# When the Rules Change:

## The Uneven Effects of SEC's Accredited Investor Reform

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**Abstract**

This paper examines how changes in investor protection regulation impact local angel financing and entrepreneurial activity. I exploit the SEC's 2020 expansion of the accredited investor definition as a quasi-natural experiment, and find an increase in angel investor participation, investment volume, employment and early-stage firm formation. These effects are concentrated in sectors and regions with greater pre-reform exposure, as measured by *ex ante* investor sophistication. The regulatory shift also results in a reallocation effect in entrepreneurial financing behavior by reducing reliance on small business loans and mortgage-based capital. At the firm level, startups backed by newly accredited investors have shorter fundraising durations and improved firm survival. Although new entrants select higher relative valuation investments, they exhibit greater risk aversion. These findings underscore the trade-off between early-stage financing and investor protection, and highlight the regulatory challenges of equitable access to private capital markets.

Keywords: Angel Investors, Government Regulation, Entrepreneurship, Investor Protection.
JEL Classification: G24, G28, L26, K22, E24.

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This paper examines how changes in investor protection regulation impact local angel financing and entrepreneurial activity. I exploit the SEC's 2020 expansion of the accredited investor definition as a quasi-natural experiment, and find an increase in angel investor participation, investment volume, employment, and early-stage firm formation. These effects are concentrated in sectors and regions with greater pre-reform exposure, as measured by *ex ante* investor sophistication. The regulatory shift also results in a reallocation effect in entrepreneurial financing behavior by reducing reliance on small business loans and mortgage-based capital. At the firm level, startups backed by newly accredited investors have shorter fundraising durations and improved firm survival. Although new entrants select higher relative valuation investments, they exhibit greater risk aversion. These findings underscore the trade-off between early-stage financing and investor protection and highlight the regulatory challenges of equitable access to private capital markets.



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*'Entrepreneurship is an essential driver of societal health and wealth. It is also a formidable engine of economic growth. It promotes the essential innovation required not only to exploit new opportunities, promote productivity, and create employment, but to also address some of society's greatest challenges.'* - Global Entrepreneurship Monitor

## 1. Introduction

Since 2011, small businesses in the United States have accounted for over 80% of the net new job creation, serving as the backbone of the nation's economic growth. Despite this, according to the Office of the Advocate for Small Business Capital Formation (OASB), 78% of emerging business owners expressed concerns regarding their ability to access capital. [2] These firms often fall outside the typical target profile of venture capital (VC) investments and often lack the operating history or collateral to access traditional lending channels such as bank lending (Puri & Zarutskie, 2012).[3] As a result, a large portion of the capital supplied to emerging firms takes the form of direct investment from individuals, commonly referred to as 'angel financing'. For small firms, securing capital remains both critical and challenging, particularly in a market characterized by substantial information asymmetries and high investor search costs (Xu, 2023). This dynamic is reflective of a significant regulatory trade-off – promoting entrepreneurial activity increases individual investors' exposure to early-stage risk – thus, creating a fine balance between small businesses' capital formation and investor protection.

[2] To view the full OASB report, please visit https://www.sec.gov/files/2023-oasb-annual-report.pdf. In its 2024 annual report, OASB documents that the top three sources of equity financing for small and emerging businesses are the business owner herself, family and friends, and angel investors, in this order. For more information, please visit: https://www.sec.gov/files/2024-oasb-annual-forum-report.pdf.

[3] While many early-stage firms lack the assets traditionally required for bank lending, recent research finds that startups are increasingly able to secure loans by pledging intellectual property as collateral (Hochberg, Serano & Ziedonis, 2018; Erhasin, Irani & Waldock, 2021).

This balance was recalibrated once again on December 8th, 2020, when the Securities and Exchange Commission (SEC) amended the accredited investors definition, or the 'most important investor protection in the private market', to include 'financially sophisticated' individuals (Lee & Crenshaw, 2020).[4] Specifically, the regulation introduced two new eligibility categories: (i) individuals who completed certain professional certifications, specifically Financial Industry Regulatory Authority (FINRA) Series 7 (Licensed General Securities Representative), Series 65 (Licensed Investment Adviser Representative), or Series 82 (Licensed Private Securities Offerings Representative); (ii) "knowledgeable employees', defined as executive officers or employees who actively participate in the investment activities of the issuer. Importantly, prior to this regulatory shift, access to private capital markets was limited to individuals meeting strict income or net worth thresholds, irrespective of their financial sophistication or investment expertise.

In this paper, I exploit the 2020 SEC regulatory reform as an exogenous shock to empirically examine the trade-off between raising capital and investor protection through the lens of angel investing. Prior studies indicate that angel investments provide a relevant setting for examining this trade-off (Kerr, Lerner, & Schoar, 2014; Bernstein, Korteweg, & Laws, 2017; Zaccaria, 2022; Denes et. al., 2023; Xu, 2023; Karlsen et. al., 2024). A defining characteristic of the 2020 regulatory reform is that it was not influenced by local entrepreneurial conditions, thereby reinforcing the exogeneity of the policy change and alleviating concerns of reverse causality.

[4] It is important to note that since its adoption in 1982, the accredited investor definition was only significantly amended twice. In 2010, the Dodd-Frank Act Wall Street Reform and Consumer Protection Act directed the SEC to exclude the value of an individual's primary residence from net worth calculations, thereby narrowing the pool of available accredited investors (Lindsey & Stein, 2019; Xu, 2023). In 2020, the SEC revised the definition to include 'knowledgeable employees' and certain professional certifications. To view the press release, please visit: https://www.sec.gov/newsroom/press-releases/2020-191.

To evaluate the impact of the regulatory change on angel financing across U.S. industries and states, I implement a differences-in-differences (DiD) framework. Exposure to treatment varies systematically across industries and regions, mainly driven by pre-existing differences in the concentration of FINRA-licensed professionals and the occupational structure of local labor markets. Using data from FINRA, PitchBook, and Crunchbase, I leverage this cross-sectional heterogeneity in *ex-ante* investor composition to identify variation in regulatory exposure. Specifically, I construct a series of indicator variables to identify the industries and states most likely to benefit from the regulatory reform, with particular emphasis on capital markets and sectors characterized by a high pre-reform share of financially sophisticated individuals.

I first show that the change in accreditation criteria had a disproportionate impact on industries with an *ex-ante* concentration of financially sophisticated individuals - particularly those more likely to qualify under the expanded definition introduced by the 2020 SEC reform. In the financial industry, the reform is associated with a 28.6% increase in the number of angel investors and a 25.5% rise in the number of investments. I expand the analysis to include a broader set of treated industries with high ex-ante investor specialization and find that the reform significantly increased angel investor participation and capital invested. These results are robust across alternative industry classifications, clustering levels, and after controlling for a comprehensive set of industry-level economic characteristics.

To further examine the regulatory policy's impact, I exploit cross-state variation in the ex-ante concentration of financially sophisticated individuals, proxied by the number of FINRA-registered professionals in 2020. The results indicate a significant, disproportionate increase in angel activity in states with higher levels of investor sophistication. These findings highlight a

critical mechanism by which securities regulation may inadvertently reinforce pre-existing geographic disparities in access to early-stage capital.

Next, to assess the broader economic implications of the 2020 SEC reform, I examine whether the expansion of accredited investor eligibility stimulated business entry and job creation by alleviating capital constraints. Using establishment-level data from the U.S. Census, I find that post-reform, treated industries experience a statistically significant increase of 4.3% to 6.5% in establishment entry rates. Additionally, net job creation in these sectors rises by approximately 26.2% to 33.4%, relative to non-treated industries. The results suggest that expanded access to early-stage capital not only facilitates new business formation but also generates substantial gains in employment, reinforcing the pivotal role of angel financing in promoting entrepreneurial activity.

To investigate whether the SEC amendment influences the composition of entrepreneurial financing, I analyze its impact on reliance on federally backed lending programs. I document that in U.S. states with higher concentrations of FINRA-registered individuals there is evidence of a substitution effect - the number of approved SBA loans declines by up to 9.8%, while applications for second-lien mortgages fall by approximately 10.8%. These effects are concentrated on the extensive margin, with no statistically meaningful changes in average loan sizes or guaranteed amounts. These findings imply that increased access to capital through angel financing partially displaces entrepreneurs' use of alternative financing sources. Overall, this is indicative of a reallocation in early-stage fundraising patterns following the regulation.

I also explore the firm-level implications of increased angel participation. The results underscore that greater involvement by new angels is associated with shorter durations between funding rounds, an increased likelihood of securing follow-on capital, and improved firm survival

over a two-year horizon. Finally, I examine differences in investment selection and risk-taking behaviors of newly accredited investors. I show that financing rounds that include new angel entrants are linked to higher relative valuations, consistent with the hypothesis that these investors selectively participate in higher-quality investment opportunities. However, these investors also exhibit greater risk aversion—they are more likely to concentrate investments in their preferred industries, participate in syndicates, and avoid lead investor roles. In general, the results indicate that newly accredited angels behave systematically differently from incumbent investors.

The remainder of the paper proceeds as follows: Section 2 provides an overview of the regulatory and institutional background of angel financing and private placements in the United States. Section 3 describes the contribution of this article to existent literature. Section 4 details the data sources and variables specification. Section 5 presents the results. Section 6 discusses the implications. Section 7 concludes.

## 2. Regulatory Background

Angel investors play a unique role in the entrepreneurial finance ecosystem by supplying capital to early-stage firms through direct investments (Shane, 2008; Kerr, Lerner & Schoar, 2014; Lerner et al, 2018; Lindsey & Stein, 2019; Thomas, 2019). Often, these emerging firms do not fit the investment profile targeted by venture capitalists and lack sufficient collateral, operating history, or profitability required to access traditional bank financing (Puri & Zarutskie, 2012). Thus, angels typically invest in start-ups and with smaller capital commitments per firm compared to institutional investors such as venture capitalists (Xu, 2023). In 2023 alone, over 400,000 active angel investors provided funding to approximately 55,000 firms, totaling $18.6 billion (SEC, 2024).

Under U.S. securities law, any company seeking to raise capital from angel investors through the issuance of securities must either register the offering under the Securities Act of 1933 (the "Securities Act") or qualify for an available exemption from registration (Ivanov & Bauguess, 2013; Bauguess, Gullapalli & Ivanov, 2015; Ivanov, 2023). Among these private offering exemptions, Regulation D is the most frequently utilized to facilitate capital formation, permitting issuers to raise capital without formal registration provided that investors - particularly under Rules 506(b) and 506(c) - meet the criteria for accredited investor status as defined by the SEC (Ewens & Farre-Mensa, 2020; Ivanov, 2023; Ewens & Farre-Mensa, 2022; Schulp, 2023; Humphery-Jenner, 2024).[5] Firms engaging in private placements must file a Form D with the SEC, providing notice of the exemption within 15 days of the first sale of securities. Approximately 99% of Form D filings are submitted under Rule 506, which allows a company to issue securities to an unlimited number of accredited investors (Bauguess, Gullapalli & Ivanov, 2015).

As of 2023, the SEC estimates that only 19% of U.S. households meet the criteria to qualify as accredited investors, highlighting the substantial constraint the definition places on both the pool of eligible investors and the volume of capital available to early-stage firms.[6] The term 'accredited investor' was introduced into the Securities Act in 1980 to designate individuals deemed financially sophisticated and capable of bearing the risk of investment loss, thereby not requiring the full protections afforded by the Act (Ivanov, 2023).[7] Since its formal adoption in

[5] According to Ivanov (2020), Regulation D was promulgated in 1982 to provide a unified scheme for exempting certain capital offerings from registration requirements. Regulation D was designed to simplify existing rules and regulations to facilitate capital formation, particularly for small businesses, consistent with the protection of investors. Initially Regulation D included three rules: Rule 504, Rule 505, and Rule 506. For more information, please visit the SEC website: https://www.sec.gov/resources-small-businesses/capital-raising-building-blocks/form-d.

[6] For additional statistics on angel financing of small and emerging businesses, as well as U.S. exempt offerings, please see the SEC Office of the Advocate for Small Business Capital Formation's (OASB) annual report.

[7] The concept of accredited investors and limiting investment into private markets to certain investors was established by the Supreme Court in its 1953 decision in *SEC v. Ralston Purina.* This ruling determined the SEC to develop accreditation guidelines based on "any person who, on the basis of such factors as financial sophistication, net worth, knowledge, and experience in financial matters, or amount of assets under management".

1982, the accredited investor definition has largely remained unchanged, with two notable exceptions: (i) in 2010, the Dodd-Frank Act Wall Street Reform and Consumer Protection Act resulted in the SEC excluding the value of an individual's primary residence from an individual's net worth, thereby reducing the pool of available accredited investors; (ii) in 2020, the SEC 'modernized' the accredited investor definition by allowing natural persons to qualify based on certain professional certifications, designations or credentials, as well as recognizing 'knowledgeable employees', thus expanding the pool of accredited investors.[8] Specifically, individuals holding a FINRA Series 7 (Licensed General Securities Representative), Series 65 (Licensed Investment Adviser Representative), or Series 82 (Licensed Private Securities Offerings Representative) certification became eligible. In addition, "knowledgeable employees"—defined as executive officers or employees who actively participate in the investment activities of the issuer—were included.[9] Importantly, prior to these amendments, access to the private capital markets was restricted to individuals who satisfied rigid income or net worth thresholds, without regard to their actual financial sophistication or investment expertise. The above amendments became effective December 8th, 2020.

In this paper, I examine how the SEC's amendment to the accredited investor definition influenced local angel financing activity and, in turn, impacted firms' entrepreneurial activity and broader local economic outcomes, by leveraging cross-industry and cross-state heterogeneity in exposure to the regulatory change.

## 3. Literature Review & Contribution

[8] The regulation changes were designed to effectively identify institutional and individual investors that have the expertise, knowledge and capacity to evaluate and bear the risks associated with private market investments. For more information, please visit: https://www.sec.gov/newsroom/press-releases/2020-191.

[9] An important distinction is that a knowledgeable employee is an accredited investor only for those offerings issued by the employer.

This paper contributes to several strands of literature, including entrepreneurial finance, investor regulation and capital constraints faced by start-up firms.

First, this study builds on research examining angel investors as key financial intermediaries in the entrepreneurial ecosystem. Prior research documents the impact of angel financing on key firm outcomes such as follow-on fundraising, survival, innovation, and performance (Kerr, Lerner, & Schoar, 2014; Bernstein, Giroud & Townsend, 2016; Lerner et. al., 2018; Cumming & Zhang, 2019; Karlsen et. al., 2024). While angels are a critical source of early-stage capital, Bernstein, Korteweg & Laws (2017) highlight that investor decision-making is highly sensitive to firm-specific characteristics, particularly the quality of the founding team. Complementing this, Herrmann, Avdeitchikova, and Hjertström (2016) underscore the importance of relational proximity between angels and entrepreneurs in shaping investment outcomes. Existent literature also emphasizes the role of syndication networks and investor affiliations in overcoming geographic distance, reducing monitoring costs and information asymmetry (Sorenson & Stuart, 2001; Sorenson & Stuart, 2007; Hopp, 2010; Puri & Zarutskie, 2012; Agrawal, Catalini, & Goldfarb, 2013; Bonini et. al., 2018; Venugopal & Yerramilli, 2022; Wesemann & Antretter, 2023; Karlsen et al., 2024).

Other studies analyze the dynamics between angel investors and venture capitalists (Chemmanur & Chen, 2014; Hellmann & Thiele, 2015; Hellmann, Schure, & Vo, 2021). While Chemmanur and Chen (2014) examine their distinct financing contracts, Hellmann and Thiele (2015) provide a theoretical model in which angels and VCs are both complementary and competitive. Hellmann, Schure, and Vo (2021) find that angels and venture capitalists often act as substitutes.

Second, this research contributes to the literature on regulatory foundations of private capital markets, with an emphasis on investor protection. A substantial body of research investigates how legal and institutional frameworks shape investor protection legislation and private markets' participation (La Porta et. al., 2000; Shleifer & Wolfenzon, 2002; Cumming & Zambelli, 2013; Agrawal, 2013). More recent work examines how changes to investor accreditation affect investor pool composition. For example, Lindsey and Stein (2019) and Xu (2023) exploit the Dodd-Frank Act's exclusion of primary residence value as an exogenous shock and find that a smaller pool of potential investors leads to reduced angel investment, firm entry, and employment. In contrast, evidence from the Jumpstart Our Business Startups (JOBS) Act and the Qualified Small Business Stock (QSBS) exemption suggests that regulatory changes which lower barriers to participation and reduce disclosure burdens can foster increased financing and entrepreneurship (Dambra, Field, & Gustafson, 2015; Barth, Landsman, & Taylor, 2017; Chen & Farre-Mensa, 2023).

Third, this paper contributes to research on capital constraints and their effects on entrepreneurship. Access to capital and personal wealth have long been recognized as crucial to entrepreneurial entry and processes (Schumpeter, 1942; Hurst and Lusardi, 2004). More recent work highlights the importance of access to collateral in the form of housing wealth as a means to alleviate credit constraints (Adelino, Schoar, & Severino, 2015; Corradin & Popov, 2015; Schmalz, Sraer, & Thesmar, 2017; Hochberg et. al., 2018). Several empirical studies exploit reductions in minimum capital requirements to show that easing entry frictions can expand entrepreneurial participation without adversely affecting firm quality (Bacher et. al., 2024). Other studies highlight the role of bank lending in addressing early-stage firms' capital needs (Cortes, 2014; Chodorow-Reich, 2014; Robb & Robinson, 2014). However, existing literature documents that banks are not

a perfect substitute for angel capital, especially at the start-up level (Hellmann, Lindsey, & Puri, 2008). Corporations have also emerged as a source of capital for emerging businesses, although their investments tend to target firms operating within adjacent technological domains (Gompers & Lerner, 2000; Ma, 2020). Similarly, this study also contributes to extant literature that seeks to understand the role of financial constraints on new firm entry, employment, and economic growth (Tian, 2012; Haltiwanger, Jarmin, & Miranda, 2013; Decker et. al., 2014; Brown & Earle, 2017).

Lastly, this paper is related to the role of public policy and government programs in promoting entrepreneurial activity. Recent research investigates how public policy instruments such as tax credits and exemptions affect entrepreneurship (Howell & Mezzanotti, 2019; Chen & Farre-Mensa, 2023; Denes et. al., 2023). Others show that government-sponsored venture capital can complement private investment and improve firm-level outcomes (Brander, Du, & Hellmann, 2015; Denes et al., 2023). Denes et al. (2023) find that while investor tax credits stimulate greater angel investment, they do not significantly enhance the likelihood of high-growth results. Several other studies assess the adequacy of different public policy instruments in promoting innovation (Da Rin, Nicodano, & Sembenelli, 2006; Tian & Xu, 2022; Babina et. al., 2023).

## 4. Data & Variables Construction

This section details the data collection methodology and outlines the different data sources utilized in the analysis.

### *4.1. U.S. Angel Investors & Investments Data*

My main empirical analysis relies on information from U.S. Securities and Exchange Commission (SEC) Form D filings, obtained through Audit Analytics and SEC's EDGAR (Electronic Data Gathering, Analysis and Retrieval) system. Pursuant to federal securities laws,

Form D is used to file a notice of an exempt offering of securities under regulation D (Ewens and Farre-Mensa, 2020).[10] These filings provide key details about issuing firms, including firm name, geographic location, industry classification, offering date, and the total amount raised. Following Xu (2023), I exclude filings from firms operating in the financial services and energy industries, as well as any duplicate entries or instances where a firm submitted more than one filing on the same day. I further exclude all financial issuers, pooled investment funds, and foreign firms from the sample to ensure consistency and relevance to the domestic entrepreneurial financing landscape.

Angel investments are particularly difficult to systematically observe in the U.S. due to the absence of a centralized, high-quality dataset (Shane, 2008; Kerr, Lerner & Schoar, 2014). To address this limitation, I supplement Form D filings with data from PitchBook and Crunchbase, in line with the methodology outlined in Denes et al. (2023).[11] Using these databases, I construct a detailed investor-level dataset, capturing variables such as full name, industry specialization, educational background, current affiliations, and number of prior exits.[12] At the investment level, I collect information on the investment amount, date, financing round, and investment status. Following the approach of Denes et. al. (2023) and Xu (2023), I classify angel investments based on a combination of investor characteristics and investment types.[13] I then manually cross-validate

[10] Per the U.S. Securities and Exchange Commission's website, the federal securities laws require the notice to be filed by companies that have sold securities without registration under the Securities Act of 1933 in an offering made under Rule 504 or 506 of Regulation D or Section 4(a)(5) of the Securities Act. A company must file this notice within 15 days after the first sale of securities in the offering.

[11] PitchBook is a commercial database that compiles detailed firm- and investor-level information, primarily through Freedom of Information Act (FOIA) requests and direct data partnerships (Cumming and Zhang, 2019). In contrast, Crunchbase is an open-source platform that aggregates data on startups and their financing activities.

[12] Industry classification is based on a combination of reported four-digit SIC and six-digit NAICS codes, supplemented by PitchBook's proprietary verticals and subverticals, which I manually verify. This granular approach ensures an accurate identification of sectors with high concentrations of financially sophisticated individuals, avoids overly broad categories, and improves precision of treatment assignment.

[13] The screening process is comprehensive and involves the following steps: (i) first, I filter all observations based on investor type and drop any observation that is not equal to "angel (individual)"; (ii) second, I screen out any investment

all investor and investment-level observations from PitchBook with data from Crunchbase to ensure accuracy and that only those relevant to the entrepreneurial and startup ecosystem are captured. The resulting dataset is matched to angel investments from Form D filings based on issuer name, geographic location, and investment dates falling within a window of fifteen days prior to and three months after the Form D filing date. As a final step, to examine heterogeneity in the effects of the SEC's regulatory change, I aggregate the final dataset at both the industry-half-year and state-half-year levels.

I compile supplementary information on newly accredited angel investors using LinkedIn and Financial Industry Regulatory Authority's (FINRA) BrokerCheck database. From LinkedIn, I manually collect information on individual angel investors' professional backgrounds and industry specializations as of 2020, prior to the regulatory change, to better capture their ex-ante characteristics. Through FINRA's BrokerCheck database[14], I verify angel investor accreditation status by identifying individuals who became unconstrained based on their possession and historical record of relevant FINRA Series certifications.

*4.2. Outcome Variables Specification*

For the main empirical specification, I construct three different measurements of angel financing activity in industry *i* or state *s* during period *t* including: ln(1+Num_Ang) or the natural logarithm of one plus the number of angel investors; ln(1+Num_Inv) as the natural logarithm of

type that is not categorized as "angel (individual)", "seed round", and "accelerator / incubator"; (iii) lastly, I drop any remaining round type that is not classified as "angel" or "series A". As opposed to previous studies, I do not include any observations labeled as "equity crowdfunding".

[14] BrokerCheck provides information on FINRA-registered investment professionals, drawing from the Central Registration Depository (CRD)—the securities industry's centralized online system for registration and licensing.

one plus the number of angel investments; and lastly, ln(1+Amt_Inv) the natural logarithm of one plus the amount of angel investments.

To analyze the impact on the demand for alternative financing sources, I follow the approach in Xu (2023) and utilize loan-level data from the U.S. Small Business Administration (SBA) based on the loan application date. I focus on three primary outcomes aggregated at the state and annual level as follows: ln(1+Num_SBA), or the natural logarithm of one plus the number of approved small business loans; ln(1+Amt_SBA), or the natural logarithm of one plus the approved amount of small business loans; and ln(1+Guar_SBA), or the natural logarithm of one plus the guaranteed amount of small business loans. Additionally, I incorporate data from the Home Mortgage Disclosure Act (HMDA) to construct two outcome variables: ln(1+Num_HMDA), the natural logarithm of one plus the number of second-lien mortgage applications, and ln(1+Amt_HMDA), the natural logarithm of one plus the total dollar amount of second-lien mortgage applications submitted in state *s* during year *t*.

At the firm level, I measure round-to-round duration using ln(Duration) defined as the natural logarithm of the number of days between consecutive funding rounds. Based on this measure, I construct a binary indicator for firm survival that equals one if the firm raises a subsequent financing round within two years. Following the methodology in Pham, Turner and Zein (2024), I compute relative valuation for each specific round as the post-money valuation divided by the total amount of equity capital invested in the firm to date. This measure is analogous to total value to paid-in (TVPI), a commonly used metric for evaluating venture capital and private equity performance. Finally, I construct binary indicators capturing whether the investment occurs in an investor's preferred industry, whether it involves syndication, or the investor is identified as lead or female.

*4.3. Other Variables Specification*

To capture the impact of newly accredited investors, I construct a binary variable, New Angel, which equals one if the investor's first recorded investment occurred after 2020 and the individual held a professional certification or qualified as a knowledgeable employee. I manually collect this information from FINRA, LinkedIn, Crunchbase and PitchBook. Based on this classification, I construct a company-round-level variable, Fraction New Angels, defined as the ratio of new angel investors to the total number of investors participating in each financing round. To identify state-level exposure to the regulation I build a state-level indicator, High FINRA, which is equal to one if the respective state is in the top median of the number of FINRA-registered individuals in 2020, and zero otherwise. All other variables are defined in *Appendix A*.

Following extant literature, I construct a vector of control variables at either the industry- or state-level. All data observations are sourced from U.S. Census Bureau, U.S. Bureau of Economic Analysis (BEA), or U.S. Bureau of Labor Statistics (BLS). I control for the following variables: (i) the natural logarithm of gross domestic product (GDP); (ii) the natural logarithm of per capita income (Per Capita Income), measured as total personal income divided by mid-year population; (iii) the natural logarithm of employment (Employment); (iv) the natural logarithm of count of establishments (Establishments); (v) the natural logarithm of population (Population); (vi) political balance (Political Balance), or the percentage of representatives who belong to the Democratic Party in a given year in a specific state.

4.4. *Summary Statistics*

Table 1 presents summary statistics for data aggregated either at industry-time or state-time level. I winsorize all variables at the 1st and 99th percentiles to alleviate any concerns that the results are driven by outliers.

[**Insert Table 1 Here**]

On average, each industry-semi-annual observation includes approximately 209 angel investors and 284 investments. Approximately one third of angel investors are newly accredited, and over half of the firms filing for Form D are angel-backed. At the macroeconomic level, the average establishment entry rate is 9.56%, and the net job creation rate centers around zero, but exhibits considerable volatility. Firm-level outcomes reveal a mean fundraising duration of 340 days and a median relative valuation of $4.3 million, with some high outliers in round valuation. 2% of firms raise follow-on funding, and 65% do not secure additional capital within two years. Only a minority of angels invest in their preferred industry or assume lead roles.

## 5. Results

### *5.1. Main Empirical Specification and Baseline Results*

To assess the impact of SEC's 2020 reform to the accredited investor definition on the dynamics of angel financing across U.S. industries and states, I implement a difference-in-differences (DiD) identification strategy.[15] The regulatory change constitutes a plausibly exogenous policy shock that introduced significant variation in the eligibility of individuals who participate in private capital markets. Importantly, the regulation was implemented to better align

[15] A potential concern is that the SEC reform coincided with the onset of the COVID-19 pandemic, which also impacted angel investing (Mason & Botelho, 2024). To mitigate this concern, I implement several identification strategies: (i) conduct placebo tests using pseudo-event dates and perform robustness checks restricted to industries less affected by pandemic-related disruptions; (ii) leverage cross-state and cross-industry variation in *ex ante* investor sophistication, which is plausibly not likely to be correlated with the pandemic; (iii) include a comprehensive set of industry- and state-level economic controls.

investor sophistication and access to private markets, rather than as a response to ongoing or anticipated entrepreneurial activity, thus mitigating concerns of reverse causality.

Exposure to the reform varies systematically across industries and regions due to pre-existing differences in the concentration of FINRA-licensed professionals and the occupational composition of local labor markets. I exploit the cross-sectional heterogeneity in ex ante investor composition to capture variation in treatment intensity. This empirical design allows for the identification of the causal effect of the expanded eligibility criteria on angel financing activity by comparing differential changes across regions and industries with varying baseline levels of exposure, conditional on fixed effects and covariates. I discuss the identification assumptions and provide robustness checks following the main results.

In the main DiD analysis I estimate the following specification:

$$Y_{i,t} = \alpha + \beta \cdot Post_t * Treated\ Industries_i + Controls_{i,t} + \mu_i + \tau_t + \epsilon_{i,t} \quad (1)$$

In this specification, $i$ indexes industry and $t$ refers to the semi-annual time period. The dependent variable $Y_{i,t}$ captures different dimensions of angel financing activity including:(i) ln(1+Num_Ang) is the natural logarithm of one plus the number of angel investors in industry $i$ during period $t$; (ii) ln(1+Num_Inv) equals the natural logarithm of one plus the number of angel investments; (iii) ln(1+Amt_Inv) represents the natural logarithm of one plus the total dollar amount of angel capital invested. $Treated\ Industries_i$ identifies industries that were more likely to benefit from the regulatory change, including capital markets and other sectors with an ex-ante high concentration of individuals likely to qualify as accredited investors prior to 2020. $Post_t$ is a binary variable that equals one if period $t$ is post 2020, and zero otherwise. The model includes industry controls for gross domestic product, number of establishments, and employment in

industry *i* at time *t*, with detailed definitions provided in *Appendix A*. To account for unobserved heterogeneity, industry and time fixed effects are included.[16] Standard errors are clustered at both industry and time level.

**[Insert Table 2 Here]**

Panel A reports the DiD estimates for the financial markets industry, examining the effects of the 2020 SEC regulatory change on various measures of angel financing activity. Panel A focuses on the financial markets industry, while Panel B expands the analysis to include additional industries with high ex-ante concentrations of financially sophisticated individuals. The results indicate a consistent and economically meaningful increase across all outcome variables. For example, in column (2), the estimated coefficient of 0.252 implies that the number of angel investors in the financial markets industry increased by approximately 28.6% (= exp (0.252) − 1), indicating higher angel investor participation following the reform. Similarly, the coefficients for the number of angel investments in columns (3) and (4), 13.4% and 25.5.%, are positive and statistically significant, particularly when controls are included. The results remain robust when restricting the sample to observations with non-zero values for the number of angel investors or investments. These findings point to the regulation positively impacting both new angels' entry and greater investment activity. Lastly, the largest effects are observed in the amount of angel investments (columns (5) and (6)), reflecting substantial growth in the total amount of angel capital. All the results remain robust after controlling for industry-level economic characteristics.

[16] The fixed effects vary across specifications to account for variations in the level of data aggregation and identification strategy. For example, in this section, industry-level regressions include industry and time fixed effects, while in section 5.3., state-level analyses use state and year fixed effects to capture unobserved regional heterogeneity.

Panel B expands the analysis to a broader group of treated industries, including the financial markets industry and the three sectors with the highest ex ante concentration of professional specialization among angel investors.[17] Across all model specifications, the interaction term *Post2020 × Treated Industries* is positive and statistically significant, indicating substantial post-reform increases in the number of angel investors, the volume of angel investments, and the total capital deployed. To verify the robustness of the main findings and to address potential concerns about the limited number of clusters in the initial specification (31), I re-estimate the model using a more granular industry classification comprising 160 clusters. The results obtained from this higher granularity analysis remain consistent with the primary estimates (see *Appendix B)*. Overall, the results suggest that the expansion of accredited investor eligibility had a large and economically meaningful impact on early-stage financing in sectors with high ex ante exposure to the newly eligible investor types.

*5.2. Empirical Identification and Robustness Checks*

To ensure the validity of the DiD specification, I first evaluate whether the parallel trends assumption holds in the pre-treatment period. To examine the period-by-period effect, I replace the single post-treatment indicator $Post_t$ in equation (1) with a series of semiannual period-specific indicators ($Period_t$), ranging from $t$ = -6 to $t$ = 5. The dummy corresponding to the event period, the second half of 2020, is omitted to avoid multicollinearity issues. The regression retains the same set of control variables and fixed effects as specified in equation (1).

[17] Besides financial markets, these three industries include software, commercial services, and communications and networking. These are identified based on LinkedIn profile data as the topmost common sectors of occupational specialization among angel investors in the sample. This classification is used to capture the ex-ante industry characteristics of new angel investors, based on their professional backgrounds and self-reported affiliations prior to the 2020 regulatory change.

**[Insert Figure 1 Here]**

Figure 1 presents the estimated coefficients on the semiannual period indicators. The upper two panels display the pre-treatment dynamics when the treated industry is the financial markets industry, while the lower two panels account for all treated industries. The dependent variables are ln (1 + Num_Ang) in panels (a) and (c), and ln(1 + Num_Inv) in panels (b) and (d). The vertical lines denote 90% confidence intervals. In all four panels, coefficient estimates prior to the event period ($t = 0$) do not significantly differ from zero, providing evidence that there are no differential trends between treated and control industries before the regulatory change. Post-treatment, all panels indicate a positive and statistically significant trend, suggesting that the 2020 SEC amendment positively affected angel financing activity in form D firms. Overall, Figure 1 provides evidence that the DiD parallel trend assumption is not violated.

To further substantiate the causal interpretation of the results, I conduct a series of placebo and robustness tests. Table 3 reports the findings.

**[Insert Table 3 Here]**

Panel A presents placebo tests based on pseudo-event dates preceding the actual implementation of the SEC regulatory reform in the second half of 2020. Specifically, to assess whether the observed effects are driven by spurious correlations or unrelated temporal shocks, I re-estimate the main specification using alternative event dates, represented by binary indicators. Across all three columns, the dependent variable is the natural logarithm of one plus the number of angel investors. The results indicate that none of the placebo interaction terms is statistically significant at conventional levels. The absence of significant effects in these placebo periods

strengthens the interpretation that the observed increase in angel investment activity post-2020 is indeed driven by the actual regulatory change rather than other unrelated factors.

Panel B addresses the econometric concerns raised by Cohn, Liu, and Wardlaw (2022) regarding the bias and interpretational issues associated with logarithm of one plus the outcome (log(1+y)) transformations in linear regressions for count outcomes.[18] To account for these concerns, I re-estimate the specifications from Panel A of Table 2 using a Poisson fixed-effects model. The estimated effects on both count outcome variables remain positive and statistically significant, reinforcing the robustness of the results[19].

Panel C shows that the 2020 SEC regulatory reform affected angel financing activity exclusively and that it did not carry broader implications for other categories of private investment. Column (1) analyzes the impact on non-angel, venture capital (VC) investments, using as the dependent variable the natural logarithm of one plus the number of VC investments, ln(1+VC_Inv). Column (2) evaluates the regulation's influence on later-stage investments ln(1+Later_Inv). In both specifications, the coefficients on the interaction term are negative and statistically insignificant, suggesting that the policy change did not affect non-angel segments of private investment. These results imply that the regulation specifically incentivized angel financing without generating unintended spillover effects into other investment categories.

Next, Panel D examines whether the observed effects of the regulatory change are confounded by the coinciding macroeconomic shock induced by the COVID-19 pandemic. To

[18] In their study, Cohn, Liu, and Wardlaw (2022) construct the argument that the common practice of estimating linear regressions of the form log(1+y) result in estimates that lack meaningful interpretation and are prone to inherent biases. Instead, the authors argue that a Poisson regression yield estimates with clear interpretations, requires minimal assumptions for valid estimation, fits count data well, and accommodates separable group fixed effects.
[19] I re-estimate a Poisson model for each count outcome in the study, and all results remain statistically significant and consistent in sign with the main findings. Full regression tables are available upon request.

address this identification concern, I follow the approach of Pagano, Wagner and Zechner (2023) and utilize the industry-level measurement of resilience to social distancing empirically developed by Koren and Peto (2020).[20] This measure captures the share of employees in each industry whose work is affected by COVID-19 restrictions, based on the extent to which their occupations require physical proximity or intensive, in-person communication. I merge this data at the industry level using firms' 3-digit NAICS codes and construct a binary indicator, *Low COVID Exposure*, which equals one for industries with below-median exposure to pandemic-related disruptions. I leverage this variable in a triple-differences (DDD) framework. The results indicate that even within low COVID exposure industries, the sectors more likely to be affected by the SEC reform experienced significant increases in the number of investors, investments volume, and transactions amount. These findings suggest that the observed effects are unlikely to be driven by heterogenous impacts of COVID-19 across industries.

Finally, Panel E provides a robustness check by estimating the effects of the regulation using an alternative outcome measure, the share of companies receiving angel investment. Column (1) shows results without additional controls, while column (2) incorporates the full set of control variables from the primary specification. The estimated coefficients for the interaction term remain positive and statistically significant across both specifications, indicating that the main findings are robust to alternative definitions of angel financing activity. Overall, these robustness tests reinforce confidence in the main results and further support the conclusion that the 2020 SEC reform positively influenced angel investment activity.

[20] Koren and Peto (2020) define a COVID-resilient firm as a firm whose operations involve minimal physical interaction either among employees or between customers and employees. Their measurement is based on three components: (i) internal communication or 'teamwork'; (ii) external communication or 'customers'; (iii) physical proximity to others or 'presence'.

*5.3. Impact on Geographic Distribution of Angel Financing*

In 2021, the SEC reported that the distance between lead investors and target companies averages only 37 miles (OASB, 2021).[21] This aligns with a well-established area of academic research documenting the existence of local bias in angel investment activity. Angels often prefer to invest within the same geographic region as the entrepreneur due to the importance of geographic proximity in mitigating information asymmetries and reducing monitoring costs (Sorenson & Stuart, 2001; Bernstein et. al., 2016; Lerner et. al., 2018; Cumming & Zhang, 2019). When close monitoring is not feasible, angels' industry knowledge and professional expertise can serve as effective substitutes, enhancing their ability to evaluate and support startups remotely (Herrmann, J., Avdeitchikova, & Hjertström, A., 2016; Bonini et. al., 2018). Building on this literature, I examine whether the impact of the 2020 SEC regulatory amendment was heterogeneous across states with differing levels of ex ante investor sophistication. Specifically, I use cross-state variation in the number of FINRA-registered individuals as a proxy for the local presence of financially sophisticated individuals. Table 4 presents the results.

**[Insert Table 4 Here]**

The main explanatory variable is an interaction term between Post2020, a post-reform time indicator, and High FINRA, a binary indicator equal to one for states above the median in the number of FINRA-registered individuals in 2020.[22] The dependent variables across columns (1) through (6) capture three distinct dimensions of angel financing activity: the number of unique

[21] In my sample, the average distance between primary issuer and entrepreneur is approximately 41 miles.
[22] I also estimate an event study specification by replacing the Post2020 indicator with a series of semiannual time-period indicators interacted with the treatment variable. The results provide evidence that the parallel trends assumption is satisfied in the pre-reform period. Please see *Appendix C.*

angel investors (ln(1+Num_Ang)), the number of angel investments (ln(1+Num_Inv)), and the total amount of angel investments (ln(1+Amt_Inv)). The results indicate that the regulatory change had a disproportionate, positive and statistically significant effect in states with higher concentrations of FINRA-registered individuals. The estimated coefficients in columns (1) and (2) suggest that the number of angel investors increased by approximately 30% to 55% post-2020 in high-FINRA states. Similarly, columns (3) and (4) show a significant increase in the number of angel investments when controls are included. The most pronounced effect is observed in column (6), where the amount of angel investment rises significantly in response to the policy, with a coefficient of 0.340, a roughly 40.5% increase. Across all specifications, the results are robust to the inclusion of a comprehensive set of state-level control variables - per capita income, GDP, population, number of establishments, and political balance, all described in *Appendix A*.

These findings underline the critical role of investor sophistication in aiding the effectiveness of securities regulation. The disproportionate response in high-FINRA states suggests that the policy's benefits were not uniformly distributed across states but were instead concentrated in areas with a pre-existing population of financially sophisticated individuals. This heterogeneity reveals a significant mechanism through which regulatory changes can exacerbate existing geographic disparities in the entrepreneurial ecosystem.

### *5.4. Impact on Entrepreneurial Activity*

Access to angel and early-stage capital plays a critical role in the formation and growth of emerging businesses, particularly when access to traditional credit markets is limited due to the absence of collateral or minimal operating history (Puri & Zarutskie, 2012; Kerr, Lerner, & Schoar, 2014). The SEC's 2020 amendment to the definition of accredited investors broadened eligibility to participate in private capital markets, thereby increasing the potential supply of early-stage

capital to start-ups. In this section, I examine whether the regulatory expansion facilitated increased business dynamism by analyzing establishment entry rates and net job creation across industries. If the reform significantly reduced capital constraints, one would expect to observe corresponding increases at the establishment-level.

The DiD approach is similar to the specification in table 1, except the outcome variables are constructed using establishment-level data from the U.S. Census, aggregated at the industry and half-year level. The first outcome is the natural logarithm of one plus the establishment entry rate, calculated as the number of new establishments divided by the average number of establishments in periods $t$ and $t–1$, multiplied by 100. The second variable of interest is net job creation rate measured as the difference between job creation and job destruction. All models include industry and semi-annual fixed effects, and control for time-varying economic conditions. Table 5 reports the results.

**[Insert Table 5 Here]**

The coefficients on the interaction term *Post2020 x Treated Industries* in columns (1) and (2) indicate a positive and statistically significant increase in the establishment entry rate following the reform. Relative to non-treated industries treated sectors experienced an increase of approximately 4.3% to 6.5% in establishment entry after the expansion of the accredited investor definition, consistent with the hypothesis that easing capital access constraints stimulates startups formation. Columns (3) and (4) show a positive and statistically significant association between the reform and net job creation rates, with estimated increases ranging from 26.2% to 33.4%. These results suggest that not only did the reform encourage business formation, but it also contributed to net employment gains within treated sectors. These findings underscore that angel participation drives both business entry and labor markets.

### *5.5. Impact on Demand for Alternative Financing Sources*

In light of the SEC's 2020 expansion of the accredited investor definition and its documented impact on angel financing, a central question is whether this regulatory change induced a substitution or complementarity effect on entrepreneurs' financing behavior. [23]. Building on the framework proposed by Xu (2023), one would expect that the increase in early-stage capital availability—resulting from a broader pool of eligible angel investors—would reduce entrepreneurs' reliance on more conventional financing mechanisms such as small business loans and second-lien mortgages. However, if the regulation failed to stimulate significant angel participation, entrepreneurs may have continued to rely on alternative sources like U.S. Small Business Administration (SBA) loans or mortgage-based funding disclosed under the Home Mortgage Disclosure Act (HMDA). This analysis serves two purposes: first, to assess whether the composition of entrepreneurial financing shifted following the regulatory expansion, and second, to identify whether the policy produced unintended spillover effects on the demand for federally supported lending programs.

#### *5.5.1. Small Business Loans*

In this section, I examine whether the 2020 expansion of the SEC's accredited investor definition affected entrepreneurs' reliance on federally backed financing, specifically small business loans guaranteed by the U.S. SBA under the 7(a) and 504 programs[24]. I aggregate loan-level observations by state and year between 2018 and 2023 based on the loan application date and

[23] OASB reports that small and emerging businesses rely predominantly on entrepreneurs' self-funding, family and friends, angel investors, or loans and grants.

[24] According to SBA, the 504-loan program provides long-term, fixed rate financing for major fixed assets that promote business growth and job creation. The 7(a) is SBA's primary business loan program and provides guarantees to lenders that allows then to provide financial help for small business with special requirements. For more information please visit: https://www.sba.gov/funding-programs/loans.

focus on three primary outcomes: the number of loans approved, the total approved loan amount, and the guaranteed amount. Table 6 presents the regression results.

**[Insert Table 6 Here]**

The dependent variables in columns (1) and (2) are the natural logarithm of one plus the number of approved SBA loans in state *s* during period *t*, ln(1 + Num_SBA); columns (3) and (4) use the approved loan amount, ln(1 + Amt_SBA); and columns (5) and (6) focus on the guaranteed amount, ln(1 + Guar_SBA). The estimates in columns (1) and (2) indicate statistically significant declines of approximately 9.8% and 6.5%, respectively, in the number of approved SBA loans in high-FINRA states following the regulatory reform. These findings are consistent with a substitution effect, wherein entrepreneurs shift from public to private financing as newly accessible capital becomes available. In contrast, columns (3) and (4) reveal no significant change in the total approved loan amount, suggesting that while fewer SBA loans were issued, the average loan size remained stable. A similar pattern is observed in columns (5) and (6) for the guaranteed loan amount. The coefficient in column (5) is marginally significant and negative, while the estimate in column (6) becomes statistically insignificant once controls are included. These mixed results for loan size and guaranteed amounts indicate that any substitution effect is more pronounced on the extensive margin rather than on the intensive margin.

*5.5.2. HMDA Second-Lien Mortgages*

Existent literature has documented that that when entrepreneurs face limited access to early-stage capital, they often rely on home equity via second-lien mortgages as an alternative

source of funding[25] (Robb & Robinson, 2014; Corradin & Popov, 2015; Adelino, Schoar & Severino, 2015; Schmalz, Sraer & Thesmar, 2017). These loans allow borrowers to leverage the value of their residential property to finance business activities. Building on this literature, I examine whether the expansion in the pool of accredited investors affected entrepreneurs' demand for second-lien mortgages. I use data collected under the Home Mortgage Disclosure Act (HMDA) and focus on mortgage applications identified as "subordinate lien". I aggregate these observations at the state-year level over the period 2018 to 2023. From the HMDA data, I construct two dependent variables: ln(1+Num_HMDA), the natural logarithm of one plus the number of second-lien mortgage applications, and ln(1+Amt_HMDA), the natural logarithm of one plus the total dollar amount of second-lien mortgage applications submitted in state *s* during year *t*. The findings are shown in Table 7.

**[Insert Table 7 Here]**

Column (1) reveals a statistically significant reduction of approximately 10.8% in the number of second-lien mortgage applications in high-FINRA states following the regulation. However, this effect becomes smaller and statistically insignificant in column (2) after the inclusion of state-level controls, suggesting that underlying economic conditions may mediate the observed relationship. The results for total loan amounts are mixed: column (3) shows a negative but statistically insignificant coefficient, while column (4) reports a negative and marginally significant effect at the 10% level. These findings suggest some evidence of reduced reliance on housing-backed credit in more financially sophisticated states, though the magnitude and significance of the effects are less robust when compared to those for SBA loans.

[25] A second-lien mortgage, also known as a junior mortgage, is a form of secured debt taken out against a property that already carries a primary mortgage and is publicly reported under the Home Mortgage Disclosure Act (HMDA).

Overall, the results across both SBA lending and HMDA second-lien mortgage activity provide evidence of a reallocation in entrepreneurs' financing behavior following the 2020 SEC regulatory expansion. In states with greater exposure to the reform, characterized by higher concentrations of FINRA-registered individuals, entrepreneurs appear to have reduced their reliance on public lending channels. The effects are particularly evident along the extensive margin of lending, indicating fewer loans were sought or approved, rather than significant changes in the loan amounts.

### *5.6. Impact on Firm-Level Outcomes*

A substantial number of studies highlight the pivotal role angel investors play in startups' outcomes (Kerr, Lerner & Schoar, 2014; Bernstein, Korteweg & Laws, 2017; Lerner et. al., 2018; Hellman, Schure & Vo, 2021; Zaccaria, 2023). Besides capital provision, angels often contribute industry expertise and access to investors' networks that can potentially facilitate subsequent financing. Empirical evidence shows that angel-backed firms are more likely to raise follow-on funding, experience faster growth, and exhibit higher survival rates relative to non-angel-backed firms. Motivated by this literature, I next investigate whether the increased angel participation positively impacted firm-level outcomes, thereby providing a more granular perspective on the reform's consequences.

For this purpose, I construct a novel independent variable, Fraction New Angels, measured as the proportion of new angel investors relative to the total number of investors participating in a specific financing round[26]. Table 8 reports the results. Columns (1) and (2) examine the effect on

[26] I identify new angel investors by manually cross-checking PitchBook and Crunchbase data to confirm the absence of any investment activity prior to 2020. I further validate that their accreditation status is not based on meeting personal net worth or income criteria but rather reflects eligibility under the expanded SEC definition.

round-to-round duration, where the dependent variable is ln (Duration)—the natural logarithm of the number of days between consecutive funding rounds. Columns (3) and (4) assess the likelihood of securing a follow-on round, using a binary indicator variable equal to one if a company raises a follow-on round of financing.

**[Insert Table 8 Here]**

In columns (1) and (2), the coefficient on Fraction New Angels is negative and statistically significant at the 10% level, indicating that a greater share of new angel investors in a financing round is associated with shorter durations between consecutive rounds. Specifically, a one-unit increase in the fraction of new angels is associated with an approximate 10.8% reduction in the length of time between rounds. This finding suggests that new angels may signal firm quality to other investors or facilitate greater access to follow-on capital. Columns (3) and (4) further support this interpretation. The estimated coefficients on Fraction New Angels are positive and highly significant, indicating that rounds with greater new angel participation are more likely to be followed by a subsequent funding round.

I next examine the relationship between new angel investor involvement and firm-level survival, defined as a company successfully raising a follow-on financing round within two years. Table 9 shows the findings. Columns (1) and (2) indicate that the presence of at least one new angel investor is significantly associated with a reduced likelihood of firm attrition over the two-year horizon. Likewise, columns (3) and (4) show that a greater proportion of new angel participation within a financing round is linked to a substantially lower probability of failing to secure subsequent funding. These findings suggest that new angels can positively affect early-stage firm survival and improve long-term financing outcomes.

**[Insert Table 9 Here]**

Overall, the results provide consistent evidence that new angel investors' participation improves firm-level financing outcomes. Angel involvement is linked to shorter durations between funding rounds, a higher likelihood of securing follow-on capital, and greater firm survival over a two-year horizon.

*5.7. Impact on Investor Sophistication*

The 2020 SEC expansion of accredited investor eligibility aimed to broaden participation in private capital markets by including individuals with demonstrated financial sophistication, irrespective of traditional net worth or income thresholds. This policy shift significantly enlarged the investor pool and raises important questions regarding the new entrants' investment behavior, sophistication and risk tolerance. Prior research indicates a relationship between investor experience and risk-taking behaviors, with seasoned investors having a higher propensity to invest across multiple industries, lead deals, and avoid syndication (Gompers et. al., 2005; Hopp, 2010; Tian, 2012; Bonini et. al., 2018; Wesemann & Antretter, 2022). At the same time, financial sophistication may also enhance investors' ability to identify higher return deals (Morrissette, 2007; Kerr, Lerner, & Schoar, 2014; Capizzi, 2015; Hellmann & Thiele, 2015). This section investigates whether post-2020 entrants differ systematically in their investment selection and risk-taking behaviors.

Table 10 analyzes the impact of new angel investors participation and round-level valuation. Following Pham, Turner and Zein (2024), the dependent variable in all specifications is Relative Valuation, calculated as the ratio of post-money valuation to the cumulative equity capital

invested in the firm. This measure is similar to market-to-book ratio or total value to paid-in (TVPI) multiple.

**[Insert Table 10 Here]**

Columns (1) and (2) show that rounds involving newly accredited angels are associated with a 4.5% higher relative valuation even when controlling for company, round, and time-level heterogeneity. Similarly, rounds with a greater proportion of entrant investors indicate a 13.9% higher round-level valuation. These results suggest that the newly accredited investors might be selecting higher-quality deals, potentially due to their track history and financial expertise.

Finally, Table 11 explores investment patterns across three dimensions: industry focus, propensity to syndicate and lead investor roles.

**[Insert Table 11 Here]**

Columns (1) and (2) indicate that new angels are significantly more likely to invest in their reported preferred industry. The estimated coefficients imply that new investors are over 60 percentage points more likely to concentrate their capital in sectors they identify as preferred. This behavior is consistent with theories of investor specialization, which suggest that less experienced or more risk-averse investors seek to mitigate information asymmetries by allocating capital to sectors in which they have perceived comparative advantage (Bonini et al., 2018). The next two columns suggest that new investors are substantially more likely to co-invest, a strategy often used to reduce individual risk (Lerner, 1994). Finally, Columns (5) and (6) reinforce that new angels prefer less exposure to risk, as they are significantly less likely to assume lead investor roles within a funding round.

Taken together, the findings presented in tables 10 and 11 provide compelling evidence that newly accredited investors behave systematically different than traditional private investors. While the selection of deals with higher relative valuations possibly reflects their sophistication, they also display a higher risk aversion. This evidence is consistent with investor specialization, indicating that while the 2020 SEC expansion broadens access to private capital markets, these new investors are more specialized in their investment approaches.

## 5. Discussion

Although this paper documents that the 2020 SEC reform to the accredited investor definition significantly expands the potential pool of investors, access to private capital markets remains largely restricted. According to SEC estimates, only 19% of U.S. households qualify under the current definition. This regulatory exclusion carries substantial implications for individual wealth accumulation, portfolio diversification, and existing economic inequalities in the U.S. Over recent decades, private markets have expanded, while investment opportunities available to non-accredited investors have decreased considerably due to a decline in publicly listed firms (Stulz, 2020; Lattanzio, Megginson & Sanati, 2023; Ewens and Farre-Mensa, 2022). Even more, firms that do enter public markets tend to be significantly older and more mature, well past the start-ups' high growth phase (Schulp, 2023). Consequently, non-accredited investors encounter high barriers to accessing early-stage, high-growth opportunities, resulting in potentially lower returns on investments and reduced diversification benefits.

As it stands, the criteria for accreditation disproportionately affect certain geographies and demographic groups. Since eligibility is predominantly contingent upon wealth and income

thresholds, the current definition privileges households that are disproportionately white and geographically concentrated in coastal areas. Empirical support for this disparity is presented in *Appendix B* Table B2, which provides difference-in-differences estimates evaluating the 2020 SEC regulatory impact on angel investment activity in non-coastal U.S. states. The analysis reveals either significant declines in angel investor participation or statistically insignificant differences post-reform, indicating that the benefits of the regulatory shift are unevenly distributed, further entrenching regional wealth disparities. In a separate analysis, I explore whether the regulatory shift influenced the gender composition of the investor pool and find no significant evidence (Table B3). The implications of these findings extend beyond individual investor welfare.

Overall, the accredited investor definition reinforces existing wealth disparities by restricting access to private market opportunities and vesting the SEC with discretionary authority to decide who gets to invest where: public markets for most, but public and private markets for those it judges to be wealthy enough or sufficiently financially sophisticated (Schulp, 2023).

## 6. Conclusion

This paper provides novel empirical evidence on the effects of investor protection regulation on early-stage financing. I exploit the 2020 expansion of the U.S. Securities and Exchange Commission's accredited investor definition as a plausibly exogenous shock to assess the causal impact of broadening private market access to financially sophisticated individuals. I use a differences-in-differences framework and construct an unique, hand-collected dataset combining Form D filings, FINRA registrations, and detailed investor-level information from PitchBook, Crunchbase, and LinkedIn. The results show that the regulatory change leads to a significant increase in angel investor participation, investment activity, business formation, and

employment—concentrated in sectors and regions with greater pre-reform concentrations of financially sophisticated individuals.

The analysis yields several key implications. First, I find that the reduction in early-stage capital constraints results in significant increases in establishment entry rates and job creation. These findings underscore the crucial role of angel financing in driving entrepreneurial activity and local economic growth. Second, I document a meaningful reallocation in financing behavior. Entrepreneurs in high-exposure regions shifted away from government-backed lending programs (i.e., small business loans and second-lien mortgages) and toward newly available private capital. This substitution pattern highlights how expanded access to private markets can reshape the composition of early-stage financing, potentially alleviating pressure on federal lending.

Third, the firm-level evidence indicates that newly accredited angel investors are associated with faster fundraising cycles, higher likelihood of follow-on rounds, and improved short-term firm survival. Entrant investors also exhibit different investment behaviors, as they disproportionately participate in higher valued rounds, concentrate their investments in familiar industries, co-invest more frequently, and avoid lead positions. These results suggest that the regulatory expansions not only broadened the investor pool but also altered its composition, introducing financially sophisticated individuals who are more specialized in their investment approach.

Despite these benefits, the analysis also reveals significant disproportionate effects. Because exposure to the reform depended heavily on the geographic distribution of financially sophisticated individuals, the positive effects of the policy are disproportionately concentrated in wealthier, coastal states. This finding suggests that regulatory efforts to expand private market access may inadvertently reinforce existing geographic and socioeconomic disparities.

To conclude, this paper contributes to a deeper understanding of the inherent trade-offs in private markets regulation. While investor protection is essential for mitigating exposure to risk, overly restrictive accreditation criteria can hinder early-stage financing, suppress entrepreneurial activity, and reinforce inequality. Future efforts to democratize access to private markets should account for underlying demographic and geographic disparities that shape who participates in, and benefits from private markets.

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**Figure 1:** Plot of Coefficient Estimates Around the Event Time

This figure plots the coefficient estimates around the 2020 SEC regulation change of accredited investors by estimating the following model:

$$Y_{i,t} = \alpha + \sum_{t=-6,\ t\neq 0}^{5} \beta_t \cdot Period_t * Treated\ Industries_i + Controls_{i,t} + \mu_i + \tau_t + \epsilon_{i,t}$$

where $Period_t$ represents a group of binary variables equal to one if the respective industry-half-year observation is from the specific time unit $t$. The omitted group contains observations from the second half of the year 2020 (i.e., when the SEC regulation changed). For example, $Period_1$ includes all observations from the first half of the year 2021. In panels (a) and (b), $Treated\ Industries_i$ is the financial markers industry, while in panels (c) and (d) all treated industries are included. Panel (a) plots the coefficient estimates of $\beta_t$ when the dependent variable is the natural logarithm of one plus the number of angel investors. Panel (b) plots the coefficient estimates of $\beta_t$ when the dependent variable is the natural logarithm of one plus the number of angel investments. In all four panels, the vertical lines represent the 90% confidence interval of $\beta_t$ estimates.

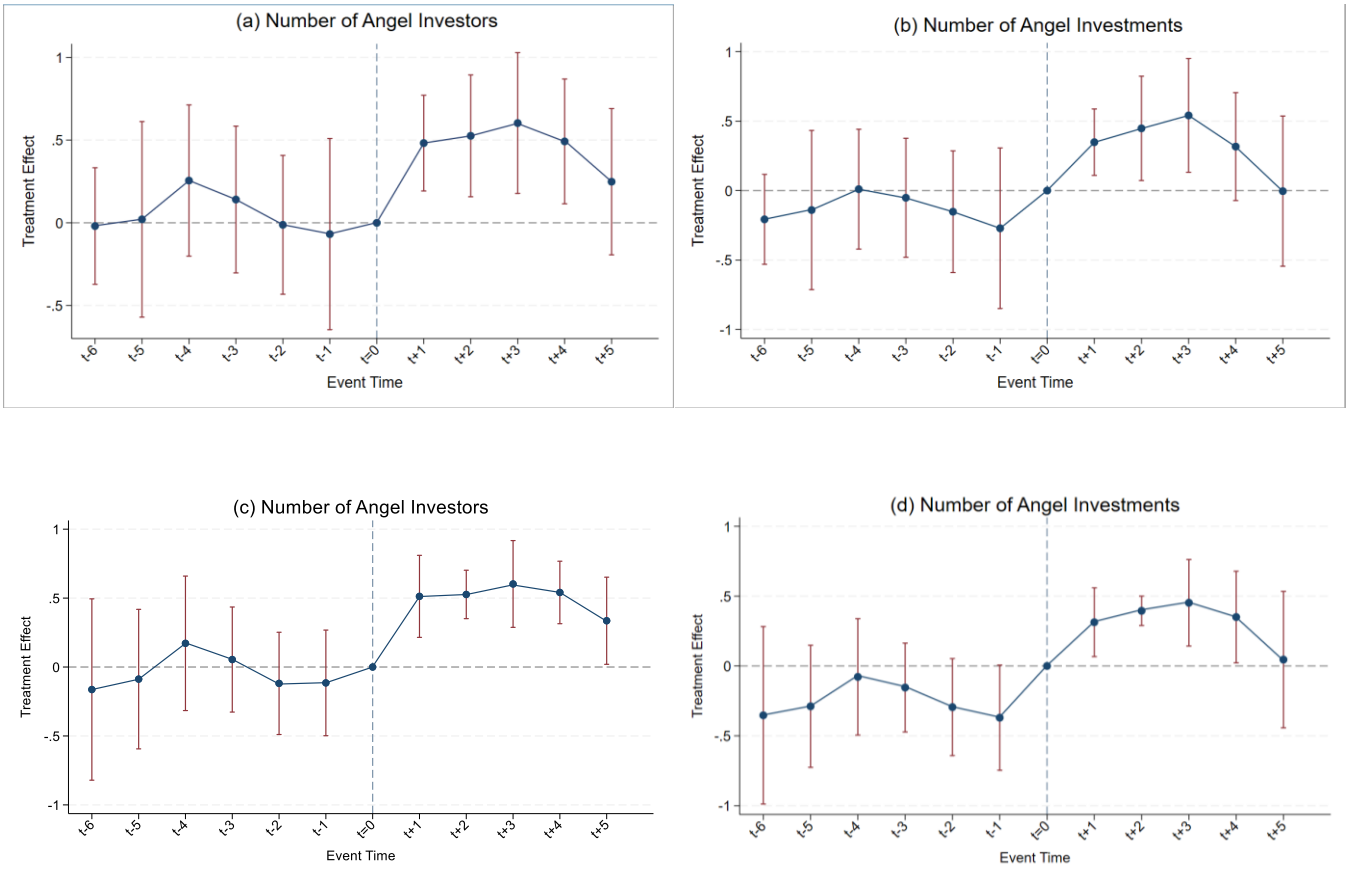

**Table 1: Summary Statistics**

This table presents summary statistics for the main variables used in the analysis, based on the final dataset covering 2018 to 2023. All variables are defined in *Appendix A*.

| | N | Mean | St. Dev. | Min | Median | Max |
|---|---|---|---|---|---|---|
| *Angel Financing* | | | | | | |
| Num_Ang | 13,336 | 209.16 | 217.26 | 1.00 | 168.00 | 694.00 |
| Num_Inv | 13,336 | 283.91 | 318.30 | 0.00 | 185.00 | 1,039.00 |
| Amt_Inv ($mil.) | 13,336 | 2.34 | 2.97 | 0.00 | 1.02 | 9.40 |
| Share_Angel_Backed | 120,528 | 0.52 | 0.15 | 0.00 | 0.57 | 1.00 |
| New Angel | 13,336 | 0.34 | 0.49 | 0.00 | 0.00 | 1.00 |
| *Federal Lending* | | | | | | |
| Num_SBA (mil.) | 51,847 | 0.14 | 0.26 | 0.00 | 0.04 | 4.08 |
| Amt_SBA ($mil.) | 51,847 | 3.10 | 2.40 | 3.41 | 1.83 | 7.69 |
| Guar_SBA ($mil.) | 51,847 | 1.57 | 1.36 | 1.10 | 8.84 | 4.91 |
| Num_HMDA (tho.) | 45,067 | 0.09 | 0.18 | 0.00 | 0.02 | 6.02 |
| Amt_HMDA ($mil.) | 45,067 | 3.75 | 12.56 | 0.00 | 2.08 | 347.00 |
| *Economic Activity* | | | | | | |
| Est_Entry | 19,628 | 9.56 | 2.92 | 0.00 | 9.18 | 42.22 |
| NetJobCreationRate | 19,628 | 0.10 | 5.88 | -75.75 | 1.20 | 64.91 |
| *Firm-Level Outcomes* | | | | | | |
| Duration | 137,515 | 339.92 | 294.58 | 0.00 | 264 | 2,793.00 |
| Relative Valuation | 46,062 | 6.22 | 24.21 | 0.02 | 4.30 | 2,425.50 |
| Follow_On | 231,711 | 0.02 | 0.16 | 0.00 | 0.00 | 1.00 |
| No_Follow_On_2yr | 30,414 | 0.65 | 0.37 | 0.00 | 1.00 | 1.00 |
| Preferred Industry | 55,894 | 0.09 | 0.29 | 0.00 | 0.00 | 1.00 |
| Syndication | 55,894 | 0.79 | 0.40 | 0.00 | 1.00 | 1.00 |
| Lead | 55,894 | 0.09 | 0.28 | 0.00 | 0.00 | 1.00 |

**Table 2**: Impact on Angel Financing Activity

This table presents the results of the main differences-in-differences (DiD) analysis by estimating the following specification:

$$Y_{i,t} = \alpha + \beta \cdot Post_t * Treated\ Industries_i + Controls_{i,t} + \mu_i + \tau_t + \epsilon_{i,t}$$

where *i* indexes industry and *t* a semi-annual time period. The dependent variables $Y_{i,t}$ represent measurements of angel financing activity in industry *i* and time *t* as follows: (i) ln(1+Num_Ang) the natural logarithm of one plus the number of angel investors; (ii) ln(1+Num_Inv) the natural logarithm of one plus the number of angel investments; (iii) ln(1+Amt_Inv) the natural logarithm of one plus the amount of angel investments. $Post_t$ is a binary variable that equals one if period *t* is after 2020, and zero otherwise. In Panel A, $Treated\ Industries_i$ represents the financial markets industry, while in Panel B, $Treated\ Industries_i$ are the financial markets, communications and networking, computer software, and commercial services industries. All control variables are described in *Appendix A.* All continuous variables are winsorized at the 1% level in both tails. Standard errors are double clustered at industry and time level. All regressions include industry and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

*Panel A*

| | (1) ln(1+Num_Ang) | (2) ln(1+Num_Ang) | (3) ln(1+Num_Inv) | (4) ln(1+Num_Inv) | (5) ln(1+Amt_Inv) | (6) ln(1+Amt_Inv) |
|---|---|---|---|---|---|---|
| *Post2020 x Financial Markets* | 0.252** | 0.315*** | 0.126* | 0.227** | 0.304** | 0.375* |
| | (0.09) | (0.07) | (0.10) | (0.12) | (0.19) | (0.33) |
| GDP | | -0.542 | | -0.685 | | -1.257 |
| | | (0.61) | | (0.68) | | (1.01) |
| Employment | | 0.461 | | 0.254 | | 1.023 |
| | | (0.53) | | (0.61) | | (0.99) |
| Establishments | | 0.002 | | 0.163 | | -0.009 |
| | | (0.28) | | (0.31) | | (0.38) |
| Observations | 13,336 | 13,336 | 13,336 | 13,336 | 13,336 | 13,336 |
| Adjusted $R^2$ | 0.563 | 0.621 | 0.578 | 0.613 | 0.142 | 0.200 |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

*Panel B*

| | (1) ln(1+Num_Ang) | (2) ln(1+Num_Ang) | (3) ln(1+Num_Inv) | (4) ln(1+Num_Inv) | (5) ln(1+Amt_Inv) | (6) ln(1+Amt_Inv) |
|---|---|---|---|---|---|---|
| *Post2020 x Treated Industries* | 0.394** | 0.461*** | 0.431* | 0.497*** | 0.389** | 0.568*** |
| | (0.12) | (0.12) | (0.14) | (0.14) | (0.13) | (0.14) |
| GDP | | -0.178 | | -0.554 | | 0.100 |
| | | (0.80) | | (0.83) | | (1.14) |
| Employment | | 0.284 | | 0.285 | | -1.176 |
| | | (0.65) | | (0.75) | | (1.33) |
| Establishments | | 0.010 | | 0.007 | | 0.036 |
| | | (0.01) | | (0.01) | | (0.02) |
| Observations | 13,336 | 13,336 | 13,336 | 13,336 | 13,336 | 13,336 |
| Adjusted $R^2$ | 0.483 | 0.484 | 0.325 | 0.329 | 0.208 | 0.268 |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 3:** Alternative Specifications & Robustness Tests

This table shows the results of alternative specifications. Panel A presents the estimates of placebo tests using pseudo-event times prior to the actual regulation change, the second half of 2020. Post2017, Post2018, and Post2019 are binary variables that equal one if time period *t* is after 2017, 2018 and 2019, respectively. Across all three columns the dependent variable is the natural logarithm of one plus the number of angel investors. To address the econometric concern introduced by Cohn, Liu, and Wardlaw (2022), Panel B reports the coefficient estimates from a Poisson regression using the same baseline specification as Panel A of Table 2. Panel C examines spillover effects of the 2020 SEC regulation change on non-angel investments. In column (1), the dependent variable, ln(1+VC_Inv) is the natural logarithm of one plus the number of investments made by venture capitalists in industry *i* at time *t.* In column (2), the dependent variable, ln(1+Later_Inv) equals the natural logarithm of one plus the number of later-stage investments in industry *i* at time *t.* Panel D presents a triple difference-in-difference (DDD) specification examining the impact of the SEC regulatory change on angel investment activity in treated industries with low COVID exposure. Panel E examines the impact of the SEC regulatory change on the fraction of angel-backed establishments post-2020. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the industry and time level. All regressions include industry and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

*Panel A*

| | (1)<br>ln(1+Num_Ang) | (2)<br>ln(1+Num_Ang) | (3)<br>ln(1+Num_Ang) |
|---|---|---|---|
| *Post2017 x Financial Markets* | 0.148 | | |
| | (0.09) | | |
| *Post2018 x Financial Markets* | | 0.148 | |
| | | (0.09) | |
| *Post2019 x Financial Markets* | | | 0.218 |
| | | | (0.09) |
| Observations | 13,336 | 13,336 | 13,336 |
| Adjusted $R^2$ | 0.621 | 0.625 | 0.631 |
| Controls | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes |

*Panel B*

| | (1)<br>Num_Ang | (2)<br>Num_Inv |
|---|---|---|
| *Post2020 x Financial Markets* | 0.277*** | 0.061*** |
| | (0.01) | (0.02) |
| Observations | 13,336 | 13,336 |

| | | |
|---|---|---|
| Pseudo $R^2$ | 0.260 | 0.194 |
| Industry FE | Yes | Yes |
| Semi-Annual FE | Yes | Yes |

*Panel C*

| | (1) ln(1+VC_Inv) | (2) ln(1+Later_Inv) |
|---|---|---|
| *Post2020 x Treated Industries* | -0.198 | -0.126 |
| | (0.15) | (0.11) |
| Observations | 36,944 | 36,944 |
| Adjusted $R^2$ | 0.492 | 0.493 |
| Controls | Yes | Yes |
| Industry FE | Yes | Yes |
| Semi-Annual FE | Yes | Yes |

*Panel D*

| | (1) ln(1+Num_Ang) | (2) ln(1+Num_Inv) | (3) ln(1+Amt_Inv) |
|---|---|---|---|
| *Post2020 x Treated Industries x Low COVID Exposure* | 0.359*** | 0.394** | 0.426** |
| | (0.10) | (0.15) | (0.16) |
| Observations | 13,336 | 13,336 | 13,336 |
| Adjusted $R^2$ | 0.672 | 0.670 | 0.247 |
| Controls | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes |

*Panel E*

| | (1) Share_Angel_Backed | (2) Share_Angel_Backed |
|---|---|---|
| *Post2020 x Treated Industries* | 0.074*** | 0.064** |
| | (0.02) | (0.03) |
| Observations | 120,528 | 120,528 |
| Adjusted $R^2$ | 0.659 | 0.693 |
| Controls | No | Yes |
| Industry FE | Yes | Yes |
| Semi-Annual FE | Yes | Yes |

**Table 4:** Impact on Angel Financing Activity & Geographic Distribution

This table presents the results of a differences-in-differences (DiD) analysis estimating the impact of the 2020 SEC regulation change on three measurements of angel financing activity across U.S. states. The dependent variables represent measurements of angel financing activity in state *s* and time *t* as follows: (i) ln(1+Num_Ang) the natural logarithm of one plus the number of angel investors; (ii) ln(1+Num_Inv) the natural logarithm of one plus the number of angel investments; (iii) ln(1+Amt_Inv) the natural logarithm of one plus the amount of angel investments. Post2020 is a binary variable that equals one if period *t* is after 2020, and zero otherwise. High FINRA is a binary variable that equals one if the respective state is in the top median of the number of FINRA-registered individuals in 2020, and zero otherwise. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are double clustered at state and semi-annual level. All regressions include state and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>ln(1+Num_Ang) | (2)<br>ln(1+Num_Ang) | (3)<br>ln(1+Num_Inv) | (4)<br>ln(1+Num_Inv) | (5)<br>ln(1+Amt_Inv) | (6)<br>ln(1+Amt_Inv) |
|---|---|---|---|---|---|---|
| *Post2020 x High FINRA* | 0.261** | 0.451*** | 0.170 | 0.283*** | 0.087 | 0.340** |
| | (0.11) | (0.08) | (0.11) | (0.09) | (0.18) | (0.14) |
| Per Capita Income | | 4.867** | | -0.154 | | 4.748** |
| | | (2.40) | | (2.62) | | (2.29) |
| GDP | | -3.758 | | -0.648 | | -3.034 |
| | | (3.32) | | (3.33) | | (3.19) |
| Population | | 2.101 | | 4.347* | | 5.328 |
| | | (2.51) | | (2.37) | | (3.37) |
| Establishments | | 0.546 | | 0.430 | | 0.390 |
| | | (1.59) | | (1.64) | | (2.39) |
| Political Balance | | -0.114 | | 0.369 | | 0.303 |
| | | (0.78) | | (0.62) | | (1.40) |
| Observations | 12,088 | 12,088 | 12,088 | 12,088 | 12,088 | 12,088 |
| Adjusted $R^2$ | 0.573 | 0.598 | 0.619 | 0.703 | 0.334 | 0.376 |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 5:** Impact on Establishments Entry & Job Creation

This table examines the impact of the SEC's regulatory change on industry-level establishment entry and job creation. Columns (1) and (2) report results for the natural logarithm of one plus the establishment entry rate, calculated as the number of new establishments relative to the average number of establishments at times *t* and *t-1*, multiplied by 100. In columns (3) and (4), ln(1+ NetJobCreationRate) is the natural logarithm of one plus the rate of net job creation measured as the difference between the job creation and job destruction rate from *t* to *t-1*. Post2020 is a binary variable that equals one if period *t* is after 2020, and zero otherwise. Panel A focuses on the financial markets industry as the treated sector, while Panel B expands the treatment group to include financial markets, communications and networking, computer software, and commercial services industries. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the industry and time level. All regressions include industry and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>ln(1+Est_Entry) | (2)<br>ln(1+Est_Entry) | (3)<br>ln(1+NetJobCreationRate) | (4)<br>ln(1+NetJobCreationRate) |
|---|---|---|---|---|
| *Post2020 x Treated Industries* | 0.065*** | 0.043*** | 0.334** | 0.262* |
| | (0.02) | (0.01) | (0.11) | (0.13) |
| GDP | | 0.358 | | 1.283 |
| | | (0.38) | | (0.96) |
| Employment | | -0.111 | | 0.733* |
| | | (0.20) | | (0.35) |
| Establishments | | 0.035** | | 0.033 |
| | | (0.01) | | (0.02) |
| Observations | 19,628 | 19,628 | 19,628 | 19,628 |
| ` | 0.452 | 0.451 | 0.302 | 0.310 |
| Industry FE | Yes | Yes | Yes | Yes |
| Semi-annual FE | Yes | Yes | Yes | Yes |

**Table 6:** Impact on Other Forms of Financing

This table shows the effect on other forms of financing, focusing on small business administration (SBA) lending activity (loan types 504 and 7(a)). In columns (1) and (2), the dependent variable is ln(1+Num_SBA), or the natural logarithm of one plus the number of approved small business loans applied for in state *s* during period *t.* In columns (3) and (4), the dependent variable is ln(1+Amt_SBA), or the natural logarithm of one plus the approved amount of small business loans applied for in state *s* during period *t*. Lastly, in columns (5) and (6), the dependent variable is ln(1+Guar_SBA), or the natural logarithm of one plus the guaranteed amount of small business loans applied for in state *s* during period *t*. Post2020 is a binary variable that equals one if period *t* is after 2020, and zero otherwise. High FINRA is a binary variable that equals one if the respective state is in the top median of the number of FINRA-registered individuals in 2020. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the state level. All regressions include state and annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) ln(1+Num_SBA) | (2) ln(1+Num_SBA) | (3) ln(1+Amt_SBA) | (4) ln(1+Amt_SBA) | (5) ln(1+Guar_SBA) | (6) ln(1+Guar_SBA) |
|---|---|---|---|---|---|---|
| *Post2020 x High FINRA* | -0.103*** | -0.067* | 0.009 | 0.024 | -0.051* | 0.046 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| Per Capita Income | | 1.887 | | 1.367* | | 2.452*** |
| | | (1.60) | | (0.79) | | (0.74) |
| GDP | | -1.156 | | -0.482 | | -1.480*** |
| | | (1.59) | | (1.41) | | (0.41) |
| Population | | -0.550 | | -0.743 | | 1.462** |
| | | (1.13) | | (1.46) | | (0.59) |
| Establishments | | 1.411 | | 0.464 | | -1.715*** |
| | | (0.91) | | (0.67) | | (0.52) |
| Political Balance | | 0.075 | | -0.055 | | 0.059 |
| | | (0.12) | | (0.10) | | (0.07) |
| Observations | 51,847 | 51,847 | 51,847 | 51,847 | 51,847 | 51,847 |
| Adjusted $R^2$ | 0. 484 | 0.532 | 0.418 | 0.430 | 0.526 | 0.604 |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

**Table 7:** Impact on Other Forms of Financing

This table presents the impact of the regulation change on second-lien mortgages. In columns (1) and (2), the dependent variable is ln(1+Num_HMDA), or the natural logarithm of one plus the number of second-lien mortgages applied for in state *s* during period *t*. In columns (3) and (4), the dependent variable is ln(1+Amt_HMDA), or the natural logarithm of one plus the approved amount of second-lien mortgages applied for in state *s* during period *t*. Post2020 is a binary variable that equals one if period *t* is after 2020, and zero otherwise. High FINRA is a binary variable that equals one if the respective state is in the top median of the number of FINRA-registered individuals in 2020. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the state level. All regressions include state and annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) ln(1+Num_HMDA) | (2) ln(1+Num_HMDA) | (3) ln(1+Amt_HMDA) | (4) ln(1+Amt_HMDA) |
|---|---|---|---|---|
| *Post2020 x High FINRA* | -0.114*** | -0.008 | -0.097 | -0.065* |
| | (0.03) | (0.02) | (0.07) | (0.03) |
| Per Capita Income | | -1.793*** | | -2.286* |
| | | (0.61) | | (1.17) |
| GDP | | -0.061 | | 0.759 |
| | | (0.70) | | (1.04) |
| Population | | 7.567*** | | 4.816** |
| | | (0.72) | | (1.85) |
| Establishments | | -0.658** | | 4.126*** |
| | | (0.25) | | (1.07) |
| Political Balance | | -0.139* | | -0.346* |
| | | (0.08) | | (0.19) |
| Observations | 45,067 | 45,067 | 45,067 | 45,067 |
| Adjusted $R^2$ | 0.283 | 0.609 | 0.228 | 0.351 |
| State FE | Yes | Yes | Yes | Yes |
| Annual FE | Yes | Yes | Yes | Yes |

**Table 8:** Impact on Duration & Follow-On

This table shows the impact of new angels' investment on two financing outcomes: round-to-round duration and the likelihood of securing follow-on funding. The variable Fraction New Angels is defined as the fraction of new angel investors to the total number of investors per financing round. In columns (1) and (2), the dependent variable is ln (Duration), or the natural logarithm of the duration between two consecutive financing rounds expressed as number of days. In columns (3) and (4), Follow-On is a binary variable that takes the value one if a company raises a follow-on round. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the company level. In the first (last) two columns, the reported R-squared is the adjusted (pseudo-) R-squared. All regressions include round, company, state, and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>ln(Duration) | (2)<br>ln(Duration) | (3)<br>Follow-On | (4)<br>Follow-On |
|---|---|---|---|---|
| *Fraction New Angels* | -0.108* | -0.110* | 0.783*** | 0.812*** |
| | (0.05) | (0.05) | (0.21) | (0.22) |
| Per Capita Income | | -0.495 | | -0.909 |
| | | (1.56) | | (2.02) |
| GDP | | 1.199 | | 2.554* |
| | | (1.22) | | (1.46) |
| Population | | -3.204 | | -2.401 |
| | | (2.28) | | (2.37) |
| Establishments | | 0.614 | | -4.431*** |
| | | (1.23) | | (1.68) |
| Political Balance | | -0.267 | | 0.386 |
| | | (0.32) | | (0.40) |
| Observations | 137,515 | 137,515 | 231,711 | 231,711 |
| $R^2$ | 0.670 | 0.678 | 0.031 | 0.033 |
| Round FE | Yes | Yes | No | No |
| Company FE | Yes | Yes | No | No |
| State FE | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes |

**Table 9:** Impact on Firm-Level Survival

This table reports the impact of new angel investors on firm-level survival. The variable New Angel is a binary variable that equals one when the investor is an angel investor whose first investment occurred post-2020, and zero otherwise. Fraction New Angels is defined as the fraction of new angel investors to the total number of investors per financing round. No_FollowOn_2yr is a binary variable that equals one when the company does not succeed in raising a follow-on round in the next two years. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the investor level. All regressions include state and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>No_FollowOn_2yr | (2)<br>No_FollowOn_2yr | (3)<br>No_FollowOn_2yr | (4)<br>No_FollowOn_2yr |
|---|---|---|---|---|
| *New Angel* | -0.224*** | -0.237*** | | |
| | (0.06) | (0.06) | | |
| *Fraction New Angels* | | | -0.518** | -0.549*** |
| | | | (0.20) | (0.21) |
| Per Capita Income | | -1.706 | | -1.747 |
| | | (3.75) | | (3.75) |
| GDP | | 1.062 | | 1.018 |
| | | (2.76) | | (2.76) |
| Population | | -2.974 | | -3.042 |
| | | (4.56) | | (4.57) |
| Establishments | | 2.212 | | 2.324 |
| | | (3.44) | | (3.44) |
| Political Balance | | -1.225 | | -1.228 |
| | | (0.85) | | (0.85) |
| Observations | 30,414 | 30,414 | 30,414 | 30,414 |
| Pseudo $R^2$ | 0.046 | 0.047 | 0.046 | 0.047 |
| State FE | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes |

**Table 10:** Impact on Round-Level Valuation

This table summarizes the impact of new angel investors on round-level valuation. Following the methodology in Pham, Turner and Zein (2024), I compute relative valuation for each specific round as the post-money valuation divided by the total amount of equity capital invested in the firm to date. Across all columns, the dependent variable is Relative Valuation. The variable New Angel is a binary variable that equals one when the investor is an angel investor whose first investment occurred post-2020. Fraction New Angels is defined as the fraction of new angel investors to the total number of investors per financing round. All control variables are described in *Appendix A*. Relative Valuation and all continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the company level. All regressions include round, company, and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>Relative Valuation | (2)<br>Relative Valuation | (3)<br>Relative Valuation | (4)<br>Relative Valuation |
|---|---|---|---|---|
| *New Angel* | 0.045** | 0.081** | | |
| | (0.11) | (0.11) | | |
| *Fraction New Angels* | | | 0.139** | 0.199*** |
| | | | (0.17) | (0.17) |
| Per Capita Income | | -2.591 | | -2.536 |
| | | (4.88) | | (4.89) |
| GDP | | 2.745 | | 2.660 |
| | | (2.80) | | (2.80) |
| Population | | -1.048 | | -1.065 |
| | | (2.59) | | (2.60) |
| Establishments | | 1.037 | | 1.079 |
| | | (4.10) | | (4.10) |
| Political Balance | | -1.029 | | -1.015 |
| | | (2.23) | | (2.23) |
| Observations | 46,062 | 46,062 | 46,062 | 46,062 |
| Adjusted $R^2$ | 0.146 | 0.162 | 0.146 | 0.162 |
| Round FE | Yes | Yes | Yes | Yes |
| Company FE | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes |

**Table 11:** Impact on Angel Investment Patterns

This table reports estimates of the likelihood that new angel investors invest in their preferred industry, participate in syndicates, and assume lead investor roles. Preferred Industry is a binary variable that equals one if the industry of the investment is the same as the angel's reported preferred industry, and zero otherwise. Syndication is a binary variable that takes the value one if the investment round involves more than one angel investor. In columns (5) and (6), Lead is a binary variable equal to one if the investor is identified as the lead investor in the round. The variable New Angel is a binary variable that equals one when the investor is an angel investor whose first investment occurred post-2020, and zero otherwise. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the investor level. Regressions include industry, state, and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) Preferred Industry | (2) Preferred Industry | (3) Syndication | (4) Syndication | (5) Lead | (6) Lead |
|---|---|---|---|---|---|---|
| *New Angel* | 0.605*** | 0.610*** | 1.682*** | 2.742*** | -2.219*** | -2.214*** |
| | (0.06) | (0.06) | (0.13) | (0.13) | (0.14) | (0.14) |
| Per Capita Income | | -0.653 | | -0.737 | | -1.551 |
| | | (2.24) | | (1.93) | | (1.63) |
| GDP | | -0.985 | | 1.702 | | 1.582 |
| | | (1.80) | | (1.49) | | (1.41) |
| Population | | 3.616 | | 5.139** | | -1.430 |
| | | (2.45) | | (2.25) | | (1.88) |
| Establishments | | -0.922 | | -0.580 | | 0.989 |
| | | (1.44) | | (1.22) | | (1.00) |
| Political Balance | | -0.803 | | -0.211 | | -0.101 |
| | | (0.53) | | (0.45) | | (0.47) |
| Observations | 55,894 | 55,894 | 55,894 | 55,894 | 47,890 | 47,890 |
| Pseudo $R^2$ | 0.023 | 0.023 | 0.057 | 0.104 | 0.025 | 0.025 |
| Industry FE | No | No | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

**Appendix A:** Variables' Definitions

Table provides the definitions and data sources for the main variables used in this study.

| **Dependent Variables** | **Description** |
|---|---|
| *Num_Ang*<br>ln(1+Num_Ang) | Measures the number of angel investors in an industry or state during a half-year time period. Angel investors are identified by investor type categorized as 'Angel (individual)".<br>*Source:* PitchBook. |
| *Num_Inv*<br>ln(1+Num_Inv) | Accounts for the number of angel investments in an industry or state during a half-year time period. Investments included are labeled as 'angel', 'accelerator / incubator' or 'seed'.<br>*Source:* PitchBook. |
| *Amt_Inv*<br>ln(1+Amt_Inv) | Accounts for the amount of angel investments in an industry or state during a half-year time period. Investments included are labeled as 'angel', 'accelerator / incubator' or 'seed'.<br>*Source:* PitchBook. |
| *VC_Inv*<br>ln(1+VC_Inv) | Defined as the number of investments completed by venture capital investors.<br>*Source*: PitchBook. |
| *Later_Inv*<br>ln(1+Later_Inv) | Defined as the number of late-stage investments realized by investors.<br>*Source*: PitchBook. |
| *Duration*<br>ln(Duration) | Computes the number of days between two consecutive financing rounds.<br>*Source*: PitchBook. |
| *Follow-On* | Binary indicator equal to one if a company raises a follow-on round.<br>*Source*: PitchBook. |
| *Est_Entry*<br>ln(1+Est_Entry) | Computes the number of new establishments relative to the average number of establishments at times *t* and *t-1*, multiplied by 100.<br>*Source*: Business Dynamics Statistics (BDS). |
| *Net Job Creation Rate*<br>ln(1+NetJobCreationRate) | Measures the difference between the job creation and job destruction rate from *t* to *t-1*. |

| | |
|---|---|
| | *Source*: Business Dynamics Statistics (BDS). |
| *Num_SBA*<br>ln(1+Num_SBA) | Represents the number of approved small business loans applied during a specific period. Only loan types 504 and 7(a) are included.<br>*Source*: Small Business Administration (SBA). |
| *Amt_SBA*<br>ln(1+Amt_SBA) | Accounts for the approved amount of small business loans applied for. Only loan types 504 and 7(a) are included.<br>*Source*: Small Business Administration (SBA). |
| *Guar_SBA*<br>ln(1+Guar_SBA) | Accounts for the guaranteed amount of small business loans applied for. Only loan types 504 and 7(a) are included.<br>*Source*: Small Business Administration (SBA). |
| *Num_HMDA*<br>ln(1+Num_HMDA) | Represents the number of second-lien mortgages applied for during a specific time period.<br>*Source*: Home Mortgage Disclosure Act (HMDA). |
| *Amt_HMDA*<br>ln(1+Amt_HMDA) | Accounts for the amount of second-lien mortgages applied for.<br>*Source*: Home Mortgage Disclosure Act (HMDA). |
| *Preferred Industry* | Binary indicator equal to one if the investment industry coincides with the investor's self-reported preferred industry.<br>*Source*: PitchBook. |
| *Syndication* | Binary variable that takes the value one if the investment round involves more than one angel investor.<br>*Source*: PitchBook. |
| *Lead* | Binary variable equal to one if the investor is identified as the lead investor in the round.<br>*Source*: PitchBook. |
| *No_FollowOn_2yr* | Binary variable that equals one when the company does not succeed in raising a follow-on round in the next two years.<br>*Source*: PitchBook. |
| *Relative Valuation* | Equals post-money valuation divided by the total amount of equity capital invested in the firm to date (Pham, Turner, & Zein, 2024).<br>*Source*: PitchBook. |

| | |
|---|---|
| *Female* | Binary indicator equal to one if the gender of the investor is female.<br>*Source*: PitchBook. |
| *Low COVID Exposure* | Binary indicator equal to one for industries with below-median exposure to pandemic-related disruptions. Based on the industry-level COVID-19 resilience proxies developed by Koren and Peto (2020).<br>*Source*: Koren and Peto (2020). |

| **Independent Variables** | **Description** |
|---|---|
| *Post2020* | Post 2020 is a binary variable equal to one if the year of investment is after 2020, and zero otherwise.<br>*Source:* PitchBook. |
| *High FINRA* | Binary variable that equals one if the respective state is in the top median of the number of FINRA-registered individuals in 2020, and zero otherwise.<br>*Source:* Financial Industry Regulatory Authority (FINRA). |
| *Financial Markets* | Binary variable equal to one if the investment industry is equal to 'financial markets/institutions.<br>*Source*: PitchBook. |
| *New Angel* | Individual investor identified as 'angel (individual)' who has not made any investments prior to the regulation change. Also holds a professional certification or is a knowledgeable employee.<br>*Source*: PitchBook, Crunchbase, LinkedIn, FINRA. |
| *Fraction New Angels* | Number of new angels divided by the total number of investors involved in a start-up's fundraising round.<br>*Source*: PitchBook. |
| *Share Angel Backed* | Proportion of form D filing companies that are angel-backed.<br>*Source*: Audit Analytics, PitchBook. |
| *Non_Coastal* | Binary variable that equals one if the state is neither on the East nor on the West coasts of the United States.<br>*Source*: PitchBook. |
| *Per Capita Income* | Defined as total personal income divided by mid-year population.<br>*Source:* U.S. Bureau of Economic Analysis (BEA). |

| | |
|---|---|
| *Gross Domestic Product (GDP)* | Comprehensive measure of U.S. economic activity, calculated as the total value of goods and services produced.<br>*Source:* U.S. Bureau of Economic Analysis (BEA). |
| *Employment* | Accounts for the number of full-time or part-time employees in an industry.<br>*Source:* U.S. Bureau of Economic Analysis (BEA), U.S. Bureau of Labor Statistics (BLS). |
| *Population* | Defined as the total number of individuals at the state level.<br>*Source:* U.S. Census Bureau. |
| *Establishments* | Measures the total number of establishments at industry or state-level.<br>*Source:* U.S. Business Dynamics Statistics (BDS), U.S. Bureau of Economic Analysis (BEA). |
| *Political Balance* | The percentage of a startup company's state of location representatives in the U.S. House of Representatives who belong to the Democratic Party, in a given year.<br>*Source:* U.S. House of Representative's website. |

## Appendix B

**Table B1:** Impact on Angel Financing Activity in Treated Industries' Subgroups

This table shows the results of a differences-in-differences (DiD) specification similar to that described in Table 2. The dependent variables $Y_{v,t}$ represent measurements of angel financing activity in industry subgroup *v* and time *t* as follows: (i) ln(1+Num_Ang) the natural logarithm of one plus the number of angel investors; (ii) ln(1+Num_Inv) the natural logarithm of one plus the number of angel investments; (iii) ln(1+Amt_Inv) the natural logarithm of one plus the amount of angel investments. *Post2020* is a binary variable that equals one if period *t* is after 2020, and zero otherwise. *Treated Subgroups* represent the industry subgroups of the five treated industries in Table 2. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at both industry and semi-annual level. All regressions include industry code and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>ln(1+Num_Ang) | (2)<br>ln(1+Num_Ang) | (3)<br>ln(1+Num_Inv) | (4)<br>ln(1+Num_Inv) | (5)<br>ln(1+Amt_Inv) | (6)<br>ln(1+Amt_Inv) |
|---|---|---|---|---|---|---|
| *Post2020 x Treated Subgroups* | 0.426*** | 0.478*** | 0.446*** | 0.492*** | 0.545*** | 0.574*** |
| | (0.13) | (0.10) | (0.14) | (0.12) | (0.17) | (0.15) |
| GDP | | 2.253 | | 4.030** | | 4.946* |
| | | (1.47) | | (1.64) | | (2.76) |
| Employment | | -0.306 | | -0.359 | | -0.138 |
| | | (0.52) | | (0.55) | | (0.80) |
| Establishments | | 0.479 | | 0.598 | | -0.663 |
| | | (0.94) | | (0.91) | | (1.60) |
| Observations | 13,336 | 13,336 | 13,336 | 13,336 | 13,336 | 13,336 |
| Adjusted $R^2$ | 0.654 | 0.693 | 0.663 | 0.698 | 0.654 | 0.665 |
| Industry Code FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Semi-annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

**Table B2:** Impact on Angel Financing in Non-Coastal States

This table presents the results of a differences-in-differences (DiD) analysis estimating the impact of the 2020 SEC regulation change on three measurements of angel financing activity across non-coastal U.S. states. The dependent variables represent measurements of angel financing activity in state *s* and time *t* as follows: (i) ln(1+Num_Ang) the natural logarithm of one plus the number of angel investors; (ii) ln(1+Num_Inv) the natural logarithm of one plus the number of angel investments; (iii) ln(1+Amt_Inv) the natural logarithm of one plus the amount of angel investments. *Post2020* is a binary variable that equals one if period *t* is after 2020, and zero otherwise. *Non_Coastal* represents a binary variable that equals one if the state is neither on the East nor on the West coasts of the United States. All control variables are described in *Appendix A*. All continuous variables are winsorized at the 1% level in both tails. Standard errors are double clustered at state and semi-annual level. All regressions include state and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) Ln(1+Num_Ang) | (2) Ln(1+Num_Ang) | (3) Ln(1+Num_Inv) | (4) Ln(1+Num_Inv) | (5) Ln(1+Amount_Inv) | (6) Ln(1+Amount_Inv) |
|---|---|---|---|---|---|---|
| *Post2020 x Non_Coastal* | -0.231** | -0.279* | -0.121 | -0.157 | 0.011 | -0.109 |
| | (0.10) | (0.14) | (0.10) | (0.15) | (0.15) | (0.19) |
| Per Capita Income | | 2.347 | | -1.760 | | 2.728 |
| | | (2.67) | | (3.15) | | (2.53) |
| GDP | | -0.346 | | 1.529 | | -0.285 |
| | | (3.55) | | (3.62) | | (3.90) |
| Population | | -0.647 | | 2.510 | | 2.651 |
| | | (2.68) | | (2.74) | | (3.92) |
| Establishments | | 1.067 | | 0.786 | | 0.940 |
| | | (1.92) | | (2.03) | | (2.51) |
| Political Balance | | -0.118 | | 0.360 | | 0.265 |
| | | (0.85) | | (0.61) | | (1.44) |
| Observations | 12,088 | 12,088 | 12,088 | 12,088 | 12,088 | 12,088 |
| Adjusted $R^2$ | 0.561 | 0.574 | 0.688 | 0.692 | 0.331 | 0.363 |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Semi-Annual FE | Yes | Yes | Yes | Yes | Yes | Yes |

**Table B3:** Impact on Investor Pool Diversity

This table shows the impact of the SEC regulation change on investor pool diversity. *Female* is a binary variable that equals one if the gender of the investor is female, and zero otherwise. *Post2020* is a binary variable that equals one if the deal year is post 2020, and zero otherwise. Treated Industries includes the financial markets, communications and networking, computer software, and commercial services industries. All control variables are described in *Appendix A.* All continuous variables are winsorized at the 1% level in both tails. Standard errors are clustered at the company level. All regressions include industry, state, and semi-annual fixed effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1)<br>Female | (2)<br>Female |
|---|---|---|
| *Post2020 x Treated Industries* | 0.281 | 0.345 |
| | (0.20) | (0.22) |
| GDP | | -5.684 |
| | | (5.00) |
| Employment | | -9.405 |
| | | (6.24) |
| Establishments | | 7.408* |
| | | (3.97) |
| Observations | 15,684 | 15,684 |
| Pseudo $R^2$ | 0.065 | 0.071 |
| Industry FE | Yes | Yes |
| Semi-Annual FE | Yes | Yes |