The Entrepreneurial Finance of Fintech Firms and the Effect of Investments in Fintech Startups on the Performance of Corporate Investors

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Abstract

We analyze how corporate direct investments in fintech startups affect startup performance and that of investing firms. Corporate investment in fintech startups is associated with a greater likelihood of successful exit; more and higher quality innovation; and a greater inflow of high-quality inventors. A stacked difference-in-differences analysis shows that direct investments enhance the operating performance and equity market valuation of corporate investors from the financial services sector, but not of those from the non-financial sector. We establish two channels that drive fintech startups' performance improvements, namely, strategic alliance formation between investors and startups and enhanced startup monitoring by corporate investors.

Keywords: Fintech Startups; Corporate Direct Investment; Corporate Venture Capital; Strategic Alliances; Board Monitoring

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I. Introduction

Financial Technology or "fintech" is one of the fastest growing sectors of the last decade. We define fintech as the use of the latest technology in solving problems in financial services, often relating to improved customer experience (CX) and insight: see, e.g., Chemmanur, Imerman, Rajaiya and Yu (2020) and Thakor (2020). In 2010, the total amount of funding raised by fintech firms was just over one billion dollars, while in 2018, total funding raised by fintech firms rose to around 40 billion dollars, highlighting the rapid growth in funding of this industry Chemmanur et al. (2020). In particular, we are witnessing a greater degree of direct investment in fintech firms by corporate investors. Unlike venture capitalists or investment funds, the primary line of business of these corporate investors is not private equity investment. Further, they make direct investment in fintech startups rather than through their corporate venture capital (CVC) arms or through other divisions. For example, U.S. banks directly invested in 45 funding rounds of fintech firms in 2018 alone.[1] Other than banks, non-financial services firms such as Amazon and IBM have also made direct investments in fintech firms. For example, Amazon invested in the payment company, Bill Me Later, which was later acquired by PayPal in 2008.

The above observations give rise to several interesting and important research questions, which we address in this paper. The first set of research questions deals with the motivation of fintech startups to accept direct investment from corporate investors and the effect of such investments on the future performance of these startups. On the one hand, these fintech startups often compete with corporate investors in the product market, so that accepting investments from corporate investors may lead to a deterioration in their future performance. On the other hand, fintech startups may have synergies with their corporate investors and thus corporate investors may provide value-adding services to the fintech startups. If this is the case, corporate investment may lead to improvements in the

[1]Please refer to the following practitioner-oriented article on CB Insights for more details: `https://interactives.cbinsights.com/us-banks-fintech-investments/`.

future performance of fintech startups. In sum, the effect of corporate direct investment on the performance of fintech startups is an empirical question.[2] We answer this question by analyzing the effect of corporate direct investments on three outcome variables of fintech firms: the likelihood of future successful exit; the innovation output of fintech startups; and the net inflow of inventors into these fintech startups.

In the event that we find that corporate direct investment creates value for fintech startups, we will move on to analyzing potential channels through which such value creation occurs. While multiple channels may exist, we propose and empirically test two in this study. The first channel is strategic alliance formation: direct investment made by corporate investors in fintech startups may be a prelude to the formation of a strategic alliance between the two. Such strategic alliances may provide fintech startups with critical resources such as mentorship and strategic advice, tech infrastructure, talent networks, market access, and established customer bases that can accelerate growth and innovation of these startups, making them more successful in the financial market, more productive, and more attractive to talents. The second channel is monitoring through board representation by corporate investors: corporate direct investors may be able to obtain board seats in fintech startups upon or after investment and thereby more effectively monitor the fintech startups to help them perform better.

Assuming that we do find that corporate direct investment improves the outcomes of fintech startups through the strategic alliance and monitoring channels, we will further explore the optimal form of investment that is more conducive to such value creation. An alternative to corporate direct investment is for the corporation to invest in the fintech startup indirectly through its CVC arm. We conjecture that corporate direct investment is

[2]We focus on the effect of corporate investment in fintech startups rather than in any other industry since the economic relationship between corporate investors and fintech startups is fundamentally different from that between corporate investors and their investee firms in other industries. In particular, fintech startups compete contemporaneously with their corporate investors (at least with those corporate investors in the financial services sector). Please refer to the following article that discusses the competition between fintech startups and banks: `https://www.wsj.com/articles/fintech-competition-mainstream-banks-11642714528`.

more effective in creating value for fintech startups through the strategic alliance and monitoring channels, compared to indirect investment through the corporate investor's CVC arm. In making this conjecture, we rely on the concept of "organizational distance" that has been advanced in the strategy literature, e.g., Belenzon, Hashai and Patacconi (2019) who argue that a corporate parent will devote less attention to and have less control over a focal subsidiary if there are more intermediaries in the corporate structure between the parent and focal subsidiary. Applied to our setting, a corporation is likely to be organizationally closer to a fintech startup in terms of allocating attention and resources and exerting control if it invests directly in the fintech startup rather than indirectly investing in the fintech startup through a CVC subsidiary (since the latter form of investment creates a greater organizational distance between the corporation and the fintech startup it invests in).[3] We thus empirically investigate whether corporate direct investors have a higher likelihood and faster speed of forming strategic alliances with the fintech startups they invest in and whether they are more likely to obtain board seats in these startups due to the shorter organizational distance (compared to corporations who invest indirectly through their CVC arms).

The second set of research questions that we address in this paper is the mirror image of our first set of research questions: Does investment in fintech startups help corporate investors improve their own operating performance and equity valuation or is it merely an empire-building exercise by corporate CEOs (Jensen (1986))? Whether investing in fintech startups negatively impacts the performance of corporate investors (e.g., through increasing product market competition from these startups) or improves their performance (e.g., through the exploitation of potential synergies between investors and fintech

[3]CVCs are either standalone subsidiaries or separate divisions within parent corporations and constitute the investment divisions of corporations: e.g., Intel Capital. Thus, even though CVCs are subsidiaries or separate divisions within parent corporations, they may still exercise a degree of independence in their investment decision, and parent firms may not exercise total control, which they do in the case of their direct investment. For a practitioner's perspective, please refer to the following article which suggests that Microsoft's Venture Capital arm, M12, shows a degree of independence in its investment decisions: `https://www.geekwire.com/2019/microsofts-m12-lays-investment-strategy-aims-make-corporate-vc-community-founder-friendly/`.

startups) is ultimately an empirical question. We address this question by analyzing the effect of such investment on the operating performance of corporate investors (as measured by profitability and market share) as well as their equity market valuation (as measured by Tobin's Q). Further, are the effects of such direct investments in fintech startups on corporate investors' own performance different for those in the financial services sector (e.g., Bank of America) which may have greater synergies with fintech startups and for those outside the financial services sector (e.g., Amazon) which may have less synergies with fintech startups?[4]

Finally, in case we do find performance improvements for at least a subset of corporate investors following their investment in fintech startups, then it is important to understand the possible channels through which such performance improvement occurs. We explore one such channel, namely, the formation of strategic alliances. Strategic alliances with fintech startups may bring various benefits to corporate investors, particularly those in the financial services sector who have greater potential for synergies with fintech startups. For example, corporate investors may gain access to innovative technologies and solutions which help them respond to customer demands more quickly, expand their market reach, and attract new customers.[5] Further, they may improve efficiency and reduce costs through integrating the fintech solutions into their operations.[6] Given this, we expect corporate investors who form strategic alliances with fintech startups

[4]Amazon is primarily involved in business activities like e-commerce, cloud computing, and other fields. It has invested directly in many startups including fintech firms. Please refer to the following article on Business Insider for more details: https://www.businessinsider.com/amazon-startup-investment-competitors-wsj-report-echo-nucleus-ubi-2020-7. Banks often compete directly with fintech firms in the product market, but also provide key infrastructure to such firms. Please refer to the following article on the Wall Street Journal for more details: https://www.wsj.com/articles/banks-and-fintech-firms-relationship-status-its-complicated-1447842603.

[5]For example, the strategic alliance between Motif (a fintech startup providing a trading platform) and J.P. Morgan Chase (Motif's corporate investor) would allow retail investors to directly participate in IPOs underwritten by J.P. Morgan on Motif's online brokerage trading platform. See https://finance.yahoo.com/news/motif-investing-partners-j-p-150916150.html.

[6]For example, the strategic alliance between Kensho (a fintech startup specializing in machine learning and data analytics) and S&P Global (Kensho's corporate investor) was deemed to "deliver value, efficiency, and automation" to S&P and its clients. See https://www.spglobal.com/marketintelligence/en/media-center/press-release/sp-global-announces-strategic-relationship-and-investment-in-kensho.

they have invested in to achieve greater improvements in their performance compared to those that have not formed such alliances.

For our empirical analyses, we obtain our data on fintech startups from the Crunchbase database, which provides funding information on startups. We verify the accuracy of our dataset using Venture Scanner and later match the verified dataset with the VentureXpert dataset. We obtain information on the sales and employment of private firms from the National Establishment Time Series (NETS) database and patent and inventor information from the PatentsView database of USPTO. We focus on publicly listed corporate investors in our empirical analyses addressing the second set of research questions, since their performance can be measured using Compustat data.

The results of our empirical analyses can be summarized as follows. We first discuss the results of our analyses addressing the first set of research questions, namely, the effect of corporate investment on the future performance of fintech startups. First, we show that corporate direct investment is associated with a significantly greater probability of successful exit of such startups, as measured by IPOs or acquisitions. In economic terms, corporate direct investment is associated with a 6.2 percentage point increase in the probability of successful exits of fintech startups. Second, we show that corporate investment is associated with a significantly greater quantity and higher quality of innovation output (as measured by patent counts and patent citations, respectively). Economically, corporate direct investment is associated with a 2.1 percentage point increase in the quantity of patents produced by firms in the third year after corporate investment. Third, we show that corporate investors help fintech startups to attract human capital/talent (as measured by the net inflow of inventors to these startups), and also help to attract top-tier talent (as measured by the net inflow of highly-cited superstar inventors). Collectively, our results demonstrate that corporate investment enhances the future performance of fintech startups.

Next, we show that synergy plays an important role when corporate investors invest in fintech startups. We conduct separate baseline analyses to study the effect of corporate investment by firms in the financial and non-financial services sectors, respectively, on the future outcomes of fintech startups. We find that direct investment by corporate investors in the financial services sector in fintech startups is associated with a significantly higher likelihood of successful exit for these startups. However, direct investment by corporate investors in the non-financial services sector has no such impact. These results suggest that the improvement in the performance of fintech startups after corporate direct investments is primarily driven by value-addition by corporate investors in the financial service sector who have a greater potential to achieve synergies with these startups.

We then analyze two channels through which corporate direct investment may help fintech startups to perform better. The first channel we explore is the formation of strategic alliances between corporate investors and fintech startups. We hand-collect information on whether and when corporate investors and fintech startups form strategic alliances upon or after corporate direct investment through an extensive search of media coverage on the Internet. We document that the performance improvement of fintech startups due to corporate direct investment is greater if their corporate investors form a strategic alliance with them upon or after their direct investments. The second channel that we propose through which corporate direct investors help fintech startups to perform better is by obtaining board seats in these startups, thereby facilitating better monitoring of these startups (over and above any monitoring by other intermediaries such as venture capitalists). We document that the improvement in the performance of fintech startups due to corporate direct investment is greater if their corporate investors obtain at least one board seat in these startups. Further, consistent with the notion that corporate direct investment leads to a shorter organizational distance between investors and their fintech investees, we find that corporate direct investors are more likely to form strategic alliances with fintech startups upon or after investment, compared to corporations who invest

indirectly through their CVC arms. Finally, conditional on the formation of strategic alliances, corporate investors tend to form such alliances significantly faster.[7] We also show that corporate direct investors are more likely to obtain board seats in their fintech investees, compared to corporations who invest indirectly through their CVC arms.

We now summarize the results of our empirical analyses addressing our second set of research questions, namely, the effect of corporate direct investments on the future performance of these corporate investors themselves. We consider a sample of publicly-listed corporate investors (treated firms) that have made direct investments in fintech startups. Out of all corporate investors in our sample, roughly half are financial services firms while the remainder are non-financial services firms. Further, among corporate investors from the financial services sector, less than half are banks, while the rest include insurance companies, mortgage lending companies, etc. For each corporate investor, we form a group of control firms in the same industry which have not invested in a fintech startup using propensity score matching based on their size, age, and R&D expenditure.

We examine the effect of investments in fintech startups on the performance of corporate investors using the above matched sample in a stacked difference in differences (DiD) framework. We find the following results. First, corporate direct investors in the financial services sector that made investments in fintech startups experience an increase in their profitability and market share compared to control firms that did not invest in fintech startups. Economically, we find that such corporate direct investors experience an average increase of 50.2% in their profitability and an average increase of 8.5% in their market share, respectively. We, however, do not find any such effect for corporate direct investors

[7]To shed more light on the advantage of corporate direct investment due to a reduced organizational distance in term of facilitating the formation of strategic alliances, we create a measure of organizational distance following Belenzon et al. (2019) between investors and fintech startups for corporate direct investments and for CVC investments. As expected, we find that greater organizational distance is negatively associated with the likelihood of formation of strategic alliances between investors and investees and positively associated with the amount of time taken to form such alliances.

from the non-financial services sector. Second, we show that corporate investors from the financial services sector that made investments in fintech startups experience an increase in their equity market valuation (as measured by Tobin's Q) compared to their control firms. Economically, we find that such corporate investors experience an average increase of 18.3% in their market valuation. Again, we do not find such an effect for corporate investors in the non-financial services sector. Since the synergy between corporate investors in the financial services sector and the fintech startups they invest in is likely to be greater than that between corporate investors in the non-financial services sector and fintech startups, the above results point to synergy as the main source of the performance and value enhancements of corporate investors following their direct fintech investments. Splitting corporate investors in the financial services sector into banks and non-bank corporations (e.g., insurance companies and mortgage lending companies), our results reveal that, while both non-bank corporate investors and banks benefit from making direct investment in fintech startups, such benefits are greater for non-bank corporate investors.

We next investigate a possible channel through which direct investment in fintech startups may enhance the operating performance and equity market valuation of corporate investors, namely, forming strategic alliances with their fintech investees. We analyze the impact of such strategic alliance formation for corporate investors in the financial services sector and in the non-financial services sector separately. We find that only corporate investors in the financial services sector that have established strategic alliances with fintech startups experience an increase in product market performance (profitability and market share) and in equity market valuation (Tobin's Q). We, however, do not find any such effect for corporate investors in the financial services sector that did not establish strategic alliances with their investees. Further, we do not find any such improvements in operating performance or equity market valuation for corporate investors in the non-financial services sector (regardless of whether or not they have formed a strategic alliance with their fintech investees). Taken together, our results suggest that strategic

alliance formation between corporate investors and fintech startups is an important channel through which corporate investors in the financial services sector realize the benefits of potential synergies with fintech startups, thereby improving their operating performance and financial market valuation.

II. Related Literature and Contribution

Our paper contributes to several strands in the literature. First, we contribute to the broader entrepreneurial finance literature. Most of the papers in the existing literature study the impact of VC (either independent venture capital (IVC) or corporate venture capital (CVC) or both) investment on startups' performance, e.g., Kortum and Lerner (2001); Chemmanur, Loutskina and Tian (2014); Tian and Wang (2014); Ewens, Nanda and Rhodes-Kropf (2018); Ma (2020), among others. In particular, Chemmanur et al. (2014) show that CVC-backed firms are more innovative, riskier, and generates less profit than IVC-backed firms, while Ma (2020) shows that corporations set up their CVC programs when they experience a decline in their innovation output and terminate their CVC programs once their (parent firms') innovation output improves. In contrast to this literature, we focus on the effect of direct investments by corporate investors in fintech startups on the performance of these startups. By controlling for IVC and CVC investments in our empirical analyses, we demonstrate that corporate direct investment provides additional benefits to fintech startups over and above any effects due to IVC and CVC investments. Specifically, we find that corporate direct investment leads to a higher probability of successful exit of these startups, more and higher quality innovation output, and a greater net-inflow of inventors into these startups. Further, we also investigate the advantages of corporate direct investment compared to indirect investment through corporate CVC arms in affecting the performance of fintech startups. We hypothesize and find supporting evidence that a key advantage of corporate direct investment lies in reducing the organizational distance between the investors and fintech startups, thereby

facilitating the formation of strategic alliances between the two and enhancing monitoring of the fintech startups through increased board representation by corporate direct investors. Finally, we show that direct investments in fintech startups also benefit corporate investors in the financial services sector themselves.

Two papers somewhat more closely related to our paper are Li, Mao, Zhang and Zheng (2023) and Puri, Qian and Zheng (2023). Li et al. (2023) study the patterns of bank investment in fintech startups. They show that banks are more likely to invest in fintech startups compared to IVCs and fintech startups funded by banks have a higher likelihood of IPO compared to those funded by IVCs. They argue that this effect is due to selection (screening). Our paper is different from Li et al. (2023) in several important ways. First, we document a positive effect of direct investment in fintech startups by corporate investors on the future outcomes of these startups and establish causality using IV analyses. We also demonstrate that these effects are primarily driven by corporate investors in the financial services sector, which includes not only banks, but also insurance companies and mortgage lenders, among others. Further, we establish two key channels through which corporate direct investors add value to fintech startups: the formation of strategic alliances and greater monitoring through board representation. Finally, we also show that direct investment made by both banks and non-bank corporate investors in the financial services sector significantly increases the likelihood of successful exit of fintech startups.

Puri et al. (2023) show that banks are more likely to invest in fintech startups when there is greater technological and business relatedness between them and when they face greater competition to invest in fintech startups. Their paper considers both direct and indirect investments by banks but does not investigate the differential effect of these two forms of investments. In other words, they are agnostic about the form of investment: direct versus indirect investment. In contrast, our study focuses specifically on direct investments made by all categories of corporate investors, extending beyond the banking sector. To the best of our knowledge, this is the first paper to study the effect of corporate

direct investment on the outcomes of fintech startups and to explore two possible channels through which this occurs: namely, forming strategic alliances with fintech startups and better monitoring these startups through greater board representation in these startups. Furthermore, this is also the first paper to analyze the advantage of corporate direct investment compared to indirect investment through CVCs in affecting the performance of fintech investees. We conjecture that corporate direct investment leads to a shorter organizational distance to the fintech investee compared to indirect investment through corporations' CVC arms, which, in turn, increases the likelihood that corporate direct investors will form strategic alliances with fintech startups and obtain board representation, compared to the corporate parents of CVC investors. Finally, this is also the first paper to analyze how direct investment in fintech startups affects the performance of corporate investors themselves (as measured by profitability, market share, and equity valuation) and the role of strategic alliance formation in this process.

Second, we contribute to the growing literature on fintech firms. A number of papers have analyzed peer-to-peer lending, e.g., Duarte, Siegel and Young (2012); Hertzberg, Liberman and Paravisini (2018); Tang (2019); Vallee and Zeng (2019), among others. There are also several other papers comparing fintech lenders and banks, e.g., Buchak, Matvos, Piskorski and Seru (2018); Fuster, Plosser, Schnabl and Vickery (2019); and Allen, Shan and Shen (2022). Gopal and Schnabl (2022) show that fintech lenders are a major source of credit for small businesses especially after the 2008 financial crisis.[8] In contrast to the above literature, this is the first paper to analyze the role of direct investments by corporate investors on fintech startups' future performance. It is also the first to study the effect of direct investments in fintech startups on the product and financial market performance of corporate investors themselves.

[8]The literature has also analyzed the application of blockchain technology to finance, e.g., Biais, Bisiere, Bouvard and Casamatta (2019); Chiu and Koeppl (2019); Cong and He (2019); Foley, Karlsen and Putniņš (2019); Griffin and Shams (2020). Other research has examined the disruptive role of fintech in investments and wealth management, e.g., D'Acunto, Prabhala and Rossi (2019) and Rossi and Utkus (2020).

Our paper is also related, albeit more distantly, to the literature on minority acquisitions. For example, Ouimet (2013) studies the motivation for minority acquisitions (less than 50% acquisition of target shares) and show that minority acquisitions are more likely when acquirers do not want to dilute the incentives of target firms' management teams. Nain and Wang (2018) show that minority acquisitions lead to lower product market competition. In contrast to the above papers, the focus of our paper is on the motivation of corporate investors to invest directly in fintech startups and the effect of such investment on the performance of both corporate investors and fintech startups.[9]

III. Conceptual Framework and Hypotheses Development

The first research question we address here relates to whether or not fintech startups benefit from direct investments from corporate investors. On the one hand, corporate direct investors (especially those from the financial sector) may compete negatively with fintech startups (possibly by using the information gained from investing in these startups such as insights into new products or business practices), thereby improving their own performance at the expense of the startups they invest in. After all, the motivation for corporate investors for investing in fintech startups may not necessarily be benign. If the effect of such competition dominates any value created due to corporate direct investment in the fintech startup, the overall effect of corporate investors' investment in the fintech startups will be negative (**H1A**).[10] On the other hand, corporate investors may have synergies with fintech startups in the product market. If the effect of such synergies dominate any negative effects of competition between corporate investors and the fintech startups they are investing in, then this will be reflected in the performance of such startups, as captured

[9]Neither the literature on minority acquisitions nor the broader mergers and acquisitions literature (see, e.g., Martos-Vila, Rhodes-Kropf and Harford (2019)) focus on startup firms. Thus, an important contribution of this paper is to study the effect of corporate direct investments on the future success of fintech startups.

[10]Note that, in developing this testable hypothesis, we focus on the negative effects of competition from corporate direct investors on the performance of fintech startups that they invest in. However, in certain scenarios, competition between corporate investors and fintech startups may instead exert pressure that encourages these startups to innovate, thereby generating a positive effect of competition. We thank an anonymous referee for suggesting this possibility.

by outcome variables such as successful exit (IPO or acquisition), innovation output, and the net inflow of inventors (and superstar inventors) into the fintech startup (**H1B**).

If indeed, the positive effects of corporate investments in fintech startups dominate any negative effect of competition between the two, then understanding source and channel of such value creation by corporate direct investment in fintech startups becomes crucial. It would be useful to analyze whether synergies between corporate investors and fintech startups they invest in are an important source of such value creation for fintech startups. In general, we would expect such synergies to exist to a much greater extent between corporate investors in the financial services sector and fintech startups then between corporate investors in the non-financial services sector and fintech startups. The effect of such synergies will therefore lead to greater value creation for fintech startups in the case where corporate investors in the financial services sector invest in such startups. This is the second hypothesis that we test here (**H2**).

If indeed corporate investment in fintech startups create value for fintech startups, it is important to understand the channels through which such values are created. While such value creation may occur through multiple channels, we investigate two possible channels. The first channel through which a corporate investor may create value for a fintech startup they invest in may be through the formation of a strategic alliance between the corporate investor and the fintech startup. Such strategic alliances may provide fintech startups with critical strategic resources such as mentorship and strategic advice, tech infrastructure, talent networks, market access, and established customer bases that can accelerate growth and innovation of these startups, making them more successful in the financial market, more productive, and more attractive to talents. If indeed, strategic alliance formation is a channel of value creation, we expect fintech startups forming strategic alliances with corporate investors to perform better in terms of our outcome variables than those that do not form such strategic alliances. This is the third hypothesis that we test here (**H3**).

A second channel through which we hypothesize that corporate investors create value for fintech startups they invest in is a monitoring channel: corporate investors may possess unique abilities (e.g., in-depth domain knowledge and an acute understanding of customer needs and market trends) to monitor and add value to the fintech startup over and above any monitoring provided by other intermediaries such as VCs. If indeed corporate investors are able to provide monitoring services to fintech startups, such monitoring would be facilitated by the corporate investor having board seats in such fintech startups. This means that fintech startups where corporate investors have board seats will perform better than those where corporate investors do not have board seats (**H4**).

Assuming that we do find that investment by corporate investors in fintech startups leads to value addition through the strategic alliance and monitoring channels, an important question that arises is regarding the optimal form of investment by corporate investors that may be conducive to such value addition. An alternative to corporate direct investment is for the corporation to invest in the fintech startup through its CVC arm. To distinguish between the economic effects of direct investment versus indirect investment through a firms' CVC arm, we appeal to the notion of "organizational distance" that has been advanced in the strategy literature. For example, Belenzon et al. (2019) argue that a corporate parent will devote less attention to and have less control over a focal subsidiary if there are more intermediaries in the corporate structure between the parent and focal subsidiary. Applied to our setting, a corporation is likely to be organizationally closer to a fintech startup in terms of allocating attention and resources and exerting control if it invests directly in the fintech startup rather than indirectly investing in the fintech startup through a CVC subsidiary (since the latter form of investment creates a greater organizational distance between the corporation and the fintech startup it invests in).

The above notions are likely to have two implications in our setting. First, since investing indirectly through a CVC arm leads to a greater organizational distance between the investor and the fintech startup, there is a lower probability of the formation of a

strategic alliance between the two compared to the case of corporate direct investment. Further, the amount of time it takes to form a strategic alliance will be greater in the case of investing in a fintech startup through a CVC arm compared to the case of a corporate direct investment.[11] This is the fifth hypothesis that we test here (**H5**).[12] Second, given their shorter organizational distance to the fintech startup, corporate investors who invest directly in fintech startups may be able to ask for (and obtain) greater board representation (more board seats) in fintech startups upon investment relative to firms that invest in fintech startups through their CVC arms. This is the next hypothesis that we test here (**H6**).

We now turn to developing testable hypotheses related to our second set of research questions: i.e., for analyzing the effect of corporations investing in fintech startups on the performance of these corporations themselves. Our main focus in the second part of the paper is to examine whether corporate investors themselves benefit from making investments in fintech startups. As in the case of fintech startups receiving investments from corporate investors, whether corporations benefit from making such direct investments in fintech startups is an empirical question. The business models of many fintech startups involve disrupting the businesses of incumbent firms, so that encouraging such startups by investing in them (and helping them in other ways, for example, by forming strategic alliances with them) may negatively impact the performance of corporate

[11] This is also consistent with practitioners' perspectives, who argue that a corporate investor investing directly in a fintech startup is advantageous from the point of view of establishing a strategic partnership with a fintech firm, since, in this case, the investor can wield significant influence over the fintech firm (see, e.g., `https://cu-2.com/2023/10/24/`).

[12] Some readers may wonder why any form of investment by the corporate investor in the fintech startup is needed at all for the formation of a strategic alliance between the two. One answer to this question is that, in a setting of incomplete contracting, some form of equity investment by the corporate investor in the fintech startup is useful to share the benefits of the strategic alliance, since otherwise the benefits associated with the strategic alliance may stay with the fintech startup. For example, if the strategic alliance involves the corporate investor steering some business from its clients to the fintech startup, it may be difficult to write explicit contracts for the corporate investor to share the benefits of this strategic alliance between the two: rather, the corporate investor making an investment in return for some equity in the startup may be the easiest way for the corporate investor to share the benefit from its help to the fintech startup, see, e.g., Mathews (2006) for a theoretical analysis of the benefits of equity investments across parties forming a strategic alliance.

investors. If the effect of corporations making such investments in fintech startups is negative for corporate investors, we expect the operating performance of these firms (as measured by profitability or market share) to deteriorate subsequent to making these investments, and the equity market valuation (as measured by Tobin's Q) of these corporate investors to decline (**H7A**). Conversely, if making such investments is beneficial to the corporations investing in fintech startups due to the synergy benefits arising from the co-operation between these two firms dominating any negative effects due to increases in competition between the two, we should expect their operating performance to improve subsequent to their investments. Further, in this scenario, we also expect the equity market valuation of corporate investors making investments in fintech startups to increase as well, reflecting the above anticipated improvements in operating performance (**H7B**).

If indeed investing in fintech startups improves the performance of at least a subset of corporate investors, understanding the source of such performance improvements becomes important. We conjecture that synergy between corporate investors and fintech startups is a potential source of this performance improvement. Clearly, the synergy between corporate investors in the financial services sector will be much greater than synergies between corporate investors outside the financial services sector and the fintech startups they invest in. This means that the operating performance improvements (and corresponding increase in equity market valuations) for corporate investors in the financial services sector following investments in fintech startups can be expected to be greater than performance and value improvements for corporate investors outside the financial services sector. This is the next hypothesis that we test here (**H8**).

Finally, if synergies between corporate investors and fintech startups they invest in are indeed the source of performance improvements and equity market value increases for corporate investors, then the channels through which they exploit such synergies become pertinent. We examine an important channel through which corporate investors may exploit such synergies, namely, through the formation of strategic alliances between the

two. Strategic alliances with fintech startups may bring corporate investors various benefits. For example, corporate investors may gain access to innovative technologies and solutions which help them respond to customer demands more quickly, expand their market reach, and attract new customers. Further, they can improve efficiency and reduce costs through integrating the fintech solutions into their operations. If, indeed, the formation of strategic alliances between corporate investors and fintech firms is an important channel through which corporate investors and fintech firms share synergies between the two, we would expect the operating performance improvements and equity market value increases for corporate investors that have formed strategic alliances with the fintech firms they invest in to be greater than such performance and value improvements for corporate investors who have invested in fintech firms but which have not formed such strategic alliances. This is the last hypothesis that we test here (**H9**).[13]

IV. Data and Sample Selection

A. Sample of FinTech Startups

As mentioned in the introduction, we define fintech startups as non-traditional intermediaries which provide financial services and products such as peer-to-peer lending, robo-advisory, insurance technology, and others to their customers. Our data on fintech startups come from various sources. The primary data source for our paper is Crunchbase, a leading open-source database collecting profiles of start-ups and information on their financing.[14] We identify startups from Crunchbase which are in the fintech sector such as blockchain technology, insurance, business lending, digital assets, peer to peer lending and other categories of fintech sector following Thakor (2020). We also verify the coverage of

[13]As discussed earlier, corporate investors may also add value to fintech startups through the monitoring channel. While it is obvious how corporate investors may add value to fintech startups through monitoring, it is less obvious how corporate investors can themselves benefit from such monitoring. One way this can happen is through corporate investors sharing the value created through monitoring fintech startups via strategic alliances formed between these corporate investors and the fintech startups that they monitor.

[14]Several studies have used data from Crunchbase: some recent examples include Xu (2023) and Yu (2020).

this dataset with Venture Scanner, which also contains data on fintech startups. Similar to Crunchbase, Venture Scanner has also sourced information from a wide variety of application programming interfaces (APIs) (including the API of AngelList), web scraping of media articles, among others (Chemmanur et al., 2020). In this paper, we focus on startup firms in the fintech sector from 2000 to 2017. Specifically, for each fintech startup, we obtain information on its founding date, location, the dates of investments across funding rounds, names of investors involved in the funding rounds, and the aggregate amount of investments across all investors per funding round. The initial sample consists of around 1300 fintech startups. We obtain information on VC investments in fintech startups from VentureXpert. Finally, we use Pitchbook to augment missing information on investments in the above startups.[15] We obtain data on board members in these startups from Pitchbook, the SEC Form D dataset, and an extensive manual search on the Internet.

We obtain data on employment and sales for our sample of fintech startups from the National Establishment Time-Series (NETS), which is a longitudinal database provided by Dun & Bradstreet and is widely used in research on private firms.[16] After matching firms covered in Crunchbase, VentureXpert, and the NETS databases, we are left with a final sample of 728 fintech startups. We use patent-based metrics to measure the innovation output of fintech startups and obtain patent information from the PatentsView database. Following Bernstein, Giroud and Townsend (2016), we use a fuzzy name matching algorithm to merge the PatentsView dataset to our matched Crunchbase dataset. Information on inventors also comes from the PatentsView database. Specifically, we retrieve information on inventors who have filed patents on the behalf of their firms and track the movement of investors across firms, making use of the name and unique identification number of each inventor provided in the PatentsView database.

[15]However, even after using the Pitchbook data, there is missing information on investment for 14 fintech startups. In these cases, we use the average of investment amount made in startups in the category of fintech industry (e.g., consumer lending) in the same funding year as the investment amount or the average over the entire sample in that category if there is no investment in any fintech startup in that category.

[16]See Neumark, Wall and Zhang (2010) for a more detailed description of the NETS dataset.

B. Sample of Corporate Investors

We obtain the names of investors who invest in the fintech startups from the Crunchbase database. We manually identify the category of each investor by searching their websites as well as news articles pertaining to such investors and collect their investor-category classifications from Crunchbase. However, Crunchbase does not have a separate classification for corporate investors. Therefore, we manually identify corporate investors, which we define as firms (either public or private) that make direct investments in startups (and not through any investment arm) and that do not have investment as their primary line of business. For example, Mastercard is categorized as a corporate investor, because it has made direct investments in fintech startup such as Mozido and its primary line of business is payment services. On the contrary, venture capitalists (VCs) like Andreessen Horowitz or Bessemer Venture Partners are are not considered as corporate investors, because identifying and making investment in startups is their core business.

Note that corporate direct investors are different from corporate venture capitalists (CVCs), which are the venture divisions of corporations (e.g., Google Ventures and Intel Capital). CVCs are either standalone subsidiaries or separate divisions of corporations and often maintain a certain degree of freedom when making investment decisions, in which case the parent corporation may not exercise total control of the investment. Corporate investors, however, make direct investments in startups (i.e., not through CVCs) and exercise total control of the investment.[17] To ensure accuracy, we carefully go through company websites and also conduct additional online search to manually verify whether the direct investors that have invested in fintech startups have a CVC division or not. Please see Table A1 in the Internet Appendix and our discussion in Section IV.E for more details.

[17]For example, American Express has made a direct investment in Stripe, which is a fast-growing payment company. Therefore, American Express is a considered as a corporate investor. Note, however, American Express also has a CVC arm named "American Express Ventures." In this case, the investments made directly by American Express are considered as corporate investments, while those made through American Express Ventures are considered CVC investments.

In this paper, our main focus is on the role of corporate direct investors in fintech startups. We merge investor names in the Crunchbase dataset to Compustat using the name matching technique employed in Bernstein et al. (2016). We are able to identify 65 publicly-listed corporate investors that have invested in fintech startups by the year 2017, out of which 32 firms are in the financial services sector (i.e., with a 4-digit SIC code between 6000 to 6999). We use Compustat to obtain accounting information of publicly-listed fintech investors from 1997 to 2020 at the quarterly frequency. We track information on corporate direct investors stating from 1997 so as to have a three-year period prior to their investment in fintech startups, given that our fintech startup sample is from 2000 onward.

C. Measures of Innovation Output

We measure the extent of the innovation output by fintech startups using the quantity and quality of patents filed by (and eventually granted to) them in the years after the first round of financing. We measure the quantity of innovation using the natural logarithm of one plus the total number of technology class-adjusted patents applied by (and eventually granted to) a firm within one year, two years, and three years after a round of financing following Seru (2014). To measure the quality of innovation, we calculate the natural logarithm of one plus the total number of technology class-adjusted forward citations of the patents which were applied by a firm within one year, two years, and three years after a round of financing following Seru (2014).

D. Measures of Inventor Mobility

We construct our inventor mobility measures at the annual frequency for fintech startups following Marx, Strumsky and Fleming (2009) and Chemmanur, Kong, Krishnan and Yu (2019). For a given firm, an inventor's move-in year is the year when she filed her first patent in this firm; her move-out year is the year when she filed her first patent in a

different firm. In case if the last patent filed by the inventor is for the same firm, we assume that she remains in the firm till the end of our sample period.[18] Once we identify each mobile inventor's move-in and move-out year, we aggregate the number of mobile inventors that move in and move out at the firm-year level to obtain the total inflows and outflows of mobile inventors for a given firm in a year. We measure the net inflow of inventors into a fintech startup in a given year by computing the difference between the natural logarithm of one plus the inflow and the natural logarithm of one plus the outflow of inventors for the fintech startup in that year. We create measures of the net inflow of inventors over the one-year, two-year, and three-year period post investment.

We also categorize inventors into different groups based on their track record of patent citations so as to analyze the mobility of high-performing inventors. We classify inventors as "superstar inventors," if they are in the top 10 percent based on the cumulative number of class-adjusted citations received over the patents filed by them over time. We also create measures of net inflow of superstar inventors over the one-year, two-year, and three-year period.

E. Summary Statistics

Panel A of Table 1 reports the summary statistics of U.S.-based fintech startups in our sample. We find that 2% of firms had a successful exit via an IPO and about 16% of firms had a successful exit via an acquisition. The mean fraction of VC investment in our sample firms is 37%. On average, 28% of fintech startups receive at least one round of direct investment from corporate investors, 60% of them receive at least one round of investment from an independent VC (IVC), and 27% of firms receive at least one round of investment from a CVC. About 11% of the startups receive both corporate direct and CVC investments, typically from separate corporations. Our control variables are winsorized at the 1st and 99th percentiles in the regressions.

[18]Inventors that have only filed one patent are excluded from our sample as we can only identify the inventor flow based on at least two patent filings.

Panel B of Table 1 reports the summary statistics of investment amount by corporate investors in fintech startups for a subsample of startups that received investment from either corporate investors or VCs (including IVCs and CVCs). Crunchbase provides the information on the aggregate investment amount in a funding round, while VentureXpert provides the information on the investment amount provided by VCs. Thus, we are able to back out the total investment amount provided by corporate investors by subtracting aggregate VC investment amount from the total investment amount in a funding round. This back-of-the-envelope calculation only applies to a subsample of fintech startups that received investment from either VCs or corporate investors (which does not include other types of investors such as accelerators or angel investors). Thus, we are able to show the total investment amount by corporate investors for 48 fintech startups (out of 203 fintech startups in our sample that have received corporate direct investment) in Panel B of Table 1. The average amount of total corporate direct investment is 9.1 million USD, which is 41.03% of the average total amount invested (23.17 million USD) in these rounds. The median number of corporate investors in the above subsample is 1. In comparison, we also find that the average amount of the total investment provided by CVCs and IVCs in the same subsample are 5.8 million USD and 10.6 million USD, respectively. Thus, the above statistics show that corporate investors provide a significant amount of funding to startups, which is comparable to that provided by IVCs and CVCs.

[Insert Table 1 about here]

In Table A1 in the Internet Appendix, we list out all the direct investors that have invested in fintech startups in our sample period. These investors consist of public and private firms in the U.S. and firms in other countries. We show that around 66% of direct investors do not have a CVC division. Further, we show in Table A2 that only 8 out of 728 fintech startups in our sample have received investment from both direct investors and the CVC divisions of these direct investors. Table A3 in the Internet Appendix reports the break-down of startups across various business categories in the fintech sector.

[Insert Table 2 about here]

Table 2 presents the summary statistics for publicly-listed corporate investors in the financial and non-financial services sectors in the U.S. that have invested in fintech startups. We consider financial services firms as firms with SIC codes between 6000 and 6999. We also show summary statistics for a group of control firms in the financial services sector that did not invest in fintech startups. We restrict our sample to investments made on or before 2017 so that we have sufficient observations in the post-investment period for these firms. We obtain three control firms for a treated firm (corporate investor) from the same three-digit SIC code using a propensity score matching based on size, age, and R&D expenditure of firms in the immediate year prior to the investment year. Our panel data is obtained at quarterly frequency from Compustat. For each treated and control firm, we consider 12 quarters pre- and post- investment by the treated firm in the fintech startup. We have a final sample of 32 corporate investors (treated firms) and 71 control firms in the financial services sector. We present the summary statistics for corporate investors in the financial services sectors and respective control firms in Panel A and Panel B, respectively. In Panel C, we present the summary statistics for corporate investors in the non-financial services sectors. In Table A4 in the Internet Appendix, we show that treated and control firms (including both financial and non-financial services sector firms) are similar in terms of age, size, R&D expenditures, and industry category.

V. The Effect of Corporate Direct Investment on the Future Outcomes of Fintech Startups

In this section, we analyze the impact of corporate direct investment on the successful exits of fintech startups (IPO or acquisition), innovation output, and net inventor inflows using our sample of 728 fintech startups.

A. Corporate Direct Investment and Future Outcomes of Fintech Startups: Main Results

We first use OLS analyses to analyze the effect of corporate direct investment on the future outcomes of fintech startups. We use the following empirical specification:

$$(1) \qquad Outcomes_i = \alpha_0 + \alpha_1 Corporate\ Investment_i + X_i + \phi_j + \gamma_t + \epsilon_i,$$

where i indexes firm, j indexes industry, and t indexes time. $Outcomes_i$ represents the three future outcomes of startups that we analyze: successful exits of fintech startups (IPO or acquisition), innovation output, and net inventor inflows, as defined in Appendix A. The independent variable of interest, $Corporate\ Investment_i$, is an indicator variable equal to one if a fintech firm receives its first ever round of direct investment from at least one corporate investor. X_i represents a vector of control variables, which includes an indicator variable capturing investment by IVCs, an indicator variable capturing investment by CVCs, firm age, sales and employment one year prior to the investment year, aggregate investment across all investment rounds in a firm, and the number of investors in the investment round. We also include two-digit SIC code industry fixed effects and the investment year fixed effects in our regressions.[19] We define investment year as the year of the latest investment round in a fintech startup by any type of investor.

[Insert Table 3 about here]

Table 3 reports the results of the effect of corporate direct investment on the future outcomes of startups. In Panel A, we show that corporate investment is associated with a higher likelihood of successful exit of startups. In Columns 1, 2, and 3, the coefficients of *Corporate Investment* are positive and significant at the 10%, 5%, and 1% levels, respectively. Our results are also economically significant. For example, corporate direct investment is associated with a 6.2 percentage point increase in the probability of

[19] Our results are broadly robust to the inclusion of startup headquarters state fixed effects in addition to industry and investment year fixed effects: please see Table A5 in the Internet Appendix.

successful exits of fintech startups.[20] In comparison, IVC investment is associated with an increase of 5.9 percentage points in the probability of a successful exit of a startup, which is similar in magnitude to that of corporate direct investment. Further, the coefficients of CVC investment are negative and insignificant. Overall, our results suggest that corporate direct investment in fintech startups increases their probability of successful exit over and above any effect due to IVC or CVC investment. This result supports our hypothesis **H1B**.

Next, we analyze the effect of corporate direct investment on the innovation output of fintech startups and report these results in Panel B of Table 3. We find that corporate direct investment is associated with a higher quantity and quality of patents received by the fintech startup subsequent to receiving the corporate investment. As shown in Columns 1 to 6, we find that the coefficients of *Corporate Investment* are positive and significant. Our results are also economically significant: for example, corporate investment is associated with a 2.1 percentage point increase in the quantity of patents produced by firms in the third year after the investment round. This result also supports our hypothesis **H1B**.

We then examine the effect of corporate direct investment on the net inflows of inventors into fintech startups and report these test results in Panel C of Table 3. In Columns 1 to 3, the dependent variable is the net inflow of inventors. In Columns 4 to 6, the dependent variable is the net inflow of superstar inventors, i.e., inventors in the top 10 percentile based on their cumulative aggregate of patent citations. For all columns, we find that the coefficients of the corporate investment variable are positive and significant. These results suggest that corporate investors help fintech startups to attract high-quality talent (scientists and engineers) to their firms, thus lending support to our hypothesis **H1B**.

One may be concerned that our baseline (OLS) results may be confounded by endogeneity issues. For instance, the observed relationship may reflect both selection effects and value creation by corporate investors in fintech startups. In addition, omitted variables—such as startup quality or the resources and networks of founders and

[20] In unreported tests, we find that our results are robust to using a probit model as well.

management—could also bias the baseline estimates. To mitigate such endogeneity concerns, we conduct an instrumental variable (IV) analysis using the change in technological breakthroughs (measured by the *RETech* variable in Bowen, Frésard and Hoberg (2023)) of public companies in the same industry as a fintech startup in the past three years as an instrument for corporate direct investment in the fintech startup. The underlying rationale is that, when established (public) companies face challenges in achieving technological breakthroughs, they are likely to search for and make direct investments in fintech startups operating in their industry to gain access to and learn about new ideas and cutting-edge technologies (which may help these established companies improve their own performance).[21]

We report the results of our instrumental variable analyses in Table 4. In Column 1 of Panel A, the first stage result reveals that the instrument is negatively and significantly associated with direct investment in fintech startups in that industry and the first stage F-statistic is greater than the critical value in Stock and Yogo (2002), thereby satisfying the relevance condition. The remainder of Table 4 reports the second stage results of our IV analyses. For most specifications, the IV results support the notion that corporate direct investment leads to a greater likelihood of successful exit, a greater quantity and quality of innovation output, and a greater net inflow of inventors.[22] In summary, the results reported in this section demonstrate that corporate direct investment improves the outcomes of fintech startups, lending support to our hypothesis **H1B**.

[Insert Table 4 about here]

[21]The details of the motivation and construction of our IV are provided in Section A1 of our Internet Appendix.

[22]The magnitudes of coefficients in our IV analyses are 3-10 times larger than those in our OLS analyses for most of the specifications. Such differences are consistent with the evidence documented in Jiang (2017) comparing IV versus OLS estimates from the existing literature, which she attributes to a "local average treatment effect." Another plausible explanation for the difference in magnitudes between our OLS and IV estimates is the presence of omitted variables, which may lead to a downward bias in our OLS estimates. Some examples of such possible omitted variables are the intrinsic quality of fintech startups or the capabilities and networks of their founders and management. For instance, top-quality startups or those led by well-connected founders or managers with strong fundraising capacity may not rely on corporate direct investment, yet still achieve strong performance.

B. Value Creation by Corporate Investors in the Financial Services versus Non-Financial Services Sectors: Test of Synergy

In this section, we analyze value creation by corporate investors in the financial services versus non-financial services sectors (**H2**). We expect greater synergies between corporate investors in the financial services sector and fintech startups than between corporate investors in the non-financial services sector and fintech startups. We therefore conduct separate baseline analyses to analyze the effect of corporate investment by firms in the financial and non-financial services sectors, respectively, on the future outcomes of fintech startups.

As reported in Table A6 in the Internet Appendix (due to space limitations), we separately analyze the effect of direct investment by corporate investors in the financial services sector and that by corporate investors in non-financial services sector on the likelihood of successful exits of fintech startups. In Panel A, we show the effect of direct investment by corporate investors in the financial services sector on the likelihood of successful exit of startups. Our sample includes startups that received direct investments from at least one corporate investor in the financial services sector (i.e., treated startup) and a group of control startups. For each treated startup, we identify a control startup in the same 2-digit SIC industry and founded in the same year using one-to-one propensity score matching based on average sales and employment. We find that direct investment by corporations in the financial services sector in fintech startups is associated with a significantly higher likelihood of successful exit for these startups. Next, in Panel B, we analyze the effect of direct investment by corporate investors in the non-financial services sector on the likelihood of successful exit of fintech startups. Using the above approach, we identify a control startup for each startup that received corporate direct investment in the non-financial services sector. We show that direct investments in fintech startups by corporations in the non-financial services sector have no significant effect on the likelihood

of successful exits of startups. Thus, the above results support our hypothesis **H2**.

Further, we analyze whether fintech startups benefit from receiving direct investments from banks or from non-bank corporate investors. Our sample comprises fintech startups that received investments from corporate investors in the financial services sector and control startups identified using the above approach. We classify corporate investors in the financial services sector into banks and non-bank investors (e.g., insurance companies, mortgage lending companies) and construct separate indicator variables for each category, respectively. We present the results of these analyses in Table A7 in the Internet Appendix. We find that direct investments from both banks and non-bank corporate investors are associated with a higher likelihood of successful exit for fintech startups.

Finally, we also conduct cross-sectional analysis to test whether fintech startups in more valuable technological areas derive greater benefit from corporate direct investment. We split our sample of fintech startups into two groups: startups operating in more valuable technological areas versus those in less valuable areas. Similar to Chen, Wu and Yang (2019), startups in more valuable technological areas include those in Blockchain, Robo-advising, Internet of Things (IoT), lending, and cyber-security industries based on the data on business categories and business description of fintech startups in our sample. In untabulated analysis, we find that corporate direct investment is associated with a higher likelihood of successful exit for startups in both more and less valuable technological areas. However, corporate direct investment seems to have a stronger positive impact on the successful exits for fintech startups in more valuable technological areas (compared to those in less valuable areas).

VI. Channels through which Corporate Direct Investment Improves the Outcomes of Fintech Startups

In this section, we explore two potential channels through which corporate direct investors may create value for fintech startups: namely, forming strategic alliances with

fintech startups and obtaining board seats in these startups to better monitor them.

A. The Effect of Strategic Alliance Formation between Corporate Direct Investors and Fintech Startups on Future Outcomes of Startups

In this subsection, we analyze whether corporate investors help fintech startups they invest in to achieve better future performance (at least partly) by forming strategic alliances with them. To empirically test this, we check whether there is an additional positive and significant impact of strategic alliances between corporate investors and fintech startups on the future outcomes of these startups, over and above any effect due to corporate investment alone (**H3**). We hand-collect data on strategic alliances between investors (both corporate direct investors and CVC parents) and fintech startups through an extensive search of news articles on the Internet. We consider an investment as leading to a strategic alliance if we can find at least one news article mentioning a strategic alliance or partnership between the investor and the fintech investee upon or after the investment. We take the date of the earliest news article that mentions the formation of such strategic alliance as the date of strategic alliance formation.

We present the results of the above analyses in Table 5. Our main independent variable of interest is an indicator variable equal to one if a strategic alliance is formed between a fintech startup and at least one corporate investor upon or after direct investment by the corporate investor (and zero otherwise). We also include the corporate investment dummy in the regression so that we can capture the effect of strategic alliance formation between a corporate investor and fintech startup over and above the effect of direct investment by the corporate investor without the formation of a strategic alliance. In Panels A, B, and C, we show that strategic alliance formation between corporate investors and fintech startups are significantly associated with a higher likelihood of successful exit, a higher quantity and quality of patents, and a higher net inflow of superstar inventors to these startups. Collectively, our results demonstrate that strategic alliance formation

between corporate investors and fintech startups create additional value to these startups over and above any benefits they obtain simply due to the direct investment by corporate investors without the formation of any strategic alliances, supporting **H3**.

[Insert Table 5 about here]

B. The Effect of Board Representation by Corporate Direct Investors on the Future Outcomes of Fintech Startups

In this subsection, we study whether corporate direct investors help to enhance the future performance of fintech startups (at least partly) by better monitoring these startups through obtaining board seats in them. Thus, we empirically check whether the corporate direct investment with board representation in fintech startups has an additional positive impact on the outcomes of these startups, over and beyond any positive impact due to corporate direct investment alone (**H4**). We collect information on board members in these fintech startups from Pitchbook, the SEC Form D dataset, and through an extensive manual search on the Internet.

We present the results of these analyses in Table 6. Our main independent variable of interest is *Board Seat by Corporate Investor*, which is an indicator variable equal to one if a corporate investor obtains a board seat in the fintech startup upon or after direct investment and zero otherwise. We include the *Corporate Investment* dummy in all the regressions in Table 6, so that the coefficient of *Board Seat by Corporate Investor* captures the effect of corporate investors' monitoring by obtaining board seats over and above any effect due to corporate direct investment alone. We include all other control variables used in our earlier analyses as well.

[Insert Table 6 about here]

In Table 6, we find that corporate direct investors who obtain board seats in fintech startups are positively associated with the likelihood of successful exit through acquisitions

for such fintech startups, the quantity and quality of innovation output (measured by patent counts and patent citations) of these startups, and the net inflow of superstar inventors to these startups. In summary, our results demonstrate that board representation by corporate direct investors helps fintech investees to perform better, over and beyond any positive effects due to corporate investment alone. Thus, the above results support our hypothesis **H4**.

C. Is Corporate Direct Investment More Conducive to Strategic Alliance Formation Compared to Investment through CVC Arms?

We showed earlier that one channel through which corporate direct investment improves the outcomes of fintech startups is through the formation of strategic alliances between corporate investors and fintech startups. Although both corporate direct investment and indirect investment through the corporation's CVC arms may lead to the formation of strategic alliances with their fintech investees, we conjecture that direct investment leads to a smaller organizational distance between the corporate investor and the fintech startup. Therefore, compared to indirect investment in fintech startups through CVC arms, we expect that corporate direct investment leads to a higher likelihood of strategic alliance formation between investors and their fintech investees and helps to form such alliances faster.

We empirically test these conjectures and present the results in Table 7. For the empirical analyses in Table 7, our sample consists of all pairs of corporate investors and their fintech investees as well as pairs of CVC parents and their fintech investees. Thus, the benchmark case we consider in this test is a CVC investment. We consider two dependent variables: a dummy variable indicating whether a strategic alliance has been formed (*Strategic Alliance*) and the amount of time it takes (in days) to form the strategic alliance, conditional on the formation of such alliance (*Days to Form Strategic Alliance*).[23] In Panel

[23]During our manual collection of information on dates of strategic alliance formation from news articles, we observed a few instances in which the reported alliance date slightly preceded the investment date. To

A of Table 7, our independent variable of interest is *Corporate Direct Investment*, an indicator variable that takes a value of one if the investor is a corporate direct investor and is equal to zero if the investor is a CVC parent. In Column 1, we find that the coefficient of *Corporate Direct Investment* is positive and significant (at the 1% level), demonstrating that corporate direct investment (compared to CVC investment) is more conducive in the formation of strategic alliances between investors and their fintech investees. Our results are economically significant: corporate direct investment is associated with a 13 percentage point greater likelihood of a strategic alliance formation between the investor and fintech startup, compared to a CVC investment. In Column 2, we show that corporate direct investment is associated with a smaller amount of time (1% significance) to form a strategic alliance, conditional on the formation of the alliance.[24] On average, it takes corporate direct investors 322 days less to form strategic alliances with their fintech investees, compared to corporations who make indirect investments through their CVC arms.

[Insert Table 7 about here]

In Panel B of Table 7, we provide more insights on the conjecture that corporate direct investment is more conducive to strategic alliance formation between investors and their fintech investees due to a shorter organizational distance. To achieve this, we create a measure of organizational distance between corporate direct investors or CVC parents to their fintech investees following Belenzon et al. (2019) based on the chain of shareholder ownership of subsidiaries. We then examine the relation between organizational distance and the propensity and speed of strategic alliance formation between the investors and their fintech investees. For corporate direct investment, we assign an organizational

deal with such scenarios, when a news article reports strategic alliance formation only shortly before the investment date, we carefully review the content of the article and assign a value of zero to *Days to Form Strategic Alliance* if it is reasonable to conclude that the alliance was formed as part of, or as a direct result of, the investment. If, however, we conclude that the strategic alliance was clearly pre-existing prior to the investment, we exclude that observation from our analysis. Note that our results remain robust even after completely removing the cases in which the reported alliance formation date just slightly precedes the investment date from the analysis: please see Table A8 in the Internet Appendix.

[24]Our results are robust to using a Poisson model as shown in Table A9 in the Internet Appendix.

distance of zero between corporate direct investors and fintech startups (investees).[25] For CVC investment, we assign an organizational distance of one between the corporate parent of a CVC and the fintech startup (investee) if the CVC is a division of the corporate parent (and not a separately existing entity or subsidiary); two if the CVC is a separate entity (LLC or corporation); and three if the CVC is a subsidiary under the control of a separate subsidiary within the apex firm.[26]

In Columns 1 and 2 of Panel B in Table 7, our sample comprises pairs of corporate investors and fintech startups or pairs of CVC parents and fintech startups. We show that a greater organizational distance is associated with a lower likelihood of strategic alliance formation between investors and investees and a longer time to form such alliances. In economic terms, an increase in the organizational distance by a value of one is associated with a decrease of 8.3 percentage points in the likelihood of strategic alliance formation and an increase of 226 days in the amount of time taken to form the alliance upon or post investment, respectively. In Columns 3 and 4, we validate our measure of organizational distance by focusing only on CVC parents and startup pairs. We find that parent companies of CVCs that have a greater organizational distance to their fintech startups are less likely to form strategic alliances with these startups and take a greater amount of time to form strategic alliances, conditional on the formation of the alliance. In sum, our results demonstrate that corporate direct investment has an advantage in facilitating strategic alliance formation with fintech startups compared to CVCs due to the shorter organizational distance of corporate investors to these startups, supporting hypothesis **H5**.

[25]For example, JP Morgan Chase directly invested in Motif, a fintech startup, and thus has an organizational distance of zero with respect to Motif.

[26]For example, GE Ventures operated as a separate subsidiary and was a venture capital arm of General Electric. In contrast, American Express Ventures is a division of American Express and is not a separate entity or a subsidiary. Thus, General Electric (the parent company of GE Ventures) has an organizational distance of two with respect to its fintech investees, while American Express (the parent of American Express Ventures) has an organizational distance of one with respect to its fintech investees.

D. Is Corporate Direct Investment More Conducive to Obtaining Board Seats in Fintech Startups Compared to Investment through CVC Arms?

We now empirically analyze whether corporate direct investors are more likely to obtain a board seat in fintech startups compared to corporations who make indirect investments through their CVC arms (**H6**). For this empirical analysis, our sample consists of pairs of corporate investors and their fintech investees as well as pairs of CVC parents and their fintech investees. As presented in Table 8, the dependent variable is *Board Seat*, a dummy variable that takes a value of one if the corporate investor or the CVC parent obtains a board seat in their fintech investees and zero otherwise. The independent variable of interest is *Corporate Direct Investment*, which is a dummy variable equal to one if a fintech startup received corporate direct investment and zero if it received investment from a CVC. Thus, the benchmark case we consider in this analysis is CVC investment. We find that the coefficients of *Corporate Direct Investment* are positive and significant using either OLS or probit regressions in Table 8. In economic terms, Column 2 suggests that corporate direct investors have a 6.6 percentage point higher probability of obtaining a board seat in fintech startups compared to corporations who make indirect investment through their CVC arms. Thus, our results demonstrate that corporate direct investment (compared to CVC investment) is more conducive to investors obtaining a board seat in their fintech investees, which supports our hypothesis **H6**.

[Insert Table 8 about here]

VII. The Effect of Direct Investments in Fintech Startups on the Outcomes Achieved by Corporate Investors Themselves

Our findings thus far indicate that fintech startups derive significant benefits from direct investments made by corporate investors. In this section, we empirically study

whether corporate investors themselves gain from these direct investments.[27] We identify 65 publicly-listed corporate investors which have made direct investment in fintech startups in our sample. Out of these 65 firms, 32 are in the financial services sector (including 15 banks and 17 non-bank investors such as insurance companies and mortgage lending companies). In contrast to the previous part of the paper where we consider investments by either public or private corporate investors, here we only focus on publicly listed corporate investors, since we need data on the performance of corporate investors for the analyses in this section (available only for publicly listed investors).

A. The Effect of Direct Investments in Fintech Startups on Future Outcomes Achieved by Corporate Investors: Empirical Strategy

In this subsection, we discuss our empirical strategy analyzing the relation between direct investment in fintech startups and the subsequent performance of the corporate investors. We later describe our results in the following subsections. We examine the impact of direct investments in fintech startups on the future performance of corporate investors using a stacked DiD framework following Gormley and Matsa (2011). Although certain corporate investors in our sample invested in multiple fintech startups, we focus on the impact of their very first investment in a fintech startup on their operating performance and equity market valuation. In other words, we focus on the effect of direct investment in fintech startups on the performance of corporate investors on the extensive margin.

For this analysis, we use a firm-quarter unbalanced panel from 1997 to the first quarter of 2020. We construct a cohort of corporate investors (i.e., treated firms) and control firms using firm-quarter observations for twelve quarters before and after the corporate investor's first investment in a fintech startup. We only include treated firms that have made their first direct investment in fintech startups by 2017 so that we can track their performance over a three-year window subsequent to the investment in a fintech

[27] We briefly analyze the factors that motivate direct investments in fintech startups made by corporate investors in Section A2 in the Internet Appendix.

startup.[28] A cohort is formed in a calendar year-quarter in which investments in fintech startups were made by corporate direct investors (i.e., treated firms). For each treated firm, we find three control firms in the same 3-digit SIC code industry based on nearest matches using propensity score matching. We match firms based on size, age, and R&D expenditure in the year immediately prior to the investment year.

We then use the following empirical specification to examine the impact of investments in fintech startups on the performance of corporate investors:

$$(2) \qquad Perf_{i,c,t} = \alpha_0 + \alpha_1 Post_{c,t} \times Direct\ Fintech\ Investment_{i,c} + \phi_{i,c} + \gamma_{c,t} + X_{i,c,t} + \epsilon_{i,c,t},$$

where i indexes firm, c indexes cohort, and t indexes time of fiscal-quarters which takes a value between -12 to 12, with t=0 being the quarter in which the firm made its first investment in a fintech startup. Thus, we include observations for 12 quarters pre- and post- investment for corporate investors and their respective control firms. $Perf_{i,c,t}$ represents the following measures for a corporate investor: profitability, market share, and Tobin's Q. $Post_{i,c,t}$ is an indicator variable equal to one for a quarter in which the corporate investor made its first direct investment in a fintech startup as well as for all the quarters subsequently, and zero otherwise. $Direct\ Fintech\ Investment_i$ is an indicator variable that takes the value of 1 for corporate investors (i.e., treated firms) and 0 for control firms. $X_{i,c,t}$ represents the control variables, including change in sales over the past six quarters, size, the number of institutional investors, and R&D expenditure. Following Gormley and Matsa (2011), we include cohort by firm fixed effects and the cohort by calendar year by quarter fixed effects in our regressions, which is a standard practice in a stacked DiD framework. Specifically, a cohort is a particular calendar year-quarter, where a group of corporate investors made their first investment in fintech startups. Thus, each cohort comprises corporate investors that made investments in fintech startups as well as their respective control firms. We cluster our standard errors at the firm level.

[28] Similar to Gormley and Matsa (2011), firms may not be present in the sample for the full 12 quarters before or after the investment events. Also note that our results are robust to using 16 or 20 quarters around the investment event instead of 12.

B. The Effect of Direct Investments in Fintech Startups on Future Outcomes Achieved by Corporate Investors: Main Results

We first analyze the effect of direct investment in fintech startups on the operating performance (measured by profitability and market share) and valuation (measured by Tobin's Q) of corporate investors using the entire sample of corporate investors. We then split our sample of corporate investors into subsamples of corporate investors in the financial services and in non-financial services sectors for further analyses. From our untabulated analysis of the entire sample, we do not find any significant effect of direct investment in fintech firms on the performance and equity market valuation of corporate investors themselves, although we find some weak support for improvement in their profitability.

[Insert Table 9 about here]

We now conduct a split-sample analysis to study the effect of direct investments in fintech startups on the operating performance and equity market valuation of corporate investors in the financial services and in the non-financial services sectors (due to synergy considerations). The results of this split-sample analysis are presented in Table 9. In Panel A of Table 9, our sample comprises corporate investors in the financial services sector and control firms in the same 3-digit SIC code industries. We show our results including and excluding control variables. In Columns 1 and 4 and in Columns 2 and 5, we find that the coefficients of *Post*×*Direct Fintech Investment* are positive and significant at the 5% level. These results demonstrate that direct investments in fintech startups improve the profitability and market share of corporate investors in the financial services sector, compared to the control firms who did not make such investments in fintech startups. In Columns 3 and 6, we find that the the coefficients of *Post*×*Direct Fintech Investment* are positive and significant at the 10% level. This implies that direct investments in fintech startups increase the equity market valuation of corporate investors compared to control

firms. Theses results are also economically significant: for example, corporate investors in the financial services sector that have invested in fintech startups experience an average increase of 50.2% in their profitability and an average increase of 8.5% in their market share, respectively. Further, corporate investors in the financial services sector that have invested in fintech startups experience an average increase of 18.3% in their market valuation.[29] Thus, this result supports our hypothesis **H7B** for the subsample of corporate investors in the financial services sector.

In Panel B of Table 9, we analyze the effect of direct investment in fintech startups by corporate investors in the non-financial services sector on their performance. We find that the coefficients of *Post*×*Direct Fintech Investment* are insignificant in all six columns. Thus, our results reveal that there is no significant difference in performance between treated and control firms in the non-financial services sector after the direct investment by treated firms in terms of profitability, market share, and market valuation. Taken together, our results in Panels A and B of Table 9 suggest that direct investment in fintech startups enhances the performance and equity market valuation of corporate investors in the financial services sector, since such investors have greater synergies with such fintech startups. In contrast, corporate investors from the non-financial services sector do not seem to benefit from their investments in fintech startups because they have a lower extent of synergies with such startups. Collectively, these results lend support to our hypothesis **H8**.

Next, in Panel C, we split corporate investors from the financial services sector into two categories: banks and non-bank investors (e.g., insurance companies and mortgage lending companies). We conduct subsample analysis of the effects of direct investments in fintech startups on the operating performance and valuation of banks and non-bank corporate investors separately. We find that, while both banks and non-bank corporate

[29] We conduct a dynamic analysis regressing the outcome variables of corporate investors on the interaction between various time indicators and corporate direct investment in Section A3 in the Internet Appendix. The results of this dynamic analysis (presented in Table A10 in the Internet Appendix) provide further support for the notion that corporate investments enhance the performance of corporate investors in the financial services sector and reinforce the validity of our parallel trend assumption.

investors benefit from making direct investment in fintech startups, such benefits are greater for non-bank investors.

In an untabulated test, we also conduct a cross-sectional analysis to test whether corporate investors in the financial services sector that invested in fintech startups in more valuable technological areas derive greater benefits from their direct fintech investments. We split the sample of these corporate investors into two categories: those investing in fintech startups in more versus less valuable technological areas, following our earlier approach to split fintech startups into more and less valuable technological areas (as in Chen et al. (2019)). We find that direct investment is associated with better performance for both sets of corporate investors, but such benefits seem to be somewhat greater for those investing in fintech startups in less valuable technological areas.[30]

VIII. Channel Analysis on How Direct Investments in Fintech Startups Affect Future Outcomes of Corporate Investors: Strategic Alliance Formation

In this section, we examine one potential channel through which corporate investors in the financial service sector may benefit from making direct investment in fintech startups, namely, through forming strategic alliances with their fintech investees.

The synergy between corporate investors in the financial service sector and fintech startups may lead to strategic alliances formation upon or after investment. Strategic alliances with fintech startups may bring corporate investors in the financial services sector

[30]Taken together with an earlier result described in Section V.B, our findings suggest that corporate direct investment has a stronger positive impact on the performance of fintech startups in more valuable technological areas, but corporate investors themselves seem to benefit more when investing in fintech startups in less valuable technological areas. We propose two possible explanations for these results. One explanation is that the distribution of synergy benefits between corporate investors and fintech investees is not symmetric (but rather depends on the relative economic situations of the fintech startups and corporate investors in a given industry): for instance, fintech startups developing more valuable technologies may possess stronger bargaining power, enabling them to capture a larger share of the synergy benefits from corporate investment. Another possible explanation is that disruptive fintech technologies in more valuable technological areas may generate substantial value for fintech startups that develop them, but create less value for incumbent financial corporations (corporate direct investors), which tend to be slower to adapt and more focused on existing customers. By contrast, such incumbent corporations may benefit more from complementary technologies in less disruptive and less valuable technological areas that enhance their existing systems and offerings.

various benefits. For example, they may gain access to innovative technologies and solutions which help them respond to customer demands more quickly, expand their market reach, and attract new customers. Further, they can improve efficiency and reduce costs through integrating various fintech solutions into their operations. All these benefits through forming strategic alliances with fintech startups may in turn enhance the operating performance and equity market valuation for corporate investors from the financial services sector.

We split our sample into two subsamples: corporate investors who have formed strategic alliances with fintech startups and corporate investors who have not formed such alliances. We analyze the effect of investments in fintech startups on the profitability, market share, and market valuation of these two subsamples using stacked DiD analyses. We report our results in Table 10. Panels A and B report the results for corporate investors in the financial and non-financial services sectors, respectively. In Panel A, we show that corporate investors in the financial services sector that have invested in fintech startups and that have formed a strategic alliance with them experience a significant increase in their profitability, in their market share, and in their market valuation, respectively. In economic terms, corporate investors in the financial services sector that have invested in fintech startups and have formed a strategic alliance with them experience an average increase of 56.7% in their profitability, an average increase of 12.1% in their market share, and an average increase of 16.6% in their market valuation, respectively. However, we find that such investment does not improve the performance of corporate direct investors if there is no strategic alliance formed between the investors and the fintech firms they invest in.

[Insert Table 10 about here]

In Panel B, we find that corporate investors in the non-financial services sector do not benefit from investment in fintech startups, whether or not they have formed a strategic alliance with these startups. These results suggest that corporate investors in the

financial services sector are better positioned to identify and implement value-enhancing strategic alliances with fintech startups, and that their performance improvements are, at least in part, attributable to these alliances, thus supporting hypothesis **H9**.

IX. Discussion and Conclusion

In this paper, we analyze the effect of corporate direct investments in fintech startups on startup performance and on the future performance of investing firms. Corporate investment in fintech startups is associated with a higher likelihood of successful exit; more and higher quality innovation; and a greater inflow of high-quality inventors for fintech startups. For corporate investors, a stacked difference-in-differences analysis shows that direct investments in fintech startups enhance the product market performance and equity market valuation of corporate investors from the financial services sector, but not for those from the non-financial services sector.

We explore the underlying channels that drive the above results. We find that corporate direct investors are more likely to form a strategic alliance with fintech startups after their investment, compared to corporations who invest in these startups indirectly through their CVC arms. Further, corporate investors are also more likely to get a board seat in fintech startups after their investments. We show that the formation of strategic alliances between corporate direct investors and fintech startups is one channel driving the above performance improvements for both fintech startups and corporate direct investors. In addition, we find that corporate investors also help improve the performance of fintech startups through obtaining board seats in such startups and monitoring them better.

An intriguing question for future research is why corporate investors in non-financial services sector choose to make direct investment in fintech startups in the first place if there is little benefit for them. While this is not the focus of our paper, we conjecture two possible explanations based on ample anecdotes. First, some non-financial firms may invest just to keep up with the prevailing trend or because their competitors are doing the same.

Second, some non-financial services firms may be attempting to enter the fintech space to expand their businesses or integrate fintech innovations into their original core businesses. At the time of making the investment (ex ante), these non-financial services corporate investors may not be able to predict whether their direct investment in fintech startups would benefit them or not. On this front, we believe that our results that non-financial corporate investors do not seem to benefit from directly investing in fintech startups generate important practical and management implications: not every firm will benefit from making direct investments in fintech startups. Corporate investors in the non-financial service sector may not benefit from such investment due to the smaller extent of their synergies with fintech startups.

References

Allen, L.; Y. Shan; and Y. Shen. "Do fintech mortgage lenders fill the credit gap? evidence from natural disasters." *Journal of Financial and Quantitative Analysis*, (2022), 1–42.

Belenzon, S.; N. Hashai; and A. Patacconi. "The architecture of attention: Group structure and subsidiary autonomy." *Strategic Management Journal*, 40 (2019), 1610–1643.

Bernstein, S.; X. Giroud; and R. R. Townsend. "The Impact of Venture Capital Monitoring." *The Journal of Finance*, 71 (2016), 1591–1622.

Biais, B.; C. Bisiere; M. Bouvard; and C. Casamatta. "The blockchain folk theorem." *The Review of Financial Studies*, 32 (2019), 1662–1715.

Bowen, D. E.; L. Frésard; and G. Hoberg. "Rapidly evolving technologies and startup exits." *Management Science*, 69 (2023), 940–967.

Buchak, G.; G. Matvos; T. Piskorski; and A. Seru. "Fintech, regulatory arbitrage, and the rise of shadow banks." *Journal of Financial Economics*, 130 (2018), 453–483.

Chemmanur, T. J.; M. B. Imerman; H. Rajaiya; and Q. Yu. "Recent Developments in the Fintech Industry." *Journal of Financial Management, Markets and Institutions*, 08 (2020), 2040,002.

Chemmanur, T. J.; L. Kong; K. Krishnan; and Q. Yu. "Top Management Human Capital, Inventor Mobility, and Corporate Innovation." *Journal of Financial and Quantitative Analysis*, 54 (2019), 2383–2422.

Chemmanur, T. J.; E. Loutskina; and X. Tian. "Corporate venture capital, value creation, and innovation." *The Review of Financial Studies*, 27 (2014), 2434–2473.

Chen, M. A.; Q. Wu; and B. Yang. "How valuable is FinTech innovation?" *The Review of financial studies*, 32 (2019), 2062–2106.

Chiu, J., and T. V. Koeppl. "Blockchain-based settlement for asset trading." *The Review of Financial Studies*, 32 (2019), 1716–1753.

Cong, L. W., and Z. He. "Blockchain disruption and smart contracts." *The Review of Financial Studies*, 32 (2019), 1754–1797.

Duarte, J.; S. Siegel; and L. Young. "Trust and credit: The role of appearance in peer-to-peer lending." *The Review of Financial Studies*, 25 (2012), 2455–2484.

D'Acunto, F.; N. Prabhala; and A. G. Rossi. "The promises and pitfalls of robo-advising." *The Review of Financial Studies*, 32 (2019), 1983–2020.

Ewens, M.; R. Nanda; and M. Rhodes-Kropf. "Cost of experimentation and the evolution of venture capital." *Journal of Financial Economics*, 128 (2018), 422–442.

Foley, S.; J. R. Karlsen; and T. J. Putniņš. "Sex, drugs, and bitcoin: How much illegal activity is financed through cryptocurrencies?" *The Review of Financial Studies*, 32 (2019), 1798–1853.

Fuster, A.; M. Plosser; P. Schnabl; and J. Vickery. "The role of technology in mortgage lending." *The Review of Financial Studies*, 32 (2019), 1854–1899.

Gopal, M., and P. Schnabl. "The rise of finance companies and fintech lenders in small business lending." *The Review of Financial Studies*, 35 (2022), 4859–4901.

Gormley, T. A., and D. A. Matsa. "Growing out of trouble? Corporate responses to liability risk." *The Review of Financial Studies*, 24 (2011), 2781–2821.

Griffin, J. M., and A. Shams. "Is Bitcoin Really Untethered?" *The Journal of Finance*, 75

(2020), 1913–1964.

Hertzberg, A.; A. Liberman; and D. Paravisini. "Screening on loan terms: evidence from maturity choice in consumer credit." *The Review of Financial Studies*, 31 (2018), 3532–3567.

Jensen, M. C. "Agency costs of free cash flow, corporate finance, and takeovers." *The American economic review*, 76 (1986), 323–329.

Jiang, W. "Have Instrumental Variables Brought Us Closer to the Truth." *The Review of Corporate Finance Studies*, 6 (2017), 127–140.

Kortum, S., and J. Lerner. *Does venture capital spur innovation?*, Emerald Group Publishing Limited (2001).

Li, E.; M. Q. Mao; H. F. Zhang; and H. Zheng. "Banks' investments in fintech ventures." *Journal of Banking & Finance*, 149 (2023), 106,754.

Ma, S. "The life cycle of corporate venture capital." *The Review of Financial Studies*, 33 (2020), 358–394.

Martos-Vila, M.; M. Rhodes-Kropf; and J. Harford. "Financial versus strategic buyers." *Journal of Financial and Quantitative Analysis*, 54 (2019), 2635–2661.

Marx, M.; D. Strumsky; and L. Fleming. "Mobility, skills, and the Michigan non-compete experiment." *Management science*, 55 (2009), 875–889.

Mathews, R. D. "Strategic alliances, equity stakes, and entry deterrence." *Journal of Financial Economics*, 80 (2006), 35–79.

Nain, A., and Y. Wang. "The product market impact of minority stake acquisitions." *Management Science*, 64 (2018), 825–844.

Neumark, D.; B. Wall; and J. Zhang. "Do Small Businesses Create More Jobs? New Evidence for the United States from the National Establishment Time Series." *The Review of Economics and Statistics*, 93 (2010), 16–29.

Ouimet, P. P. "What motivates minority acquisitions? The trade-offs between a partial equity stake and complete integration." *The Review of Financial Studies*, 26 (2013),

1021–1047.

Puri, M.; Y. Qian; and X. Zheng. "From Competitors to Partners: Banks' Venture Investments in Fintech." *Working Paper*, (2023).

Rossi, A. G., and S. P. Utkus. "Who benefits from robo-advising? Evidence from machine learning." *Evidence from Machine Learning (March 10, 2020)*, (2020).

Seru, A. "Firm boundaries matter: Evidence from conglomerates and R&D activity." *Journal of Financial Economics*, 111 (2014), 381–405.

Stock, J. H., and M. Yogo, "Testing for weak instruments in linear IV regression." (2002).

Tang, H. "Peer-to-peer lenders versus banks: substitutes or complements?" *The Review of Financial Studies*, 32 (2019), 1900–1938.

Thakor, A. V. "Fintech and banking: What do we know?" *Journal of Financial Intermediation*, 41 (2020), 100,833.

Tian, X., and T. Y. Wang. "Tolerance for failure and corporate innovation." *The Review of Financial Studies*, 27 (2014), 211–255.

Vallee, B., and Y. Zeng. "Marketplace lending: a new banking paradigm?" *The Review of Financial Studies*, 32 (2019), 1939–1982.

Xu, J. "Is there a trade-off between protecting investors and promoting entrepreneurial activity? evidence from angel financing." *Journal of Financial and Quantitative Analysis*, 58 (2023), 3305–3341.

Yu, S. "How do accelerators impact the performance of high-technology ventures?" *Management Science*, 66 (2020), 530–552.

Appendix A

Variable Definitions

Variable Name	Detailed Definition
Variables in Analyses on Outcomes of Fintech Startups and Underlying Channels	
IPO only	A dummy variable equal to one if a fintech startup had an initial public offering (IPO), and zero otherwise.
Acquisition only	A dummy variable equal to one if a fintech startup was acquired by another firm, and zero otherwise.
IPO or Acquisition	A dummy variable equal to one if a fintech startup either had an IPO or was acquired by another firm, and zero otherwise.
Ln (Patents) (1-year, 2-year, and 3-year)	The natural logarithm of one plus the adjusted number of patents filed and eventually granted to a fintech startup in the one, two, and three years, respectively, subsequent to the year of first investment by a corporate investor (or the year of the last round of investment in case of no corporate investment). We follow Seru (2014) to adjust the number of patents.
Ln (Citations) (1-year, 2-year, and 3-year)	The natural logarithm of one plus the adjusted forward citations received by the patents filed and eventually granted to fintech startups in the one, two, and three years, respectively, subsequent to the year of first investment by a corporate investor (or the year of the last round of investment otherwise in case of no corporate investment). We follow Seru (2014) to adjust the number of citations.
Net Inflow of Inventors (1-year, 2-year, and 3-year)	Differences between the natural logarithm of the inventor inflow and the natural logarithm of the inventor outflow in the one, two, and three years, respectively, after the year of first investment by a corporate investor (or the year of the last round of investment in case of no corporate investment).
Net Inflow of Superstar Inventors (1-year, 2-year, and 3-year)	Differences between the natural logarithm of the inflow of superstar inventors and the natural logarithm of the outflow of superstar inventors in one, two, and three years, respectively, after the year of first investment by a corporate investor (or the year of the last round of investment in case of no corporate investment).
Corporate Investment	An indicator variable equal to one if a fintech startup received its first-ever direct investment from a corporate investor and zero otherwise.
Corporate Investment (Financial Services)	An indicator variable equal to one if a fintech startup received its first-ever direct investment from a corporate investor that is in the financial services sector and zero otherwise.
Corporate Investment (Non-Financial Services)	An indicator variable equal to one if a fintech startup received its first-ever direct investment from a corporate investor that is *not* in the financial services sector and zero otherwise. If both corporate investors in the financial services sector and in the non-financial services sectors have invested directly in a fintech startup, we consider it as a case of corporate investment in the financial services sector.
Corporate Investment (Tech)	An indicator variable equal to one if a fintech startup received its first-ever direct investment from a corporate investor that is in the high-tech sector and zero otherwise.
Corporate Direct Investment (in Tables 7 and Table 8)	An indicator variable equal to one if a fintech startup received investment from a corporate direct investor and is equal to zero if the fintech startup has instead received investment from a corporate venture capital (CVC) investor.
IVC Investment	An indicator variable equal to one if an independent venture capitalist has invested in a fintech startup in at least one investment round and zero otherwise.
CVC Investment	An indicator variable equal to one if a CVC investor has invested in a fintech startup in at least one investment round and zero otherwise.
Ln (Age)	The natural logarithm of one plus the number of years from the founding year of a fintech startup to the year of the last investment round of the startup.
Sales	The aggregate sales made by all the establishments of a fintech startup in the year in which any corporate investor invested in the fintech startup for the first time (or in the year of its last investment round in case of no corporate investment).
Employment	The aggregate employment across all the establishments of a fintech startup in the year in which any corporate investor invested in the fintech startup for the first time (or in the year of its last investment round in case of no corporate investment).

Ln (Total Amount Raised)	The natural logarithm of the aggregate investment raised by a fintech startup across all investment rounds.
No. of Investors	The number of investors that have invested in a fintech startup in an investment round in which a corporate investor invested in the fintech startup for the first time or in the last investment round in case of no corporate investment.
No. of Rounds	The total number of investment rounds in a startup by the end of our sample period.
Strategic Alliance with Corporate Investor (Table 5)	An indicator variable equal to one if a corporate investor forms a strategic alliance with the fintech startup upon or after investment and zero otherwise.
Board Seat by Corporate Investor (Table 6)	An indicator variable equal to one if a corporate investor obtains a board seat in the fintech startup upon or after the first investment.
Strategic Alliance (Table 7)	An indicator variable equal to one if a corporate investor or CVC forms a strategic alliance with the fintech startup upon or after investment and zero otherwise.
Days to Form Strategic Alliance (Table 7)	The number of days it takes for a corporate investor or CVC to form a strategic alliance with the fintech startup starting from the day of investment.
Organizational Distance (Table 7)	We follow Belenzon et al. (2019) to measure organizational distance between the investor (either corporate direct investor or parent company of a CVC) and its fintech investee by considering the layers of subsidiaries. For corporate direct investment, we assign an organizational distance of zero to corporate direct investors. For CVC investment, we assign an organizational distance of one to the corporate parent of a CVC if the CVC is a division of the corporate parent (and not a separately existing entity or subsidiary); two if the CVC is a separate entity (LLC or corporation); and three if the CVC is a subsidiary under the control of a separate subsidiary within the apex firm.
Board Seat (Table 8)	An indicator variable equal to one if the corporate investor or CVC obtains a board seat in the fintech startup in which they have invested.
Board Size	The number of board seats in a fintech startup.
Change in Breakthrough Patents (instrumental variable)	It is defined as the change in the number of breakthrough patents filed by public companies in the same (two-digit SIC) industry as the fintech startup over the past three years (i.e., the difference in the annual number of breakthrough patents filed by publicly listed companies in the same industry between year *t-1* and year *t-4*). Breakthrough patents in a given year are defined as the patents that belong to the top quartile of all filed patents in that year in the Bowen, Hoberg, and Fresard (2023)'s dataset based on their measure *RETech*, which captures the breakthrough nature of patents.
Variables in Analyses on Outcomes of Corporate Investors and Channel Analysis	
Profitability (ROA)	Operating income before depreciation divided by the book value of total assets of a firm.
Market Share	Sales made by a firm in a quarter divided by the sum of sales made by all firms in the same 3-digit SIC code in a quarter.
Ln (Sales)	The natural logarithm of the quarterly sales of a firm.
Tobin's Q	Market value of assets divided by the book value of assets.
Ln (Assets)	The natural logarithm of the book value of total assets of a firm.
Ln (Age)	The natural logarithm of one plus the number of years since a firm (corporate investor or control firm) has return data available from CRSP database.
R&D Expenditure	The ratio of R&D investment made by firms in a quarter scaled by the book value of assets of the firm.
Change in Sales	Difference in sales over the past six quarters, i.e., between quarter -1 and quarter -7, with respect to the current quarter (quarter 0).
Direct Fintech Investment	An indicator variable equal to one for corporate investors that made direct investment in fintech startups (i.e., treated firms) and zero for control firms.
No. of Institutional Investors	The number of institutional investors holding shares of the firm.
Post	An indicator variable equal to one for the treated firm and respective control firms for 12 quarters (1095 days or 3 years) after the date of first-ever investment in a fintech startup by the corporate investor (treated firm) and equal to zero for 12 quarters (1095 days) prior to the investment date.

TABLE 1

Summary Statistics of Fintech Startups in the U.S.

This table reports summary statistics for the sample of U.S. fintech start-ups in our paper. Panel A reports summary statistics of fintech startups. Panel B reports summary statistics of corporate direct investment for a subsample of startups where only corporate investors and/or VCs have invested in a round. We obtain the corporate investment amount by subtracting the VC investment amount from the total investment made in the investment round.

Panel A: Summary Statistics of Fintech Startups

Variable	**N**	**Mean**	**S.D.**	**Median**	**Min**	**Max**
IPO Only	728	0.022	0.147	0	0	1
Acquisition Only	728	0.157	0.364	0	0	1
IPO or Acquisition	728	0.179	0.383	0	0	1
Corporate Investment	728	0.279	0.449	0	0	1
Corporate Investment (Financial Services)	728	0.158	0.365	0	0	1
Corporate Investment (Non-Financial Services)	728	0.121	0.326	0	0	1
Corporate Investment (Tech)	728	0.048	0.214	0	0	1
IVC Investment	728	0.593	0.492	1	0	1
CVC Investment	728	0.269	0.444	0	0	1
Ln (Age)	728	1.496	0.625	1.609	0	2.890
Sales ($millions)	728	5.567	61.805	0.609	0.00001	1648.165
Employment	728	39.115	262.614	7	1	6758
Ln (Total Amount Raised)	728	16.602	1.949	16.757	11.127	20.754
No. of Investors	728	3.709	3.051	3	1	14
No. of Rounds	728	3.192	2.004	3	1	10

Panel B: Summary Statistics of Corporate Investment

Variable	**N**	**Mean**	**S.D.**	**Min**	**Median**	**Max**
Total Corporate Investment in a Round ($Millions)	48	9.1058	16.0587	0.0001	4.0283	100
Total CVC Investment in a Round ($Millions)	32	5.7950	6.8850	0	4.1430	30
Total IVC Investment in a Round ($Millions)	47	10.5996	14.7763	0	4.6668	78.3334
Total Investment in a Round ($Millions)	48	23.1733	27.1744	0.4800	15.0000	115
Corporate Investment (fraction)	48	0.4103	0.2937	0	0.3312	1
No. of Investors in a Round	48	4.5208	2.7132	1	4	14
No. of Corporate Investors in a Round	48	1.3542	1.0617	1	1	8

TABLE 2

Summary Statistics of Corporate Investors and Control Firms

Panels A and B of this table reports the summary statistics for the sample of U.S. public firms in the financial services sector that made direct investments in fintech startups and a group of control U.S. public firms in the financial services sector that did not make direct investments in fintech startups. Panel C reports the summary statistics for the sample of U.S. public firms in the non-financial services sector that made direct investments in fintech startups. We obtain three control firms for a treated firm (corporate investor) from the same industry at the three-digit SIC code level using a propensity score matching based on size, age, and R&D expenditure. Our panel data is obtained at a quarterly frequency from Compustat. For each treated and control firm, we consider 12 quarters pre- and post- investment by the treated firm in the fintech startup. All variables are defined in Appendix A.

Panel A: Summary Statistics for Firms in the Financial Services Sector that Directly Invested in Fintech Startups						
Variable	**N**	**Mean**	**S.D.**	**1st Quartile**	**Median**	**3rd Quartile**
Profitability	719	0.009	0.02	0.002	0.003	0.008
Market Share	697	0.113	0.127	0.01	0.037	0.211
Ln (Sales)	735	7.112	2.087	5.592	7.3	8.648
Tobin's Q	707	1.528	1.245	1.008	1.066	1.291
Ln (Assets)	720	10.5	2.403	8.5	10.366	12.424
Strategic Alliance	743	0.681	0.466	0	1	1
Ln (Age)	743	2.988	0.951	2.398	3.219	3.892
R&D Expenditure	743	0.0004	0.005	0	0	0
Panel B: Summary Statistics for Control Firms in the Financial Services Sector that Did Not Directly Invest in Fintech Startups						
Variable	**N**	**Mean**	**S.D.**	**1st Quartile**	**Median**	**3rd Quartile**
Profitability	2064	0.005	0.015	0.001	0.003	0.005
Market Share	1779	0.036	0.053	0.003	0.019	0.044
Ln (Sales)	2094	6.255	1.905	4.505	6.435	7.842
Tobin's Q	1808	1.337	0.962	1.016	1.058	1.156
Ln (Assets)	2068	9.788	2.464	7.961	10.082	12.057
Ln (Age)	2144	2.973	0.893	2.303	3.135	3.784
R&D Expenditure	2144	0.001	0.006	0	0	0
Panel C: Summary Statistics for Firms in the Non-financial Services Sector that Directly Invested in Fintech Startups						
Variable	**N**	**Mean**	**S.D.**	**1st Quartile**	**Median**	**3rd Quartile**
Profitability	741	0.012	0.028	-0.002	0.011	0.025
Market Share	711	0.152	0.151	0.005	0.101	0.347
Ln (Sales)	760	7.278	1.77	5.923	7.084	9.045
Tobins' Q	712	2.976	1.857	1.538	2.282	4.238
Ln (Assets)	741	9.025	1.889	7.682	8.701	10.525
Strategic Alliance	768	0.590	0.492	0.000	1.000	1.000
Ln (Age)	768	2.976	0.914	2.197	2.996	3.932
R&D Expenditure	768	0.012	0.017	0.000	0.000	0.019

TABLE 3

The Effect of Corporate Direct Investment on Successful Exits, Innovation Output, and the Net Inflows of Inventors into Fintech Startups: Baseline Analysis

This table reports the results of the effect of corporate direct investment on the future outcomes of fintech startups. Panels A, B, and C report the baseline analysis results on the effect of corporate direct investment on fintech startups' successful exits, innovation output, and inventor net inflows, respectively. We multiply *Ln(Citations)* by 100 to improve the readability for our readers. All variables are defined in Appendix A. Constant (suppressed), investment year fixed effects, and two-digit SIC code industry fixed effects are included in all regressions. We define investment year as the year of the latest investment round by any type of investor in fintech startups. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Baseline Analysis of Successful Exits			
	1	2	3
Variables	IPO only	Acquisition only	IPO or Acquisition
Corporate Investment	0.019*	0.043**	0.062***
	(0.010)	(0.020)	(0.019)
IVC Investment	-0.018	0.077***	0.059***
	(0.012)	(0.016)	(0.020)
CVC Investment	-0.018	0.015	-0.003
	(0.012)	(0.033)	(0.028)
Ln (Age)	0.025***	0.027	0.052***
	(0.005)	(0.020)	(0.017)
Sales	-0.002*	-0.000	-0.002**
	(0.001)	(0.000)	(0.001)
Employment	0.001**	-0.000	0.001**
	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.008***	-0.008	0.000
	(0.002)	(0.005)	(0.005)
No. of Investors	0.006***	-0.000	0.006***
	(0.002)	(0.002)	(0.002)
Observations	719	719	719
R-squared	0.194	0.232	0.258
Investment Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes

Panel B: Baseline Analysis of Corporate Innovation						
	1	2	3	4	5	6
	Ln (Patents)			Ln (Citations)		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Corporate Investment	0.013***	0.020***	0.021***	0.015	0.041**	0.065**
	(0.005)	(0.007)	(0.007)	(0.009)	(0.019)	(0.026)
IVC Investment	0.006**	0.009***	0.007***	0.009**	0.009	0.008
	(0.002)	(0.003)	(0.002)	(0.004)	(0.006)	(0.008)
CVC Investment	-0.001	0.000	0.000	0.014	0.045	0.065
	(0.001)	(0.003)	(0.004)	(0.011)	(0.029)	(0.041)
Ln (Age)	0.002*	0.004***	0.003**	0.013***	0.010**	0.005
	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)	(0.006)
Sales	-0.000*	-0.000*	-0.000**	-0.000	-0.002**	-0.003**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)
Employment	0.000	0.000*	0.000*	0.000	0.000**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.002***	0.003***	0.004***	0.004***	0.016***	0.025***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.005)	(0.008)
No. of Investors	0.000	0.000*	0.001***	0.001**	0.004***	0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Observations	719	719	719	719	719	719
R-squared	0.071	0.068	0.060	0.120	0.059	0.044
Investment Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Baseline Analysis of Inventor Net Inflows						
	1	2	3	4	5	6
	Net Inflow of Inventors			Net Inflow of Superstar Inventors		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Corporate Investment	0.066**	0.074**	0.098**	0.011**	0.010	0.016**
	(0.026)	(0.033)	(0.037)	(0.004)	(0.008)	(0.007)
IVC Investment	0.032**	0.028*	0.017	0.001*	-0.004	-0.001
	(0.013)	(0.015)	(0.014)	(0.001)	(0.004)	(0.005)
CVC Investment	0.055***	0.034**	0.029	-0.002***	0.007*	0.006
	(0.020)	(0.016)	(0.019)	(0.001)	(0.004)	(0.005)
Ln (Age)	0.021***	0.044***	0.045***	-0.002**	0.006	0.006
	(0.007)	(0.011)	(0.014)	(0.001)	(0.008)	(0.008)
Sales	-0.001	-0.002	-0.002**	-0.000**	0.001***	0.001**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Employment	0.000	0.000	0.001**	0.000**	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.005	0.009	0.009	0.001**	0.002	0.002
	(0.004)	(0.007)	(0.006)	(0.000)	(0.002)	(0.002)
No. of Investors	0.002	0.006**	0.006**	0.000***	0.002	0.001
	(0.001)	(0.002)	(0.003)	(0.000)	(0.001)	(0.002)
Observations	719	719	719	719	719	719
R-squared	0.104	0.113	0.135	0.037	0.094	0.094
Investment Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 4

The Effect of Corporate Direct Investment on the Probability of Successful Exit, Innovation Output, and the Net Inventor Inflow into Fintech Startups: IV Analyses

This table reports the instrumental variable (IV) regression results of the effect of corporate direct investment on the probability of successful exit, innovation output, and net inflows of inventors into fintech startups. Panels A, B, and C report the IV analysis results on successful exits, innovation output, and inventor net inflows, respectively. All variables are defined in Appendix A. Constant (suppressed), fintech startup's headquarters state, and two-digit SIC code industry fixed effects are included in all regressions. The Kleibergen-paap F statistic is reported in in Column 1 of Panel A. All standard errors are clustered at the fintech startup's headquarters state level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: IV Analyses of Successful Exits (First and Second Stage Results)

	1	2	3	4
	First Stage	Second Stage		
Variables	Corporate Investment	IPO only	Acquisition only	IPO or Acquisition
Change in Breakthrough Patents	-0.014***			
	(0.001)			
Corporate Investment (instrumented)		0.319***	0.101**	0.421***
		(0.023)	(0.045)	(0.058)
IVC Investment	-0.037	-0.003	0.070***	0.067**
	(0.032)	(0.014)	(0.020)	(0.029)
CVC Investment	0.090	-0.047***	-0.042	-0.090**
	(0.064)	(0.015)	(0.030)	(0.040)
Ln (Age)	0.031	0.011	0.010	0.020
	(0.025)	(0.011)	(0.019)	(0.014)
Sales	-0.001	-0.002**	-0.001*	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Employment	0.000	0.001**	0.000	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.054***	-0.008**	-0.023***	-0.031***
	(0.010)	(0.004)	(0.005)	(0.006)
No. of Investors	0.016***	0.000	-0.005	-0.004
	(0.003)	(0.002)	(0.003)	(0.004)
Observations	715	715	715	715
Adjusted R-squared	0.097			
F Statistics	296.331			
Industry FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Panel B: IV Analyses of Corporate Innovation (Second-Stage Results)						
	1	2	3	4	5	6
	Ln (Patents)			Ln (Citations)		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Corporate Investment (instrumented)	-0.004	0.080***	0.112***	0.003***	0.008***	0.012***
	(0.003)	(0.006)	(0.008)	(0.000)	(0.000)	(0.001)
IVC Investment	0.003*	0.009**	0.009	0.000**	0.000	0.000
	(0.002)	(0.004)	(0.006)	(0.000)	(0.000)	(0.000)
CVC Investment	0.000	-0.005	-0.008	-0.000	-0.000	-0.000
	(0.000)	(0.007)	(0.010)	(0.000)	(0.001)	(0.001)
Ln (Age)	0.004***	0.003	0.001	0.000	-0.000	-0.000
	(0.001)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)
Sales	-0.000*	-0.000*	-0.000**	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment	0.000*	0.000*	0.000*	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.002**	-0.002***	-0.004***	-0.000***	-0.000***	-0.000***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
No. of Investors	0.000***	-0.001	-0.001	-0.000***	-0.000***	-0.000**
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Observations	715	715	715	715	715	715
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: IV Analyses of Inventor Net Inflows (Second-Stage Results)						
	1	2	3	4	5	6
	Net Inflow of Inventors			Net Inflow of Superstar Inventors		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Corporate Investment (instrumented)	0.569***	1.020***	0.982***	-0.017***	0.025***	0.025***
	(0.024)	(0.053)	(0.057)	(0.002)	(0.005)	(0.008)
IVC Investment	0.051***	0.071**	0.059**	-0.000	-0.004	0.001
	(0.019)	(0.028)	(0.027)	(0.001)	(0.005)	(0.007)
CVC Investment	-0.010	-0.073	-0.077	-0.002	0.004	0.002
	(0.053)	(0.078)	(0.076)	(0.002)	(0.003)	(0.002)
Ln (Age)	-0.002	0.010	0.012	-0.000	0.006	0.004
	(0.017)	(0.030)	(0.031)	(0.001)	(0.007)	(0.008)
Sales	-0.001	-0.001	-0.002	-0.000**	0.001***	0.001***
	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.000)
Employment	0.000	0.000	0.000	0.000**	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	-0.026***	-0.049***	-0.046***	0.001***	-0.000	0.000
	(0.004)	(0.006)	(0.006)	(0.000)	(0.001)	(0.001)
No. of Investors	-0.007***	-0.012***	-0.011***	0.001***	0.001	0.000
	(0.002)	(0.003)	(0.003)	(0.000)	(0.001)	(0.002)
Observations	715	715	715	715	715	715
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 5

The Effect of Strategic Alliances between Corporate Investors and Fintech Startups on the Future Performance of Fintech Startups

This table reports the test results on the effect of strategic alliances between corporate investors and fintech startups on the future performance of these fintech startups. In Panels A, B, and C, we report the effect of strategic alliance formed between corporate investors and fintech startups on successful exits, innovation output, and inventor net inflows into these fintech startups, respectively. We multiply *Ln(Citations)* by 100 to improve the readability for our readers. We have the same set of controls as our baseline analysis. All variables are defined in Appendix A. Constant (suppressed), investment year fixed effects, and two-digit SIC code industry fixed effects are included in all regressions. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Strategic Alliance and Fintech Startups' Successful Exits of Fintech Startups			
	1	2	3
Variables	IPO only	Acquisition only	IPO or Acquisition
Strategic Alliance with Corporate Investor	-0.004	0.074*	0.070*
	(0.014)	(0.037)	(0.038)
Corporate Investment	0.021	0.013	0.034
	(0.013)	(0.031)	(0.029)
Controls	Yes	Yes	Yes
Observations	719	719	719
R-squared	0.194	0.235	0.260
Investment Year and Industry FE	Yes	Yes	Yes

Panel B: Strategic Alliance and Innovation Output of Fintech Startups						
	1	2	3	4	5	6
	Ln (Patents)			Ln (Citations)		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Strategic Alliance with Corporate Investor	0.009**	0.018**	0.023**	0.011*	0.113**	0.195**
	(0.003)	(0.008)	(0.010)	(0.006)	(0.051)	(0.089)
Corporate Investment	0.010***	0.013***	0.012***	0.010	-0.004	-0.014
	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)	(0.016)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	719	719	719	719	719	719
R-squared	0.073	0.070	0.063	0.120	0.063	0.048
Investment Year and Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Strategic Alliance and Net Inflows of Inventors into Fintech Startups						
	1	2	3	4	5	6
	Net Inflow of Inventors			Net Inflow of Superstar Inventors		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Strategic Alliance with Corporate Investor	-0.021	-0.031	-0.016	0.012**	0.021***	0.031**
	(0.052)	(0.064)	(0.052)	(0.005)	(0.008)	(0.012)
Corporate Investment	0.074*	0.086	0.105*	0.006***	0.002	0.003
	(0.042)	(0.055)	(0.053)	(0.002)	(0.006)	(0.003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	719	719	719	719	719	719
R-squared	0.105	0.114	0.135	0.040	0.098	0.100
Investment Year and Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 6

The Effect of Board Representation by Corporate Direct Investors on the Future Performance of Fintech Startups

This table reports the test results on the effect of corporate direct investors' obtaining board seats in fintech startups on future performance of these fintech startups. In Panels A, B, and C, we report the effect of corporate investors' obtaining board seats on successful exits, innovation output, and inventor net inflows into fintech startups, respectively. We multiply *Ln(Citations)* by 100 to improve the readability for our readers. We have the same set of controls as in our baseline analysis. All variables are defined in Appendix A. Constant (suppressed), investment year fixed effects, and two-digit SIC code industry fixed effects are included in all regressions. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Board Seat and Fintech Startups' Successful Exit

	1	2	3
Variables	IPO only	Acquisition only	IPO or Acquisition
Board Seat by Corporate Investor	-0.023	0.037*	0.014
	(0.024)	(0.020)	(0.022)
Corporate Investment	0.023**	0.032*	0.055***
	(0.009)	(0.018)	(0.020)
Controls	Yes	Yes	Yes
Observations	680	680	680
R-squared	0.231	0.245	0.266
Investment Year and Industry FE	Yes	Yes	Yes

Panel B: Board Seat and Innovation Output of Fintech Startups

	1	2	3	4	5	6
	Ln (Patents)			Ln (Citations)		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Board Seat by Corporate Investor	0.010**	0.019***	0.022***	-0.008	0.082**	0.157**
	(0.004)	(0.005)	(0.007)	(0.009)	(0.033)	(0.060)
Corporate Investment	0.010**	0.014**	0.014**	0.016*	0.011	0.009
	(0.004)	(0.005)	(0.006)	(0.009)	(0.012)	(0.013)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	680	680	680	680	680	680
R-squared	0.082	0.083	0.075	0.126	0.074	0.060
Investment Year and Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Board Seat and Net Inflows of Inventors into Fintech Startups

	1	2	3	4	5	6
	Net Inflow of Inventors			Net Inflow of Superstar Inventors		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Board Seat by Corporate Investor	0.007	-0.015	-0.017	0.011*	0.013**	0.007
	(0.018)	(0.021)	(0.026)	(0.006)	(0.005)	(0.005)
Corporate Investment	0.063**	0.078**	0.103***	0.008***	0.006	0.014**
	(0.026)	(0.030)	(0.032)	(0.003)	(0.007)	(0.006)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	680	680	680	680	680	680
R-squared	0.108	0.117	0.141	0.045	0.104	0.100
Investment Year and Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 7

The Effect of Corporate Direct Investment (Compared to CVC Investment) on the Propensity and Speed of Forming Strategic Alliances with Fintech Startups

Panel A of this table reports the results on the effect of corporate direct investment (compared to CVC investment) on the propensity and speed of forming strategic alliances with fintech startups. Panel B of this table reports results on the effect of organizational distance on the likelihood and speed of formation of strategic alliances between corporate investors (or CVCs) and fintech startups. Our sample comprises pairs of corporate direct investors-fintech startups and CVC parents-fintech startups only. All variables are defined in Appendix A. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: The Effect of Corporate Direct Investment on the Propensity and Speed of Forming Strategic Alliances

	1	2
	Sample Includes: CVCs and Direct Investors	
Variables	Strategic Alliance	Days to Form Strategic Alliance
Corporate Direct Investment	0.130***	-322.257***
	(0.021)	(61.828)
IVC Investment	-0.015	-120.463**
	(0.031)	(40.896)
Ln (Age)	0.082*	90.034
	(0.040)	(64.192)
Sales	-0.002**	1.275
	(0.001)	(1.737)
Employment	0.001***	-0.344
	(0.000)	(0.423)
Ln (Total Amount Raised)	0.019	39.313
	(0.013)	(32.834)
Observations	592	145
R-squared	0.150	0.157
Industry FE	Yes	Yes

Panel B: The Effect of Organizational Distance on the Propensity and Speed of Forming Strategic Alliances

	1	2	3	4
	Sample Includes: CVCs and Direct Investors		Sample Includes: CVCs Only	
Variables	Strategic Alliance	Days to Form Strategic Alliance	Strategic Alliance	Days to Form Strategic Alliance
Organizational Distance	-0.083***	225.774***	-0.102***	396.033**
	(0.010)	(47.433)	(0.035)	(152.528)
IVC Investment	-0.014	-126.780**	0.050*	-299.080***
	(0.030)	(44.272)	(0.027)	(47.638)
Ln (Age)	0.084**	95.762	0.067	261.339
	(0.039)	(57.755)	(0.044)	(132.017)
Sales	-0.002**	1.474	-0.008	-38.444***
	(0.001)	(1.983)	(0.007)	(6.897)
Employment	0.001***	-0.398	0.001*	5.655***
	(0.000)	(0.482)	(0.001)	(0.988)
Ln (Total Amount Raised)	0.017	39.999	0.048***	25.281
	(0.012)	(33.013)	(0.008)	(58.891)
Observations	592	145	268	46
R-squared	0.156	0.172	0.175	0.192
Industry FE	Yes	Yes	Yes	Yes

TABLE 8

The Effect of Corporate Direct Investment (Compared to CVC Investment) on Board Seats

This table reports the effect of corporate direct investment (compared to CVC investment) on the propensity of obtaining a board seat in fintech startups. Our sample comprises pairs of corporate direct investors-fintech startups and CVC parents-fintech startups only. All variables are defined in Appendix A. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

	1	2	3	4
	Sample Includes: CVCs and Direct Investors			
	OLS		Probit	
Variables	Board Seat			
Corporate Direct Investment	0.065*	0.066*	0.069*	0.064*
	(0.035)	(0.033)	(0.038)	(0.038)
Ln (Age)		0.029		0.039
		(0.049)		(0.053)
Sales		-0.000***		-0.002
		(0.000)		(0.003)
Ln (Total Amount Raised)		0.002		0.005
		(0.009)		(0.006)
Board Size		0.020***		0.018***
		(0.002)		(0.002)
Observations	561	561	528	528
R-squared/Pseudo R-squared	0.056	0.080	0.036	0.062
Industry FE	Yes	Yes	Yes	Yes

TABLE 9

The Effect of Direct Investment by Corporate Investors in Fintech Startups on the Performance and Market Valuation of Corporate Investors

This table reports the results of the effect of the direct investment in fintech startups by corporate investors on the performance and market valuation of corporate investors themselves using a stacked difference-in-differences empirical specification. Panel A and Panel B comprise firms in the financial services sector and in the non-financial services sector, respectively, that made investment in fintech startups and their control firms. Panel C shows subsample analysis for two categories of corporate investors and controls in the financial services sector: banks and non-banks corporate investors. We consider all investments made in fintech startups between 2000 and 2017. All variables are defined in Appendix A. Controls include *Change in Sales*, *Ln (Assets)*, *No. of Institutional Investors*, and *R&D Expenditure* and are defined in Appendix A. Constant (suppressed), cohort by year by quarter fixed effects, and cohort by firm fixed effects are included in all regressions. All standard errors are clustered at the firm level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: The Impact of Direct Investment on Corporate Investors in the Financial Services Sector						
	1	2	3	4	5	6
Variables	Profitability	Market Share	Tobin's Q	Profitability	Market Share	Tobin's Q
Post x Direct Fintech Investment	0.005**	0.010**	0.280*	0.004**	0.010**	0.245*
	(0.002)	(0.005)	(0.166)	(0.002)	(0.004)	(0.144)
Controls	No	No	No	Yes	Yes	Yes
Observations	2,782	2,476	2,514	2,703	2,444	2,477
Adjusted R-squared	0.486	0.972	0.819	0.491	0.978	0.830
Cohort x Year x Qtr FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort x Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: The Impact of Direct Investment on Corporate Investors in the Non-Financial Services Sector						
	1	2	3	4	5	6
Variables	Profitability	Market Share	Tobin's Q	Profitability	Market Share	Tobin's Q
Post x Direct Fintech Investment	0.002	-0.002	0.036	-0.001	-0.008	0.038
	(0.003)	(0.010)	(0.169)	(0.002)	(0.010)	(0.144)
Controls	No	No	No	Yes	Yes	Yes
Observations	2,869	2,745	2,783	2,796	2,712	2,735
Adjusted R-squared	0.339	0.946	0.822	0.371	0.951	0.855
Cohort x Year x Qtr FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort x Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: The Impact of Direct Investment on Corporate Investors: Banks versus Non-Banks						
	1	2	3	4	5	6
	Banks			Non-Banks		
Variables	Profitability	Market Share	Tobin's Q	Profitability	Market Share	Tobin's Q
Post x Direct Fintech Investment	-0.001	0.007*	0.014**	0.009**	0.009	0.540*
	(0.001)	(0.004)	(0.007)	(0.004)	(0.007)	(0.279)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,156	1,020	1,038	1,601	1,471	1,488
Adjusted R-squared	0.368	0.994	0.899	0.497	0.965	0.835
Cohort x Year x Qtr FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort x Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 10

The Effect of Direct Investment by Corporate Investors in Fintech Startups on the Performance and Market Valuation of Corporate Investors: Strategic Alliance Channel

This table reports the results of the effect of strategic alliances formed between fintech startups and corporate investors after the latter's direct investment in fintech startups on the performance and market valuation of these investors using a stacked difference-in-differences empirical specification. Panel A and Panel B show the results for corporate investors and control firms in the financial services and non-financial services sector, respectively. We split the firms (corporate investors) based on whether they have any strategic alliance with the fintech startups. We classify an investment as "*Strategic Alliance*" if there is any news on strategic alliance formation between the corporate investor and the fintech startup, otherwise it is classified as "*No Strategic Alliance*". Controls include *Change in Sales*, *Ln (Assets)*, *No. of Institutional Investors*, and *R&D Expenditure* and are defined in Appendix A. Constant (suppressed), cohort by year by quarter fixed effects, and cohort by firm fixed effects are included in all regressions. All standard errors are clustered at the firm level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: The Effect of Strategic Alliance on the Performance of Corporate Investors in the Financial Services Sector						
	1	2	3	4	5	6
	Strategic Alliance			No Strategic Alliance		
Variables	Profitability	Market Share	Tobin's Q	Profitability	Market Share	Tobin's Q
Post × Direct Fintech Investment	0.005*	0.014**	0.253**	0.003	0.002	0.223
	(0.003)	(0.005)	(0.111)	(0.002)	(0.005)	(0.226)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,685	1,530	1,587	1,006	897	874
Adjusted R-squared	0.512	0.980	0.858	0.583	0.974	0.824
Cohort × Year × Qtr. FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort × Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: The Effect of Strategic Alliance on the Performance of Corporate Investors in the Non-Financial Services Sector						
	1	2	3	4	5	6
	Strategic Alliance			No Strategic Alliance		
Variables	Profitability	Market Share	Tobin's Q	Profitability	Market Share	Tobin's Q
Post × Direct Fintech Investment	0.003	-0.007	0.021	-0.007	-0.004	0.076
	(0.003)	(0.006)	(0.152)	(0.004)	(0.021)	(0.237)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,568	1,531	1,536	1,310	1,263	1,277
Adjusted R-squared	0.384	0.961	0.875	0.510	0.925	0.802
Cohort × Year × Qtr. FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort × Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Internet Appendix (Not To Be Published)

A1. Instrumental Variable Analysis: Details on Motivation and Construction of the Instrument

In this section, we provide additional details on both the motivation and construction of our instrumental variable, as well as the results of the IV analysis. As briefly discussed in Section V.A in the main paper, we conduct an instrumental variable (IV) analysis using the change in technological breakthroughs of public companies in the same industry as a fintech startup as an instrument for corporate direct investment in the fintech startup. The motivation for our instrument is as follows. When established (public) companies face challenges in achieving technological breakthroughs, they may search for and make direct investments in fintech startups operating in their industry to gain access to and learn about new ideas and cutting-edge technologies (which may help these established companies improve their own performance). This implies that, when established companies in an industry experience a decline (increase) in producing breakthrough technologies, fintech startups in that industry are more (less) likely to receive corporate direct investment.

Specifically, we construct our instrument as the change in the number of breakthrough patents filed by public companies in the same (two-digit SIC) industry as the fintech startup over the past three years, i.e., the difference in the annual number of breakthrough patents filed by publicly listed companies in the same industry as the focal fintech startup between year $t-1$ and year $t-4$. Breakthrough patents in a given year are defined as the patents that belong to the top quartile of all filed patents in that year in the dataset of Bowen, Frésard and Hoberg (2023) based on their *RETech* variable, which captures the breakthrough nature of patents.[1] As discussed earlier, we expect and confirm

[1] A higher value of the *RETech* variable indicates a greater likelihood that the underlying invention of a patent is a breakthrough innovation – one that uses a rapidly evolving technology to substitute for existing technologies. Bowen, Frésard and Hoberg (2023) demonstrate that historical breakthrough patents such as

in our first stage regression result below that our instrument is negatively associated with the probability of fintech startups receiving corporate direct investment: i.e., the probability of fintech startups receiving corporate investment will be greater (smaller) when there is a decline (increase) in breakthrough patents generated by established firms in the same industry. Thus, our instrument satisfies the relevance condition required for a valid instrument.

We next discuss why our instrument is also likely to satisfy the exclusion restrictions required for a valid instrument. To start with, our instrument makes use of the change in the number of breakthrough patents by all *public* firms in an industry, while the outcome variables are the performance variables of individual *private* fintech startups. Thus, it is unlikely that the instrument affects the outcome of individual private fintech startups other than through the direct investment channel.

One may be concerned that industry-wide technology shocks may affect both the instrument and the outcomes of individual private fintech startups. Two things are worth noting, which help to alleviate such concerns. First, if industry-wide technology shocks indeed affect both our instrument and the outcomes of individual private startups, we would expect our instrument and the outcomes of private fintech startups to be positively related to each other. However, we find the opposite: the reduced form regressions indicate that our instrument is negatively related to the outcomes of private fintech startups. This result provides reassuring evidence that industry-wide technology shocks are unlikely to drive the IV results that we document in this section.

Second, our instrument is unlikely to involve a look-ahead bias which may be directly related to future outcomes of private startups. As mentioned earlier, we construct breakthrough patents as those belonging to the top quartile of all patents filed in that year

"complex computer" and "laser" rank in the 72nd percentile (i.e., top 28%) of the *RETech* distribution. Based on this insight, we define breakthrough patents as those with *RETech* values in the top quartile of the distribution. Please refer to the following link for more details on this dataset: `https://bowen.finance/bfh_data/`.

in the Bowen, Frésard and Hoberg (2023)'s dataset based on their *RETech* varible. As is carefully discussed in Bowen, Frésard and Hoberg (2023), their measure is free of look-ahead bias and is only weakly correlated with a host of existing innovation measures (e.g., citations) since it relies on patent text information that is measurable ex-ante.[2]

For our IV analyses, we conduct the following 2SLS regressions:

$$(1) \qquad \textit{Corporate Investment}_{it} = \alpha_1 \textit{Change in Breakthrough Patents}_{\ it} + \alpha_2 X_{it} + \epsilon_{it},$$

$$(2) \qquad \textit{Outcome}_{it} = \beta_1 \widehat{\textit{Corporate Investment}}_{it} + \beta_2 X_{it} + \epsilon_{it},$$

where *Corporate Investment* takes the value of one if a fintech startup received its first-ever direct investment from a corporate investor in any investment round of a fintech startup. *Change in Breakthrough Patents* is the above mentioned instrument. We include all control variables (X_i) used in our baseline analyses. We also include fixed effects for industry and for the state where a fintech startup's headquarters is located. Given that we use cross-sectional data on fintech startups and capture variations in the technological breakthrough of established firms across years, we choose not to include investment year fixed effects in this specification.

We report the results of our instrumental variable analyses in Table 4 in the main paper. In Panel A, B, and C, our dependent variables are the successful exits, innovation output, and inventor inflows, respectively. In Column (1) of Panel A, the first stage result reveals that the change in the number of breakthrough patents by established firms in an industry is negatively and significantly associated with probability of direct investments in fintech startups in that industry, consistent with our expectation. The first stage F-statistic is 296.331, which is above the critical value suggested by Stock and Yogo (2002). Taken together, the first result confirms that our instrument satisfies the relevance condition.

[2]Although the above results and arguments are reassuring, one may argue that the requirement that the change in technological breakthroughs by established companies in the same industry as a fintech startup be correlated with future outcomes of the startup only through corporate direct investment may not always hold. In this scenario, the exclusion restriction for a valid instrument will not be satisfied. Given this, the results of our IV analysis should be interpreted with caution.

The rest of Table 4 in the main paper report the second stage regression results of our IV analyses. In Panel A, our dependent variables are the three successful exit measures: IPO only, acquisition only, and IPO or acquisition. We show that corporate direct investment causally leads to a higher likelihood of IPO (significant at 1%), a higher likelihood of acquisition (significant at 5%), and a higher likelihood of exit via either IPO or acquisition (significant at 1%) in Columns (2), (3), and (4), respectively. Next, in Panel B, our dependent variables are measures of innovation output. We show that corporate direct investment causally leads to a greater quantity of patents and a higher quality of patents (citations) produced by fintech startups. Finally, in Panel C, our dependent variables are measures of net inflow of inventors. We find that, for most of the specifications, corporate direct investment causally leads to a greater inflow of inventors and a greater inflow of superstar inventors into fintech startups. We also find that our results are robust and quantitatively similar when we exclude control variables in our IV analyses (see, for example, Table A11 in the Internet Appendix for the IV analyses on successful exit without control variables).

A2. Factors Motivating Corporate Investors to Make Direct Investments in Fintech Startups

In this section, we briefly analyze the factors that motivate direct investments in fintech startups made by corporate investors. We conjecture that deterioration in some aspects of firm performance or difficulty in achieving technological breakthroughs may prompt corporations to make direct investment in fintech startups, motivated by the objective of rectifying any such performance deterioration. We build a sample consisting of corporate investors in fintech startups (treated firms) and a matched sample of control firms in the same 3-digit SIC code industry that did not invest in fintech startups. For each treated firm, we find three control firms in the same industry using nearest-neighbor propensity score matching based on size, age, and R&D expenditures in the immediate

year prior to the year of direct investment by treated firms. Our group of control firms consists of 153 firms, out of which 71 firms are in the financial services sector. Using the matched sample, we conduct analyses at the firm-quarter level as well as the firm-year level to investigate the factors that motivate corporate direct investment in fintech startups.

For the firm-quarter analysis (reported in Panel A of Table A12 in the Internet Appendix due to space constraints), we examine whether the change in sales, change in ROA (profitability), change in Tobin's Q, or change in the market share over the past six quarters is a significant determinant of the probability of corporations making direct investment in fintech startups in a given quarter. We find that corporations that experience a drop in sales tend to make direct investments in fintech startups.

For the firm-year level analysis (reported in Panel B of Table A12 in the Internet Appendix), we examine whether the change in sales, change in ROA, change in competition in the previous year, and the change in the number of breakthrough patents filed by established companies in the past three years in an industry (i.e., our instrument used previously for corporate direct investment in fintech startups in the first part of the paper) are significant determinants of a corporations making direct investments in fintech startups. The results in Panel B suggest that corporations in an industry that experience a decline in breakthrough patents tend to make direct investments in fintech startups.

Overall, we find that corporations facing challenges in enhancing operating performance and/or achieving technological breakthroughs are more likely to make direct investment in fintech startups. In the following subsections, we move on to analyzing whether such direct investments in fintech startups indeed help corporate investors to perform better.

A3. The Dynamic Effect of Direct Investment in Fintech Startups on Corporate Investors in the Financial Services Sector

In this section, we conduct a dynamic analysis to further support the notion that such investments indeed improve the performance of corporate investors in the financial services sector and to support our parallel trend assumption. Our sample comprises corporate investors in the financial services sector and a group of control firms in the same 3-digit SIC code. We use the following empirical specification:

$$(3) \qquad Perf_{i,c,t} = \alpha_0 + \alpha_1 \sum T \times Corporate\ Investment_i + \sum T + \phi_{i,c} + \gamma_{c,t} + \epsilon_{i,c,t},$$

where T captures the different event times. Our dependent variables are profitability, market share, and Tobin's Q. We include all possible time indicators in our regression, which we have defined in detail in Table A10 in the Internet Appendix.

As shown in Table A10 in the Internet Appendix, we find that the coefficients of the interaction of time and corporate investment variables are insignificant prior to the investment, i.e., before $T = 0$. This confirms that there is no pre-trend in terms of the performance and market valuation of corporate investors in the financial services sector (compared to control firms) and supports our parallel trend assumption.

Further, we show that the coefficients of the interaction of time and corporate investment variables are positive and significant in the post-investment periods for all three dependent variables for multiple time periods. In particular, for profitability and market share, there is a long-term benefit of direct investments in fintech startups for corporate investors in the financial services sector compared to their control firms. However, we do not observe any long-term effect for equity market valuation. It is likely that equity market investors are able to factor in the long-term benefits of investments into their valuations of corporate investors within two or three quarters. We also plot the coefficients of the interactions of each event-time dummy and the corporate investment indicator variable in Figure 1 in the Internet Appendix for easy visualization.

References

Bowen, D. E.; L. Frésard; and G. Hoberg. "Rapidly evolving technologies and startup exits." *Management Science*, 69 (2023), 940–967.

Stock, J. H., and M. Yogo, "Testing for weak instruments in linear IV regression." (2002).

Table A1: List of Corporate Investors and CVC Divisions

This table reports the list of corporate investors that have made direct investment in fintech startups in our sample. We also check whether or not these direct investors have a corporate venture capital (CVC) division and find that about 66% of direct investors do not have a CVC division.

Direct Investors	CVC Division
500Tech	No
9F Group	No
Abra	No
A-Cap	No
Aflac	Yes
Akuna Capital	No
Allianz Life Insurance	Yes
Alostar	No
Alphabet	Yes
Altice Usa	No
Amazon	Yes
American Express	Yes
American Pacific Ventures	No
Antenna Group	Yes
Atlantic Merchant Capital	No
Atom Factory	No
Baidu	Yes
Banco Bilbao Vizcaya Argentaria	Yes
Banco Bradesco	Yes
Bandwidth	No
Bangkok Bank	Yes
Bank Leumi	Yes
Bank Of America	No
Bank Of Montreal (Bmo)	No
Baofu	No
Barclays Plc	Yes
Berenson & Company	Yes
Best Buy	Yes
Binance	Yes
Bip Systems	Yes
Bitfinex	No
Bitso	No
Blocktower Capital	Yes
Blue Mountain	No
Bm&Fbovespa S.A.	No
Broadridge	No
Brookstone	No
Btcs	No
Cambia Health Solutions	No

Direct Investors	CVC Division
Liberty Media	Yes
Lightspeed	No
Lockheed Martin	Yes
Magellan Health Services	No
Magna International	Yes
Marcus & Millichap	No
Markel Corporation	Yes
Mastercard	No
Membrain	No
Metalab	No
Metlife	Yes
Microventures	No
Mitsubishi Ufj Financial Group	Yes
Mitsui & Co	Yes
Moelis & Company	No
Moody'S Investors Service	No
Morgan Stanley	No
Morningstar	No
Mozido	No
Mr. Cooper	No
Nationwide Insurance	Yes
Natixis	No
Nea	No
Nelnet	Yes
Netease	Yes
Nex Group	No
Noah Holdings	No
Northern Trust	No
Novatron	No
Nzxt	No
Oakview Group	No
Ob1	No
Orrick	Yes
Overstock	Yes
Pacific Life Corporation	No
Paypal	Yes
Payu	Yes
Pnc Financial Services Group	No
Polaris Software Lab	No

Capital Nine	No
Caterpillar%Inc	Yes
Cboe Fx Markets	No
Center For Financial Services Innovation (Cfsi)	No
Central Florida	No
Centrocredit Bank	No
Chubb	No
Cisco	Yes
Citigroup	Yes
Coincircle	No
Comporium	Yes
Consensys	Yes
Credit Suisse	No
Ct Communications	No
Ctbc Financial Holding	Yes
Cu Solutions Group	No
Curo Financial Technologies	No
Daimler	Yes
Danske Bank	No
Digital Garage	Yes
Donuts	No
Dst Systems	No
Dz Bank	No
Eagle Bancorp	No
Emergent Technology Holdings	No
Employee Stock Option Fund (Eso Fund)	No
Endurance Companies	No
Euromoney Institutional Investor	No
Euronet Worldwide	No
Expedia	No
Experian	Yes
Fifth Third Bancorp	Yes
Financial Information Technologies (Fintech)	No
First Data Corporation	No
First Financial	No
Ford Motor Company	No
Fortinet	No
Foxconn Technology Group	Yes
Galaxy Digital Lp	No
General Electric (Ge)	Yes
Getco	No
Giesecke & Devrient	Yes
Goldman Sachs	No
Google	Yes
Great West Lifeco	No

Posco	No
Prometheus Group	No
Prudential Financial	Yes
Qihoo 360 Technology	No
Rakuten	Yes
Renren Inc.	Yes
Revolution Health	No
Ripple	No
Rock The Post	No
S&P Global	Yes
Safecharge	No
Salesforce	Yes
Sallie Mae	No
Sandisk	Yes
Sberbank	Yes
Seagate Technology Llc	Yes
Securian Financial Group	No
Sei	Yes
Shapeshift Ag	No
Silar Advisors	No
Sirius International Insurance	No
Sompo Japan Nipponkoa Insurance	Yes
Source Interlink Companies	No
Sprint	No
Square	No
Standard Chartered Bank	Yes
Starbucks	No
Startup Monthly	No
State National Companies	No
Strul Logistics	No
Sun Life Financial	No
Suncorp Group	No
Sunflower Development Group	No
Synopsys	No
Tabcorp Holdings Limited	No
Tencent Holdings	Yes
The Bancorp	No
The Bank Of Nova Scotia	No
The Cincinnati Insurance Companies	No
The Hartford	Yes
The New York Times	No
The Restaurant Group	No
The Royal Bank Of Scotland	Yes
The Uprising Creative	No
Thomson Reuters	Yes

Green Bank	No	Tokio Marine	Yes
Groupe Aeroplan	No	Tradeshift	No
Guideone Insurance	No	Transunion	No
Guidewell	No	Trepp	No
H&R Block	No	Tumml	No
Hannover Re	No	Uber	No
Haystack	No	Umb Banks	No
Heartland Payment Systems	No	Umb Financial Corporation	No
Hertz Lichtenstein & Young	No	Undercurrent	No
Hiscox	No	Upshift Partners	No
Hpi Group	No	Usaa	Yes
Hundsun Technologies	No	Vayner Media	No
Ibm	Yes	Verily	No
Ideo	No	Vesta Corporation	No
Incenter	Yes	Virgin America	Yes
Insurance Australia Group (Iag)	No	Visa	Yes
Intesa Sanpaolo	Yes	Vw Credit%Inc.	No
Intralinks	No	W. R. Berkley Corporation	Yes
Intuit	Yes	Wasted Talent	No
Itau Unibanco	Yes	Wells Fargo	No
Japan Finance Corporation	Yes	Wesfarmers	Yes
Je Dunn Construction	Yes	Western Union	Yes
Jp Morgan	No	Westpac	No
Jp Morgan Chase & Co.	No	Workday	Yes
Keybank	No	Wpp	Yes
Keystone National Group	No	Yet2.Com	No
Leucadia National	Yes	Zurich Insurance Group	No

Table A2: List of Fintech Startups Invested in by Both Direct Investors and the CVC Division of the Same Firm

This table reports the list of fintech startups that received investment both from corporate investors (parent firms) directly and from the CVC divisions of the same corporate parents. There are only 8 such fintech startups out of 728 fintech startups in our sample.

Fintech Startup	Direct Investor	CVC Division
Abra	American Express	American Express Ventures
Alpaca	Mitsubishi Ufj Financial Group	Mitsubishi Ufj Capital
Apttus	IBM	IBM Ventures
Assetavenue	Netease	Netease Capital
Authy	Salesforce	Salesforce Ventures
Bill.Com	American Express	American Express Ventures
Blooom	Allianz Life Insurance	Allianz Life Ventures
Stripe	American Express	American Express Ventures

Table A3: Breakdown of Fintech Startups in Various Categories

This table reports the breakdown of fintech startups in various categories.

Category	Freq.	Percent	Cum.
Auto Insurance	9	1.24	1.24
Banking Infrastructure	24	3.30	4.53
Blockchain Innovations	36	4.95	9.48
Business Lending	41	5.63	15.11
Consumer Insurance Management Platforms	4	0.55	15.66
Consumer Lending	69	9.48	25.14
Consumer Payments	9	1.24	26.37
Consumer and Commercial Banking	10	1.37	27.75
Crowdfunding	16	2.20	29.95
Digital Asset Business Services	1	0.14	30.08
Digital Asset Exchanges	9	1.24	31.32
Digital Asset Financial Services	7	0.96	32.28
Digital Asset Gambling	1	0.14	32.42
Digital Asset Infrastructure	3	0.41	32.83
Digital Asset Payments	4	0.55	33.38
Digital Asset Trust & Verification Services	3	0.41	33.79
Digital Asset Wallets	6	0.82	34.62
Employee Benefits Platforms	8	1.10	35.71
Enterprise/Commercial Insurance	10	1.37	37.09
Equity Financing	20	2.75	39.84
Financial Research and Data	16	2.20	42.03
Financial Transaction Security	32	4.40	46.43
Health/Travel Insurance	27	3.71	50.14
Institutional Investing	56	7.69	57.83
Insurance Comparison/Marketplace	15	2.06	59.89
Insurance Data/Intelligence	15	2.06	61.95
Insurance Infrastructure/Backend	31	4.26	66.21
Insurance User Acquisition	7	0.96	67.17
International Money Transfer	7	0.96	68.13
Life, Home, Property & Casualty Insurance	10	1.37	69.51
Payments Backend and Infrastructure	45	6.18	75.69
Personal Finance	52	7.14	82.83
Point of Sale Payments	24	3.30	86.13
Product Insurance	4	0.55	86.68
Retail Investing	29	3.98	90.66
Small and Medium Business Tools	68	9.34	100.00
Total	728	100.00	

Table A4: Propensity Score Matched Sample of Corporate Investors and Control Firms

In this table, we show the comparison of observable characteristics of corporate investors and control firms in the same industry based on propensity score matching. For each treated firm, we find three control firms in the same industry at the 3-digit SIC code level based on the nearest matches using propensity score matching. We match firms based on their size, age, and R&D expenditure in the year prior to the year of direct investment by treated firms.

Propensity Score Matched Sample: Comparison of Controls				
	Mean		T test (difference)	
Variable	Treated	Control	% Difference	p>t
Ln (Age)	2.858	2.860	-0.2	0.989
R&D Expenditure	0.023	0.017	3.1	0.494
Ln (Assets)	9.349	8.880	18.6	0.159
3-digit SIC code	605.610	610.890	-4.3	0.811

Table A5: The Effect of Corporate Direct Investment on the Outcomes of Fintech Startups: Controlling for State Fixed Effects

This table reports the baseline results of the effect of corporate direct investment on the probability of successful exit (Panel A), innovation output (Panel B), and inventor inflows (Panel C) of fintech startups with the inclusion of state fixed effects in addition to controls as well as industry and investment year fixed effects. All variables are defined in Appendix A. Constant (suppressed), investment year fixed effects, two-digit SIC code industry, and state of fintech startups' headquarter fixed effects are included in all regressions. We define investment year as the year of the latest investment round by any type of investor in fintech startups. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Corporate Direct Investment and Successful Exit of Fintech Startups			
	(1)	(2)	(3)
Variables	IPO only	Acquisition only	IPO or Acquisition
Corporate Investment	0.018*	0.034	0.053**
	(0.009)	(0.023)	(0.022)
VC Investment	-0.021	0.082***	0.061**
	(0.013)	(0.021)	(0.024)
CVC Investment	-0.018	-0.002	-0.019
	(0.012)	(0.033)	(0.027)
Ln (Age)	0.023***	0.017	0.040**
	(0.005)	(0.018)	(0.015)
Sales	-0.002**	0.000	-0.002*
	(0.001)	(0.000)	(0.001)
Employment	0.001**	-0.000	0.001*
	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.009***	-0.004	0.005
	(0.003)	(0.006)	(0.006)
No. of Investors	0.006***	-0.000	0.006**
	(0.002)	(0.003)	(0.002)
Observations	711	711	711
R-squared	0.225	0.269	0.293
Investment Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes

Panel B: Corporate Direct Investment and Corporate Innovation of Fintech Startups						
	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (Patents)			Ln (Citations)		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Corporate Investment	0.014***	0.021***	0.021***	0.015*	0.041**	0.063**
	(0.005)	(0.006)	(0.007)	(0.009)	(0.019)	(0.027)
VC Investment	0.005*	0.008**	0.006**	0.004	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.009)
CVC Investment	-0.000	0.002	0.001	0.017	0.049	0.069
	(0.001)	(0.004)	(0.004)	(0.012)	(0.032)	(0.045)
Ln (Age)	0.003	0.004**	0.003**	0.014***	0.011*	0.007
	(0.002)	(0.002)	(0.001)	(0.004)	(0.006)	(0.007)
Sales	-0.000**	-0.000**	-0.000**	-0.000	-0.002**	-0.003**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)
Employment	0.000**	0.000**	0.000**	0.000	0.000**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.002***	0.003***	0.004***	0.004***	0.017***	0.027***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.005)	(0.009)
No. of Investors	0.000	0.000	0.000*	0.001**	0.004***	0.006***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Observations	711	711	711	711	711	711
R-squared	0.105	0.094	0.081	0.148	0.065	0.047
Investment Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Corporate Direct Investment and Net Inflow of Inventors into Fintech Startups						
	(1)	(2)	(3)	(4)	(5)	(6)
	Net Inflow of Inventors			Net Inflow of Superstar Inventors		
Variables	1-year	2-year	3-year	1-year	2-year	3-year
Corporate Investment	0.073***	0.081***	0.101***	0.011**	0.012*	0.016**
	(0.020)	(0.029)	(0.036)	(0.004)	(0.007)	(0.007)
VC Investment	0.032***	0.030**	0.018	0.001	-0.004	-0.000
	(0.009)	(0.014)	(0.015)	(0.001)	(0.005)	(0.006)
CVC Investment	0.045*	0.023	0.017	-0.003***	0.006	0.005
	(0.025)	(0.021)	(0.021)	(0.001)	(0.004)	(0.005)
Ln (Age)	0.022***	0.048***	0.051***	-0.001	0.007	0.006
	(0.007)	(0.011)	(0.014)	(0.001)	(0.008)	(0.008)
Sales	-0.001	-0.002	-0.003*	-0.000***	0.001***	0.001**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Employment	0.000	0.000	0.001	0.000***	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.004	0.007	0.007	0.001**	0.002	0.002
	(0.003)	(0.007)	(0.006)	(0.000)	(0.002)	(0.002)
No. of Investors	0.002	0.005*	0.005	0.000	0.002	0.001
	(0.001)	(0.003)	(0.003)	(0.000)	(0.002)	(0.002)
Observations	711	711	711	711	711	711
R-squared	0.166	0.165	0.159	0.043	0.133	0.106
Investment Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A6: The Role of Synergy on the Relation between Corporate Direct Investment and Successful Exits of Fintech Startups

This table reports the OLS regression results on the role of synergy on the relation between corporate direct investment and successful exit of fintech startups. In Panel A, we report the results of successful exits for the case of direct investment by corporate investors in the financial services sector. This panel includes startups that received investment from corporate investors in the financial services sector and a control group of startups in the same industry and the same founding year that are propensity-score matched based on their average sales and employment. In Panel B, we report the results of successful exits for the case of direct investment by corporate investors in the non-financial services sectors. This panel includes startups that received investment from corporate investors in the non-financial services sector and a control group of startups in the same industry and the same founding year that are propensity-score matched based on their average sales and employment level. All variables are defined in Appendix A. All standard errors are clustered at the fintech startup's headquarters state level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Direct Investment by Corporate Investors in the Financial Services Sector and Successful Exits of Fintech Startups			
	(1)	(2)	(3)
Variables	IPO only	Acquisition only	IPO or Acquisition
Corporate Investment	0.034***	0.034***	0.068***
	(0.007)	(0.011)	(0.016)
IVC Investment	-0.008	0.080***	0.072*
	(0.029)	(0.008)	(0.035)
CVC Investment	-0.006	0.078*	0.072**
	(0.019)	(0.039)	(0.027)
Ln (Age)	0.046***	0.048***	0.094***
	(0.004)	(0.009)	(0.010)
Sales	-0.004***	0.001	-0.004**
	(0.001)	(0.001)	(0.002)
Employment	0.001***	-0.000	0.001**
	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.007	-0.027***	-0.020*
	(0.005)	(0.005)	(0.009)
No. of Investors	0.004**	-0.017***	-0.013***
	(0.002)	(0.004)	(0.004)
Observations	186	186	186
R-squared	0.383	0.237	0.343
Investment Year and Industry FE	Yes	Yes	Yes
Panel B: Direct Investment by Corporate Investors in Non-Financial Services Sectors and Successful Exits of Fintech Startups			
	(1)	(2)	(3)
Variables	IPO only	Acquisition only	IPO or Acquisition
Corporate Investment	-0.009	0.049	0.041
	(0.006)	(0.033)	(0.032)
IVC Investment	-0.027*	0.032	0.005
	(0.012)	(0.025)	(0.027)
CVC Investment	-0.042***	0.036	-0.006
	(0.007)	(0.033)	(0.035)
Ln (Age)	0.030***	-0.048*	-0.018
	(0.006)	(0.024)	(0.027)
Sales	0.006***	0.003	0.009
	(0.002)	(0.008)	(0.009)
Employment	-0.001***	-0.000	-0.001
	(0.000)	(0.001)	(0.001)
Ln (Total Amount Raised)	0.017***	-0.026***	-0.009
	(0.003)	(0.004)	(0.006)
No. of Investors	0.014***	0.012**	0.026***
	(0.003)	(0.005)	(0.004)
Observations	133	133	133
R-squared	0.214	0.231	0.206
Investment Year and Industry FE	Yes	Yes	Yes

Table A7: Corporate Investment and Successful Exits of Startups: Banks versus Non-Bank Corporate Investors

This table reports the OLS regression results of the effect of corporate investment by banks versus those investments by non-bank corporate investors on the successful exit of fintech startups. *Corporate Investment by Banks* is an indicator variable equal to one if a fintech startup received its first-ever investment from a bank and zero otherwise. *Corporate Investment by Non-Banks* is an indicator variable equal to one a fintech startup received its first-ever investment from a non-bank corporate investor only (and there is no involvement of any bank as a corporate investor) and zero otherwise. This panel includes startups that received investment from corporate investors in the financial services sector and a control group of startups in the same 2-digit SIC industry and the same founding year that are propensity-score matched based on their average sales and employment level. All other variables are defined in Appendix A. All standard errors are clustered at the fintech startup's headquarters state level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

	(1)	(2)	(3)
Variables	IPO only	Acquisition only	IPO or Acquisition
Corporate Investment by Banks	0.032	0.086***	0.117**
	(0.037)	(0.015)	(0.039)
Corporate Investment by Non-Banks	0.042**	0.020	0.063**
	(0.015)	(0.014)	(0.021)
IVC Investment	-0.016	0.115***	0.098**
	(0.036)	(0.014)	(0.043)
CVC Investment	0.015	0.053*	0.068***
	(0.018)	(0.026)	(0.021)
Ln (Age)	0.038**	0.005	0.044*
	(0.013)	(0.014)	(0.022)
Sales	-0.001	-0.001***	-0.002**
	(0.001)	(0.000)	(0.001)
Employment	0.000	0.000***	0.001**
	(0.000)	(0.000)	(0.000)
Ln (Total Amount Raised)	0.018***	-0.019***	-0.001
	(0.004)	(0.003)	(0.004)
No. of Investors	0.008***	-0.012***	-0.004
	(0.002)	(0.004)	(0.003)
Observations	213	213	213
R-squared	0.351	0.244	0.351
Investment Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes

Table A8: The Effect of Corporate Direct Investment (Compared to CVC Investment) on the Propensity and Speed of Forming Strategic Alliances with Fintech Startups: Restrictive Sample Excluding All Strategic Alliances Slightly that Predated Investment

This table reports the test results showing the effect of corporate direct investment (compared to CVC investment) on the propensity and speed of forming strategic alliances with fintech startups in Panel A. In Panel B, we show the effect of organizational distance on the likelihood and speed of formation of strategic alliances between corporate investors (or CVCs) and fintech startups. Our sample comprises pairs of corporate direct investors-fintech startups and CVC parents-fintech startups only, excluding all strategic alliances that slightly predated investment. All variables are defined in Appendix A. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: The Effect of Corporate Direct Investment on the Propensity and Speed of Forming Strategic Alliances

	(1)	(2)
	Sample Includes: CVCs and Direct Investors	
Variables	Strategic Alliance	Days to Form Strategic Alliance
Corporate Investment	0.116***	-309.744***
	(0.025)	(49.596)
VC Investment	-0.022	-65.462*
	(0.017)	(32.090)
Ln(Age)	0.080	62.491
	(0.052)	(64.651)
Sales	-0.002**	0.454
	(0.001)	(2.160)
Employment	0.001***	-0.137
	(0.000)	(0.523)
Ln(Amount Raised)	0.022	31.854
	(0.015)	(31.664)
Observations	568	134
R-squared	0.159	0.123
Industry FE	Yes	Yes

Panel B: The Effect of Organizational Distance on the Propensity and Speed of Forming Strategic Alliances

	(1)	(2)	(3)	(4)
	Sample Includes: CVCs and Direct Investors		Sample Includes: CVCs Only	
Variables	Strategic Alliance	Days to Form Strategic Alliance	Strategic Alliance	Days to Form Strategic Alliance
Organizational Distance	-0.074***	233.540***	-0.091**	474.839*
	(0.011)	(50.415)	(0.038)	(183.363)
VC Investment	-0.020	-77.555**	0.027	-182.555**
	(0.016)	(34.744)	(0.026)	(52.472)
Ln(Age)	0.082	73.737	0.062	281.057
	(0.052)	(58.508)	(0.054)	(148.954)
Sales	-0.002**	0.640	-0.008	-38.294***
	(0.001)	(2.394)	(0.007)	(7.924)
Employment	0.001**	-0.186	0.001	5.683***
	(0.000)	(0.580)	(0.001)	(0.960)
Ln(Amount Raised)	0.021	30.299	0.052***	-18.239
	(0.015)	(31.257)	(0.012)	(69.408)
Observations	568	134	262	40
R-squared	0.164	0.147	0.193	0.190
Industry FE	Yes	Yes	Yes	Yes

Table A9: The Effect of Corporate Direct Investment (Compared to CVC Investment) on the Speed of Forming Strategic Alliances with Fintech Startups: Poisson Regression Results

This table reports the Poisson regression results on the effect of corporate direct investment (compared to CVC investment) on the speed of forming strategic alliances with fintech startups. Our sample comprises pairs of corporate direct investors-fintech startups and CVC parents-fintech startups only, where strategic alliances are formed between the investor-investee pairs. All variables are defined in Appendix A. All standard errors are clustered at the industry level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

	(1)	(2)	(3)
	Sample Includes: Corporate Direct Investors and CVCs		CVCs only
Variables	Days to Form Strategic Alliance		
Corporate Investment	-1.189***		
	(0.169)		
Organizational Distance		0.730***	0.858***
		(0.104)	(0.235)
IVC Investment	-0.562***	-0.597***	-0.739***
	(0.106)	(0.126)	(0.119)
Ln(Age)	0.416*	0.385**	0.340*
	(0.218)	(0.155)	(0.205)
Sales	-0.071***	-0.060***	-0.077**
	(0.017)	(0.017)	(0.031)
Employment	0.007***	0.006***	0.011***
	(0.002)	(0.002)	(0.004)
Ln(Amount Raised)	0.206**	0.216***	0.127*
	(0.093)	(0.071)	(0.067)
Observations	145	145	44
Industry FE	Yes	Yes	Yes

Table A10: The Dynamic Effects of Direct Investment in Fintech Startups by Corporate Investors in the Financial Services Sector on their Performance and Market Valuation

This table reports the results of the dynamic effects of direct investment in fintech startups by corporate investors in the financial services sector on their (investors') performance and market valuation using a dynamic stacked difference-in-differences empirical specification. We construct a cohort of treated firms (corporate investors) and control firms using firm-quarter observations for twelve quarters before and after investments in fintech startups by treated firms in a particular calendar year-quarter. A cohort is formed in a calendar year-quarter in which investments in fintech startups are made. For each treated firm, we find three control firms in the same industry at the 3-digit SIC code level based on nearest matches using propensity score matching. We match firms based on their size, age, and R&D expenditure. We only consider firms in the financial services sector. We consider all investments made in fintech startups between 2000 and 2017. *T = 0+* is an indicator variable that is equal to 1 for all treated and control firms between day 0 and day 91 after the dates in which treated firms made investments in fintech startups; otherwise, the indicator variable is equal to 0. *T = -1, T = -2, T = -3, and T = -4* are indicator variables that are equal to 1 for all treated and control firms between day 1 and day 90, day 91 and day 181, day 182 and day 273, and day 274 and day 364, respectively, prior to the investment date; otherwise, the indicator variable is equal to 0. *T = +1, T = +2, and T = +3* are indicator variables that are equal to 1 for all treated and control firms between day 92 and day 182, day 183 and day 273, and day 274 and day 364, respectively, after the investment date; otherwise, the indicator variable is equal to 0. *T = 4+* is an indicator variable that is equal to 1 for all firms in a cohort for all days or quarters after 365 days post the investment date of that cohort; otherwise, it is equal to 0. *T = before -4* is an indicator variable that is equal to 1 for all firms in a cohort for all days or quarters before the 365 days prior to the investment calendar-year quarter of that cohort; otherwise, it is equal to 0. *T= before-4* is omitted as a benchmark. Constant (suppressed), cohort by year by quarter fixed effects, and cohort by firm fixed effects are included in all regressions. All standard errors are clustered at the firm level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Variables	(1) Profitability	(2) Market Share	(3) Tobin's Q
T = -4 × Direct Fintech Investment	0.004	-0.004	0.122
	(0.003)	(0.002)	(0.088)
T = -3 × Direct Fintech Investment	0.004	0.002	0.031
	(0.002)	(0.003)	(0.083)
T = -2 × Direct Fintech Investment	0.001	0.011	0.062
	(0.001)	(0.008)	(0.077)
T = -1 × Direct Fintech Investment	-0.000	0.005	0.009
	(0.003)	(0.005)	(0.094)
T = 0+ × Direct Fintech Investment	0.004	0.006	0.119
	(0.003)	(0.005)	(0.095)
T = +1 × Direct Fintech Investment	0.006*	0.012*	0.208*
	(0.003)	(0.006)	(0.120)
T = +2 × Direct Fintech Investment	0.004	0.011**	0.239
	(0.004)	(0.005)	(0.144)
T = +3 × Direct Fintech Investment	0.006**	0.019**	0.270*
	(0.003)	(0.009)	(0.156)
T = 4+ × Direct Fintech Investment	0.005*	0.011*	0.352
	(0.003)	(0.006)	(0.216)
T = -4	-0.005	0.012*	-0.170**
	(0.003)	(0.007)	(0.065)
T =-3	-0.011**	0.022	-0.127
	(0.004)	(0.014)	(0.138)
T= -2	-0.014*	0.031	-0.143
	(0.008)	(0.020)	(0.310)
T = -1	-0.016	0.043*	-0.195
	(0.011)	(0.025)	(0.520)
T = 0+	-0.006	0.046	-0.214
	(0.021)	(0.032)	(0.788)
T = +1	-0.006	0.014	-0.458
	(0.026)	(0.055)	(0.932)
T = +2	0.003	0.011	-0.270
	(0.035)	(0.060)	(1.157)
T = +3	0.009	0.004	-0.067
	(0.041)	(0.065)	(1.613)
T = 4+	0.008	0.005	0.458
	(0.046)	(0.061)	(2.102)
Observations	2,782	2,476	2,514
Adjusted R-squared	0.486	0.973	0.818
Cohort × Year × Qtr FE	Yes	Yes	Yes
Cohort × Firm FE	Yes	Yes	Yes

Table A11: The Effect of Corporate Direct Investment on Successful Exits of Fintech Startups: Instrumental Variable Analyses (Without Controls)

This table reports the instrumental variable (IV) regression results of the effect of corporate direct investment on the probability of successful exit without using control variables. All variables are defined in Appendix A. Constant (suppressed), fintech startup's headquarters state, and two-digit SIC code industry fixed effects are included in all regressions. We report the Kleibergen-paap F statistic in the table. All standard errors are clustered at the fintech startup's headquarters state level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

	(1)	(2)	(3)
		Second Stage	
Variables	IPO only	Acquisition only	IPO or Acquisition
Corporate Investment (Instrumented)	0.363***	0.153***	0.515***
	(0.030)	(0.045)	(0.066)
Observations	715	715	715
F Statistics		268.345	
Industry FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes

Table A12: Determinants of Corporate Direct Investment in Fintech Startups

This table reports the OLS regression results on the factors that drive direct investment by public firms in fintech startups. This sample comprises firms that made investment in fintech startups and control firms in the same industry at the 3-digit SIC code level that did not invest in fintech startups. For each treated firm, we find three control firms in the same industry at the 3-digit SIC code level based on the nearest matches using propensity score matching. We match firms based on their size, age, and R&D expenditure. In Panel A, we analyze the firms at a quarterly frequency. Our sample starts from 1997 and ends in 2017. In Column (1), we present our results including the full sample, while in Columns (2) and (3), we present our results using subsamples comprising financial services and non-financial services firms, respectively. The dependent variable, *Corporate Investment in Fintech Startups*, is an indicator variable equal to one in the quarter in which a public firm makes a direct investment in a fintech startup and zero otherwise. *Change in Sales* is the difference in sales over the past six quarters, i.e., between quarter -1 and quarter -7, with respect to the current quarter (quarter 0). *Change in ROA* is the difference in ROA over the past six quarters, i.e., between quarter -1 and quarter -7, with respect to the current quarter (quarter 0). *Change in Tobin's Q* is the difference in Tobin's Q over the past six quarters, i.e., between quarter -1 and quarter -7, with respect to the current quarter (quarter 0). *Change in Market Share* is the difference in *Market Share* over the past six quarters, i.e., between quarter -1 and quarter -7, with respect to the current quarter (quarter 0). For a corporate investor, we include all observations available up to the quarter in which the investment is made and omit all quarters post the investment. For non-corporate investors we include all available observations. In Panel B, we analyze the firms at annual level. We measure the change in sales and change in ROA over a period of two years. *Change in Breakthrough Patents* is the change in the annual number of breakthrough patents filed by public companies in the same (two-digit SIC) industry as the fintech startup over the past three years. *Change in Herfindahl Index* is the change in Herfindahl Index (measure of competition) over the past two years in the same industry as the corporate investor. All other variables are defined in Appendix A. Constant (suppressed), year by quarter fixed effects, and firm fixed effects are included in all regressions. All standard errors are clustered at the firm level and are reported in parentheses below the coefficient estimates. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Determinants of Corporate Direct Investment (Quarterly Level Analysis)

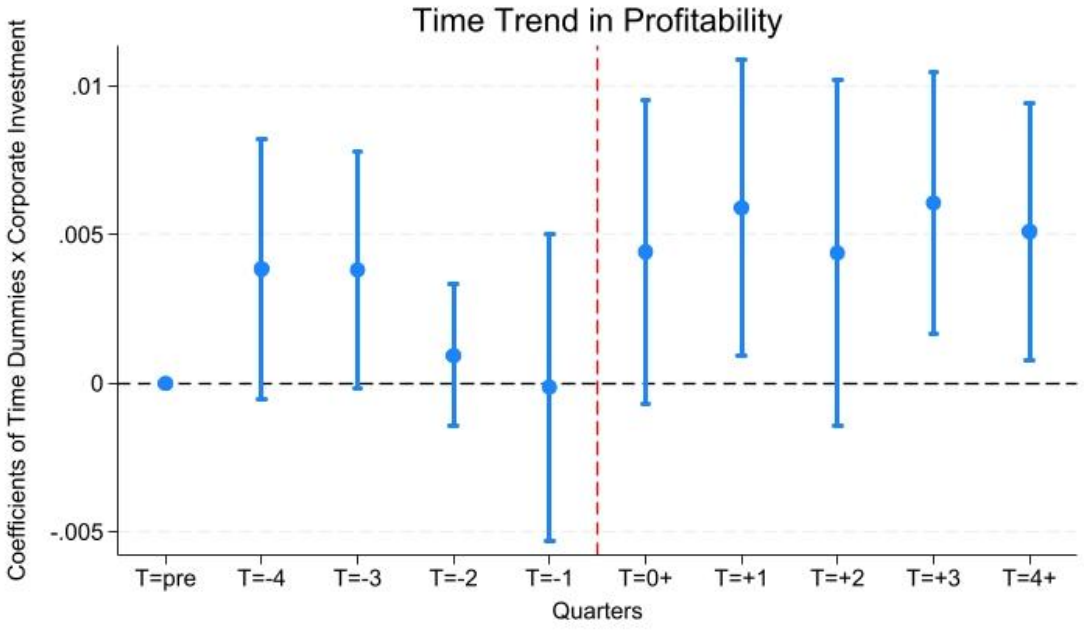
	(1)	(2)	(3)
	Full Sample	Financial Services	Non-Financial Services
Variables	Corporate Investment in Fintech Startups		
Change in Sales	-0.004**	-0.005**	-0.003
	(0.002)	(0.002)	(0.003)
Change in ROA	-0.003	-0.011	-0.003
	(0.006)	(0.015)	(0.006)
Change in Tobins' q	-0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)
Change in Market Share	0.000	0.018	-0.018
	(0.019)	(0.022)	(0.029)
No. of Institutional Investors	0.000**	0.000	0.000*
	(0.000)	(0.000)	(0.000)
Ln (Assets)	0.001	0.002	0.000
	(0.002)	(0.003)	(0.002)
Ln (Age)	-0.003	-0.009	0.000
	(0.005)	(0.009)	(0.006)
R&D/Asset	-0.089	-0.124***	-0.080
	(0.063)	(0.021)	(0.092)
Observations	11,820	5,340	6,480
Adjusted R-squared	0.034	0.037	0.026
Year × Qtr FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes

Panel B: Determinants of Corporate Direct Investment (Annual Level Analysis)

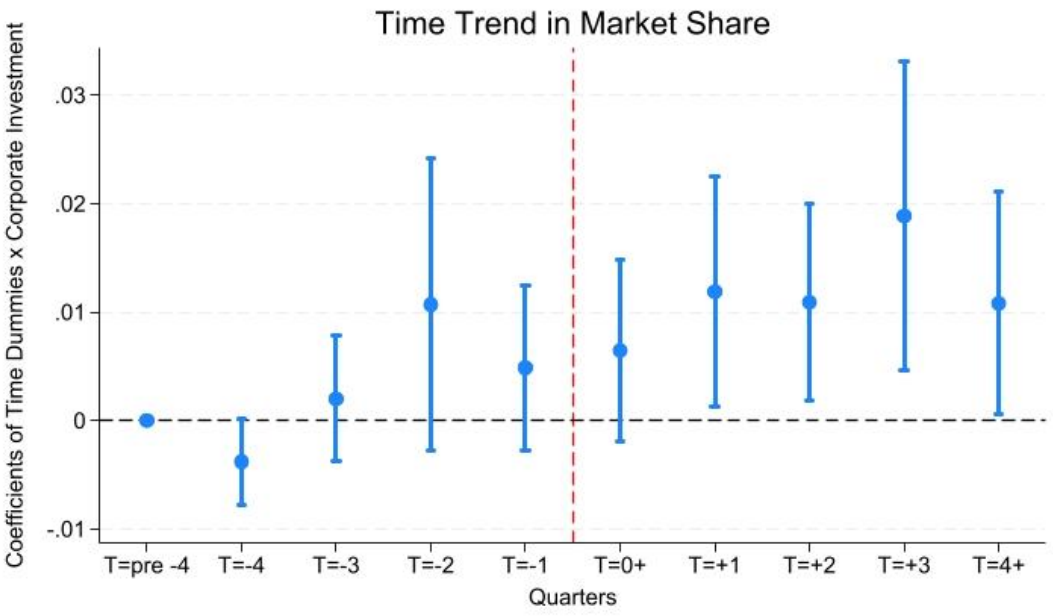
	(1)	(2)	(3)
	Full Sample	Financial Services	Non-Financial Services
Variables	Corporate Investment in Fintech Startups		
Change in Breakthrough Patents	-0.004*	-0.165	-0.003
	(0.002)	(0.114)	(0.003)
Change in Sales	0.001	0.004	-0.007
	(0.009)	(0.015)	(0.008)
Change in ROA	-0.003	-0.025	0.003
	(0.023)	(0.032)	(0.026)
Change in Herfindahl Index	-0.017	0.070	-0.136
	(0.100)	(0.071)	(0.226)
No. of Institutional Investors	0.000***	0.000***	0.000*
	(0.000)	(0.000)	(0.000)
Ln (Assets)	0.003	0.006	0.001
	(0.006)	(0.011)	(0.007)
Ln (Age)	0.019	0.013	0.019
	(0.016)	(0.024)	(0.021)
R&D Expenditure	0.527	2.799	0.315
	(0.419)	(2.303)	(0.426)
Observations	3,382	1,622	1,760
Adjusted R-squared	0.084	0.096	0.069
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes

Figure 1: Time Trends in Corporate Investors' Performance and Market Valuation

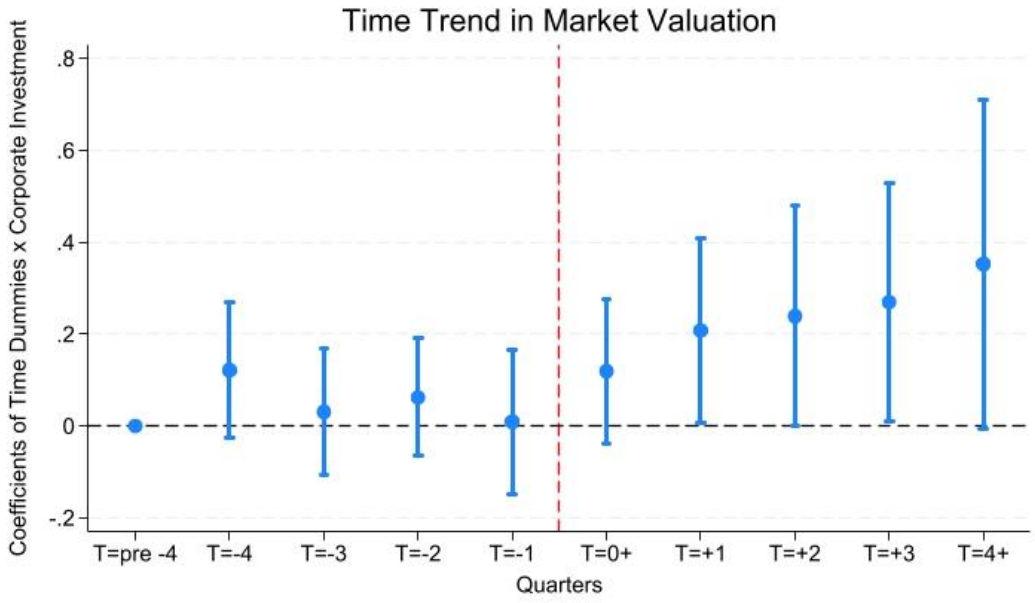
We plot the time trends comparing the performance of corporate investors in the financial services industry and control firms in the same 3-digit SIC code. The corresponding empirical specification is equation (5) from the paper. *T = -1, T = -2, T = -3,* and *T = -4* are indicator variables that are equal to 1 for all treated and control firms between day 1 and day 90, day 91 and day 181, day 182 and day 273, and day 274 and day 364, respectively, prior to the investment date; otherwise, the indicator variable is equal to 0. *T = 0+* is an indicator variable that is equal to 1 for all treated and control firms between day 0 and day 91 after the dates in which treated firms made direct investments in fintech startups. *T = +1, T = +2, and T = +3* are indicator variables that are equal to 1 for all treated and control firms between day 92 and day 182, day 183 and day 273, and day 274 and day 364, respectively, after the investment date; otherwise, the indicator variable is equal to 0. *T = 4+* is an indicator variable that is equal to 1 for all firms in a cohort for all days or quarters after 365 days post the investment date of that cohort; otherwise, it is equal to 0. *T = pre -4* is an indicator variable that is equal to 1 for all firms in a cohort for all days or quarters before the 365 days prior to the investment calendar-year quarter of that cohort; otherwise, it is equal to 0. *T = pre -4* is omitted as a benchmark. The confidence interval is 90%. Panel A, Panel B, and Panel C show the plots for the following dependent variables: profitability, market share, and market valuation, respectively. We show the coefficients of the interaction of time-trends with the corporate investment indicator variable in these graphs.



Panel A: Time Trends in Profitability



Panel B: Time Trends in Market Share



Panel C: Time Trends in Market Valuation