 0.053***<br>(0.019)    | 0.046**<br>(0.018)   | 0.035*<br>(0.019)    |                     | -0.006<br>(0.012)       | -0.001<br>(0.012)    | 0.001<br>(0.011)     |
| Prior investor links $\geq 5$ (1/0)      | -0.013<br>(0.013)      | -0.017<br>(0.013)    | -0.022*<br>(0.013)   |                     | -0.002<br>(0.009)       | -0.002<br>(0.008)    | -0.002<br>(0.008)    |
| Prior board links $\geq 5$ (1/0)         | 0.063***<br>(0.013)    | 0.064***<br>(0.013)  | 0.055***<br>(0.013)  |                     | -0.004<br>(0.009)       | -0.002<br>(0.008)    | 0.000<br>(0.008)     |
| Prior board in same industry (1/0)       | 0.078***<br>(0.013)    | 0.079***<br>(0.013)  |                      |                     |                         |                      |                      |
| Still active prior board seat (1/0)      |                        |                      | 0.024*<br>(0.013)    |                     | -0.009<br>(0.009)       | -0.004<br>(0.008)    | -0.006<br>(0.008)    |
| Public board in same industry (1/0)      |                        |                      | 0.064<br>(0.043)     |                     | 0.029<br>(0.026)        | 0.020<br>(0.025)     | 0.015<br>(0.023)     |
| Non-startup board in same industry (1/0) |                        |                      | 0.047***<br>(0.014)  |                     | 0.014<br>(0.009)        | 0.013<br>(0.009)     | 0.015*<br>(0.009)    |
| Startup board in same industry (1/0)     |                        |                      | 0.067***<br>(0.016)  |                     | -0.005<br>(0.010)       | -0.004<br>(0.009)    | -0.003<br>(0.009)    |
| Ln (investment amount)                   |                        | 0.049***<br>(0.008)  | 0.048***<br>(0.008)  |                     | -0.057***<br>(0.007)    | -0.047***<br>(0.007) | -0.012*<br>(0.007)   |
| Ln (average purchase price)              |                        |                      |                      |                     |                         |                      | -0.103***<br>(0.012) |
| Observations                             | 8,994                  | 8,994                | 8,994                | 8,994               | 8,994                   | 8,989                | 8,989                |
| Adjusted R-squared                       | 52.1%                  | 52.6%                | 52.7%                | 62.8%               | 64.4%                   | 66.1%                | 68.2%                |
| Firm clusters                            | 2,548                  | 2,548                | 2,548                | 2,548               | 2,548                   | 2,547                | 2,547                |
| Investor clusters                        | 8,152                  | 8,152                | 8,152                | 8,152               | 8,152                   | 8,150                | 8,150                |
| Firm FE                                  | Yes                    | Yes                  | Yes                  | Yes                 | Yes                     | Yes                  | Yes                  |
| Investment firm age quarters FE          | No                     | No                   | No                   | No                  | No                      | Yes                  | Yes                  |

Table VI: Board Seats and Post-Investment Financing Outcomes

Table VI reports OLS estimates relating the composition of outside individual investors in a financing round to subsequent firm financing outcomes. The unit of observation is the firm by investment round, where an investment round is defined as the investments in a firm occurring within a given calendar quarter (e.g., all the investments in firm X in 2019Q3). The sample includes HIP firms after 2010 and is restricted to financing rounds with at least one outside individual investor. The dependent variable in Columns (1)–(2) is an indicator equal to one if the firm has a subsequent financing round. Columns (3)–(4) use an indicator equal to one if the firm receives financing in a subsequent round from an individual investor with a prior connection to one of the focal round’s outside individual investors. Columns (5)–(6) use the same indicator, but condition on follow-on individuals whose first round is after the focal round. Columns (3)–(6) are estimated among firm-rounds with a subsequent financing round. Columns (7)–(8) use an indicator equal to one if the firm receives VC financing in a subsequent round. Investor attributes are measured as the maximum value across outside individual investors in the round, capturing whether at least one investor with the attribute participated. In all specifications, we additionally include the following (unreported) control variables: the natural logarithm of round investment amount and indicator variables for whether the firm reported revenues in the year before the round, the founder of the firm founded another firm prior to the focal firm and the firm received institutional VC investment in the focal or a prior round. All specifications include financing-round year fixed effects and round-sequence fixed effects. Standard errors are clustered at the firm level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                              | Has follow-on<br>round |                      | Follow-on<br>connected investor |                      | Strictly follow-on<br>connected investor |                      | Follow-on<br>VC investment |                     |
|----------------------------------------------|------------------------|----------------------|---------------------------------|----------------------|------------------------------------------|----------------------|----------------------------|---------------------|
|                                              | (1)                    | (2)                  | (3)                             | (4)                  | (5)                                      | (6)                  | (7)                        | (8)                 |
| Ln (gross wealth)                            | 0.009***<br>(0.002)    |                      | 0.007<br>(0.007)                |                      | 0.008<br>(0.005)                         |                      | -0.000<br>(0.001)          |                     |
| Wealthiest investor x Takes board seat (1/0) |                        | -0.074***<br>(0.013) |                                 | -0.164***<br>(0.028) |                                          | -0.069***<br>(0.020) |                            | -0.007<br>(0.006)   |
| Prior board exp. in same industry (1/0)      | 0.008<br>(0.009)       |                      | 0.060***<br>(0.023)             |                      | 0.015<br>(0.016)                         |                      | -0.001<br>(0.004)          |                     |
| Industry board exp. x Takes board seat (1/0) |                        | -0.001<br>(0.011)    |                                 | 0.024<br>(0.029)     |                                          | -0.023<br>(0.023)    |                            | -0.008**<br>(0.004) |
| Prior focal founder link (1/0)               | -0.021*<br>(0.011)     |                      | 0.345***<br>(0.031)             |                      | 0.069***<br>(0.023)                      |                      | -0.009**<br>(0.004)        |                     |
| Founder linked x Takes board seat (1/0)      |                        | -0.023*<br>(0.012)   |                                 | 0.363***<br>(0.038)  |                                          | 0.056**<br>(0.026)   |                            | -0.006<br>(0.004)   |
| Prior VC-backed firm link (1/0)              | 0.069***<br>(0.016)    |                      | 0.036<br>(0.031)                |                      | 0.029<br>(0.022)                         |                      | 0.009<br>(0.009)           |                     |
| VC-linked x Takes board seat (1/0)           |                        | 0.108***<br>(0.019)  |                                 | 0.034<br>(0.040)     |                                          | 0.033<br>(0.028)     |                            | 0.019**<br>(0.010)  |
| Prior investor links $\geq 5$ (1/0)          | 0.042***<br>(0.012)    |                      | 0.078***<br>(0.027)             |                      | 0.073***<br>(0.018)                      |                      | -0.004<br>(0.005)          |                     |
| Many investor links x Takes board seat (1/0) |                        | 0.049***<br>(0.013)  |                                 | 0.082**<br>(0.032)   |                                          | 0.057***<br>(0.021)  |                            | -0.008<br>(0.005)   |
| Prior board links $\geq 5$ (1/0)             | -0.003<br>(0.011)      |                      | 0.057**<br>(0.028)              |                      | 0.017<br>(0.018)                         |                      | 0.006<br>(0.004)           |                     |
| Many board links x Takes board seat (1/0)    |                        | 0.000<br>(0.012)     |                                 | 0.080**<br>(0.033)   |                                          | 0.045**<br>(0.022)   |                            | 0.007*<br>(0.004)   |
| Observations                                 | 8,953                  | 8,953                | 2,101                           | 2,101                | 2,101                                    | 2,101                | 8,953                      | 8,953               |
| Adjusted R-squared                           | 22.2%                  | 22.3%                | 22.7%                           | 19.9%                | 5.8%                                     | 3.4%                 | 16.7%                      | 16.8%               |

Table VII: Board Seats and Post-Investment Operational Outcomes

Table VII reports OLS estimates relating the composition of outside individual investors in a financing round to subsequent firm outcomes. The unit of observation is the firm by investment round, where an investment round is defined as the investments in a firm occurring within a given calendar quarter (e.g., all the investments in firm X in 2019Q3). The sample includes HIP firms after 2010 and is restricted to financing rounds with at least one outside individual investor. The dependent variable in Columns (1)–(2) is an indicator equal to one if the firm enters bankruptcy or liquidation within five years after the round. Columns (3)–(4) use an indicator equal to one if the firm experiences an M&A or IPO outcome within five years after the round. Columns (5)–(6) use the natural logarithm of (positive) firm revenues accumulated over the five consecutive years after the financing round. Investor attributes are measured as the maximum value across outside individual investors in the round, capturing whether at least one investor with the attribute participated. In all specifications, we additionally include the following (unreported) control variables: the natural logarithm of round investment amount and indicator variables for whether the firm reported revenues in the year before the round, the founder of the firm founded another firm prior to the focal firm and the firm received institutional VC investment in the focal or a prior round. All specifications include financing-round year fixed effects and round-sequence fixed effects. Standard errors are clustered at the firm level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                              | Bankruptcy/<br>Liquidation |                      | M&A/IPO             |                    | Ln(Revenues)         |                      |
|----------------------------------------------|----------------------------|----------------------|---------------------|--------------------|----------------------|----------------------|
|                                              | (1)                        | (2)                  | (3)                 | (4)                | (5)                  | (6)                  |
| Ln (gross wealth)                            | -0.006<br>(0.005)          |                      | 0.002<br>(0.003)    |                    | 0.004<br>(0.026)     |                      |
| Wealthiest investor x Takes board seat (1/0) |                            | 0.011<br>(0.019)     |                     | -0.023<br>(0.016)  |                      | -0.045<br>(0.124)    |
| Prior board exp. in same industry (1/0)      | -0.052***<br>(0.017)       |                      | -0.007<br>(0.013)   |                    | 0.402***<br>(0.102)  |                      |
| Industry board exp. x Takes board seat (1/0) |                            | -0.061***<br>(0.019) |                     | 0.003<br>(0.014)   |                      | 0.365***<br>(0.110)  |
| Prior focal founder link (1/0)               | -0.020<br>(0.017)          |                      | 0.019<br>(0.016)    |                    | 0.302**<br>(0.118)   |                      |
| Founder linked x Takes board seat (1/0)      |                            | -0.007<br>(0.020)    |                     | 0.021<br>(0.017)   |                      | 0.439***<br>(0.128)  |
| Prior VC-backed firm link (1/0)              | 0.033<br>(0.023)           |                      | -0.042**<br>(0.021) |                    | -0.467***<br>(0.157) |                      |
| VC-linked x Takes board seat (1/0)           |                            | 0.025<br>(0.028)     |                     | -0.044*<br>(0.024) |                      | -0.565***<br>(0.179) |
| Prior investor links $\geq 5$ (1/0)          | 0.002<br>(0.018)           |                      | 0.034**<br>(0.016)  |                    | -0.218*<br>(0.115)   |                      |
| Many investor links x Takes board seat (1/0) |                            | 0.004<br>(0.019)     |                     | 0.040**<br>(0.018) |                      | -0.224*<br>(0.125)   |
| Prior board links $\geq 5$ (1/0)             | -0.005<br>(0.018)          |                      | 0.016<br>(0.015)    |                    | 0.012<br>(0.112)     |                      |
| Many board links x Takes board seat (1/0)    |                            | -0.020<br>(0.019)    |                     | 0.006<br>(0.017)   |                      | 0.018<br>(0.121)     |
| Observations                                 | 4,412                      | 4,412                | 4,412               | 4,412              | 3,390                | 3,390                |
| Adjusted R-squared                           | 1.4%                       | 1.4%                 | 4.0%                | 4.0%               | 18.7%                | 18.8%                |

Table VIII: Investor Characteristics and Firm Characteristics

Table VIII explores the equilibrium observed matching between investors and firms. It reports OLS estimates from firm-by-investment-round regressions, where an investment round is defined as the investments in a firm occurring within a given calendar quarter (e.g., all the investments in firm X in 2019Q3). The sample includes financing rounds in HIP firms with at least one outside individual investor. The dependent variables are round size, defined as the natural logarithm of the total amount invested in the round; capital intensity, an indicator equal to one for firms in the top quartile of total equity raised during the sample period; indicators for positive assets, revenues, and salary expenses in the year before the round, respectively; founder wealth, defined as the natural logarithm of founder gross wealth in the year before startup incorporation; experienced founder, an indicator equal to one if the founder previously started another firm; and VC co-investor, an indicator equal to one if an institutional VC investor participated in the round. Average retail participation is the percentage of retail investors (average of the retail-investor indicator) across outside individual investments in the round. All other investor attributes are measured as the maximum value across outside individual investors in the round, capturing whether at least one investor with the attribute participated. All specifications include fixed effects for the calendar year of the financing round and for the round sequence. Standard errors are clustered at the firm level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                         | Total<br>Round<br>size | Capital<br>Intensive<br>(1/0) | Has<br>Assets (t-1)<br>(1/0) | Has<br>Revenue (t-1)<br>(1/0) | Has<br>Salary (t-1)<br>(1/0) | Founder<br>wealth    | Experienced<br>founder<br>(1/0) | VC co-<br>investor<br>(1/0) |
|-----------------------------------------|------------------------|-------------------------------|------------------------------|-------------------------------|------------------------------|----------------------|---------------------------------|-----------------------------|
|                                         | (1)                    | (2)                           | (3)                          | (4)                           | (5)                          | (6)                  | (7)                             | (8)                         |
| Average retail participation            | -1.239***<br>(0.042)   | -0.316***<br>(0.012)          | -0.083***<br>(0.008)         | -0.046***<br>(0.008)          | -0.051***<br>(0.008)         | -0.205***<br>(0.060) | -0.153***<br>(0.015)            | -0.016***<br>(0.004)        |
| Ln (gross wealth)                       | 0.226***<br>(0.011)    | 0.033***<br>(0.002)           | 0.009***<br>(0.002)          | 0.003<br>(0.002)              | 0.008***<br>(0.002)          | 0.203***<br>(0.018)  | 0.004<br>(0.003)                | 0.003**<br>(0.001)          |
| Prior board exp. in same industry (1/0) | -0.071*<br>(0.038)     | -0.025**<br>(0.010)           | 0.005<br>(0.007)             | 0.010<br>(0.008)              | 0.010<br>(0.008)             | 0.112*<br>(0.057)    | 0.053***<br>(0.014)             | -0.006<br>(0.004)           |
| Prior focal founder link (1/0)          | 0.109**<br>(0.045)     | 0.004<br>(0.011)              | -0.036***<br>(0.008)         | -0.040***<br>(0.010)          | -0.054***<br>(0.009)         | 0.715***<br>(0.061)  | 0.213***<br>(0.016)             | -0.014***<br>(0.005)        |
| Prior VC-backed firm link (1/0)         | 0.467***<br>(0.065)    | 0.084***<br>(0.013)           | 0.031**<br>(0.012)           | 0.027*<br>(0.016)             | 0.037**<br>(0.015)           | 0.072<br>(0.082)     | 0.026<br>(0.021)                | 0.051***<br>(0.010)         |
| Prior investor links $\geq 5$ (1/0)     | 0.180***<br>(0.048)    | 0.048***<br>(0.012)           | 0.012<br>(0.009)             | -0.004<br>(0.010)             | 0.007<br>(0.009)             | -0.091<br>(0.067)    | 0.020<br>(0.017)                | -0.002<br>(0.006)           |
| Prior board links $\geq 5$ (1/0)        | 0.080*<br>(0.043)      | 0.016<br>(0.012)              | 0.020**<br>(0.008)           | 0.020**<br>(0.009)            | 0.015*<br>(0.009)            | 0.209***<br>(0.066)  | 0.021<br>(0.016)                | -0.004<br>(0.005)           |
| Observations                            | 9,074                  | 9,074                         | 9,074                        | 9,074                         | 9,074                        | 6,853                | 8,953                           | 9,074                       |
| Adjusted R-squared                      | 53.9%                  | 53.0%                         | 63.5%                        | 42.6%                         | 47.7%                        | 13.6%                | 10.5%                           | 7.1%                        |

**Internet Appendix for  
“Are Some Angels Better than Others?”**

# A Variable Definitions

Table AI: Variable Definitions

| Variable                                         | Definition                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Investor Types and Sample Classifications</b> |                                                                                                                                                                                                                                                                                                                                                                                     |
| Angel                                            | Non-retail individual investor in the full sample. In the restricted sample, angels are non-retail outside individual investors, excluding identified insiders.                                                                                                                                                                                                                     |
| Retail investor                                  | Individual investor who makes only one investment and invests less than USD 20,000 over the sample period.                                                                                                                                                                                                                                                                          |
| Average retail participation                     | Share, or average value, of the retail-investor indicator among outside individual investments in a firm or financing round. In firm-level specifications, this is the share of outside individual investments in the firm made by retail investors. In firm-round specifications, this is the average retail-investor indicator among outside individual investments in the round. |
| Outside individual investor                      | Non-founder individual investor. In the HIP post-2010 sample, outside investors exclude identified insiders, including family members and employees before or at the time of investment.                                                                                                                                                                                            |
| Insider                                          | Individual investor who is identified as a family member of the founder or an employee of the firm before or at the time of investment.                                                                                                                                                                                                                                             |
| HIP firm                                         | Ex ante high-innovation-potential firm, as defined in Kisseleva, Mjøs, and Robinson (2026). The HIP post-2010 sample is used when data availability permits identifying insiders and measuring individual gross wealth.                                                                                                                                                             |
| Multi-investor firm                              | Firm with more than one individual investor. These firms identify the within-firm estimates because they allow comparisons among co-investors in the same firm.                                                                                                                                                                                                                     |
| <b>Investor Characteristics</b>                  |                                                                                                                                                                                                                                                                                                                                                                                     |
| Gross wealth                                     | Investor's taxable gross wealth net of tax-related value discounts but before debt deduction. Individual-level wealth data are available for investors in the HIP post-2010 sample.                                                                                                                                                                                                 |
| Prior public investment / Public investment      | Investor's total amount invested in domestic public stocks before the focal private-firm investment. This variable proxies for investor wealth in the full sample when gross wealth is not observed.                                                                                                                                                                                |
| Repeat investor                                  | Indicator equal to one if the investor made an individual private-firm investment before the focal investment. Retail investors are one-time investors by construction.                                                                                                                                                                                                             |
| Prior board experience                           | Indicator equal to one if the investor held a board position (including being a CEO) before the focal investment.                                                                                                                                                                                                                                                                   |
| Prior board in same industry                     | Indicator equal to one if the investor held a board position before the focal investment in a firm operating in the same industry as the focal firm. Industries are classified using ISIC codes.                                                                                                                                                                                    |
| N of prior board links                           | Number of distinct individuals to whom the investor is connected through overlapping prior board memberships.                                                                                                                                                                                                                                                                       |

(continued on next page)

| Variable                                          | Definition                                                                                                                                                                                                                                          |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prior board links ( $\geq 5$ )                    | Indicator equal to one if the investor has at least five prior board links.                                                                                                                                                                         |
| N of prior investor links                         | Number of distinct individuals in the shareholder database to which the investor is connected through common firm ownership prior to the focal investment, conditional on 1% or greater ownership stakes.                                           |
| Prior investor links ( $\geq 5$ )                 | Indicator equal to one if the investor has at least five prior investor links.                                                                                                                                                                      |
| Prior focal founder link                          | Indicator equal to one if the investor had a prior connection to the focal startup founder before the focal investment, either through a board relationship or through joint investment in another firm.                                            |
| Prior VC-backed firm link                         | Indicator equal to one if the investor had a prior connection, through board membership or joint investment, to a firm that had received institutional VC financing before the focal investment.                                                    |
| Still active prior board seat                     | Indicator equal to one if the investor holds an active board seat in another firm at the time of the focal investment.                                                                                                                              |
| Public board in same industry                     | Indicator equal to one if the investor previously held a board position in a public firm operating in the same industry as the focal firm.                                                                                                          |
| Non-startup board in same industry                | Indicator equal to one if the investor previously held a board position in a private non-startup firm operating in the same industry as the focal firm.                                                                                             |
| Startup board in same industry                    | Indicator equal to one if the investor previously held a board position in a startup operating in the same industry as the focal firm.                                                                                                              |
| Wealthiest investor ( $\times$ ) Takes board seat | Indicator equal to one if the wealthiest outside individual investor in the financing round takes a board seat in the focal firm.                                                                                                                   |
| Industry board exp. ( $\times$ ) Takes board seat | Indicator equal to one if an outside individual investor with prior board experience in the same industry takes a board seat in the focal firm.                                                                                                     |
| Founder linked ( $\times$ ) Takes board seat      | Indicator equal to one if an outside individual investor with a prior focal founder link takes a board seat in the focal firm.                                                                                                                      |
| VC-linked ( $\times$ ) Takes board seat           | Indicator equal to one if an outside individual investor with a prior VC-backed-firm link takes a board seat in the focal firm.                                                                                                                     |
| Many investor links ( $\times$ ) Takes board seat | Indicator equal to one if an outside individual investor with at least five prior investor links takes a board seat in the focal firm.                                                                                                              |
| <b>Investment Characteristics and Governance</b>  |                                                                                                                                                                                                                                                     |
| Investment amount                                 | Amount invested by the individual investor in the focal firm. Monetary amounts are converted from NOK to USD using the daily interbank mid-market exchange rate from Norges Bank on the investment date.                                            |
| Ln(Investment amount)                             | Natural logarithm of the investor's investment amount in the focal firm. In between-firm regressions, the variable is measured at the firm level as the natural logarithm of the total amount invested by outside individual investors in the firm. |
| Round amount                                      | Total amount invested in the firm-round, where rounds are defined by calendar-year quarter.                                                                                                                                                         |
| Ln(Round amount) / Total Round size               | Natural logarithm of the total amount invested in the financing round.                                                                                                                                                                              |
| Ownership stake                                   | Total number of shares acquired by the investor divided by total number of firm shares outstanding.                                                                                                                                                 |
| Share of invested capital                         | Investor's investment amount divided by the total amount invested in the same firm or financing round.                                                                                                                                              |

(continued on next page)

| Variable                        | Definition                                                                                                                                                                    |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Takes board seat                | Indicator equal to one if the investor takes a board seat in the focal firm at the time of investment.                                                                        |
| Multi-round investor            | Indicator equal to one if the investor invested in multiple financing rounds in the firm.                                                                                     |
| Purchase price                  | Share purchase price paid by the investor in the focal investment transaction.                                                                                                |
| Ln(Purchase price)              | Natural logarithm of the share purchase price paid by the investor in the focal transaction.                                                                                  |
| Ln(Average purchase price)      | The natural logarithm of the average purchase price per share paid by the investor across the investor's investments in the firm.                                             |
| Exit price                      | Share price received by the investor when shares are sold or liquidated.                                                                                                      |
| Ln(Exit price)                  | Natural logarithm of the share exit price.                                                                                                                                    |
| Investment realized             | Indicator equal to one if the investor realizes any shares in the focal firm through sale or liquidation during the sample period.                                            |
| Realized exit                   | Indicator equal to one if the investment or transaction is realized during the sample period.                                                                                 |
| Holding period                  | Time between investment and realization, or between investment and the end of the sample period for unrealized investments, measured in years.                                |
| Entry year                      | Calendar year of the investor's investment in the focal firm.                                                                                                                 |
| Exit year                       | Calendar year of the investor's realization event. For unrealized investments, the exit year is December 31, 2018.                                                            |
| Entry age / Investment firm age | Firm age at investment, measured in quarters.                                                                                                                                 |
| Exit firm age                   | Firm age at realization or exit, measured in quarters.                                                                                                                        |
| <b>Return Measures</b>          |                                                                                                                                                                               |
| TVPI                            | Total value to paid-in capital, defined as total proceeds and terminal value divided by paid-in capital.                                                                      |
| Realized TVPI                   | TVPI computed using observed realization transactions.                                                                                                                        |
| Adjusted TVPI                   | TVPI that additionally treats investments as losses when firms report no revenues for five consecutive years after investment and have no subsequent equity financing.        |
| Full TVPI                       | TVPI that assigns unrealized shares the most recent observed share price from the latest financing round.                                                                     |
| BHAR                            | Buy-and-hold annualized return, defined as the annualized TVPI return.                                                                                                        |
| Gross BHAR                      | Buy-and-hold annualized return plus one.                                                                                                                                      |
| Realized BHAR                   | BHAR computed from Realized TVPI.                                                                                                                                             |
| Adjusted BHAR                   | BHAR computed from Adjusted TVPI.                                                                                                                                             |
| Full BHAR                       | BHAR computed from Full TVPI.                                                                                                                                                 |
| PME                             | Public market equivalent, which is calculated as TVPI adjusted either by the Oslo Børs Benchmark Index (OSEBX), the Russell 2000, or the Russell 3000 at each cash-flow date. |
| Total loss                      | Indicator equal to one if the investment value is zero.                                                                                                                       |
| TVPI < 1                        | Indicator equal to one if TVPI is less than one.                                                                                                                              |
| TVPI > 2                        | Indicator equal to one if TVPI is greater than two.                                                                                                                           |
| TVPI > 5                        | Indicator equal to one if TVPI is greater than five.                                                                                                                          |

*(continued on next page)*

| Variable                              | Definition                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BHAR > p90                            | Indicator equal to one if full (gross) BHAR is above the 90th percentile of the relevant return distribution. In firm-level specifications, the variable equals one if firm-level full BHAR, computed as the investment-weighted average of individual-investment full BHAR, is above the 90th percentile of the firm-level return distribution. |
| Held at cost                          | Indicator equal to one if the investment has zero return (BHAR) because the unrealized position is valued at cost.                                                                                                                                                                                                                               |
| Negative return                       | Indicator equal to one if full BHAR is below zero.                                                                                                                                                                                                                                                                                               |
| Predicted investment performance      | Fitted value from the pooled OLS regression using observable pre-investment investor characteristics and fixed effects for investment calendar year and firm age at investment.                                                                                                                                                                  |
| Middle predicted-performance group    | Indicator equal to one if predicted investment performance is above the median and at or below the 75th percentile.                                                                                                                                                                                                                              |
| Top predicted-performance group       | Indicator equal to one if predicted investment performance is above the 75th percentile.                                                                                                                                                                                                                                                         |
| <b>Firm and Round Characteristics</b> |                                                                                                                                                                                                                                                                                                                                                  |
| Outside equity financing round        | Financing round in which the firm raises equity from at least one non-founder outside investor. Outside investors can include individual investors, institutional VC investors, corporations, financial institutions, government investors, or foreign investors.                                                                                |
| Capital intensity / Capital intense   | Indicator equal to one if the firm is in the top quartile of total equity raised during the sample period.                                                                                                                                                                                                                                       |
| Assets                                | Indicator equal to one if the firm has positive assets in the year before the financing round.                                                                                                                                                                                                                                                   |
| Revenues                              | Indicator equal to one if the firm has positive revenues in the year before the financing round.                                                                                                                                                                                                                                                 |
| Salary expenses                       | Indicator equal to one if the firm has positive salary expenses in the year before the financing round.                                                                                                                                                                                                                                          |
| Pre-round assets                      | Indicator equal to one if the firm reports positive assets in the year before the financing round.                                                                                                                                                                                                                                               |
| Pre-round revenues                    | Indicator equal to one if the firm reports positive revenues in the year before the financing round.                                                                                                                                                                                                                                             |
| Pre-round salary expenses             | Indicator equal to one if the firm reports positive salary expenses in the year before the financing round.                                                                                                                                                                                                                                      |
| Founder wealth                        | Natural logarithm of founder gross wealth in the year before startup incorporation.                                                                                                                                                                                                                                                              |
| Experienced founder                   | Indicator equal to one if the founder previously founded another firm before the focal startup.                                                                                                                                                                                                                                                  |
| VC co-investor                        | Indicator equal to one if an institutional VC investor participates in the same financing round as the outside individual investor.                                                                                                                                                                                                              |
| VC-backed                             | Indicator equal to one if the firm received institutional VC financing in the focal round or before the focal round.                                                                                                                                                                                                                             |

*(continued on next page)*

| Variable                                     | Definition                                                                                                                                                                                                                                                               |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Follow-on VC-investment / Future VC investor | Indicator equal to one if an institutional VC investor invests in a subsequent financing round of the same firm.                                                                                                                                                         |
| Has follow-on round                          | Indicator equal to one if the firm has a subsequent financing round.                                                                                                                                                                                                     |
| Follow-on connected investor                 | Indicator equal to one if the firm receives financing in a subsequent financing round from an individual investor with a prior connection to one of the focal round's outside individual investors.                                                                      |
| Strictly follow-on connected investor        | Indicator equal to one if the firm receives financing in a subsequent financing round from an individual investor with a prior connection to one of the focal round's outside individual investors and whose first financing round in the firm is after the focal round. |
| Bankrupt                                     | Indicator equal to one if the firm enters bankruptcy or liquidation within five years after the financing round.                                                                                                                                                         |
| M&A/IPO                                      | Indicator equal to one if the firm experiences a merger, acquisition, or initial public offering within five years after the financing round.                                                                                                                            |
| 5-year cumulative revenues                   | Firm revenues accumulated over the five consecutive years after the financing round.                                                                                                                                                                                     |
| Ln(Revenues)                                 | Natural logarithm of firm revenues accumulated over the five consecutive years after the financing round.                                                                                                                                                                |
| 5-year cumulative salary expenses            | Firm salary expenses accumulated over the five consecutive years after the financing round.                                                                                                                                                                              |
| Ln(Salaries)                                 | Natural logarithm of firm salary expenses accumulated over the five consecutive years after the financing round.                                                                                                                                                         |
| Round year                                   | Calendar year of the financing round.                                                                                                                                                                                                                                    |
| Round sequence                               | Sequence number of the financing round for the firm.                                                                                                                                                                                                                     |
| Industry                                     | Firm operating industry, classified using the International Standard Industrial Classification (ISIC).                                                                                                                                                                   |

## B Data and Returns Measurement

### A Definition of an Investment

Our main data come from the annual tax declarations of all Norwegian public and private limited liability companies and their shareholders. These declarations have been digitally collected and stored since 2004, and we use data through December 2018. The declarations identify firms' shareholders, their shareholdings, and all equity purchase, sale, and liquidation transactions. Each record includes the date, monetary amount, and number of shares transacted. In addition, we observe whether purchases occur in primary financing rounds (88% of all purchases) or in secondary trades of already issued shares among existing investors. The detailed description of the data is provided in Kisseleva, Mjøs, and Robinson (2026).

At the most granular level, our data identify unique share purchase transactions using five variables: investor, firm, purchase date, purchase type, and share class. By the end of our sample period, a purchase may be fully or partially realized through sales or liquidation of shares. Thus, if a single initial purchase is exited across several distinct sales, we observe more than one transaction outcome. The outcome date is the exit date for realized transactions or the last day of the sample period (December 31, 2018) for unrealized transactions. To illustrate the data structure consider three examples: (a) Investor  $j$  purchases 100 shares in firm  $i$  at time  $t$ . She sells 50 shares at time  $s$  and 50 shares at a later date  $k$ . This represents one purchase with two distinct realized outcomes. (b) Investor  $j$  purchases 50 shares in firm  $i$  at time  $t$  and 50 shares in firm  $i$  at a later date  $z$ . She sells all 100 shares at time  $s$ . This represents two purchases, each with one realized outcome. (c) Investor  $j$  purchases 100 shares in firm  $i$  at time  $t$ . She sells 50 shares at time  $s$ . This represents one purchase with a realized outcome at time  $s$  and an unrealized outcome at  $k = \text{December 31, 2018}$ .

In all of our main analyses, we aggregate share purchase transactions to the investor–firm level. This means that if an angel provides capital in multiple tranches within the same round, or makes follow-on investments in subsequent rounds, we treat the entire engagement as a single investment. In other words, for each investor–firm combination, the angel may have made one or multiple share purchase transactions in the firm, each of which may have one or multiple investment outcomes. When computing returns, we aggregate across all purchases and all outcomes for a given investor–firm pair by summing cash inflows and outflows.

## B Measurement of Returns

To illustrate our procedure for measuring investment returns when there are multiple outcomes and how returns are aggregated to the investor–firm level, consider the following examples. In example (a), an investor  $j$  purchases 100 shares for a price of NOK 100/share in firm  $i$  at time  $t$ . She sells 50 shares at time  $s$  for NOK 60/share and 50 shares for NOK 75/share at a later point at time  $k$ . This implies  $Realized\ TVPI = \frac{60 \times 50 + 75 \times 50}{100 \times 100} = 0.675$ . In example (b), an investor  $j$  purchases 50 shares for a price of NOK 100/share in firm  $i$  at time  $t$  and another 50 shares for a price of NOK 110/share in the same firm  $i$  at time  $b$ . She sells the 50 shares purchased at time  $t$  at time  $s$  for NOK 70/share and the 50 shares purchased at time  $b$  for NOK 125/share at a later point at time  $k$ . This implies  $Realized\ TVPI = \frac{70 \times 50 + 125 \times 50}{100 \times 50 + 110 \times 50} = 0.929$ . In example (c), an investor  $j$  purchases 100 shares in firm  $i$  at time  $t$  for a price of NOK 100/share. She sells 50 shares at time  $s$  for NOK 80/share. This case is one investment with both a realized outcome at time  $s$  and an unrealized outcome at time  $k = 12/31/2018$ . This implies that the  $Realized\ TVPI = \frac{80 \times 50}{100 \times 50} = 0.8$ , but the other return measures depend on the firm outcome. First, assume that firm  $i$  earns neither revenues nor raises outside equity throughout

years  $t + 5$ . Then,  $Adjusted\ TVPI = \frac{80 \times 50 + 0 \times 50}{100 \times 100} = 0.4$ . Alternatively, assume that the firm earns revenues and that the average share price in the firm's last financing round is NOK 125/share. We calculate  $Full\ TVPI = \frac{80 \times 50 + 125 \times 50}{100 \times 100} = 1.025$ . In this case,  $Realized\ TVPI = Adjusted\ TVPI = 0.8$ , while  $Full\ TVPI = 1.025$ .

As these examples illustrate, investor–firm-level TVPI is calculated as the purchase-amount-weighted average of transaction-level TVPI across the investor's distinct investment outcomes in the firm. To account for differences in holding periods, our analyses use buy-and-hold annualized returns (BHAR). Following the same aggregation procedure, investor–firm-level BHAR is the purchase-amount-weighted average of transaction-level BHAR across the investor's distinct investment outcomes in the firm. Transaction-level BHAR is obtained by annualizing transaction-level TVPI according to

$$BHAR = \exp \left\{ \frac{365}{\text{holding period}} \ln (TVPI) \right\} - 1,$$

where the holding period is the number of days between the purchase date and the exit date associated with the investment outcome. This expression yields net BHAR; gross BHAR is obtained by omitting the final subtraction of one. When TVPI equals zero and the logarithmic transformation is therefore undefined, we assign net BHAR a value of  $-1$  and gross BHAR a value of zero.

## C Additional Figures and Tables

Figure C1: Industry Composition

Figure C1 compares the industry composition of different samples of Norwegian startups with individual investors founded between 2004 and 2017. Panel A reports the share of firms in each operating industry for the full sample, restricted sample of ex ante high-innovation-potential (HIP) firms after 2010, restricted sample with at least one outside investor, and restricted sample with multiple outside investors. Panel B compares the industry composition in the restricted sample with outside angel investors and outside retail investors. Industries are classified using the International Standard Industrial Classification (ISIC).

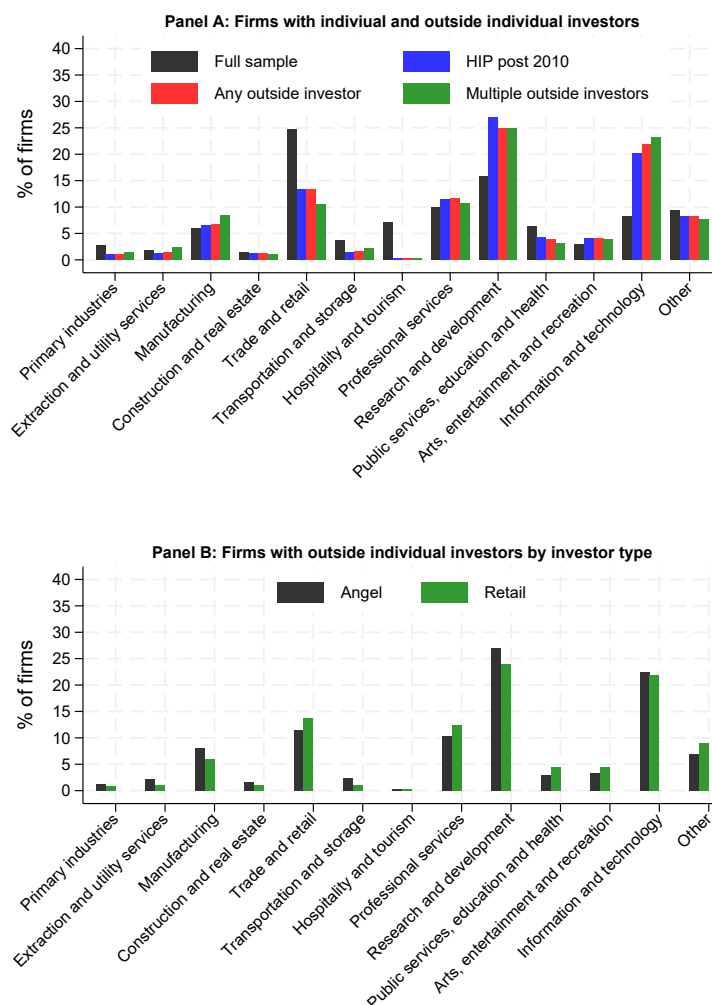


Table CI: Single- vs. Multiple-outside-investor Firms

Table CI compares the restricted sample of HIP post-2010 outside-investor firms by whether they receive investment from one or multiple outside individual investors. Panel A reports firm-level characteristics and ultimate firm outcomes. Panel B reports investment-level characteristics for the corresponding investments. Firms with multiple outside investors identify the within-firm estimates in our analyses. For binary variables, the table reports means. Monetary variables are winsorized at the 0.5th and 99.5th percentiles and reported in thousand USD, converted from NOK to USD using the interbank mid-market exchange rate from Norges Bank. Firm characteristics are measured as averages over firms' first five years.

| Panel A: Firm-level characteristics and outcomes                    |                      |       |       |         |                            |       |       |         |
|---------------------------------------------------------------------|----------------------|-------|-------|---------|----------------------------|-------|-------|---------|
| N of firms:                                                         | One Outside Investor |       |       |         | Multiple Outside Investors |       |       |         |
|                                                                     | 4,946                |       |       |         | 2,548                      |       |       |         |
|                                                                     | mean                 | p50   | p75   | p90     | mean                       | p50   | p75   | p90     |
| N of outside investors                                              |                      |       |       |         | 3.5                        | 2.0   | 3.0   | 6.0     |
| Total equity injected                                               | 389.8                | 6.0   | 26.0  | 198.6   | 1328.0                     | 44.0  | 424.8 | 2548.0  |
| VC-backed                                                           | 1.6%                 |       |       |         | 5.8%                       |       |       |         |
| <i>Ultimate firm outcomes</i>                                       |                      |       |       |         |                            |       |       |         |
| Independently operating                                             | 74.0%                |       |       |         | 73.8%                      |       |       |         |
| Bankruptcy/liquidation                                              | 18.4%                |       |       |         | 17.9%                      |       |       |         |
| M&A                                                                 | 7.6%                 |       |       |         | 8.1%                       |       |       |         |
| IPO (Oslo Børs)                                                     | 0.0%                 |       |       |         | 0.2%                       |       |       |         |
| <i>Firm characteristics (averages over firms' first five years)</i> |                      |       |       |         |                            |       |       |         |
| Total assets                                                        | 533.8                | 33.2  | 133.0 | 529.7   | 1,504.0                    | 95.5  | 485.4 | 2,099.0 |
| Revenues                                                            | 364.7                | 19.9  | 122.8 | 448.4   | 881.3                      | 25.9  | 175.5 | 877.8   |
| Net income                                                          | -12.6                | -0.9  | 2.9   | 26.3    | -75.2                      | -3.3  | 1.5   | 43.0    |
| Salary expenses                                                     | 115.5                | 0.1   | 41.8  | 164.8   | 291.8                      | 4.1   | 95.4  | 385.7   |
| Bank loans                                                          | 88.2                 | 0.0   | 0.0   | 26.1    | 221.9                      | 0.0   | 0.0   | 122.5   |
| Convertible loans                                                   | 1.9                  | 0.0   | 0.0   | 0.0     | 6.9                        | 0.0   | 0.0   | 0.0     |
| Cash                                                                | 68.6                 | 8.7   | 30.5  | 98.6    | 194.3                      | 19.0  | 85.0  | 354.4   |
| Intangible assets                                                   | 61.6                 | 0.0   | 0.5   | 12.7    | 242.7                      | 0.0   | 9.6   | 160.0   |
| Panel B: Investment- and investor-level characteristics             |                      |       |       |         |                            |       |       |         |
| N of investments:                                                   | One Outside Investor |       |       |         | Multiple Outside Investors |       |       |         |
|                                                                     | 4,946                |       |       |         | 8,994                      |       |       |         |
|                                                                     | mean                 | p50   | p75   | p90     | mean                       | p50   | p75   | p90     |
| <i>Investment characteristics</i>                                   |                      |       |       |         |                            |       |       |         |
| Investment amount                                                   | 30.5                 | 2.6   | 9.1   | 42.0    | 64.1                       | 11.5  | 46.5  | 143.9   |
| Ownership stake                                                     | 40.8%                | 50.0% | 50.0% | 50.0%   | 16.7%                      | 10.7% | 26.7% | 33.3%   |
| Share of invested capital                                           | 41.5%                | 50.0% | 50.0% | 50.0%   | 14.5%                      | 9.2%  | 25.0% | 33.3%   |
| Takes board seat (1/0)                                              | 85.9%                |       |       |         | 47.7%                      |       |       |         |
| Firm age (years)                                                    | 0.3                  | 0.0   | 0.0   | 1.0     | 1.0                        | 0.0   | 1.0   | 3.0     |
| Investment realized (1/0)                                           | 45.7%                |       |       |         | 40.0%                      |       |       |         |
| Holding period (years)                                              | 3.3                  | 2.9   | 4.6   | 6.2     | 3.3                        | 2.9   | 4.7   | 6.4     |
| <i>Investor characteristics</i>                                     |                      |       |       |         |                            |       |       |         |
| Retail investor (1/0)                                               | 66.0%                |       |       |         | 45.1%                      |       |       |         |
| Gross wealth                                                        | 1,067.0              | 164.9 | 418.5 | 1,519.0 | 1,746.0                    | 306.0 | 993.2 | 3,753.0 |
| Repeat investor (1/0)                                               | 19.0%                |       |       |         | 26.5%                      |       |       |         |
| Prior focal founder link (1/0)                                      | 18.6%                |       |       |         | 17.6%                      |       |       |         |
| Prior VC-backed firm link (1/0)                                     | 7.0%                 |       |       |         | 12.8%                      |       |       |         |
| Prior board experience (1/0)                                        | 59.9%                |       |       |         | 65.3%                      |       |       |         |
| Prior board in same industry (1/0)                                  | 35.8%                |       |       |         | 34.9%                      |       |       |         |
| Prior board links                                                   | 8.7                  | 2.0   | 8.0   | 21.0    | 13.5                       | 3.0   | 13.0  | 36.0    |
| Prior investor links                                                | 5.6                  | 0.0   | 4.0   | 14.0    | 11.8                       | 2.0   | 11.0  | 34.0    |

Table CII: Firm-level Return Distributions

Table CII reports the distribution of firm-level buy-and-hold annualized returns (BHAR), computed as the investment-weighted average of the full sample of investments by individual investors, across the analysis samples. Returns are reported separately for realized BHAR, adjusted BHAR, and full BHAR. The first block uses the full sample of firms with individual investors. The second block restricts the sample to HIP post-2010 firms with outside individual investors. The third block further restricts the HIP post-2010 sample to firms with multiple outside individual investors, which identify the within-firm estimates. Realized BHAR is based on observed realization transactions. Adjusted BHAR additionally treats investments as losses when firms have no revenues for five consecutive years after investment and no subsequent equity financing. Full BHAR assigns unrealized shares the most recent observed share price from the latest financing round. Returns are winsorized at the 0.5th and 99.5th percentiles.

|                                              |        | BHAR   |          |       |         |         |        |      |       |        |           | Total |
|----------------------------------------------|--------|--------|----------|-------|---------|---------|--------|------|-------|--------|-----------|-------|
|                                              | N      | mean   | sd       | skew. | p10     | p25     | p50    | p75  | p90   | p95    | p99       | Loss  |
| <b>Full sample</b>                           |        |        |          |       |         |         |        |      |       |        |           |       |
| Realized BHAR                                | 27,415 | 95.4%  | 1,423.0% | 12.25 | -100.0% | -100.0% | -37.3% | 0.0% | 41.1% | 109.8% | 1,840.0%  | 31.2% |
| Adjusted BHAR                                | 28,997 | 65.1%  | 1,140.0% | 12.24 | -100.0% | -100.0% | -51.8% | 0.0% | 37.0% | 101.6% | 1,598.0%  | 35.0% |
| Full BHAR                                    | 49,229 | -8.1%  | 163.2%   | 9.50  | -100.0% | -70.8%  | 0.0%   | 0.0% | 10.2% | 45.6%  | 467.8%    | 19.1% |
| <b>Restricted sample</b>                     |        |        |          |       |         |         |        |      |       |        |           |       |
| <i>Firms with outside investors</i>          |        |        |          |       |         |         |        |      |       |        |           |       |
| Realized BHAR                                | 3,863  | 231.8% | 2,010.0% | 8.52  | -100.0% | -100.0% | -22.5% | 0.0% | 71.9% | 224.8% | 18,610.0% | 23.1% |
| Adjusted BHAR                                | 4,112  | 172.5% | 1,601.0% | 8.55  | -100.0% | -100.0% | -37.2% | 0.0% | 60.5% | 190.1% | 12,870.0% | 27.8% |
| Full BHAR                                    | 7,494  | 9.5%   | 211.7%   | 7.57  | -100.0% | -40.9%  | 0.0%   | 0.0% | 20.1% | 85.4%  | 1,488.0%  | 13.5% |
| <i>Firms with multiple outside investors</i> |        |        |          |       |         |         |        |      |       |        |           |       |
| Realized BHAR                                | 1,511  | 390.6% | 2,577.0% | 6.66  | -100.0% | -93.2%  | -13.4% | 3.4% | 90.6% | 355.2% | 18,610.0% | 16.9% |
| Adjusted BHAR                                | 1,592  | 301.0% | 2,056.0% | 6.68  | -100.0% | -99.0%  | -23.7% | 0.0% | 85.3% | 321.8% | 14,930.0% | 21.1% |
| Full BHAR                                    | 2,548  | 23.6%  | 253.0%   | 6.52  | -100.0% | -35.1%  | 0.0%   | 1.1% | 34.4% | 111.0% | 1,894.0%  | 9.8%  |

Table CIII: Investment-level Return Distributions

Table CIII reports the distribution of buy-and-hold annualized returns (BHAR) for individual startup investments. The table reports realized BHAR, adjusted BHAR, and full BHAR for the full sample, the restricted, HIP post-2010, sample, and subsamples of HIP investments by outside investors, outside investors in multi-investor firms, and insiders. Realized BHAR is based on observed realization transactions. Adjusted BHAR additionally treats investments as losses when firms have no revenues for five consecutive years after investment and no subsequent equity financing. Full BHAR assigns unrealized shares the most recent observed share price from the latest financing round. Returns are winsorized at the 0.5th and 99.5th percentiles.

|                                                            | N      | N per<br>Investor | BHAR   |          |       |         |         |        |      |        |        |           | Total<br>Loss |
|------------------------------------------------------------|--------|-------------------|--------|----------|-------|---------|---------|--------|------|--------|--------|-----------|---------------|
|                                                            |        |                   | mean   | sd       | skew. | p10     | p25     | p50    | p75  | p90    | p95    | p99       |               |
| <b>Full sample</b>                                         |        |                   |        |          |       |         |         |        |      |        |        |           |               |
| Realized BHAR                                              | 45,180 | 1.1               | 48.9%  | 915.9%   | 12.08 | -100.0% | -100.0% | -41.0% | 0.0% | 41.1%  | 108.6% | 1,430.7%  | 35.0%         |
| Adjusted BHAR                                              | 48,103 | 1.1               | 26.6%  | 719.3%   | 11.93 | -100.0% | -100.0% | -60.9% | 0.0% | 37.0%  | 99.0%  | 1,204.0%  | 38.9%         |
| Full BHAR                                                  | 86,585 | 1.1               | -10.2% | 136.2%   | 8.53  | -100.0% | -82.1%  | 0.0%   | 0.0% | 17.1%  | 54.7%  | 423.5%    | 20.9%         |
| <b>Restricted sample</b>                                   |        |                   |        |          |       |         |         |        |      |        |        |           |               |
| Realized BHAR                                              | 7,856  | 1.1               | 152.1% | 1,337.7% | 8.18  | -100.0% | -100.0% | -20.6% | 0.0% | 78.9%  | 222.5% | 11,942.9% | 28.7%         |
| Adjusted BHAR                                              | 8,521  | 1.1               | 104.8% | 1,042.5% | 8.21  | -100.0% | -100.0% | -41.0% | 0.0% | 69.6%  | 209.9% | 9,339.7%  | 34.3%         |
| Full BHAR                                                  | 19,257 | 1.1               | 7.6%   | 167.8%   | 7.18  | -100.0% | -26.5%  | 0.0%   | 0.0% | 35.1%  | 100.6% | 919.5%    | 14.5%         |
| <i>...of which by outsiders</i>                            |        |                   |        |          |       |         |         |        |      |        |        |           |               |
| Realized BHAR                                              | 5,863  | 1.1               | 147.5% | 1,344.1% | 8.22  | -100.0% | -100.0% | -25.0% | 0.0% | 71.9%  | 209.9% | 11,942.9% | 28.6%         |
| Adjusted BHAR                                              | 6,346  | 1.1               | 100.0% | 1,042.1% | 8.29  | -100.0% | -100.0% | -45.8% | 0.0% | 62.4%  | 195.6% | 9,339.7%  | 34.1%         |
| Full BHAR                                                  | 13,940 | 1.1               | 6.8%   | 169.3%   | 7.18  | -100.0% | -32.3%  | 0.0%   | 0.0% | 36.2%  | 100.7% | 1,088.4%  | 14.7%         |
| <i>...of which by outsiders in multiple-investor firms</i> |        |                   |        |          |       |         |         |        |      |        |        |           |               |
| Realized BHAR                                              | 3,602  | 1.0               | 183.1% | 1,478.8% | 7.49  | -100.0% | -100.0% | -20.1% | 0.2% | 82.1%  | 231.1% | 11,942.9% | 28.6%         |
| Adjusted BHAR                                              | 3,913  | 1.0               | 126.2% | 1,143.5% | 7.59  | -100.0% | -100.0% | -38.4% | 0.0% | 71.6%  | 211.7% | 9,339.7%  | 34.3%         |
| Full BHAR                                                  | 8,994  | 1.1               | 10.5%  | 172.9%   | 7.07  | -100.0% | -29.1%  | 0.0%   | 2.2% | 46.1%  | 120.3% | 1,204.0%  | 14.0%         |
| <i>...of which by insiders</i>                             |        |                   |        |          |       |         |         |        |      |        |        |           |               |
| Realized BHAR                                              | 1,993  | 1.0               | 165.8% | 1,319.0% | 8.04  | -100.0% | -100.0% | -11.1% | 8.0% | 102.9% | 314.1% | 11,857.7% | 29.0%         |
| Adjusted BHAR                                              | 2,175  | 1.0               | 118.8% | 1,043.9% | 7.99  | -100.0% | -100.0% | -28.8% | 1.6% | 92.7%  | 258.1% | 9,339.7%  | 34.9%         |
| Full BHAR                                                  | 5,317  | 1.0               | 9.5%   | 163.8%   | 7.18  | -100.0% | -11.3%  | 0.0%   | 0.0% | 32.6%  | 100.5% | 919.5%    | 13.7%         |

Table CIV: Return Distributions for Angel and Retail Investments

Table CIV reports the distribution of buy-and-hold annualized returns (BHAR) separately for angel and retail investments. Returns are reported for the full sample and for outside individual investments in the restricted sample of HIP firms after 2010. An angel is a non-retail individual investor in the full sample and a non-retail outside individual investor in the restricted sample. For each sample, the table reports realized BHAR, adjusted BHAR, and full BHAR. Realized BHAR is based on observed realization transactions. Adjusted BHAR additionally treats investments as losses when firms have no revenues for five consecutive years after investment and no subsequent equity financing. Full BHAR assigns unrealized shares the most recent observed share price from the latest financing round. Returns are winsorized at the 0.5th and 99.5th percentiles.

|                    | N      | N per Investor | BHAR   |          |       |         |         |        |      |       |        |           | Total Loss |
|--------------------|--------|----------------|--------|----------|-------|---------|---------|--------|------|-------|--------|-----------|------------|
|                    |        |                | mean   | sd       | skew. | p10     | p25     | p50    | p75  | p90   | p95    | p99       |            |
| Full sample        |        |                |        |          |       |         |         |        |      |       |        |           |            |
| Angel investments  |        |                |        |          |       |         |         |        |      |       |        |           |            |
| Realized BHAR      | 17,024 | 1.3            | 83.7%  | 1,075.0% | 10.27 | -100.0% | -100.0% | -37.7% | 0.0% | 51.8% | 146.1% | 3,156.2%  | 32.1%      |
| Adjusted BHAR      | 18,106 | 1.3            | 54.3%  | 843.8%   | 10.17 | -100.0% | -100.0% | -53.4% | 0.0% | 46.6% | 132.5% | 2,744.7%  | 36.2%      |
| Full BHAR          | 31,162 | 1.5            | -6.2%  | 152.4%   | 7.81  | -100.0% | -78.6%  | 0.0%   | 0.0% | 26.7% | 71.6%  | 606.6%    | 19.7%      |
| Retail investments |        |                |        |          |       |         |         |        |      |       |        |           |            |
| Realized BHAR      | 28,156 | 1.0            | 27.8%  | 803.9%   | 13.75 | -100.0% | -100.0% | -44.2% | 0.0% | 35.2% | 90.8%  | 852.0%    | 36.7%      |
| Adjusted BHAR      | 29,997 | 1.0            | 9.9%   | 631.9%   | 13.54 | -100.0% | -100.0% | -66.6% | 0.0% | 31.8% | 83.4%  | 746.6%    | 40.6%      |
| Full BHAR          | 55,423 | 1.0            | -12.5% | 126.2%   | 9.01  | -100.0% | -84.9%  | 0.0%   | 0.0% | 11.1% | 45.5%  | 341.1%    | 21.6%      |
| Restricted sample  |        |                |        |          |       |         |         |        |      |       |        |           |            |
| Angel investments  |        |                |        |          |       |         |         |        |      |       |        |           |            |
| Realized BHAR      | 2,713  | 1.1            | 185.2% | 1,449.2% | 7.52  | -100.0% | -100.0% | -20.6% | 4.4% | 91.7% | 289.6% | 11,942.9% | 28.1%      |
| Adjusted BHAR      | 2,938  | 1.1            | 131.0% | 1,132.3% | 7.54  | -100.0% | -100.0% | -40.7% | 0.0% | 83.7% | 248.8% | 9,339.7%  | 33.6%      |
| Full BHAR          | 6,618  | 1.3            | 8.7%   | 168.3%   | 7.22  | -100.0% | -31.6%  | 0.0%   | 3.8% | 45.8% | 109.5% | 1,032.1%  | 13.8%      |
| Retail investments |        |                |        |          |       |         |         |        |      |       |        |           |            |
| Realized BHAR      | 3,150  | 1.0            | 115.0% | 1,245.8% | 9.00  | -100.0% | -100.0% | -28.4% | 0.0% | 54.0% | 143.0% | 10,424.9% | 29.1%      |
| Adjusted BHAR      | 3,408  | 1.0            | 73.2%  | 956.9%   | 9.15  | -100.0% | -100.0% | -49.6% | 0.0% | 45.8% | 128.2% | 5,896.2%  | 34.5%      |
| Full BHAR          | 7,322  | 1.0            | 5.1%   | 170.2%   | 7.15  | -100.0% | -33.9%  | 0.0%   | 0.0% | 23.7% | 93.6%  | 1,124.3%  | 15.6%      |

Table CV: Alternative Return Measures

Table CV reports the return distributions of individual investments in the full sample using alternative performance measures: *total value to paid-in* (TVPI), defined as total proceeds and terminal value divided by paid-in capital, and *public market equivalents* (PME), where TVPI is adjusted by the Oslo Børs Benchmark Index (OSEBX), the Russell 2000, or the Russell 3000 at each cash-flow date, respectively. All returns are winsorized at the 0.5th and 99.5th percentiles.

|                                          |        | Returns |      |       |      |      |      |      |      |      |       |
|------------------------------------------|--------|---------|------|-------|------|------|------|------|------|------|-------|
|                                          | N      | mean    | sd   | skew. | p10  | p25  | p50  | p75  | p90  | p95  | p99   |
| Total value to paid-in (TVPI)            |        |         |      |       |      |      |      |      |      |      |       |
| Realized TVPI                            | 45,180 | 2.38    | 9.63 | 7.76  | 0.00 | 0.00 | 0.32 | 1.00 | 3.33 | 8.39 | 50.91 |
| Adjusted TVPI                            | 48,103 | 2.17    | 8.74 | 7.59  | 0.00 | 0.00 | 0.14 | 1.00 | 3.00 | 7.67 | 48.92 |
| Full TVPI                                | 86,585 | 1.96    | 7.50 | 8.51  | 0.00 | 0.01 | 1.00 | 1.00 | 1.98 | 5.00 | 39.57 |
| Public Market Equivalent (PME)           |        |         |      |       |      |      |      |      |      |      |       |
| <i>Oslo Børs Benchmark Index (OSEBX)</i> |        |         |      |       |      |      |      |      |      |      |       |
| Realized PME                             | 45,180 | 1.75    | 6.93 | 7.76  | 0.00 | 0.00 | 0.23 | 0.92 | 2.48 | 6.26 | 36.98 |
| Adjusted PME                             | 48,103 | 1.61    | 6.44 | 7.76  | 0.00 | 0.00 | 0.10 | 0.89 | 2.28 | 5.85 | 35.20 |
| Full PME                                 | 86,585 | 1.35    | 5.17 | 8.55  | 0.00 | 0.01 | 0.56 | 0.85 | 1.45 | 3.44 | 26.90 |
| <i>Russell 2000</i>                      |        |         |      |       |      |      |      |      |      |      |       |
| Realized PME                             | 45,180 | 1.79    | 7.00 | 7.62  | 0.00 | 0.00 | 0.25 | 0.95 | 2.54 | 6.47 | 38.23 |
| Adjusted PME                             | 48,103 | 1.65    | 6.55 | 7.67  | 0.00 | 0.00 | 0.10 | 0.92 | 2.33 | 5.94 | 36.33 |
| Full PME                                 | 86,585 | 1.47    | 5.54 | 8.57  | 0.00 | 0.01 | 0.61 | 0.93 | 1.53 | 3.69 | 29.51 |
| <i>Russell 3000</i>                      |        |         |      |       |      |      |      |      |      |      |       |
| Realized PME                             | 45,180 | 1.81    | 7.02 | 7.54  | 0.00 | 0.00 | 0.25 | 0.95 | 2.58 | 6.53 | 39.33 |
| Adjusted PME                             | 48,103 | 1.66    | 6.56 | 7.57  | 0.00 | 0.00 | 0.10 | 0.92 | 2.35 | 6.01 | 37.15 |
| Full PME                                 | 86,585 | 1.44    | 5.52 | 8.59  | 0.00 | 0.01 | 0.57 | 0.90 | 1.51 | 3.66 | 29.31 |

Table CVI: Investor Professionalization

Table CVI relates pre-investment investor attributes to retail status and continuous measure of investment returns. Columns (1)–(2) report linear probability models in which the dependent variable equals one for retail investors, defined as individual investors who make only one investment and invest less than 20.0 thousand USD over the sample period. Columns (3)–(8) report return regressions. The dependent variable is full TVPI in Columns (3)–(4) and (gross) full BHAR in Columns (5)–(8). Columns (1), (3), and (5) use the full sample of individual investments. Columns (2), (4), and (6) restrict the sample to individual investments in HIP firms after 2010. Columns (7) and (8) split the restricted sample into outside and insider investments, respectively. Return measures are winsorized at the 0.5th and 99.5th percentiles. All specifications include fixed effects for the investment calendar year and firm age at investment measured in quarters. Standard errors are double-clustered at the firm and investor level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                     | Retail status (1/0)  |                      | TVPI                |                     | BHAR                |                    |                    |                   |
|-------------------------------------|----------------------|----------------------|---------------------|---------------------|---------------------|--------------------|--------------------|-------------------|
|                                     | (1)                  | (2)                  | (3)                 | (4)                 | All                 | All                | Outsiders          | Insiders          |
|                                     | (1)                  | (2)                  | (3)                 | (4)                 | (5)                 | (6)                | (7)                | (8)               |
| Prior public investment             | -0.005***<br>(0.000) |                      | -0.013*<br>(0.008)  |                     | 0.001<br>(0.003)    |                    |                    |                   |
| Ln (gross wealth)                   |                      | -0.045***<br>(0.002) |                     | -0.058<br>(0.046)   |                     | -0.011<br>(0.010)  | -0.009<br>(0.012)  | 0.004<br>(0.017)  |
| Prior board experience (1/0)        | -0.103***<br>(0.005) | -0.117***<br>(0.011) | -0.060<br>(0.079)   | 0.264<br>(0.201)    | 0.003<br>(0.015)    | 0.049<br>(0.038)   | 0.036<br>(0.043)   | 0.123<br>(0.079)  |
| Prior board in same industry (1/0)  | -0.045***<br>(0.005) | -0.025**<br>(0.010)  | 0.289***<br>(0.098) | 0.425*<br>(0.246)   | 0.060***<br>(0.017) | 0.078*<br>(0.045)  | 0.061<br>(0.049)   | 0.121<br>(0.097)  |
| Prior focal founder link (1/0)      | -0.061***<br>(0.006) | -0.059***<br>(0.011) | 0.501***<br>(0.112) | 0.765***<br>(0.289) | 0.050**<br>(0.020)  | 0.082<br>(0.051)   | 0.079<br>(0.063)   | -0.019<br>(0.080) |
| Prior VC-backed firm link (1/0)     | -0.107***<br>(0.009) | -0.041***<br>(0.013) | 0.264<br>(0.189)    | 0.224<br>(0.323)    | 0.103**<br>(0.045)  | 0.144**<br>(0.072) | 0.151**<br>(0.075) | 0.253<br>(0.204)  |
| Prior investor links $\geq 5$ (1/0) | -0.197***<br>(0.007) | -0.187***<br>(0.011) | 0.096<br>(0.108)    | -0.142<br>(0.255)   | 0.023<br>(0.020)    | -0.031<br>(0.048)  | -0.053<br>(0.055)  | 0.129<br>(0.098)  |
| Prior board links $\geq 5$ (1/0)    | -0.075***<br>(0.006) | -0.031***<br>(0.011) | 0.080<br>(0.097)    | 0.098<br>(0.261)    | 0.015<br>(0.018)    | 0.049<br>(0.045)   | 0.096*<br>(0.052)  | -0.072<br>(0.086) |
| Observations                        | 86,583               | 19,257               | 86,583              | 19,257              | 86,583              | 19,257             | 13,939             | 5,313             |
| Adjusted R-squared                  | 19.1%                | 31.4%                | 0.2%                | 0.3%                | 1.4%                | 1.2%               | 1.1%               | 2.2%              |
| Sample                              | Full                 | Restricted           | Full                | Restricted          | Full                | Restricted         | Restricted         | Restricted        |

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Table CVII: Predicted Investment Performance

Table CVII reports estimates from linear probability models examining whether predicted investment performance is associated with a higher probability of obtaining returns from different quantiles of the full BHAR distribution. The dependent variables are indicators for mutually exclusive return intervals: investments held at cost (zero returns), negative returns, returns between the 50th and 85th percentiles, returns between the 85th and 90th percentiles, returns between the 90th and 95th percentiles, and returns above the 95th percentile. Panel A uses the full sample of individual investments, while Panel restricts the sample to investments in HIP firms after 2010. Predicted investment performance is computed as the fitted value from the pooled OLS return regression as shown in Equation 2. The results are presented in Appendix Table CVI. Based on the distribution of these fitted values, we classify investments into three predicted-performance groups: at or below the median, above the median and at or below the 75th percentile, and above the 75th percentile. The first group is omitted; the table reports coefficients for the middle and top predicted-performance groups. All specifications include fixed effects for the investment calendar year and firm age at investment measured in quarters. Standard errors are double-clustered at the firm and investor level. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

| Panel A: Full sample       |                      |                     |                         |                         |                         |                     |
|----------------------------|----------------------|---------------------|-------------------------|-------------------------|-------------------------|---------------------|
|                            | Full BHAR (r) (1/0)  |                     |                         |                         |                         |                     |
|                            | Held at<br>cost      | $r < 0\%$           | $p50 < r$<br>$\leq p85$ | $p85 < r$<br>$\leq p90$ | $p90 < r$<br>$\leq p95$ | $p95 < r$           |
|                            | (1)                  | (2)                 | (3)                     | (4)                     | (5)                     | (6)                 |
| Predicted performance      |                      |                     |                         |                         |                         |                     |
| Middle group (1/0)         | -0.044***<br>(0.005) | 0.030***<br>(0.005) | 0.001<br>(0.002)        | 0.001<br>(0.002)        | 0.003<br>(0.002)        | 0.010***<br>(0.002) |
| Top group (1/0)            | -0.066***<br>(0.005) | 0.028***<br>(0.005) | 0.003<br>(0.002)        | 0.009***<br>(0.002)     | 0.008***<br>(0.002)     | 0.019***<br>(0.002) |
| Observations               | 86,583               | 86,583              | 86,583                  | 86,583                  | 86,583                  | 86,583              |
| Adjusted R-squared         | 17.1%                | 10.5%               | 1.2%                    | 1.4%                    | 0.9%                    | 0.5%                |
| Panel B: Restricted sample |                      |                     |                         |                         |                         |                     |
|                            | Full BHAR (r) (1/0)  |                     |                         |                         |                         |                     |
|                            | Held at<br>cost      | $r < 0\%$           | $p50 < r$<br>$\leq p85$ | $p85 < r$<br>$\leq p90$ | $p90 < r$<br>$\leq p95$ | $p95 < r$           |
|                            | (1)                  | (2)                 | (3)                     | (4)                     | (5)                     | (6)                 |
| Predicted performance      |                      |                     |                         |                         |                         |                     |
| Middle group (1/0)         | -0.073***<br>(0.011) | 0.045***<br>(0.011) | 0.000<br>(0.004)        | 0.004<br>(0.005)        | 0.010**<br>(0.005)      | 0.014**<br>(0.006)  |
| Top group (1/0)            | -0.082***<br>(0.011) | 0.034***<br>(0.010) | 0.002<br>(0.004)        | 0.012**<br>(0.005)      | 0.011**<br>(0.005)      | 0.024***<br>(0.006) |
| Observations               | 19,257               | 19,257              | 19,257                  | 19,257                  | 19,257                  | 19,257              |
| Adjusted R-squared         | 14.9%                | 8.8%                | 2.2%                    | 3.9%                    | 3.1%                    | 1.2%                |

Table CVIII: Investor Attributes and Top-Tail Returns: Family insiders

Table CVIII reports linear probability model estimates relating pre-investment investor attributes to the probability of a top-decile return. The sample includes individual investments by family investors in HIP firms after 2010. In columns (1)–(4), the dependent variable equals one if the firm-level full BHAR, computed as the investment-weighted average of the full sample of investments by individual investors, falls above the 90th percentile of the firm-level return distribution. In columns (5)–(7), the dependent variable equals one for investments with full BHAR above the 90th percentile of the investment-level return distribution. Columns (1)–(4) report between-firm estimates. In these columns, the data are collapsed to the firm level by averaging retail participation and taking the sum of investment amount across individual family investors in the firm. The other investor attributes are measured as the maximum value among investors. Investment timing fixed effects in these columns absorb the firm age (in quarters) at the time of the earliest investment. Firm controls in Column (4) include an indicator for firms in the top quartile of total equity raised during the sample period (i.e., whether it is a capital-intensive firm), an indicator for whether the firm had positive assets in the year before the earliest investment, an indicator for experienced founders and an indicator for whether the firm receives VC investment during the sample period. Columns (5)–(7) report within-firm estimates at the investment level. Investment timing fixed effects in these columns absorb firm age (in quarters) at time of the investor's equity purchase. Standard errors are robust in Columns (1)–(4) and double-clustered at the firm and investor level in Columns (5)–(7). One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                     | Between-firm        |                    |                   |                   | Within-firm       |                    |                    |
|-------------------------------------|---------------------|--------------------|-------------------|-------------------|-------------------|--------------------|--------------------|
|                                     | (1)                 | (2)                | (3)               | (4)               | (5)               | (6)                | (7)                |
| Retail investor (1/0)               | -0.034**<br>(0.014) | -0.020<br>(0.014)  | -0.010<br>(0.015) | 0.002<br>(0.015)  | 0.076<br>(0.066)  | 0.028<br>(0.055)   | 0.006<br>(0.047)   |
| Ln (gross wealth)                   | 0.008**<br>(0.003)  | 0.006**<br>(0.003) | 0.005<br>(0.003)  | 0.006*<br>(0.003) | 0.004<br>(0.007)  | 0.001<br>(0.006)   | 0.003<br>(0.006)   |
| Prior board experience (1/0)        | -0.017<br>(0.015)   | -0.015<br>(0.015)  | -0.014<br>(0.015) | -0.013<br>(0.015) | -0.023<br>(0.027) | -0.009<br>(0.017)  | -0.005<br>(0.017)  |
| Prior board in same industry (1/0)  | 0.001<br>(0.017)    | -0.000<br>(0.016)  | -0.000<br>(0.016) | 0.001<br>(0.016)  | 0.042<br>(0.032)  | 0.030<br>(0.022)   | 0.017<br>(0.018)   |
| Prior focal founder link (1/0)      | 0.015<br>(0.015)    | 0.013<br>(0.015)   | 0.012<br>(0.015)  | -0.005<br>(0.015) | 0.039<br>(0.045)  | 0.009<br>(0.019)   | 0.011<br>(0.018)   |
| Prior VC-backed firm link (1/0)     | 0.071<br>(0.045)    | 0.065<br>(0.044)   | 0.062<br>(0.044)  | 0.031<br>(0.041)  | 0.097<br>(0.087)  | 0.073*<br>(0.039)  | 0.056<br>(0.034)   |
| Prior investor links $\geq 5$ (1/0) | 0.009<br>(0.019)    | 0.002<br>(0.019)   | 0.003<br>(0.019)  | 0.006<br>(0.019)  | 0.030<br>(0.050)  | -0.058*<br>(0.033) | -0.042<br>(0.032)  |
| Prior board links $\geq 5$ (1/0)    | 0.014<br>(0.018)    | 0.016<br>(0.018)   | 0.017<br>(0.018)  | 0.017<br>(0.018)  | -0.026<br>(0.027) | -0.006<br>(0.017)  | -0.004<br>(0.017)  |
| Ln (Investment amount)              |                     |                    | 0.009<br>(0.006)  | -0.007<br>(0.008) |                   |                    | -0.046*<br>(0.025) |
| Observations                        | 2,553               | 2,546              | 2,546             | 2,546             | 628               | 626                | 626                |
| Adjusted R-squared                  | 1.1%                | 3.5%               | 3.5%              | 6.2%              | 66.6%             | 79.1%              | 80.0%              |
| Firm clusters                       |                     |                    |                   |                   | 269               | 268                | 268                |
| Investor clusters                   |                     |                    |                   |                   | 619               | 617                | 617                |
| Firm FE                             | No                  | No                 | No                | No                | Yes               | Yes                | Yes                |
| Investment timing FE                | No                  | Yes                | Yes               | Yes               | No                | Yes                | Yes                |
| Firm controls                       | No                  | No                 | No                | Yes               | No                | No                 | No                 |

Table CIX: Investor Attributes and Top-Tail Returns: Employee insiders

Table CIX reports linear probability model estimates relating pre-investment investor attributes to the probability of a top-decile return. The sample includes individual investments by employee investors in HIP firms after 2010. In columns (1)–(4), the dependent variable equals one if the firm-level full BHAR, computed as the investment-weighted average of the full sample of investments by individual investors, falls above the 90th percentile of the firm-level return distribution. In columns (5)–(7), the dependent variable equals one for investments with full BHAR above the 90th percentile of the investment-level return distribution. Columns (1)–(4) report between-firm estimates. In these columns, the data are collapsed to the firm level by averaging retail participation and taking the sum of investment amount across individual employee investors in the firm. The other investor attributes are measured as the maximum value among investors. Investment timing fixed effects in these columns absorb the firm age (in quarters) at the time of the earliest investment. Firm controls in Column (4) include an indicator for firms in the top quartile of total equity raised during the sample period (i.e., whether it is a capital-intensive firm), an indicator for whether the firm had positive assets in the year before the earliest investment, an indicator for experienced founders and an indicator for whether the firm receives VC investment during the sample period. Columns (5)–(7) report within-firm estimates at the investment level. Investment timing fixed effects in these columns absorb firm age (in quarters) at time of the investor's equity purchase. Standard errors are robust in Columns (1)–(4) and double-clustered at the firm and investor level in Columns (5)–(7). One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                     | Between-firm         |                     |                     |                     | Within-firm       |                   |                      |
|-------------------------------------|----------------------|---------------------|---------------------|---------------------|-------------------|-------------------|----------------------|
|                                     | (1)                  | (2)                 | (3)                 | (4)                 | (5)               | (6)               | (7)                  |
| Retail investor (1/0)               | -0.060***<br>(0.023) | -0.032<br>(0.024)   | 0.000<br>(0.027)    | 0.025<br>(0.027)    | -0.000<br>(0.040) | 0.013<br>(0.036)  | -0.034<br>(0.038)    |
| Ln (gross wealth)                   | 0.009<br>(0.006)     | 0.006<br>(0.006)    | 0.003<br>(0.006)    | 0.002<br>(0.006)    | -0.006<br>(0.009) | -0.001<br>(0.008) | 0.004<br>(0.008)     |
| Prior board experience (1/0)        | 0.090***<br>(0.030)  | 0.081***<br>(0.030) | 0.082***<br>(0.030) | 0.075***<br>(0.029) | 0.043<br>(0.029)  | 0.028<br>(0.027)  | 0.027<br>(0.027)     |
| Prior board in same industry (1/0)  | -0.038<br>(0.030)    | -0.028<br>(0.031)   | -0.028<br>(0.031)   | -0.027<br>(0.030)   | 0.025<br>(0.038)  | 0.034<br>(0.033)  | 0.037<br>(0.033)     |
| Prior focal founder link (1/0)      | -0.064**<br>(0.027)  | -0.057**<br>(0.028) | -0.056**<br>(0.028) | -0.060**<br>(0.028) | 0.036<br>(0.038)  | 0.026<br>(0.037)  | 0.028<br>(0.036)     |
| Prior VC-backed firm link (1/0)     | 0.024<br>(0.049)     | -0.001<br>(0.052)   | -0.008<br>(0.051)   | -0.056<br>(0.051)   | -0.016<br>(0.068) | 0.034<br>(0.069)  | 0.034<br>(0.068)     |
| Prior investor links $\geq 5$ (1/0) | 0.039<br>(0.031)     | 0.038<br>(0.031)    | 0.031<br>(0.031)    | 0.037<br>(0.031)    | 0.027<br>(0.034)  | 0.001<br>(0.035)  | 0.006<br>(0.035)     |
| Prior board links $\geq 5$ (1/0)    | -0.035<br>(0.031)    | -0.047<br>(0.031)   | -0.051*<br>(0.031)  | -0.052*<br>(0.031)  | -0.010<br>(0.037) | -0.003<br>(0.034) | -0.008<br>(0.034)    |
| Ln (Investment amount)              |                      |                     | 0.023**<br>(0.009)  | 0.011<br>(0.010)    |                   |                   | -0.053***<br>(0.020) |
| Observations                        | 1,775                | 1,768               | 1,768               | 1,747               | 1,342             | 1,336             | 1,336                |
| Adjusted R-squared                  | 1.6%                 | 3.6%                | 4.0%                | 6.3%                | 62.4%             | 65.9%             | 66.3%                |
| Firm clusters                       |                      |                     |                     |                     | 423               | 422               | 422                  |
| Investor clusters                   |                      |                     |                     |                     | 1338              | 1332              | 1332                 |
| Firm FE                             | No                   | No                  | No                  | No                  | Yes               | Yes               | Yes                  |
| Investment timing FE                | No                   | Yes                 | Yes                 | Yes                 | No                | Yes               | Yes                  |
| Firm controls                       | No                   | No                  | No                  | Yes                 | No                | No                | No                   |

Table CX: Investor Attributes and Top-Tail Returns: Full Sample

Table CX reports linear probability model estimates relating pre-investment investor attributes to the probability of a top-decile return in the full sample of investments. In columns (1)–(4), the dependent variable equals one if the firm-level full BHAR, computed as the investment-weighted average of the full sample of investments by individual investors, falls above the 90th percentile of the firm-level return distribution. In columns (5)–(7), the dependent variable equals one for investments with full BHAR above the 90th percentile of the investment-level return distribution. Columns (1)–(4) report between-firm estimates. In these columns, the data are collapsed to the firm level by averaging retail participation and taking the sum of investment amount across individual investors in the firm. The other investor attributes are measured as the maximum value among investors. Investment timing fixed effects in these columns absorb the firm age (in quarters) at the time of the earliest investment. Firm controls in Column (4) include an indicator for firms in the top quartile of total equity raised during the sample period (i.e., whether it is a capital-intensive firm), an indicator for whether the firm had positive assets in the year before the earliest investment, an indicator for experienced founders and an indicator for whether the firm receives VC investment during the sample period. Columns (5)–(7) report within-firm estimates at the investment level. Investment timing fixed effects in these columns absorb firm age (in quarters) at time of the investor's equity purchase. Standard errors are robust in Columns (1)–(4) and double-clustered at the firm and investor level in Columns (5)–(7). One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                     | Between-firm         |                      |                      |                      | Within-firm         |                     |                      |
|-------------------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|---------------------|----------------------|
|                                     | (1)                  | (2)                  | (3)                  | (4)                  | (5)                 | (6)                 | (7)                  |
| Retail investor (1/0)               | -0.029***<br>(0.003) | -0.027***<br>(0.004) | -0.015***<br>(0.004) | -0.008*<br>(0.004)   | 0.041***<br>(0.004) | 0.038***<br>(0.004) | 0.000<br>(0.004)     |
| Prior public investment             | 0.000<br>(0.000)     | 0.000<br>(0.000)     | -0.000<br>(0.000)    | -0.000<br>(0.000)    | -0.000<br>(0.000)   | 0.000<br>(0.000)    | 0.001**<br>(0.000)   |
| Prior board experience (1/0)        | 0.001<br>(0.004)     | 0.002<br>(0.004)     | 0.002<br>(0.004)     | 0.000<br>(0.004)     | 0.004<br>(0.004)    | 0.005<br>(0.004)    | 0.007*<br>(0.004)    |
| Prior board in same industry (1/0)  | 0.019***<br>(0.004)  | 0.019***<br>(0.004)  | 0.018***<br>(0.004)  | 0.017***<br>(0.004)  | 0.009**<br>(0.004)  | 0.009**<br>(0.004)  | 0.008**<br>(0.004)   |
| Prior focal founder link (1/0)      | -0.009**<br>(0.004)  | -0.009**<br>(0.004)  | -0.009**<br>(0.004)  | -0.014***<br>(0.004) | 0.017***<br>(0.005) | 0.011**<br>(0.005)  | 0.011**<br>(0.005)   |
| Prior VC-backed firm link (1/0)     | 0.047***<br>(0.009)  | 0.044***<br>(0.009)  | 0.038***<br>(0.009)  | 0.024***<br>(0.009)  | -0.019**<br>(0.008) | -0.016**<br>(0.008) | -0.006<br>(0.007)    |
| Prior investor links $\geq 5$ (1/0) | 0.002<br>(0.005)     | 0.001<br>(0.005)     | -0.000<br>(0.005)    | -0.003<br>(0.005)    | -0.006<br>(0.004)   | -0.003<br>(0.004)   | -0.002<br>(0.004)    |
| Prior board links $\geq 5$ (1/0)    | 0.010**<br>(0.004)   | 0.009**<br>(0.004)   | 0.007*<br>(0.004)    | 0.006<br>(0.004)     | -0.004<br>(0.004)   | -0.003<br>(0.004)   | -0.000<br>(0.004)    |
| Ln (Investment amount)              |                      |                      | 0.008***<br>(0.001)  | 0.005***<br>(0.001)  |                     |                     | -0.047***<br>(0.003) |
| Observations                        | 49,229               | 49,224               | 49,224               | 48,580               | 53,975              | 53,973              | 53,973               |
| Adjusted R-squared                  | 0.7%                 | 0.8%                 | 0.9%                 | 1.4%                 | 55.6%               | 56.3%               | 57.2%                |
| Firm clusters                       |                      |                      |                      |                      | 16,619              | 16,618              | 16,618               |
| Investor clusters                   |                      |                      |                      |                      | 48,352              | 48,350              | 48,350               |
| Firm FE                             | No                   | No                   | No                   | No                   | Yes                 | Yes                 | Yes                  |
| Investment firm age FE              | No                   | Yes                  | Yes                  | Yes                  | No                  | Yes                 | Yes                  |
| Firm controls                       | No                   | No                   | No                   | Yes                  | No                  | No                  | No                   |

Table CXI: Investor-specific Pricing and Timing: Full Sample

Table CXI reports within-firm estimates examining investor-specific channels that may explain return differences among co-investors in the same firm. The sample is the full sample of investments by individual investors. In Column (1), the dependent variable is an indicator equal to one if the investor purchases shares in the firm in multiple financing rounds. The 53,975 observations are investor-firm pairs. In the remaining columns, the unit of observation is an equity transaction with 74,482 share purchases and 43,396 share realizations, of which 26,734 are share sales. Standard errors are double-clustered at the firm and investor level. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                    | Multi-round<br>investor (1/0)<br>(1) | Firm Age @<br>Investment<br>(2) | Ln(Purchase<br>price)<br>(3) | Realized<br>Exit (1/0)<br>(4) | Exit<br>firm age<br>(5) | Ln(Exit<br>price)<br>(6) |
|------------------------------------|--------------------------------------|---------------------------------|------------------------------|-------------------------------|-------------------------|--------------------------|
| Takes board seat (1/0)             | 0.093***<br>(0.004)                  | -0.731***<br>(0.093)            | -0.150***<br>(0.012)         | -0.023***<br>(0.005)          | 0.827***<br>(0.157)     | -0.123**<br>(0.053)      |
| Retail investor (1/0)              | -0.111***<br>(0.005)                 | -1.689***<br>(0.092)            | -0.206***<br>(0.013)         | 0.016***<br>(0.005)           | -0.956***<br>(0.164)    | -0.081<br>(0.053)        |
| Prior public investment            | 0.001***<br>(0.000)                  | 0.026***<br>(0.007)             | 0.005***<br>(0.001)          | 0.001<br>(0.000)              | 0.002<br>(0.014)        | -0.001<br>(0.004)        |
| Prior board in same industry (1/0) | -0.016***<br>(0.004)                 | 0.073<br>(0.089)                | -0.012<br>(0.011)            | 0.014***<br>(0.005)           | -0.411**<br>(0.169)     | 0.042<br>(0.051)         |
| Prior focal founder link (1/0)     | 0.009<br>(0.006)                     | -0.322**<br>(0.134)             | -0.111***<br>(0.016)         | -0.014**<br>(0.007)           | -0.093<br>(0.223)       | -0.021<br>(0.069)        |
| Prior VC-backed firm link (1/0)    | 0.015*<br>(0.009)                    | 0.678***<br>(0.184)             | 0.087***<br>(0.029)          | -0.001<br>(0.009)             | -0.261<br>(0.299)       | 0.025<br>(0.098)         |
| Prior investor links >= 5 (1/0)    | -0.005<br>(0.005)                    | 0.337***<br>(0.098)             | 0.007<br>(0.014)             | 0.002<br>(0.006)              | 0.049<br>(0.176)        | -0.127*<br>(0.065)       |
| Prior board links >= 5 (1/0)       | 0.010**<br>(0.004)                   | 0.373***<br>(0.077)             | 0.015<br>(0.011)             | 0.009*<br>(0.005)             | -0.244<br>(0.169)       | 0.046<br>(0.054)         |
| Observations                       | 53,975                               | 74,482                          | 74,481                       | 74,481                        | 43,396                  | 26,734                   |
| Adjusted R-squared                 | 43.4%                                | 44.4%                           | 93.4%                        | 67.3%                         | 69.0%                   | 83.7%                    |
| Firm clusters                      | 16,619                               | 19,448                          | 19,448                       | 19,448                        | 11,554                  | 7,414                    |
| Investor clusters                  | 48,352                               | 50,676                          | 50,676                       | 50,676                        | 27,253                  | 16,926                   |
| Firm FE                            | Yes                                  | Yes                             | Yes                          | Yes                           | Yes                     | Yes                      |
| Investment firm age quarters FE    | No                                   | No                              | Yes                          | Yes                           | Yes                     | Yes                      |
| Exit firm age quarters FE          | No                                   | No                              | No                           | No                            | No                      | Yes                      |

Table CXII: The Importance of Board Seats for Investor Returns: Full Sample

Table CXII reports within-firm estimates examining whether holding a board seat is correlated with investor-specific differences in top-tail returns. The sample is the full sample of investments by individual investors. The dependent variable in Columns (1)–(3) equals one if the investor takes a board seat in the firm with the investment. The dependent variable in Columns (4)–(7) equals one for investments with full BHAR above the 90th percentile of the investment-level return distribution. The variable “Still active prior board seat” is a dummy equaling one if the investor holds an active board seat in another firm at the time of the focal investment. Public, non-startup, and startup same-industry board indicators capture whether the investor previously held a board seat in the same industry in a public firm, a non-startup private firm, or a startup, respectively. Standard errors are double-clustered at the firm and investor level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                          | Takes board seat (1/0) |                      |                      |                     | Earns Top Decile Return |                      |                      |
|------------------------------------------|------------------------|----------------------|----------------------|---------------------|-------------------------|----------------------|----------------------|
|                                          | (1)                    | (2)                  | (3)                  | (4)                 | (5)                     | (6)                  | (7)                  |
| Takes board seat (1/0)                   |                        |                      |                      | 0.015***<br>(0.004) | 0.030***<br>(0.004)     | 0.018***<br>(0.004)  | 0.001<br>(0.003)     |
| Retail investor (1/0)                    | -0.060***<br>(0.006)   | -0.002<br>(0.006)    | 0.001<br>(0.006)     |                     | -0.000<br>(0.004)       | -0.000<br>(0.004)    | -0.000<br>(0.004)    |
| Prior public investment                  | -0.002***<br>(0.001)   | -0.003***<br>(0.001) | -0.003***<br>(0.001) |                     | 0.001**<br>(0.000)      | 0.001**<br>(0.000)   | 0.001**<br>(0.000)   |
| Prior focal founder link (1/0)           | 0.076***<br>(0.008)    | 0.077***<br>(0.008)  | 0.073***<br>(0.008)  |                     | 0.015***<br>(0.005)     | 0.011**<br>(0.005)   | 0.003<br>(0.005)     |
| Prior VC-backed firm link (1/0)          | 0.037***<br>(0.012)    | 0.022*<br>(0.012)    | 0.014<br>(0.012)     |                     | -0.010<br>(0.008)       | -0.008<br>(0.007)    | -0.004<br>(0.007)    |
| Prior investor links $\geq 5$ (1/0)      | -0.027***<br>(0.007)   | -0.030***<br>(0.007) | -0.035***<br>(0.007) |                     | -0.003<br>(0.004)       | -0.001<br>(0.004)    | -0.003<br>(0.004)    |
| Prior board links $\geq 5$ (1/0)         | 0.063***<br>(0.006)    | 0.057***<br>(0.006)  | 0.045***<br>(0.006)  |                     | 0.000<br>(0.004)        | 0.001<br>(0.004)     | 0.001<br>(0.003)     |
| Prior board in same industry (1/0)       | 0.066***<br>(0.006)    | 0.066***<br>(0.006)  |                      |                     |                         |                      |                      |
| Still active prior board seat (1/0)      |                        |                      | 0.031***<br>(0.006)  |                     | 0.001<br>(0.003)        | 0.002<br>(0.003)     | 0.002<br>(0.003)     |
| Public board in same industry (1/0)      |                        |                      | 0.044*<br>(0.024)    |                     | 0.018<br>(0.016)        | 0.016<br>(0.016)     | 0.019<br>(0.015)     |
| Non-startup board in same industry (1/0) |                        |                      | 0.051***<br>(0.007)  |                     | 0.005<br>(0.004)        | 0.005<br>(0.004)     | 0.005<br>(0.004)     |
| Startup board in same industry (1/0)     |                        |                      | 0.035***<br>(0.008)  |                     | 0.002<br>(0.005)        | 0.004<br>(0.005)     | 0.001<br>(0.005)     |
| Ln (investment amount)                   |                        | 0.071***<br>(0.004)  | 0.070***<br>(0.004)  |                     | -0.052***<br>(0.003)    | -0.048***<br>(0.003) | -0.017***<br>(0.003) |
| Ln (average purchase price)              |                        |                      |                      |                     |                         |                      | -0.096***<br>(0.006) |
| Observations                             | 53,975                 | 53,975               | 53,975               | 53,975              | 53,975                  | 53,973               | 53,973               |
| Adjusted R-squared                       | 41.9%                  | 42.8%                | 42.9%                | 55.4%               | 56.8%                   | 57.2%                | 59.5%                |
| Firm clusters                            | 16,619                 | 16,619               | 16,619               | 16,619              | 16,619                  | 16,618               | 16,618               |
| Investor clusters                        | 48,352                 | 48,352               | 48,352               | 48,352              | 48,352                  | 48,350               | 48,350               |
| Firm FE                                  | Yes                    | Yes                  | Yes                  | Yes                 | Yes                     | Yes                  | Yes                  |
| Investment firm age quarters FE          | No                     | No                   | No                   | No                  | No                      | Yes                  | Yes                  |

Table CXIII: Board Seats and Post-Investment Financing Outcomes: Full Sample

Table CXIII reports OLS estimates relating the composition of individual investors in a financing round to subsequent firm financing outcomes. The unit of observation is the firm by investment round, where an investment round is defined as the investments in a firm occurring within a given calendar quarter (e.g., all the investments in firm X in 2019Q3). The sample is based on all firms with investments by individual investors and is restricted to financing rounds with at least one individual investor. Prior public investment serves as a proxy for investor wealth in this sample, since we do not observe wealth for all individual investors. The dependent variable in Columns (1)–(2) is an indicator equal to one if the firm has a subsequent financing round. Columns (3)–(4) use an indicator equal to one if the firm receives financing in a subsequent round from an individual investor with a prior connection to one of the focal round's individual investors. Columns (5)–(6) use the same indicator, but condition on follow-on individuals whose first round is after the focal round. Columns (3)–(6) are estimated among firm-rounds with a subsequent financing round. Columns (7)–(8) use an indicator equal to one if the firm receives VC financing in a subsequent round. Investor attributes are measured as the maximum value across individual investors in the round, capturing whether at least one investor with the attribute participated. In all specifications, we additionally include the following (unreported) control variables: the natural logarithm of round investment amount and indicator variables for whether the firm reported revenues in the year before the round, the founder of the firm founded another firm prior to the focal firm and the firm received institutional VC investment in the focal or a prior round. All specifications include financing-round year fixed effects and round-sequence fixed effects. Standard errors are clustered at the firm level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                              | Has follow-on<br>round |                      | Follow-on<br>connected investor |                      | Strictly follow-on<br>connected investor |                      | Follow-on<br>VC investment |                      |
|----------------------------------------------|------------------------|----------------------|---------------------------------|----------------------|------------------------------------------|----------------------|----------------------------|----------------------|
|                                              | (1)                    | (2)                  | (3)                             | (4)                  | (5)                                      | (6)                  | (7)                        | (8)                  |
| Prior public investment                      | 0.001<br>(0.000)       |                      | 0.003***<br>(0.001)             |                      | 0.001<br>(0.001)                         |                      | 0.000<br>(0.000)           |                      |
| Wealthiest investor x Takes board seat (1/0) |                        | -0.087***<br>(0.005) |                                 | -0.125***<br>(0.011) |                                          | -0.074***<br>(0.008) |                            | -0.009***<br>(0.002) |
| Prior board exp. in same industry (1/0)      | 0.002<br>(0.004)       |                      | 0.033***<br>(0.011)             |                      | 0.008<br>(0.007)                         |                      | 0.001<br>(0.001)           |                      |
| Industry board exp. x Takes board seat (1/0) |                        | 0.004<br>(0.004)     |                                 | 0.029**<br>(0.012)   |                                          | 0.001<br>(0.008)     |                            | -0.001<br>(0.001)    |
| Prior focal founder link (1/0)               | -0.022***<br>(0.004)   |                      | 0.442***<br>(0.013)             |                      | 0.073***<br>(0.009)                      |                      | -0.003**<br>(0.001)        |                      |
| Founder linked x Takes board seat (1/0)      |                        | -0.022***<br>(0.004) |                                 | 0.449***<br>(0.015)  |                                          | 0.060***<br>(0.009)  |                            | -0.004***<br>(0.001) |
| Prior VC-backed firm link (1/0)              | 0.093***<br>(0.010)    |                      | 0.018<br>(0.018)                |                      | 0.031**<br>(0.014)                       |                      | 0.008<br>(0.005)           |                      |
| VC-linked x Takes board seat (1/0)           |                        | 0.102***<br>(0.011)  |                                 | 0.008<br>(0.022)     |                                          | 0.033**<br>(0.017)   |                            | 0.015***<br>(0.006)  |
| Prior investor links >= 5 (1/0)              | 0.046***<br>(0.005)    |                      | 0.074***<br>(0.012)             |                      | 0.053***<br>(0.008)                      |                      | 0.002<br>(0.002)           |                      |
| Many investor links x Takes board seat (1/0) |                        | 0.040***<br>(0.006)  |                                 | 0.081***<br>(0.014)  |                                          | 0.052***<br>(0.009)  |                            | -0.000<br>(0.002)    |
| Prior board links >= 5 (1/0)                 | 0.044***<br>(0.005)    |                      | 0.060***<br>(0.011)             |                      | 0.035***<br>(0.007)                      |                      | 0.001<br>(0.001)           |                      |
| Many board links x Takes board seat (1/0)    |                        | 0.045***<br>(0.005)  |                                 | 0.065***<br>(0.013)  |                                          | 0.040***<br>(0.008)  |                            | 0.002<br>(0.001)     |
| Observations                                 | 56,892                 | 56,892               | 10,459                          | 10,459               | 10,459                                   | 10,459               | 56,892                     | 56,892               |
| Adjusted R-squared                           | 15.1%                  | 15.2%                | 30.5%                           | 27.4%                | 6.3%                                     | 5.1%                 | 23.1%                      | 23.2%                |

Table CXIV: Board Seats and Post-Investment Operational Outcomes: Full Sample

Table CXIV reports OLS estimates relating the composition of individual investors in a financing round to subsequent firm outcomes. The unit of observation is the firm by investment round, where an investment round is defined as the investments in a firm occurring within a given calendar quarter (e.g., all the investments in firm X in 2019Q3). The sample is based on all firms with investments by individual investors and is restricted to financing rounds with at least one individual investor. Prior public investment serves as a proxy for investor wealth in this sample, since we do not observe wealth for all individual investors. The dependent variable in Columns (1)–(2) is an indicator equal to one if the firm enters bankruptcy or liquidation within five years after the round. Columns (3)–(4) use an indicator equal to one if the firm experiences an M&A or IPO outcome within five years after the round. Columns (5)–(6) use the natural logarithm of (positive) firm revenues accumulated over the five consecutive years after the financing round. Investor attributes are measured as the maximum value across individual investors in the round, capturing whether at least one investor with the attribute participated. In all specifications, we additionally include the following (unreported) control variables: the natural logarithm of round investment amount and indicator variables for whether the firm reported revenues in the year before the round, the founder of the firm founded another firm prior to the focal firm and the firm received institutional VC investment in the focal or a prior round. All specifications include financing-round year fixed effects and round-sequence fixed effects. Standard errors are clustered at the firm level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                              | Bankruptcy/<br>Liquidation |                      | M&A/IPO             |                      | Ln(Revenues)         |                      |
|----------------------------------------------|----------------------------|----------------------|---------------------|----------------------|----------------------|----------------------|
|                                              | (1)                        | (2)                  | (3)                 | (4)                  | (5)                  | (6)                  |
| Prior public investment                      | 0.001**<br>(0.001)         |                      | -0.001**<br>(0.001) |                      | -0.021***<br>(0.004) |                      |
| Wealthiest investor x Takes board seat (1/0) |                            | -0.008<br>(0.008)    |                     | -0.039***<br>(0.006) |                      | 0.102**<br>(0.045)   |
| Prior board exp. in same industry (1/0)      | -0.009<br>(0.006)          |                      | 0.020***<br>(0.004) |                      | 0.278***<br>(0.030)  |                      |
| Industry board exp. x Takes board seat (1/0) |                            | -0.014**<br>(0.006)  |                     | 0.023***<br>(0.004)  |                      | 0.263***<br>(0.031)  |
| Prior focal founder link (1/0)               | -0.028***<br>(0.006)       |                      | 0.011**<br>(0.005)  |                      | 0.147***<br>(0.033)  |                      |
| Founder linked x Takes board seat (1/0)      |                            | -0.028***<br>(0.006) |                     | 0.010*<br>(0.005)    |                      | 0.152***<br>(0.034)  |
| Prior VC-backed firm link (1/0)              | -0.021*<br>(0.011)         |                      | 0.007<br>(0.012)    |                      | -0.305***<br>(0.081) |                      |
| VC-linked x Takes board seat (1/0)           |                            | -0.035***<br>(0.013) |                     | 0.001<br>(0.014)     |                      | -0.376***<br>(0.089) |
| Prior investor links $\geq 5$ (1/0)          | -0.022***<br>(0.007)       |                      | 0.010*<br>(0.006)   |                      | -0.138***<br>(0.039) |                      |
| Many investor links x Takes board seat (1/0) |                            | -0.021***<br>(0.007) |                     | 0.011*<br>(0.006)    |                      | -0.100**<br>(0.041)  |
| Prior board links $\geq 5$ (1/0)             | 0.004<br>(0.006)           |                      | 0.025***<br>(0.005) |                      | -0.160***<br>(0.033) |                      |
| Many board links x Takes board seat (1/0)    |                            | 0.008<br>(0.007)     |                     | 0.024***<br>(0.005)  |                      | -0.168***<br>(0.035) |
| Observations                                 | 41,425                     | 41,425               | 41,425              | 41,425               | 34,400               | 34,400               |
| Adjusted R-squared                           | 0.8%                       | 0.9%                 | 4.1%                | 4.1%                 | 12.4%                | 12.1%                |

Table CXV: Investor Characteristics and Firm Characteristics: Full Sample

Table CXV explores the equilibrium observed matching between investors and firms. It reports OLS estimates from firm-by-investment-round regressions, where an investment round is defined as the investments in a firm occurring within a given calendar quarter (e.g., all the investments in firm X in 2019Q3). The sample is based on all firms with investments by individual investors and is restricted financing rounds with at least one individual investor. Prior public investment serves as a proxy for investor wealth in this sample, since we do not observe wealth for all individual investors. The dependent variables are round size, defined as the natural logarithm of the total amount invested in the round; capital intensity, an indicator equal to one for firms in the top quartile of total equity raised during the sample period; indicators for positive assets, revenues, and salary expenses in the year before the round, respectively; founder wealth, defined as the natural logarithm of founder gross wealth in the year before startup incorporation; experienced founder, an indicator equal to one if the founder previously started another firm; and VC co-investor, an indicator equal to one if an institutional VC investor participated in the round. Average retail participation is the percentage of retail investors (average of the retail-investor indicator) across individual investments in the round. All other investor attributes are measured as the maximum value across individual investors in the round, capturing whether at least one investor with the attribute participated. All specifications include fixed effects for the calendar year of the financing round and for the round sequence. Standard errors are clustered at the firm level and reported in parentheses. One, two, and three asterisks denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|                                         | Total<br>Round<br>size | Capital<br>Intensive<br>(1/0) | Has<br>Assets (t-1)<br>(1/0) | Has<br>Revenue (t-1)<br>(1/0) | Has<br>Salary (t-1)<br>(1/0) | Founder<br>wealth    | Experienced<br>founder<br>(1/0) | VC co-<br>investor<br>(1/0) |
|-----------------------------------------|------------------------|-------------------------------|------------------------------|-------------------------------|------------------------------|----------------------|---------------------------------|-----------------------------|
|                                         | (1)                    | (2)                           | (3)                          | (4)                           | (5)                          | (6)                  | (7)                             | (8)                         |
| Average retail participation            | -1.083***<br>(0.014)   | -0.423***<br>(0.005)          | -0.059***<br>(0.003)         | -0.045***<br>(0.003)          | -0.049***<br>(0.003)         | -0.319***<br>(0.042) | -0.112***<br>(0.005)            | -0.005***<br>(0.001)        |
| Prior public investment                 | 0.030***<br>(0.002)    | 0.003***<br>(0.000)           | 0.001***<br>(0.000)          | -0.001<br>(0.000)             | 0.000<br>(0.000)             | 0.001<br>(0.004)     | 0.002***<br>(0.001)             | 0.000<br>(0.000)            |
| Prior board exp. in same industry (1/0) | 0.025*<br>(0.013)      | -0.004<br>(0.004)             | 0.000<br>(0.003)             | 0.004<br>(0.003)              | 0.007**<br>(0.003)           | 0.069*<br>(0.041)    | 0.050***<br>(0.005)             | -0.000<br>(0.001)           |
| Prior focal founder link (1/0)          | 0.084***<br>(0.015)    | -0.009**<br>(0.004)           | -0.012***<br>(0.003)         | -0.019***<br>(0.003)          | -0.022***<br>(0.003)         | 0.677***<br>(0.041)  | 0.155***<br>(0.006)             | -0.004***<br>(0.001)        |
| Prior VC-backed firm link (1/0)         | 0.596***<br>(0.038)    | 0.074***<br>(0.008)           | 0.022***<br>(0.007)          | -0.011<br>(0.009)             | 0.004<br>(0.009)             | 0.271***<br>(0.066)  | 0.052***<br>(0.012)             | 0.046***<br>(0.006)         |
| Prior investor links >= 5 (1/0)         | 0.247***<br>(0.018)    | 0.039***<br>(0.005)           | 0.010***<br>(0.004)          | -0.006<br>(0.004)             | -0.002<br>(0.004)            | 0.125***<br>(0.048)  | 0.030***<br>(0.007)             | -0.000<br>(0.002)           |
| Prior board links >= 5 (1/0)            | 0.197***<br>(0.015)    | 0.053***<br>(0.005)           | 0.009***<br>(0.003)          | -0.001<br>(0.003)             | -0.003<br>(0.003)            | 0.326***<br>(0.045)  | 0.010*<br>(0.006)               | 0.002<br>(0.001)            |
| Observations                            | 57,597                 | 57,597                        | 57,597                       | 57,597                        | 57,597                       | 13,551               | 56,892                          | 57,597                      |
| Adjusted R-squared                      | 47.4%                  | 45.3%                         | 64.6%                        | 49.1%                         | 47.7%                        | 8.9%                 | 11.8%                           | 6.3%                        |