Tax Incentives and Venture Capital Risk

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Abstract

Can tax incentives prompt investors to back riskier ventures? We answer this question under a conceptual framework where venture capitalists combine outside funding with incentive-based compensation and empirically examine a policy that eliminated capital gains taxes on certain startup investments. Using a triple-difference design that exploits industry eligibility rules, investment entry years, and holding period requirements, we analyze data from 186 thousand investor–firm pairings over two decades. When tax benefits apply, venture capitalists shift toward riskier bets by targeting earlier-stage opportunities: their deals are 60% more likely to occur during the product beta stage and twice as likely to occur in stealth mode or at the pre-clinical trial stage; in turn, the recipient portfolio companies are 76% more likely to go out of business and 165% more likely to face funding gaps exceeding five years. This increased risk-taking generates salient outcomes: tax-advantaged investments are 27% more likely to achieve unicorn status (valuation above $1 billion), with venture capitalists becoming twice as likely to exit through private equity buyouts, while 47% less likely to pursue strategic sales. Using detailed data on board voting rights, executive turnover, and exit multiples, we show that tax effects operate through risk-taking rather than enhanced monitoring or value-added. Our results show that tax policy can shift capital toward more experimental ventures, with outcomes shaped by investor organizational structure and incentives.

KEYWORDS: Tax Policy, Venture Capital, Risk-Taking, Financial Intermediation
JEL CLASSIFICATION: G24, G23, H25, O31

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1 Introduction

The allocation of capital to entrepreneurial ventures is central to innovation and economic growth. Young firms account for nearly all net job creation in the U.S. economy and drive over 50% of productivity growth through creative destruction (Haltiwanger et al. 2013; Akcigit and Kerr 2018). Financing these ventures presents challenges due to inherent market frictions. Information asymmetries, moral hazard, and incomplete contracting create barriers to efficient risk-sharing between entrepreneurs and investors (Holmstrom and Tirole 1997). These frictions can lead to systematic underinvestment in high-potential startups, particularly those pursuing new technologies or business models where uncertainty is highest.

Market frictions create a fundamental tension in the design of tax policies meant to promote entrepreneurship. On one hand, specialized financial intermediaries like venture capitalists help overcome market failures by combining risk capital with intensive screening and monitoring. If tax benefits encourage these intermediaries to fund more high-potential ventures—particularly at early stages where frictions are most severe—such policies could help address the underinvestment problem. On the other hand, providing tax benefits to investors who already have high risk tolerance and sophisticated investment capabilities might simply increase returns to their existing strategies without improving capital allocation to the marginal venture. The value of tax benefits in entrepreneurial finance depends crucially on whether they help overcome market failures or merely create opportunities for tax arbitrage by the most sophisticated investors.

We study whether tax policy can improve capital allocation in entrepreneurial markets by examining how different types of investors respond to targeted tax benefits. Our analysis addresses three fundamental questions. First, how does the response to tax benefits vary across investor types with different organizational structures and incentive schemes—from venture capitalists who combine outside capital with incentive-based compensation, to angels investing personal wealth, to strategic corporate investors? Second, can tax benefits affect not just the level of investment but also investors' willingness to back earlier-stage and riskier ventures? Third, through what mechanisms do these policies operate? Do they affect project selection, or do they also change how investors engage with—and support—their portfolio companies?

We study these questions under a conceptual framework where venture capitalists combine outside capital with incentive-based compensation through carried interest. This organizational structure creates option-like payoffs that increase in value with return volatility. Our framework predicts that venture capitalists should be uniquely responsive to tax benefits compared to other investors because they can share risk while maintaining convex return profiles. The model generates testable predictions about both selection and treatment effects: venture capitalists should increase risk-taking in project selection when their investments qualify for tax benefits, but we should observe limited changes in value-creation activities like monitoring since both the costs and benefits of these activities scale proportionally with tax rates.

We test these predictions empirically by exploiting the 2009–2010 enhancement of the Qualified Small Business Stock (QSBS) program, which created significant discontinuities in tax benefits for certain startup investments. The program provides preferential tax treatment for investments in qualifying small businesses, subject to a mandatory five-year holding period requirement. Qualification is restricted to newly issued stock in C-corporations with gross assets below $50 million operating in eligible sectors like technology and manufacturing, but excluding service-based industries. These requirements effectively concentrate benefits in capital-intensive sectors where financing frictions are often most severe.

The American Recovery and Reinvestment Act of 2009 marked the first major change in the QSBS program's tax treatment, creating a substantial wedge in after-tax returns between qualified and non-qualified investments. Prior to 2009, QSBS provided a 50% exemption on capital gains but applied this to an outdated tax threshold from 1993, resulting in a fixed 14% effective tax rate regardless of current capital gains rates. As regular capital gains rates declined—falling to 15% by 2003—the net tax benefit of QSBS qualification became essentially muted, reaching just 1 percentage point. The 2009 reform fundamentally altered this calculation by switching to a percentage-based exclusion: investors would now pay tax on only 25% of their gains at the *prevailing* capital gains rate. With the federal long-term capital gains rate at 15%, qualifying investments faced an effective tax rate of just 3.75% (paying 15% tax on 25% of gains), generating an 11.25 percentage point tax benefit. The Small Business Jobs Act of 2010 further expanded these benefits by fully eliminating capital gains taxes on qualifying investments.

Our analysis leverages comprehensive data from PitchBook that tracks the near-universe of U.S. venture capital, angel, and corporate investments in startups. Given the program's five-year holding requirement, we construct our sample by following investor entries between 2004 and 2017, allowing us to track potential tax benefit qualification through 2022. Using detailed investment-level data, we track 52.3 thousand unique investors and 53.7 thousand unique portfolio companies, observing each investor-firm relationship from initial investment through exit. Consistent with QSBS eligibility criteria, we focus on investments in C-corporations with funding rounds below $50 million and track key outcomes including deal characteristics, risk-taking behavior, exit patterns, and monitoring intensity. The extensive cross-sectional variation in our data is notable: the average investor makes 3.5 different investments (with venture capitalists averaging 8.9), while the average firm receives funding from 3.5 distinct investors.

We begin by examining how tax benefits affect ex-ante investment decisions. Using difference-in-differences analysis that exploits variation in sector eligibility and investment timing around the 2009 reform, we find that venture capitalists systematically select ventures with higher fundamental risk. When their investments qualify for tax benefits, venture capital investments in eligible sectors become 60% more likely to occur during product beta stage and twice as likely during stealth mode. This risk-taking extends to biotech investments, where we can measure uncertainty through clinical trial stages: venture capitalists double their share of pre-clinical trial investments (the earliest and riskiest stage of drug development) while showing no change in FDA approval-stage investments (the safest stage), revealing a shift toward more experimental ventures.

For our main analyses, we exploit three key features of the QSBS program: (1) explicit industry eligibility criteria that exclude service-based sectors, creating well-defined treatment and control groups; (2) a sharp policy change in 2009 that significantly increased tax benefits; and (3) the mandatory five-year holding period requirement before investors can claim the tax exemption. These institutional features allow us to implement a triple-difference research design that compares changes in investment behavior across eligible *versus* non-eligible sectors, pre- *versus* post-reform investments, and investments held more *versus* less than five years.

Our empirical strategy includes several features designed to isolate the causal effect of tax benefits. The inclusion of investor $\times$ firm fixed effects ensures that we identify responses from

within-pair variation in holding periods rather than changes in the matching between investors and firms. This addresses potential selection concerns about investors choosing different types of firms after the reform. Year fixed effects control for aggregate changes in entrepreneurial finance markets, while entry-year fixed effects account for vintage-specific shocks that might affect all investments initiated in a particular year. Holding-period fixed effects absorb any mechanical relationship between investment duration and outcomes that is common across investor-firm pairs. We cluster standard errors at the investor level to account for correlation in the residuals across different investments made by the same investor.

Our analysis yields several important new results. First, we find that tax benefits significantly affect *both* the level and the composition of venture capital investment. When investments satisfy both QSBS requirements—being in an eligible sector and reaching the five-year holding period after the 2009 tax reform—venture capitalists increase deal sizes by 112% (+$54MM relative to a mean of $48MM) and attract 30% more co-investors per round (+1.6 relative to a mean 5.3). This response to tax qualification is unique to venture capitalists: we find *no* significant changes in investment patterns for angel investors or corporate investors, consistent with tax benefits working most effectively through intermediaries who combine outside capital with incentive-based compensation.

The shift in venture capitalists' investment selection also manifests in ultimate investment outcomes. When their investments qualify for tax benefits, venture capital investments in eligible sectors experience a 76% higher rate of complete business failures relative to their baseline failure rate. The effects extend beyond outright failures: tax-advantaged investments are 107% more likely to experience extended periods (five or more years) without raising new funding, a common predictor of distress in venture capital markets where successful firms typically raise capital every 12–18 months. These results confirm that the increased risk-taking we observe in initial investment selection translates into realized investment outcomes.

The increased risk-taking is accompanied by significant changes in exit patterns. Venture capitalists become 114% more likely to exit through private equity buyouts but 47% less likely to pursue quick strategic sales when investments qualify for tax benefits. This shift in exit timing suggests that the five-year holding requirement creates incentives for more patient investment

strategies. We also find a significant decline in IPO exits, with venture capital investments seeing a 117% decrease in public listings relative to their baseline IPO rate. Since PE buyouts typically occur later in a company's lifecycle while IPOs and strategic acquisitions often represent earlier exit opportunities, these patterns indicate that tax benefits discourage quick exits in favor of longer-term value creation strategies.

The impact on firm valuations is substantial and precisely timed with tax benefit eligibility. Tax-advantaged investments experience a 6.1% increase in valuations on average, with the effect more pronounced among venture capitalists and strengthening to 10.4% when examining exited investments. Dynamic analysis reveals that valuations of venture capital investments in eligible sectors begin diverging upward exactly when tax benefits become available, with no differential trends prior to the five-year threshold. This pattern persists in subsequent investment years, reflecting that firm exits typically involve multiple investors who may complete their individual five-year holding periods at different times. The effect on extreme outcomes is particularly striking: venture capital investments become 26.7% more likely to achieve unicorn status (valuations exceeding $1 billion), suggesting that tax benefits encourage venture capitalists to pursue more high-risk, high-reward investment strategies.

These valuation effects exhibit systematic heterogeneity based on tax exposure and investor characteristics. The impact varies sharply with state-level tax rates: venture capitalists in high-tax states show a baseline increase of $76.554 million in valuations when investments qualify for tax benefits, while those in low-tax states see this effect almost completely reversed (quadruple interaction coefficient of −$66.321 million). This pattern makes economic sense since most states conform with federal QSBS treatment—investors in high-tax states receive substantially larger total benefits through combined federal and state exemptions. Similarly revealing patterns emerge when examining investor quality. Top 50 venture capital firms, ranked by historical exit performance, show a much more modest increase in failure rates (quadruple interaction coefficient of −0.012 largely offsets the 0.014 baseline effect). This heterogeneity suggests that while top-tier venture capitalists largely maintain their selective investment approach, tax benefits enable lower-tier firms to compete more aggressively by pursuing riskier ventures.

Finally, we examine whether tax benefits affect venture capitalists' monitoring intensity

and value creation beyond financing. Using detailed data from each financing round in PitchBook, we track whether investors receive formal board voting rights, which provide them direct oversight and input into major corporate decisions. This board-level data reveals no evidence that tax benefits change how venture capitalists engage with portfolio companies: the triple-difference coefficient for board voting rights is small and statistically insignificant, representing only a 4.5% increase relative to the mean board voting rights rate of 0.4.

We complement this board-level analysis with detailed data on management changes using PitchBook's individual-level employment records. These records track executive appointments and departures over time, allowing us to identify both CEO transitions and broader changes in the senior executive team. We find no significant changes in either CEO turnover or executive team turnover when investments qualify for tax benefits. The absence of effects on these governance measures—which represent perhaps the most significant oversight actions investors can take—suggests that tax benefits do not alter venture capitalists' post-investment monitoring approach.

Analysis of exit multiples provides further evidence on value creation. Measuring returns as the ratio of exit value to total capital raised, we find that while the average exit multiple increases when investments qualify for tax benefits (1.3% increase), this effect is *not* statistically significant. Dynamic analysis reveals that exit multiples show modest and insignificant effects around the five-year holding threshold, with similar effects on the likelihood of achieving various multiple thresholds (5×, 10×, or 20× returns). Together, these results suggest that tax benefits operate primarily by changing venture capitalists' risk-taking behavior in project selection rather than by altering their governance or value-added activities.

Collectively, our findings provide novel evidence on how tax policy affects capital allocation in entrepreneurial finance markets. We show that tax benefits have important effects on both the type of investors who provide risk capital and how they deploy it. The stronger response among venture capitalists, particularly in high-tax states and among those with better track records, suggests that tax benefits work most effectively when channeled through sophisticated intermediaries with strong incentive structures. The concentration of effects in risk-taking behavior, evidenced by increased investment in pre-revenue firms and greater tolerance for failure, indicates that tax benefits help overcome financing frictions by encouraging venture capitalists to fund

marginally riskier ventures that might otherwise go unfunded. These results have implications for ongoing policy debates about the design of tax incentives for entrepreneurial investment, particularly as the fiscal cost of programs like QSBS continues to grow.

We contribute to two main strands of literature. First, we build on research examining how tax policy affects entrepreneurial activity and investment. Early theoretical and empirical work shows how personal and corporate tax rates influence entrepreneurial entry decisions and risk-taking behavior (Cullen and Gordon 2007; Gentry and Hubbard 2000; Bruce 2002). Cross-country and regional analyses document that corporate tax changes affect aggregate business formation and investment allocation (Djankov et al. 2010; Giroud and Rauh 2019). Building on Poterba (1989)'s framework highlighting supply-side and demand-side channels in venture capital markets, recent studies examine policies targeting entrepreneurial investment. Edwards and Todtenhaupt (2020) find that the QSBS reform led to larger funding rounds for firms that had already raised venture capital; the authors do not consider whether the reform affected investor selection or risk-taking. Relatedly, Chen and Farre-Mensa (2023) document that the reform increased aggregate firm births by 12% in eligible sectors, but their word does not speak to changes in investor behavior or investment outcomes since they only track entry decisions. Dimitrova and Eswar (2023) use staggered state tax changes to show that higher capital gains taxes reduce both VC-backed firms' innovation and VCs' investment and support activities; the authors do not study how organizational structure and incentives mediate these effects. We push this literature forward by revealing the crucial role of investor organizational structure. Tax benefits work primarily through sophisticated financial intermediaries like venture capitalists, who uniquely combine risk-sharing capabilities with convex payoff structures through carried interest.

Second, we contribute to the literature on financial intermediation and tax policy. Prior work shows how intermediaries arise to bridge beliefs between optimists and pessimists (Coval and Thakor 2005), build reputation through repeated interactions (Chemmanur and Fulghieri 1994), and coexist with other intermediary types due to different funding costs (Donaldson et al. 2021). Our analysis shows how financial intermediary type shapes the transmission of tax policy. We find that venture capital partnerships uniquely magnify these incentives through their portfolio decisions and monitoring intensity, while other intermediaries like angel investors show no

response. This selective response suggests that organizational structure mediates how tax policy affects capital allocation, even in markets dominated by sophisticated investors.

The remainder of the paper is organized as follows. Section 2 develops our conceptual framework, and Section 3 provides institutional details on the Qualified Small Business Stock program. Section 4 describes the data, sample construction, and variable definitions, and Section 5 outlines our empirical strategy. Section 6 examines initial investment selection, Section 7 presents our main investment outcomes. Section Section 8 explores heterogeneity in tax benefit effects, and Section 9 investigates the sources of value creation. Finally, Section 10 concludes.

2 Conceptual Framework

Building on Poterba (1989), we develop a framework that explains why tax benefits have heterogeneous effects across investor types in entrepreneurial finance markets. While prior work focused primarily on the supply of venture capital funds, our framework emphasizes the interaction between tax benefits and investor incentive structures. The key insight is that venture capitalists, who combine outside capital with incentive-based compensation, should be particularly responsive to tax benefits compared to other investors. By modeling differences in capital sources and compensation structures across investor types, our framework helps explain why tax benefits affect not only the level of investment but also risk-taking behavior and investment outcomes.

2.1 Setup

Consider an investor evaluating a startup investment opportunity. The project requires initial capital I_0 at $t = 0$ and potentially follow-on investment I_1 at $t = 1$. Project quality $\theta \in [0,1]$ is uncertain at the time of investment, following distribution $G(\theta)$ with density $g(\theta)$. Investors observe only a noisy signal $s = \theta + \epsilon$ about quality, where $\epsilon \sim N(0, \sigma_\epsilon^2)$.

The project's final payoff depends on both underlying quality and total investment:

$$R = \theta f(I) + \eta \tag{1}$$

where $f(I)$ is concave ($f'(I) > 0$, $f''(I) < 0$), reflecting diminishing marginal returns to investment—a standard feature in entrepreneurial finance where initial capital is crucial but additional funding faces decreasing productivity. The term $\eta \sim N(0, \sigma_\eta^2)$ represents uninsurable risk that can be diversified by investors but not eliminated, creating a fundamental risk-return tradeoff in project selection. The investor faces a combined federal and state capital gains tax rate $\tau = \tau_f + \tau_s$. Under the tax benefit program, this becomes $\tau_b = (1-\phi_f)\tau_f + (1-\phi_s)\tau_s$, where ϕ_f and ϕ_s represent federal and state exemption levels.

2.2 Investor Types and Incentives

Investor differ in their capital sources and incentive structures. Venture capitalists maximize:

$$\Pi_{VC}(\theta) = \alpha I + (1-\tau_b)\beta E_\eta[\max(R - I - h, 0)] - I \tag{2}$$

where $\Pi_{VC}(\theta)$ is the VC's expected payoff from investing in a project of quality θ, α is the management fee rate on committed capital I, τ_b is the effective tax rate under the tax benefit program, β is the carried interest rate, R is the project's final payoff, h is the hurdle rate that must be exceeded before earning carry, and $E_\eta[\cdot]$ denotes expectation over the distribution of risk η. This structure creates option-like payoffs that increase in value with return volatility.

Corporate investors, in contrast, maximize:

$$\Pi_{Corp}(\theta) = (1-\tau_c)E_\eta[\max(R - I, 0)] + \gamma S(R, \theta) - I \tag{3}$$

where τ_c is the corporate tax rate and $S(R, \theta)$ represents strategic value (e.g., access to new technologies, market intelligence, or customers) that corporations derive beyond pure financial returns, with γ representing the weight they place on these strategic benefits. Corporate investors might be therefore less sensitive to tax benefits than venture capitalists—their investment decisions are driven by a broader set of objectives that extend beyond maximizing after-tax returns.

Angel investors, who invest personal capital, maximize:

$$\Pi_{Angel}(\theta) = (1-\tau_b)E_\eta[\max(R-I,0)] + \lambda U(R,\theta) - I - \rho(\sigma_\theta^2) \tag{4}$$

where $U(R,\theta)$ represents non-pecuniary benefits (e.g., mentoring opportunities, community involvement, personal interest in the technology) weighted by λ, and $\rho(\sigma_\theta^2)$ captures the direct cost of bearing undiversified risk since angels invest their personal wealth. Unlike VCs who can share risk with limited partners, angels face more concentrated exposure, making them more sensitive to the project's risk σ_θ^2. Therefore, despite facing the same tax benefits as VCs, angels might be less responsive to these incentives—they face higher personal costs of risk-taking and derive utility from non-financial aspects of early-stage investing.

2.3 Investment Decisions and Risk-Taking

For VCs, the optimal investment threshold θ_{VC}^* satisfies:

$$\alpha I + (1-\tau_b)\beta \int_I^\infty (R-I-h) f(R|\theta_{VC}^*) dR = I \tag{5}$$

The left side of this equation represents the VC's expected benefits from investment. The first term, αI, is the management fee earned regardless of performance. The integral term captures the expected carried interest on successful investments. Within this term, $R-I-h$ represents the investment profit above the hurdle rate, multiplied by the probability density of returns $f(R|\theta_{VC}^*)$ for a project at the minimum acceptable quality. By integrating from I to infinity, we sum over all possible positive outcomes, with $(1-\tau_b)\beta$ representing the VC's after-tax share of these profits. The right side, I, represents the cost of investment. At the threshold θ_{VC}^*, the VC is indifferent between investing and not investing.

The tax benefit affects investment through two key channels. First, it directly increases after-tax returns by reducing τ_b. Second, it creates an asymmetric payoff structure since gains receive preferential treatment while losses remain fully deductible.

2.4 Value Creation versus Risk-Taking

Investors can create value through monitoring intensity m, which affects both expected returns and risk:

$$R = \theta f(I, m) + \sigma(m)\eta \tag{6}$$

Project returns depend on two monitoring channels: the production function $f(I, m)$ captures how monitoring directly affects expected returns through value-added activities like strategic guidance and network access, while $\sigma(m)$ represents how monitoring reduces return volatility through better governance and risk management. Monitoring increases expected returns ($\frac{\partial f}{\partial m} > 0$) and reduces risk ($\frac{\partial \sigma}{\partial m} < 0$), but requires costly effort captured by a convex cost function $c(m)$. The optimal monitoring intensity m^* satisfies:

$$(1-\tau_b)\beta\left[\frac{\partial f}{\partial m} - \frac{\partial \sigma}{\partial m} E[\eta|\eta > -\frac{R-I-h}{\sigma}]\right] = c'(m^*) \tag{7}$$

This condition equates the marginal benefit of monitoring (left side) with its marginal cost $c'(m^*)$. Since both the benefits and costs of monitoring scale proportionally with the tax rate $(1-\tau_b)$, optimal monitoring remains unchanged with tax benefits. This suggests tax benefits operate primarily by altering the risk-return tradeoff in project selection rather than by changing value creation activities. This leads to more extreme outcomes, captured by:

$$P(|R - E[R]| > k) = \int_{-\infty}^{E[R]-k} f(R|\theta, m)dR + \int_{E[R]+k}^{\infty} f(R|\theta, m)dR \tag{8}$$

where the first integral represents the probability of significantly negative returns and the second integral captures the probability of significantly positive returns, with threshold k defining what constitutes an extreme outcome. As VCs lower their quality threshold in response to tax benefits, both probabilities increase, consistent with more failures but also more large successes.

2.5 Testable Predictions

The model generates four predictions about how tax benefits affect VC investment behavior:

Prediction 1: Tax benefits increase risk-taking in venture investment selection

Tax benefits create asymmetric payoffs by providing preferential treatment of gains while maintaining full deductibility of losses. For venture capitalists, who already have convex payoff structures through carried interest, this asymmetry is particularly powerful. When their effective tax rate on gains decreases, they should be willing to accept higher risk projects, leading to:

$$\frac{\partial Var(R|\text{Investment})}{\partial \tau_b} < 0 \tag{9}$$

Prediction 2: Venture capitalists exhibit the strongest response to tax benefits

The effect of tax benefits depends critically on investors' ability to share risk and capture upside returns. Venture capitalists combine two unique features that maximize their response to tax benefits: they invest other people's money (allowing risk-sharing) and earn carried interest (providing convex payoffs). Therefore:

$$\left|\frac{\partial \theta^*_{VC}}{\partial \tau_b}\right| > \max\left\{\left|\frac{\partial \theta^*_{Corp}}{\partial \tau_b}\right|, \left|\frac{\partial \theta^*_{Angel}}{\partial \tau_b}\right|\right\} \tag{10}$$

Prediction 3: Tax-based investment effects operate through risk-taking rather than value creation

Tax benefits affect investment decisions by changing risk-taking incentives rather than value-creation activities. Since both the benefits and costs of monitoring scale proportionally with the tax rate, optimal monitoring intensity remains unchanged. However, the threshold for accepting risky projects shifts:

$$\frac{\partial m^*}{\partial \tau_b} = 0 \quad \text{but} \quad \frac{\partial \theta^*}{\partial \tau_b} > 0 \tag{11}$$

3 Institutional Background

3.1 Overview of Qualified Small Business Stock (QSBS)

The Qualified Small Business Stock (QSBS) program represents a significant tax policy initiative designed to stimulate investment in small businesses through capital gains tax exemptions. Ini-

tially established in 1993, the program has evolved substantially, with its fiscal impact reaching $1.8 billion in foregone federal tax revenue as of 2023, and projections indicating $19.6 billion in real terms between 2024 and 2033.

3.2 Company Eligibility Requirements

For a company's stock to qualify as QSBS under Section 1202 of the Internal Revenue Code, the issuing corporation must satisfy several criteria (IRS 1993). The entity must be a domestic C-corporation at the time of stock issuance and throughout the holding period. The corporation's gross assets, defined as cash plus the adjusted bases of other property, cannot exceed $50 million at any point before and immediately after stock issuance. This asset test refers to gross assets rather than firm valuation—for instance, Lyft maintained QSBS eligibility during its Series B round despite a valuation substantially above $50 million (Viswanathan 2020).

The corporation must maintain at least 80% of assets in qualified business sectors throughout the shareholder's holding period. The program explicitly excludes several major industries, such as professional services, financial services, hospitality businesses, farming, natural resource extraction, and businesses where the principal asset is employee reputation or skill. These restrictions effectively concentrate benefits in technology and other capital-intensive enterprises that typically require substantial investment for growth. Table IA2 provides a comprehensive list of sectors not eligible for the exemption.

3.3 Shareholder Eligibility Requirements

Shareholder eligibility centers on four key dimensions that determine tax benefit qualification. First, investors must acquire stock at original issuance directly from the corporation in exchange for money, property (excluding stock), or services—not through secondary transactions. Second, shareholders face a mandatory five-year holding period before qualifying for tax benefits.[1] Third, the maximum exclusion per issuing corporation is bounded by the greater of $10 million or ten

[1]The holding period begins: at exercise (not grant) for stock options; at issuance for restricted stock awards (RSAs) with 83(b) election (at vesting without); and at conversion for convertible securities (e.g., SAFEs).

times the initial investment basis. Fourth, while tax benefits are generally non-transferable, certain exceptions exist for gifts, inheritance, and partnership transfers where the original holder maintains interest.[2]

3.4 Evolution of Tax Benefits

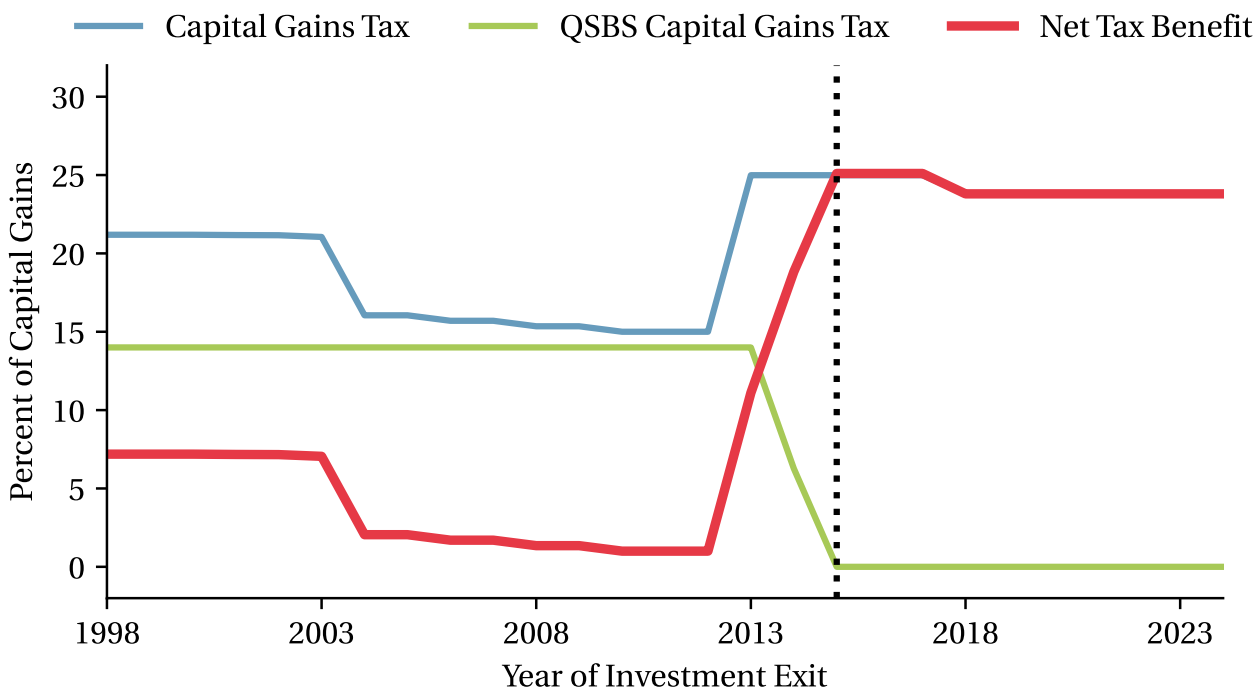
The tax benefits associated with QSBS have evolved significantly since the program's inception in 1993. Initially, QSBS provided an approximately 50% capital gains tax exclusion. In 1993, when the maximum long-term federal capital gains tax rate was 29.19% (Feenberg and Coutts 1993), the exclusion reduced the effective tax rate to 14% for qualifying investments. However, the program's benefits diminished steadily over the following decade. While the QSBS effective rate remained fixed at 14%, regular capital gains rates declined, eventually falling to 15% in 2003. This convergence reduced the net tax benefit to just 1%, as illustrated by the declining red line in Figure 1.

Two major policy changes in the late 2000s revitalized the program. The American Recovery and Reinvestment Act (ARRA) of 2009 marked the first significant enhancement by increasing the exclusion to 75% for stock purchased after February 17, 2009. This legislation also fundamentally changed how QSBS benefits were calculated: instead of a fixed effective rate, tax benefits would now scale with regular capital gains rates. For example, with the prevailing 15% capital gains rate, investors would pay only 3.75% tax on their gains (25% of 15%). The Small Business Jobs Act (SBJA) of 2010 raised the exclusion to 100% for qualified stock acquired after September 27, 2010. While the full exemption was initially temporary, the 2015 Protecting Americans from Tax Hikes (PATH) Act made it permanent.

As shown in Figure 1, these policy changes significantly increased the tax benefit for qualified small business investments. The blue line shows how the maximum federal capital gains tax rate has varied over time, from nearly 30% in 1993 to its current level of 23.8%. The green represents the QSBS tax rate, which dropped to zero for post-2010 investments after the five-year holding period elapsed. The red line shows the net tax benefit—the difference between these rates—which increased from just 1% in 2003 to 23.8% by 2015. Most states aligned their tax treat-

[2] In M&A, shareholders can maintain QSBS benefits through qualifying stock-for-stock exchanges or by reinvesting cash proceeds into another qualified small business within 60 days under Section 1045.

Figure 1: Evolution of QSBS Federal Tax Benefits

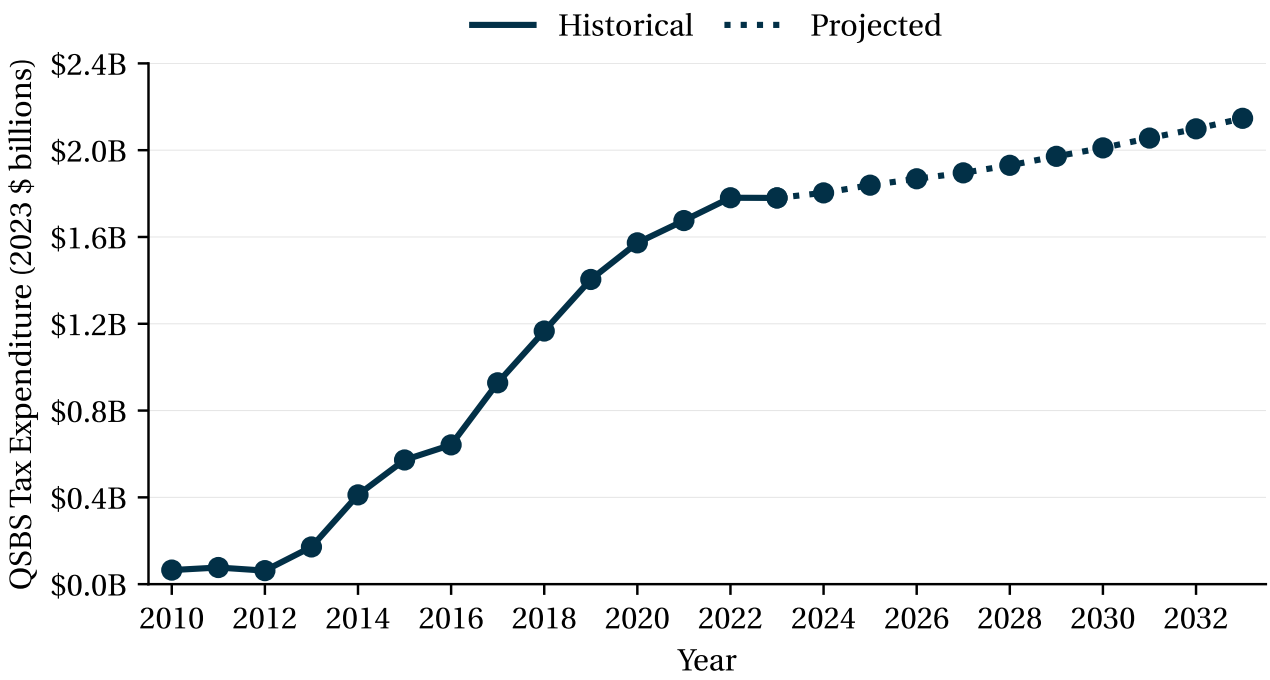


This figure plots three series from 1998 to 2023: the maximum federal long-term capital gains tax rate (blue line), the QSBS capital gains tax rate (green line), and their difference, which represents the net tax benefit (red line). The vertical line marks 2015, when the first exits qualifying for full exemption under the 2010 SBJA became possible, reflecting QSBS's mandatory five-year holding period. Data are from NBER TAXSIM.

ment with federal law, making this federal tax benefit even more attractive to startup investors.

The fiscal impact of these tax benefits has grown substantially over time. As shown in Figure 2, the cost to the federal government in terms of foregone tax revenue increased from $65 million in 2010 to $1.8 billion in 2023 (in 2023 dollars). The first major increase occurred in 2014, when tax expenditure more than doubled to $412 million, reflecting the first exits of investments qualifying for the 75% exemption introduced by American Recovery and Reinvestment Act in early 2009. Treasury projections indicate continued growth, with annual tax expenditure reaching $2.2 billion by 2033 and cumulative federal tax expenditures over the next decade (2024-2033) estimated at $19.6 billion in real terms. This growth reflects increased awareness and utilization of the program among investors of qualified businesses. Figure 2 understates the total cost of the program, as it does not include forgone tax revenue at the state level, where most states follow

Figure 2: Fiscal Impact of QSBS Tax Exemption



This figure shows the evolution of federal tax expenditures due to QSBS exemptions from 2010 to 2033. Tax expenditures represent the government's foregone tax revenue from preferential tax treatment. Values are in 2023 dollars, adjusted using the PCE Price Index. Historical values are in solid line while projections are in dotted line. The figure includes federal tax expenditures only. Data are from the U.S. Department of the Treasury.

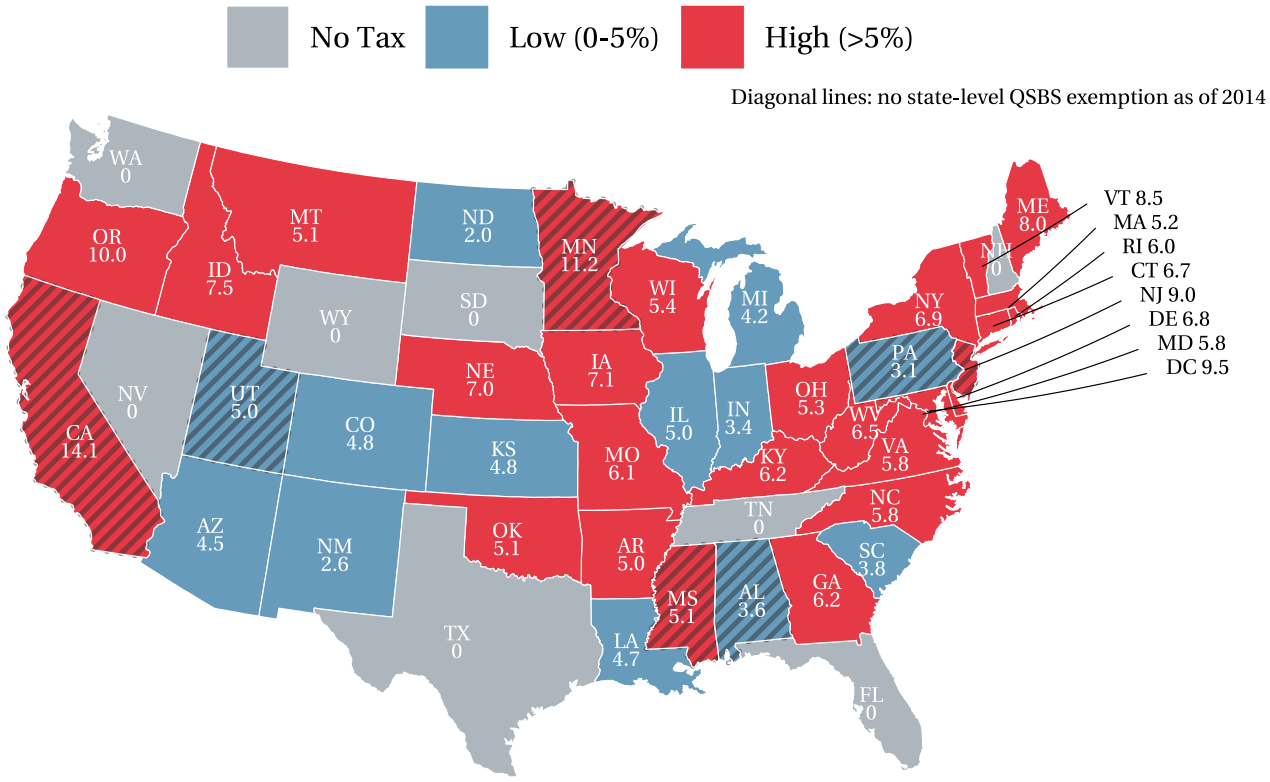
federal QSBS treatment.

3.5 State-Level Compliance

The economic value of QSBS benefits varies significantly across states based on the investor's state of primary residency and is driven by two factors: state-level capital gains tax rates and state conformity with federal QSBS treatment. As shown in Figure 3, state capital gains tax rates in 2014 ranged from 0% to 14.1%. Nine states—Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming—impose no state capital gains tax on their residents, making state-level QSBS compliance effectively moot in these jurisdictions.

Most states default to conforming with federal QSBS treatment through "rolling conformity" provisions in their tax codes, which automatically incorporate federal tax updates. However,

Figure 3: State-Level Capital Gains Tax Rates (2014)



This figure displays state-level capital gains tax rates as of 2014. States are categorized by their tax rates: no tax (gray), low 0–5% (blue), and high >5% (red). Diagonal lines indicate states where the QSBS exemption does not apply at the state level, though these states still qualify for the federal QSBS exemption. Data are from NBER TAXSIM.

several economically significant states maintain distinct policies. California, which has the highest state capital gains tax rate at 14.1% in 2014 (currently 13.3%), eliminated its QSBS provisions in 2012 after the state appellate court ruled that the state's partial conformity approach violated the Commerce Clause of the U.S. Constitution. The court found that providing preferential treatment only for California-based businesses was unconstitutional, leaving California-resident investors subject to the full state tax rate on QSBS gains.

Similarly, Pennsylvania, New Jersey, Alabama and Misssissipi have consistently opted out of offering state-level QSBS benefits. Nevertheless, investors residing in these states remain eligible for the federal QSBS exemption, even if no state-level benefits are available. As shown in Table IA1, some states have recently expanded their QSBS benefits. Massachusetts, which histor-

ically did not recognize the federal exclusion, adopted QSBS conformity in 2022. Utah adopted QSBS conformity in 2016 and maintains the exclusion at the state level, effectively eliminating state capital gains tax on qualifying investments for its residents.

3.6 Recent Policy Developments

The program's substantial fiscal impact has sparked policy debates about its effectiveness. In 2021, as part of the Build Back Better Act negotiations, Congress considered changes to the program's structure. The main proposal involved reducing the exclusion percentage from 100% to 50% for taxpayers with adjusted gross income exceeding $400,000. This potential modification coincided with the Biden administration's broader proposal to increase the top federal capital gains rate from 23.8% to 43.4%, which would have made the QSBS exemption substantially more valuable for high-income investors (Karachale and Buckner 2021).

While these changes were ultimately not implemented, they highlighted a fundamental tension in the program's design. Critics emphasize that over 80% of QSBS benefits accrue to taxpayers with annual incomes exceeding $1 million, suggesting the program functions more as a tax shelter for wealthy investors than a catalyst for entrepreneurship. The concentration of benefits among high-income taxpayers raises questions about whether the growing tax expenditure efficiently targets capital formation in entrepreneurial ventures.

Proponents counter that this distribution of benefits reflects the program's underlying economic mechanism rather than a design flaw. They argue that the tax benefit is important for attracting risk capital to early-stage ventures, particularly in capital-intensive sectors where financing constraints are most acute. This view suggests that the concentration of benefits among high-income investors is a necessary consequence of incentivizing investment in high-risk, early-stage companies that typically require sophisticated investor participation.

4 Data

Our analysis employs comprehensive data on private market investments from PitchBook. We construct our sample in several steps to identify investments potentially eligible for QSBS tax benefits. First, we restrict the sample to U.S.-based companies founded after 2000, as the QSBS program primarily targets domestic entrepreneurial activity. Second, we exclude firms organized as LLPs or LPs since only C-corporations can issue qualifying stock. Third, consistent with the program's $50 million gross asset requirement, we exclude any investor-firm pairs where the investment amount exceeds $50 million in the investor's entry year.

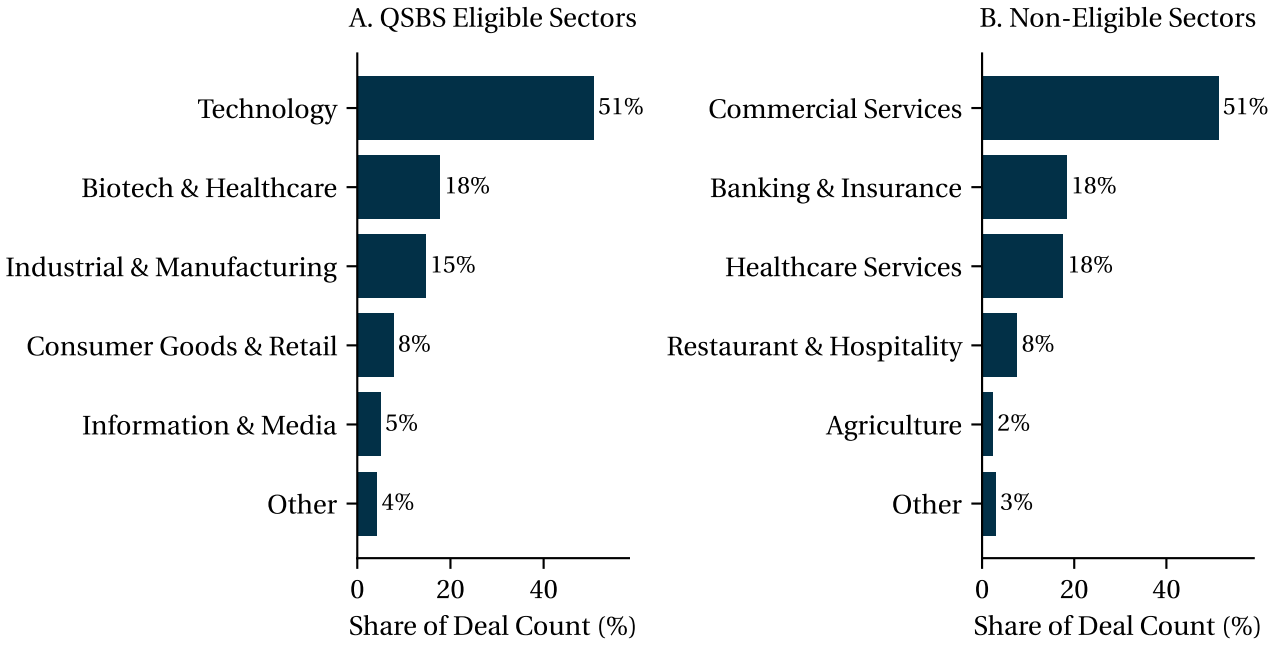
We then classify firms into eligible and non-eligible sectors based on Section 1202 criteria. As shown in Table IA2, excluded sectors primarily comprise service-based industries (e.g., financial, legal, and consulting services), natural resource extraction, and hospitality businesses. This restriction effectively concentrates benefits in technology and capital-intensive sectors that typically require substantial growth capital.

Our final sample tracks investor-firm pairs from investment entry through exit between 2004 and 2022. We consider only investment entries through 2017 to ensure each investment can be held for at least five years—the minimum holding period required for QSBS qualification. The resulting panel dataset contains 52,345 unique investors and 53,657 unique firms, yielding 1,080,754 investor-firm-year observations.

4.1 Industry and Investment Composition

The QSBS program's eligibility criteria create clear distinctions between qualified and non-qualified sectors that reflect the policy's focus on promoting investment in growth-oriented, capital-intensive businesses. As shown in Panel A of Figure 4, eligible sectors are dominated by technology companies, which account for 51% of investments in our sample. This concentration aligns with the program's goal of supporting innovative enterprises that typically require substantial early-stage capital. Biotech and healthcare firms represent the second-largest eligible category at 18%, followed by industrial and manufacturing at 15%. Consumer goods and retail (8%) and information and media (5%) constitute smaller shares of eligible investments, with other qualified sectors ac-

Figure 4: Investment Distribution by Sector



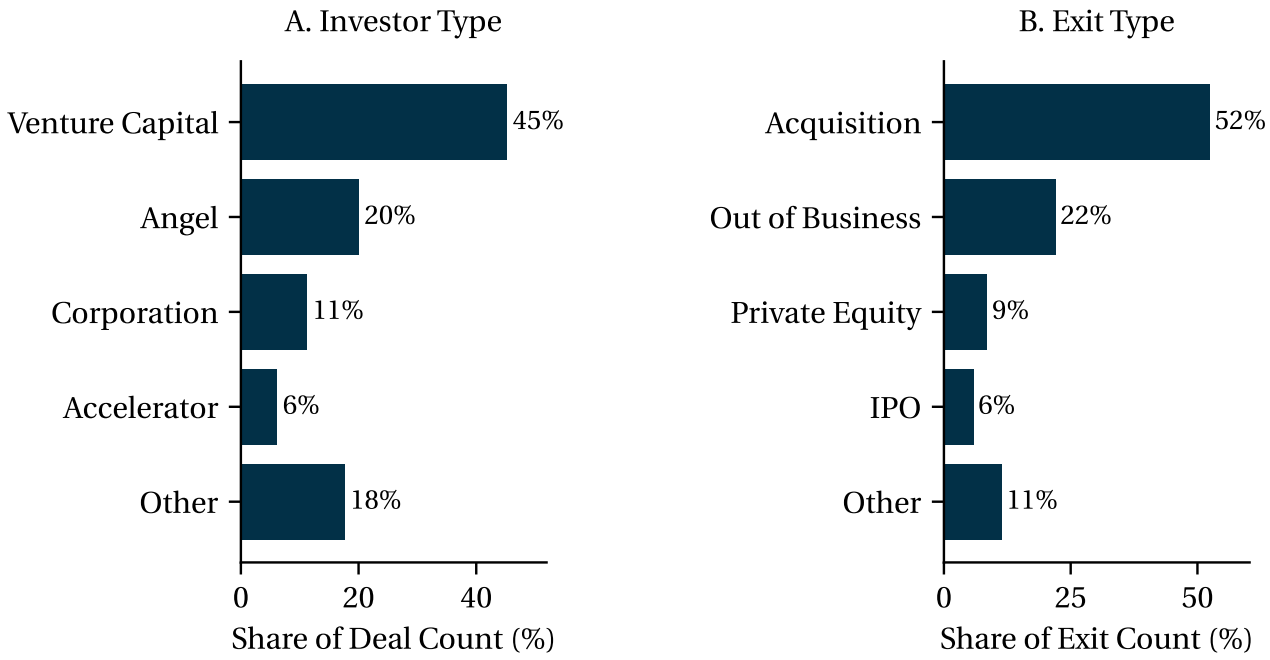
This figure shows the distribution of investments across QSBS eligible and non-eligible sectors from 2004 to 2022. Panel A shows the composition of QSBS eligible sectors, where sectors are defined based on IRC Section 1202 eligibility criteria. Panel B shows non-eligible sectors, which are explicitly excluded from QSBS benefits. Commercial Services primarily includes consulting, education and training, legal, and accounting services. Percentages represent the share of total number of deals in each category. Data are from PitchBook.

counting for the remaining 4%.

In contrast, Panel B reveals that excluded sectors primarily comprise service-based industries where the principal asset is human capital rather than physical or intellectual property. Commercial services—including consulting, education, legal, and accounting services—represent 51% of non-eligible investments. Banking and insurance (18%), healthcare services (18%), and restaurant and hospitality (8%) make up most of the remaining non-eligible activity, with agriculture (2%) and other sectors (3%) accounting for small shares. This exclusion pattern reflects the program's intent to target benefits toward businesses requiring significant capital investment for growth rather than professional service firms.

The composition of investors and exit outcomes in our sample, presented in Figure 5, reveals the central role of venture capital in early-stage finance. Panel A shows that venture capital firms are the dominant investor type, accounting for 45% of investments. Angel investors repre-

Figure 5: Distribution of Investor and Exit Types



This figure shows the distribution of investments by investor type (Panel A) and exits by exit type (Panel B) from 2004 to 2022. Venture Capital includes traditional VC firms and corporate venture capital. Angel includes individual angel investors and angel groups. Percentages represent the share of deal and exit counts. Data are from PitchBook.

sent 20% of deals, while corporations participate in 11% of investments. Accelerators contribute 6% of deals, with other investors including private equity firms accounting for the remaining 18%. This distribution suggests that tax benefits could have substantial effects through their impact on professional investors, particularly venture capitalists who combine outside capital with incentive-based compensation.

The distribution of exit types in Panel B highlights both the opportunities and risks in early-stage investment. Acquisitions represent the most common successful exit at 51% of outcomes, while business failures account for 21% of exits. Private equity buyouts and IPOs each represent 8% of exits, with other exit types including secondary sales accounting for the remaining 11%. This mix of outcomes underscores the importance of understanding how tax benefits might affect both the likelihood of extreme successes and the tolerance for potential failures.

4.2 Key Variables and Summary Statistics

We analyze the effect of tax policy on investment behavior at three different levels of data organization. We first discuss our main investment outcomes measured at the investor-firm-year level, followed by ex-ante investment decisions at the investor-firm level, and finally portfolio allocation decisions at the investor-year level.

4.2.1 Main Sample: Investor-Firm-Year Level

Treatment Variables

We define treatment status through three main variables. First, we create an indicator for QSBS-eligible sectors based on Section 1202 criteria, which exclude service-based industries where the principal asset is employee skill or reputation. A full list of sectors classified as non-eligible in our analysis is available in Table IA2. Second, our investment holding period indicator (Holding ≥ 5) equals one if the difference between the current year and the investor's entry year is five or more years. Third, we identify post-reform investments with an indicator for entry years after 2009, when the QSBS tax benefit was substantially expanded.

We construct two measures to capture cross-sectional variation in tax benefit exposure. First, we create an indicator for investors based in states below median of capital gains tax rates, which we calculate using state-level maximum long-term capital gains tax rates obtained from NBER TAXSIM. For each year, we rank states based on their statutory rates and classify those below median as low-tax states. In 2014, for instance, these rates ranged from 0% to 14.1%, with nine states imposing no capital gains tax. Second, we identify top venture capital investors using their historical exit performance. Specifically, we first identify IPOs or acquisitions above $100 million for U.S.-based portfolio companies between 2004 and 2022. We then rank venture capital firms based on their number of successful exits and create an indicator for investors ranking in the top 50.

Outcome Variables

Our first set of outcome variables examines whether tax benefits affect investors' willingness to provide and maintain investments in early-stage firms. At the financing round level, we

measure deal size as the total dollar amount invested. We track both the total number of investors and separately identify new investors (those investing in the firm for the first time) to capture whether tax benefits attract additional capital providers to these high-risk ventures.

To examine whether tax benefits encourage greater risk-taking, we construct three measures that capture different aspects of investment risk. Our goal is to understand to whether tax benefits encourage investment in marginal projects that might otherwise go unfunded. First, we measure ex-ante risk-taking through a pre-revenue indicator that equals one if the firm has no revenue-generating operations in a given year. We construct this measure using PitchBook's business status classification, which identifies firms as "Pre-Revenue" or "Generating Revenue" based on information released during financing rounds. While this information is primarily observed when firms raise capital, these are precisely the moments when investors evaluate firm quality and decide whether to invest. Pre-revenue investments represent the riskiest segment of the market, where information asymmetries are highest and business models remain unproven.

We complement this ex-ante measure with two ex-post measures of realized risk. Our first measure identifies complete investment failures through an indicator for firms flagged by PitchBook as "Out of Business," which captures cessations of operations rather than exits through acquisition or other means. Our second measure captures firms experiencing severe difficulties by identifying those unable to attract new capital for extended periods. Specifically, we create an indicator that equals one if a firm goes five or more years without raising new funding, which we construct by tracking financing events and counting consecutive years without new capital at the firm-year level. Given that successful ventures in our sample typically raise capital every 12–18 months, extended periods without new investment often precede failure.

To examine investment performance, we track both intermediate success measures and final exit outcomes. For exits, we create indicators for different types: private equity buyouts (acquisitions by PE firms), IPOs (successful public listings), and strategic acquisitions (sales to other companies). We observe these events through PitchBook's deal events, which identify the timing and nature of each deal.

Between investment and exit, we track firm progression through valuations using two approaches. Our main measure is the natural logarithm of interpolated valuations. We construct

this by linearly interpolating post-money valuations between funding rounds at the firm-year level, which helps address the discrete nature of valuation observations in private markets. This interpolation provides a continuous measure of firm value progression, though we also present results using non-interpolated valuations in the Internet Appendix as a robustness check. Using the interpolated (non-logged) valuations, we create an indicator for firms achieving "unicorn" status—private companies valued at $1 billion or more. These valuation measures provide market-based indicators of interim success, which is particularly important given the long holding periods typical in venture capital and the fact that many firms in our sample remain private. To measure economic returns upon exit, we calculate exit multiples as the ratio between the exit value and the total amount of capital raised by the firm in funding rounds prior to the exit event.

To test whether tax benefits affect investors' monitoring intensity, we examine three measures of investor engagement and management oversight. First, we track whether investors receive board voting rights, which we observe directly from deal-level data in PitchBook where such control rights are reported during financing rounds. Board representation is a crucial channel through which investors formally monitor and influence portfolio companies, providing them both information access and direct input into major corporate decisions.

Second, we measure CEO and executive team turnovers. Using PitchBook's people-position data, which tracks individual employment spells, we create indicator variables that equals one in years when the CEO position changes hands. We identify CEOs through reported titles, focusing on "Chief Executive Officer" and "CEO" designations. We create a similar measure for changes in C-suite executive positions, tracking title patterns that include "CFO," "Senior VP," and other senior executive designations. Replacement of the chief executive and other senior management executives represents perhaps the most significant governance action investors can take.

Together, these monitoring variables let us test whether tax benefits affect investors' commitment to post-investment governance. This is economically important because monitoring intensity represents a key channel through which investors can create value beyond providing capital. If tax benefits primarily operate by increasing risk tolerance rather than encouraging more active oversight, we would expect limited changes in these monitoring measures even if investment patterns shift.

Summary Statistics

Table 1 presents summary statistics for our investor-firm-year panel. Panel A shows the average holding period is 3.3 years (standard deviation = 2.6), with 31.3% of investor-firm pairs reaching the five-year QSBS holding requirement. The mean investment entry year is 2012.8, and 85.7% of investments occur after the 2009 QSBS tax benefit expansion. Eligible sectors based on Section 1202 criteria comprise 88.3% of observations.

Panel B documents financing characteristics. The mean deal size, measured as total dollars invested in a financing round, is $42.2 million (standard deviation = $423.2 million), with substantial right-skew evidenced by a median of $5.8 million. Investments involve an average of 2.9 rounds with 5.1 total investors, of whom 3.7 are investing in the firm for the first time. Board voting rights are present in 33.6% of observations. Our measure of funding difficulties shows 6.2% of investor-firm-years experience periods of five or more years without new capital.

Firm characteristics in Panel C indicate a mean revenue of $130.9 million (standard deviation = $913.1 million). The pre-revenue indicator, capturing ex-ante risk-taking, equals one for 31.5% of observations. Management teams comprise 3.2 C-suite executives on average. Founder-CEOs lead 70.7% of firms, while 22.9% of CEOs hold MBAs. The annual frequencies of CEO and C-suite turnover are 4.4% and 34.5%, respectively.

Panel D reports exit outcomes. Acquisitions by other companies represent 4.3% of observations, followed by out-of-business exits without bankruptcy (1.8%), private equity buyouts (0.7%), and IPOs (0.5%). Panel E documents performance metrics. The mean exit multiple, calculated as exit value divided by total capital raised, is 9.2 (standard deviation = 124.8). The distribution of exit multiples shows 34.3% exceed 5×, 15.1% exceed 10×, and 4.9% exceed 20×. The mean post-money valuation is $1,353.4 million (standard deviation = $6,541.5 million), and 2.5% of investor-firm-year observations achieve unicorn status with valuations above $1 billion.

The subset of exited investments exhibits distinct characteristics. The mean holding period for exited observations is 2.6 years versus 3.3 years in the full sample. Similarly, exited investments show higher deal sizes ($64.4 million versus $42.2 million) and executive turnover rates (41.8% versus 34.5%). Conversely, they display lower frequencies of board voting rights (26.1% versus 33.6%) and founder-CEOs (56.7% versus 70.7%). Exited investments also show higher rates

of unicorn status (17.1% versus 2.5% in the full sample), suggesting that successful firms achieve higher valuations before exit.

4.2.2 Sample at Investor-Firm Level: Initial Investment Selection

At the investor-firm level, we construct several measures to analyze investment stage and contract terms at the time of initial investment. Our main treatment variable is the interaction between post-reform entry and sector eligibility ($\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$). For investment stage, we track whether firms are in product beta stage (where firms have an early test version of their product), stealth mode (firms operating in secrecy), and seed stage investments using PitchBook's development stage classification. For contract terms, we create indicators for three key provisions: participating preferred stock (providing liquidation rights that allow investors to "double-dip" by first receiving their liquidation preference and then sharing pro-rata in remaining proceeds), cumulative dividend rights (requiring dividend accrual regardless of declaration), and equal footing (pari-passu) rights in liquidation (ensuring new investors share equally with existing ones).

Table IA3 presents summary statistics for these investor-firm pairs. At the investment stage, 0.5% of investments occur during product beta testing and 0.3% while firms are in stealth mode, reflecting the rare nature of these earliest-stage investments. A larger fraction (18.6%) represents seed stage investments. Contract terms show substantial variation in investor protections: 24.7% of investments include participating preferred rights, 16.8% have cumulative dividend provisions, and 33.1% grant equal footing (pari-passu) rights in liquidation.

4.2.3 Sample at Investor-Year Level: Portfolio Management

At the investor-year level, we analyze how investors allocate their portfolios across risk levels and sectors. Our treatment variable here simply indicates post-reform years ($\mathbb{1}\{\text{Post-2009}\}_{i,t}$) since we examine within-investor changes in portfolio allocation. For biotech investments specifically, we identify clinical trial stages through finer classifications: pre-clinical trials, Phase 1 (discovery), Phases 2-3 (research), and Phase 4 (FDA approval). For clinical trial exposure, we calculate the

fraction of an investor's deals in each stage relative to their total deals in eligible sectors. Specifically, for each investor i in year t and clinical stage s, we compute:

$$\text{Clinical Stage Share}_{i,t,s} = \frac{N_{i,t,s}}{\sum_s N_{i,t,s}} \tag{12}$$

where $N_{i,t,s}$ represents the number of deals in clinical stage s. We also construct a Herfindahl-Hirschman Index of portfolio industry concentration (cf. Barber et al. (2022)) as:

$$\text{HHI}_{i,t} = \sum_s \left(\frac{N_{i,t,s}}{\sum_s N_{i,t,s}} \right)^2 \tag{13}$$

where $N_{i,t,s}$ represents the number of deals by investor i in year t in industry sector s, and $\sum_s N_{i,t,s}$ is the total number of deals by that investor-year. The HHI ranges from $1/n$ (where n is the number of sectors) when investment is equally spread across sectors to 1 when investment is concentrated in a single sector. We compute this measure separately for eligible and non-eligible sectors.

As shown in Table IA5, clinical trial investments represent a small but important segment of venture portfolios, with pre-clinical, Phase 1 discovery, and Phases 2-3 research deals comprising 0.5%, 0.4%, and 0.6% of all investments in eligible sectors respectively. The average industry HHI in eligible sectors is 1.519 compared to 1.086 in non-eligible sectors, suggesting that investors maintain more concentrated portfolios when investing in QSBS-eligible industries.

4.3 Comparison of Eligible and Non-Eligible Sectors

Table 2 presents differences between QSBS-eligible and non-eligible sectors. The pre-period analysis (investor entry from 2004–2008) reveals that the two groups exhibit similar fundamental characteristics prior to the 2009 QSBS expansion. Investment holding periods and entry timing show minimal differences. The mean holding period differs by only 0.05 years (t-stat = 1.47), and the difference in five-year holding periods is just -0.4 percentage points (t-stat = -0.92). Similarly, we observe minimal differences in firm characteristics, with revenue differing by -$39.4 million (t-stat = -1.11), and the frequency of pre-revenue firms differing by only 1.6 percentage points (t-stat = 1.71).

Management characteristics in the pre-period also demonstrate comparable distributions. C-suite size differs by -0.02 executives (t-stat = -0.24), and CEO characteristics show similar patterns—the prevalence of MBA degrees differs by 1.2 percentage points (t-stat = 1.25), while founder-CEOs differ by -0.8 percentage points (t-stat = -0.48). CEO turnover rates show a small difference of 1.3 percentage points (t-stat = 3.87).

These patterns shift notably in the full sample period. Investment holding periods diverge by 0.09 years (t-stat = 8.01), and the difference in five-year holding periods increases to 0.5 percentage points (t-stat = 3.21). Revenue shows larger disparities, with eligible sectors generating $120.3 million less on average (t-stat = -6.56). The gap in pre-revenue firms widens to 4.8 percentage points (t-stat = 16.57). Management characteristics also diverge, with eligible sectors showing lower C-suite size by 0.09 executives (t-stat = -3.65) and lower founder-CEO rates by 2.3 percentage points (t-stat = -5.18).

Performance differences are particularly striking in the full sample period. Eligible sectors show lower valuations by $937.6 million (t-stat = -5.15) and lower unicorn rates by 1.0 percentage points (t-stat = -6.20). Exit multiples also differ substantially, with eligible sectors showing 14.7 times lower multiples (t-stat = -1.41) and a 2.9 percentage point lower likelihood of achieving 5× returns (t-stat = -2.29).

The investment selection patterns we observe at entry, shown in Table IA4, reinforce these findings. Eligible sectors show significantly higher rates of product beta stage (0.4 percentage points) and stealth mode investments (0.3 percentage points), but lower rates of seed stage deals (-4.2 percentage points). Contract terms also differ markedly: eligible sector investments are 9.7 percentage points more likely to include participating preferred rights and slightly more likely to have cumulative dividends (1.0 percentage points), but 2.2 percentage points less likely to grant equal footing rights. Notably, these differences in investment selection emerge only after the 2009 reform—in the pre-period sample, most differences are either insignificant or show the opposite pattern. The emergence of these systematic differences following the QSBS expansion, despite similar pre-period characteristics, suggests that tax benefits influenced both investment selection and outcomes.

5 Empirical Strategy

Our empirical analysis proceeds in two steps. We first examine whether investors actively change their investment decisions in anticipation of tax benefits, then analyze how these decisions manifest in investment outcomes using a triple-difference framework that exploits the program's eligibility requirements.

5.1 Investment Selection Analysis

To identify changes in investment behavior, we exploit the 2009 QSBS reform as a shock to the expected tax treatment of new investments. We examine investment decisions at two distinct levels that enable different analyses. The investor-firm sample allows us to study specific deal characteristics at the time of investment. The investor-year sample allows us to analyze shifts in portfolio allocation strategy since it captures how investors adjust the distribution of their investments across different risk levels and sectors over time.

First, we examine investment selection at the investor-firm level using:

$$\begin{aligned} Y_{i,j} = &\beta_0 + \beta_1 \cdot \mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} + \beta_2 \cdot \mathbb{1}\{\text{Eligible Sector}\}_j \\ &+ \beta_3 \cdot [\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j] \\ &+ \alpha_i + \gamma_{ind} + \lambda_{s,t} + \epsilon_{i,j} \end{aligned} \tag{14}$$

where $Y_{i,j}$ represents characteristics at the time of initial investment, including firm stage (e.g., product development phase, firm in stealth mode) and contractual terms (e.g., liquidation preferences, cumulative dividends). The interaction term identifies how investment selection differs for eligible sectors after the reform. We include investor fixed effects (α_i) to absorb time-invariant investor characteristics like investment style and risk preferences. Industry fixed effects (γ_{ind}) control for systematic differences across sectors, while state-by-entry year fixed effects ($\lambda_{s,t}$) account for local economic conditions that might affect startup formation and investment opportunities.

Second, we analyze portfolio allocation decisions at the investor-year level:

$$Y_{i,t} = \beta_0 + \beta_1 \cdot \mathbb{1}\{\text{Investments Post-2009}\}_t + \alpha_i + \epsilon_{i,t} \tag{15}$$

where $Y_{i,t}$ captures portfolio allocation decisions through two measures computed at the investor-year level. First, we calculate the fraction of investor i's deals in each clinical trial stage relative to their total deals in eligible sectors in year t. Clinical trials follow well-defined stages (pre-clinical, Phase 1, Phase 2-3, and FDA approval) with increasing probability of success, making changes in this distribution a clear measure of risk-taking in biotech investments. Second, we construct a Herfindahl-Hirschman Index of industry concentration using the share of investor i's deals across different sectors in year t. An increase in concentration indicates reduced diversification and therefore higher portfolio risk. We include investor fixed effects to isolate changes in these allocation patterns from persistent differences in investment strategies across investors.

For both specifications, we cluster standard errors at the investor level since investment decisions are likely correlated across deals made by the same investor. This clustering choice is particularly important given that investors in our sample make multiple investments and often follow consistent strategies in their deal selection.

5.2 Main Identification Strategy: Difference-in-Difference-in-Differences

In our main regression analyses, we estimate the effect of QSBS tax benefits on investment outcomes using a triple-difference research design that exploits variation in sector eligibility, investor entry timing, and holding period requirements. Our main specification is:

$$
\begin{aligned}
Y_{i,j,t} = &\beta_0 + \beta_1 \cdot \mathbb{1}\{\text{Holding Years} \geq 5\}_{i,j,t} + \beta_2 \cdot \mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j,t} + \beta_3 \cdot \mathbb{1}\{\text{Eligible Sector}\}_j \\
&+ \beta_4 \cdot [\mathbb{1}\{\text{Holding Years} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j,t}] \\
&+ \beta_5 \cdot [\mathbb{1}\{\text{Holding Years} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible Sector}\}_j] \\
&+ \beta_6 \cdot [\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible Sector}\}_j] \\
&+ \beta_7 \cdot [\mathbb{1}\{\text{Holding Years} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible Sector}\}_j] \\
&+ \text{Fixed Effects} + \epsilon_{i,j,t}
\end{aligned}
\tag{16}
$$

where i indexes investors, j indexes firms, and t indexes years. The dependent variable $Y_{i,j,t}$ represents various investment outcomes including deal characteristics (e.g., deal size, number of investors), risk measures (e.g., business failures, funding gaps), and performance indicators (e.g., valuations, exit types). Our coefficient of interest is β_7, which captures how the relationship between five-year holding periods and outcomes differs for eligible versus non-eligible sectors after QSBS tax benefits were enhanced in 2009.

Our baseline specification includes an extensive set of fixed effects to isolate the impact of QSBS tax benefits from potential confounding factors. Year fixed effects control for aggregate economic conditions and changes in the entrepreneurial finance environment—such as overall funding availability, IPO market conditions, or macroeconomic shifts that affect all firms simultaneously. Entry year fixed effects account for cohort-specific shocks that might affect all investments initiated in a particular year, like changes in startup formation rates or the quality of entrepreneurial opportunities in different vintages. Holding period fixed effects absorb any mechanical relationship between investment duration and outcomes that is common across all investor-firm pairs, such as the natural evolution of early-stage firms or systematic patterns in follow-on financing needs.

The inclusion of investor × firm fixed effects represents our most stringent control for unobserved heterogeneity. These fixed effects ensure that we identify the effect of tax benefits from within-pair variation in holding periods, effectively comparing how the same investor-firm rela-

tionship evolves differently when the investment qualifies for tax benefits versus when it does not. This addresses several potential confounds. First, it controls for time-invariant investor characteristics that might affect investment behavior, such as investment style (e.g., early vs. late stage focus), organizational structure (e.g., fund size, partnership composition), or risk preferences. Second, it absorbs firm-specific attributes that could influence outcomes, including industry, business model, founding team quality, or initial growth prospects. Third, it accounts for any assortative matching between investors and firms—for instance, if higher-quality venture capital firms systematically invest in more promising startups.

For exit multiple analyses, we replace investor × firm fixed effects with separate investor and firm fixed effects. This modification is necessary because exit outcomes are observed only once for each investment. The investor fixed effects control for systematic differences in exit performance across investors that might reflect variation in value-added capabilities, while firm fixed effects absorb company-specific factors affecting exit potential. This specification thus compares exit performance across investments by the same investor while controlling for firm-level differences in exit potential.

We cluster standard errors at the investor level throughout our analysis. This accounts for potential correlation in the residuals across different investments made by the same investor, which might arise from common portfolio management practices, risk preferences, or network effects in deal sourcing and exit opportunities. The investor-level clustering is more conservative than clustering at the firm level since investors typically make multiple investments while firms usually have fewer investors. In our sample, the mean venture capital investor makes 8.9 investments while the median firm has 3.5 investors, making investor-level clustering the more stringent approach. This clustering choice helps ensure that our statistical inference is robust to arbitrary correlation patterns within investor portfolios.

5.3 Triple Difference Identification Requirements

Following Olden and Møen (2022), identification in our triple-difference setting requires the absence of shocks that differentially affect the relationship between holding periods and outcomes

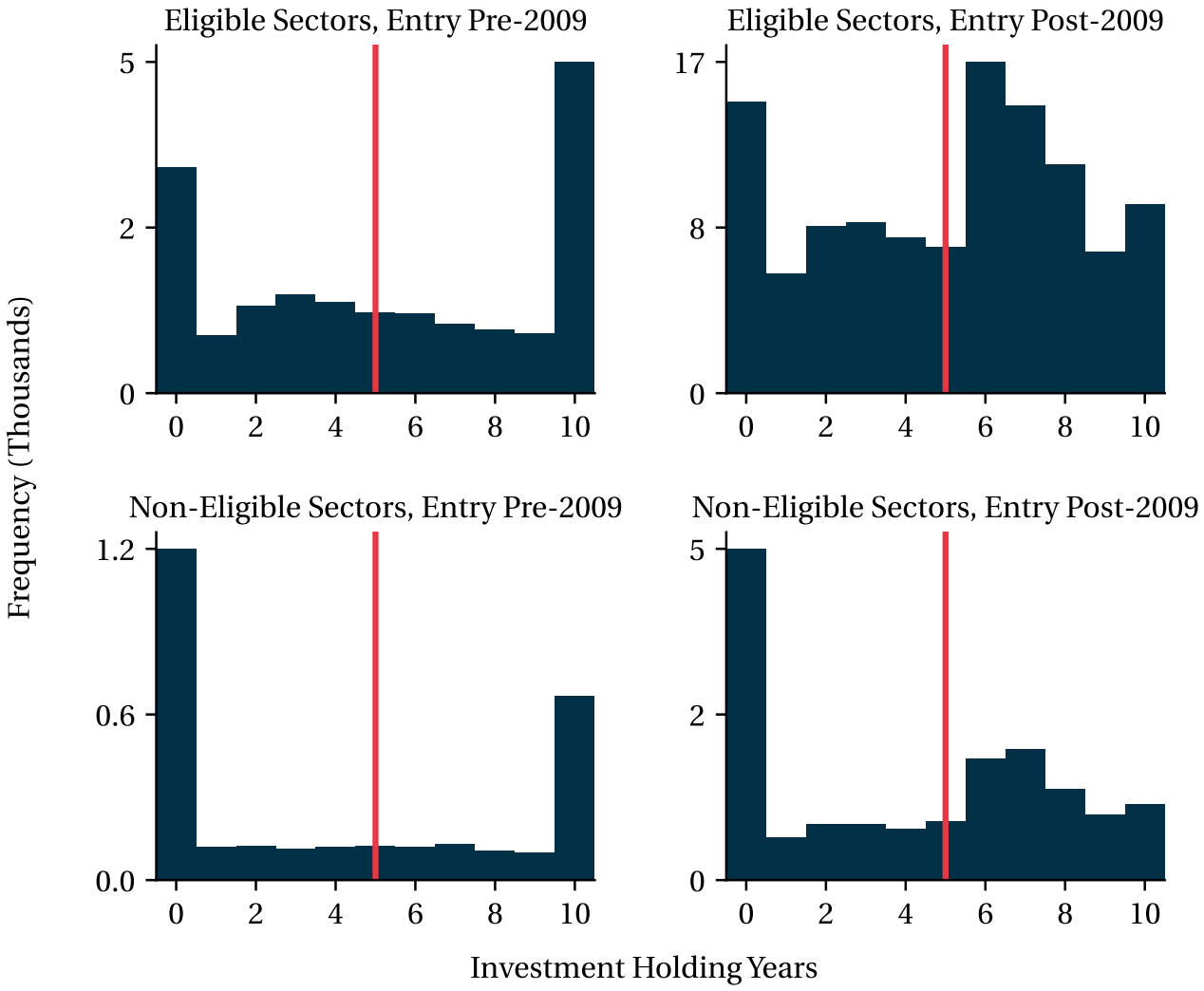
across eligible and non-eligible sectors in the post-reform period. This is a stronger requirement than parallel trends in standard difference-in-differences, as it involves comparing differences in slopes rather than levels. For example, our identifying assumption would be violated if eligible sectors experienced technological changes that specifically altered the returns to longer-duration investments around the time they qualified for enhanced QSBS benefits.

The intuition behind our identification strategy is that QSBS tax benefits should primarily affect investment behavior in eligible sectors when the five-year holding requirement binds. If other factors were driving our results—such as sector-specific growth opportunities or changing investor preferences—we would not expect to see effects concentrated around this specific holding period threshold. Similarly, if broader economic changes in were driving our results, these changes would likely affect both eligible and non-eligible sectors similarly, rather than creating discontinuities around the point where tax benefits become available.

Several patterns in the data support the plausibility of our identifying assumption. First, Figure 6 shows that the distribution of investment holding periods exhibits a stronger discontinuity after the five-year threshold for eligible sectors after 2009, consistent with investors responding to the QSBS holding period requirement. Second, data plots with minimal controls in Figures IA1 and 7 demonstrate that differences in the relationship between holding periods and outcomes across eligible and non-eligible sectors emerge only after the reform.

Dynamic difference-in-differences estimates presented in Figures IA2, IA3 and 8 provide further support for our identification strategy. These plots show no systematic differences in pre-trends between eligible and non-eligible sectors, with effects materializing only after investments satisfy both the entry year and holding period requirements for QSBS benefits. The absence of pre-trends suggests that our results are not driven by pre-existing differences in investment patterns across sectors.

Figure 6: Distribution of Investment Holding Period



This figure shows the distribution of investment holding periods for investor-firms in our sample, based on the last year each investor-firm pair appears in our sample, excluding 2017 investment entries. Panels A and B show sectors eligible for QSBS exemption. Panels C and D show non-eligible sectors. Data are from PitchBook.

6 Investment Selection and Portfolio Management

We begin by examining how tax benefits affect ex-ante investment decisions. A common view of venture capital risk-taking focuses on investment timing: backing companies at earlier financing rounds, particularly seed stage, when valuations are lower but uncertainty is higher. Our evidence

reveals a different risk-taking channel. When tax benefits become available, investors do not simply shift toward earlier financing rounds—instead, they systematically select ventures with higher fundamental risk, measured through development stage and technological uncertainty.

This selection of riskier ventures is evident in the investor-firm sample, where we exploit variation in sector eligibility and investment timing through the interaction of post-reform entry and sector eligibility ($\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$). Table 3 shows that venture capital investments in eligible sectors become 0.3 percentage points more likely to occur during product beta stage (t-stat = 2.77) and 0.5 percentage points more likely during stealth mode (t-stat = 2.25) after the reform. These effects are economically large, representing 60% and 100% increases relative to their respective means of 0.5% and 0.5%. While angel-backed deals are 28% more likely to be at the seed stage post-2009 (+0.8% relative to a mean of 28.2%), this increase at the earliest funding stage is not observed for venture capitalists.

The risk-taking response appears even stronger when examining biotech investments at the investor-year level, as shown in. Here, we calculate each investor's portfolio allocation across clinical trial stages as a fraction of their total investments in eligible sectors, comparing within-investor changes after the reform ($\mathbb{1}\{\text{Post-2009}\}_{i,t}$). Table 4 shows that venture capitalists significantly increase their exposure to early-stage trials relative to their overall eligible sector investments: their share of pre-clinical investments doubles (+0.05 relative to a mean of 0.05), with similar increases in Phase 1 discovery (+0.05 relative to a mean of 0.06) and Phases 2-3 research stages (+0.09 relative to a mean of 0.09). For robustness, using the investor-firm sample, we test whether investors joined eligible industries at clinical trial stages post-2009, and find similar results (Table IA6). In all cases, we find no significant change in Phase 4 (FDA approval stage) investments, consistent with tax benefits encouraging investments in scientific development risk rather than commercialization risk.

The risk-taking response extends to other portfolio management decisions. Table 5 shows that venture capitalists increase their industry concentration in eligible sectors by 0.165 (t-stat = 3.52) after the reform, representing a 9% increase relative to the mean HHI of 1.834. Angel investors show an even larger increase of 0.369 (t-stat = 6.20). We find no significant changes in concentration within non-eligible sectors, suggesting that investors specifically concentrate their

portfolios in sectors qualifying for tax benefits.

This increased business and technological risk appears to affect deal structure. Table IA7 shows that venture capital investments in eligible sectors after the reform are 50% more likely to require cumulative dividends (+0.77 relative to a mean of 0.155) and 22.8% more likely to include participating preferred rights (0.060 relative to a mean of 0.263). They are also 21.4% less likely to grant equal footing (pari-passu) rights in liquidation (-0.074 relative to a mean of 0.341), meaning they demand seniority over other investors in liquidation rather than sharing proceeds equally. This pattern suggests that venture capitalists adjust contractual protections to account for their selection of riskier ventures under tax benefits.

Together, these results reveal that tax benefits affect risk-taking primarily through the selection of inherently riskier ventures rather than through earlier-stage investing. The effects are concentrated among venture capital investors, who combine increased risk-taking in individual deals with greater portfolio concentration in tax-advantaged sectors. In contrast, corporate investors show no significant response in any of our measures, while angel investors exhibit only limited adjustments in portfolio concentration. This pattern of investor responses aligns with our conceptual framework: venture capitalists, who combine outside capital with incentive-based compensation through carried interest, are uniquely positioned to pursue riskier investments under tax benefits. Corporate investors, driven by strategic objectives, and angel investors, investing personal capital, show limited or no response to these incentives.

7 Investment Outcomes

Having established that venture capitalists respond to tax benefits by selecting riskier ventures, we now examine how this shift in investment strategy manifests in investment outcomes. We implement a triple-difference research design that exploits three sources of variation: sector eligibility under QSBS criteria, investment entry timing relative to the 2009 reform, and the program's five-year holding period requirement.

7.1 Funding Patterns

We begin by analyzing funding patterns. Table 6 presents our baseline triple-difference estimates for deal size and investor participation. Panel A shows that when investments qualify for tax benefits, deal sizes increase by +66% ($30.495 million relative to a mean of $46.143 million). This effect is particularly pronounced for venture capital investments, with an increase of +112% ($54.063 million relative to a mean of $48.097 million), and becomes even larger when examining exited venture capital investments, where the increase reaches 135% (+$94.668 million relative to a mean of $70.244 million). In contrast, we find no significant effects for angel or corporate investors.

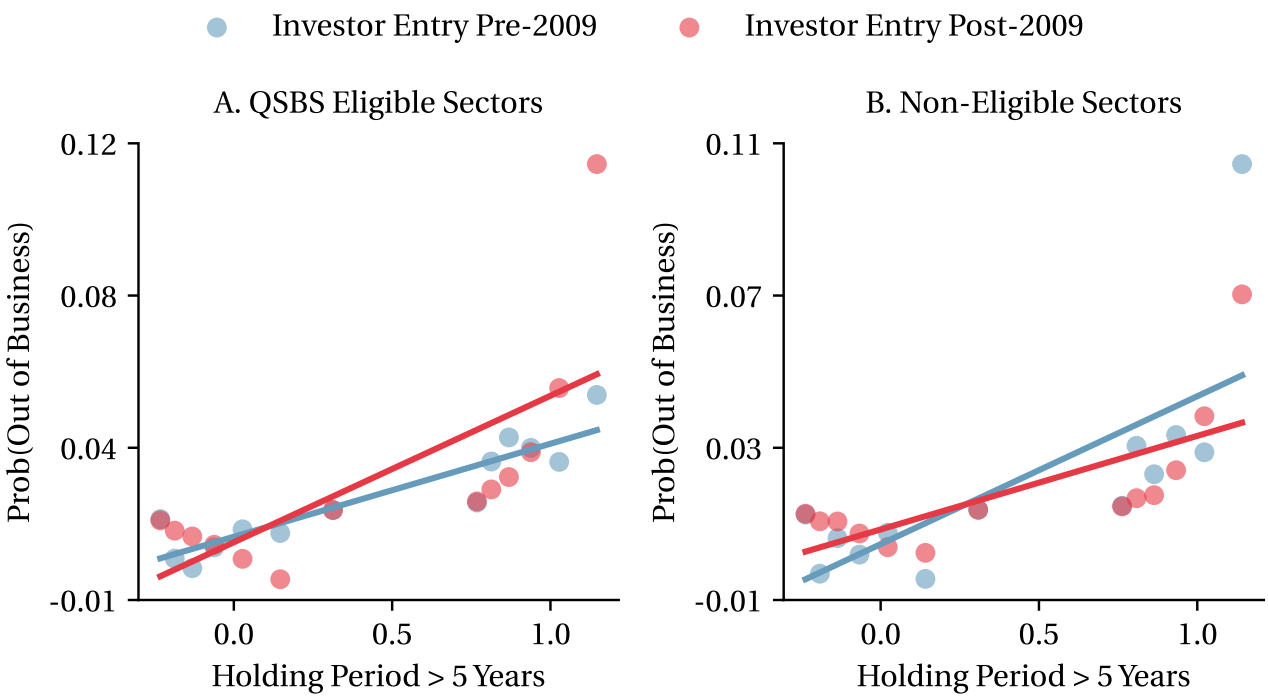
The tax benefit also attracts a broader investor base to eligible investments. Panel B shows that qualifying investments attract 30% more investors (+1.559 relative to a mean of 5.255 investors per round). This expansion in investor participation is particularly strong for angel investors (+2.795 investors, representing a 42% increase relative to their mean of 6.678) and venture capital firms (+1.032 investors, representing a 20% increase relative to their mean of 5.207). Panel C reveals that much of this increase comes from new investors entering these deals, with qualifying investments attracting +31% more first-time investors (+1.171 relative to a mean of 3.809 new investors). These effects persist in the subsample of exited investments.

The differential response across investor types aligns with our conceptual framework's emphasis on the interaction between tax benefits and investor incentive structures. Venture capitalists, who combine other people's money with carried interest compensation, show the most consistent response across all measures, while angel and corporate investors exhibit limited or no significant changes. This pattern suggests that the ability to share risk while maintaining convex payoff structures amplifies the impact of tax benefits on investment behavior.

7.2 Investment Failure

We next examine how QSBS tax benefits affect investor risk-taking behavior by looking into ex-post outcomes. Table 7 presents striking evidence that tax benefits significantly increase venture capitalists' tolerance for failure. When their investments qualify for tax benefits, venture capital investments in eligible sectors become 76% more likely to fail completely (+0.013 relative to a

Figure 7: Binned Scatterplots of Holding Period on the Likelihood of Firm Closure



This figure shows the relationship between business closure probabilities and investment holding periods, separately for QSBS eligible sectors (Panel A) and non-eligible sectors (Panel B). The plots compare investments made pre- and post-2009. Each point shows the mean closure probability within holding period bins after controlling for investor-firm fixed effects. The plots reflect within-firm variation in investment performance over different holding periods.

mean of 0.017). This effect more than doubles in the exit sample, where the likelihood of failure increases by 129% (+0.044 relative to a mean of 0.034). In contrast, we find no significant changes in failure rates for angel or corporate investors.

The increased failure risk is visually apparent in Figure 7. Panel A shows that for eligible sectors, investments made after 2009 experience a markedly steeper increase in failure rates as they approach and exceed the five-year holding requirement. Panel B shows no such pattern for non-eligible sectors, where the relationship between holding period and failure remains relatively flat regardless of entry timing. This divergence in failure patterns appears precisely when tax benefits become available, suggesting a direct link between tax incentives and risk-taking behavior.

Tax benefits also lead to more subtle manifestations of distress through funding droughts. We track these funding difficulties in two ways. First, we count the number of consecutive years

a firm goes without raising new capital, which starts at zero in the year of a funding round and increases by one each subsequent year without new funding. Panel C shows that when venture capital investments qualify for tax benefits, they experience a 36% increase in consecutive years without funding (+0.360 relative to a mean of 0.994 years). This effect persists in the exit sample, where the increase is 33% (+0.222 relative to a mean of 0.675 years).

These funding droughts often become severe enough to signal serious distress. When investments qualify for tax benefits, venture capital investments become 165% more likely to experience funding gaps of five or more years (+0.081 relative to a mean of 0.049). Given that successful startups typically raise new rounds every 12–18 months, such extended periods without capital often precede outright failure. The effect is particularly strong for venture capital investments in the exit sample, where the probability of experiencing these prolonged funding gaps increases by 494% (+0.094 relative to a mean of 0.019). Moreover, these funding difficulties are unique to venture capital — they do not appear for corporate investors, and their effects for angel investors are also large but become insignificant in the exited sample.

The differential response across investor types aligns with our conceptual framework. Venture capitalists, who combine outside capital with incentive-based compensation, show consistent increases in risk-taking across all measures. In contrast, angel investors and corporations show limited or no significant changes in failure rates and funding patterns. This pattern suggests that organizational structure—particularly the ability to share risk while maintaining convex payoff structures—plays a crucial role in how investors respond to tax incentives.

7.3 Value Creation

We next examine how tax benefits affect investment outcomes, focusing on exit types and valuations. According to our framework, tax benefits should lead venture capitalists to pursue more high-risk, high-reward investment strategies. Table 8 presents our baseline estimates. Panel A shows that venture capital investments in eligible sectors see a $61.957 million increase in valuations (+6.1% relative to a mean of $1,011.235 million) when tax benefits become available. This effect nearly doubles for exited investments, reaching $105.674 million (+10.4% relative to a mean

of $1,020.297 million). Figure IA1 visualizes this pattern, showing that in eligible sectors, investments initiated after 2009 experience much steeper valuation growth as they approach and exceed the five-year holding requirement. In contrast, non-eligible sectors show no such differential pattern between pre- and post-2009 investments.

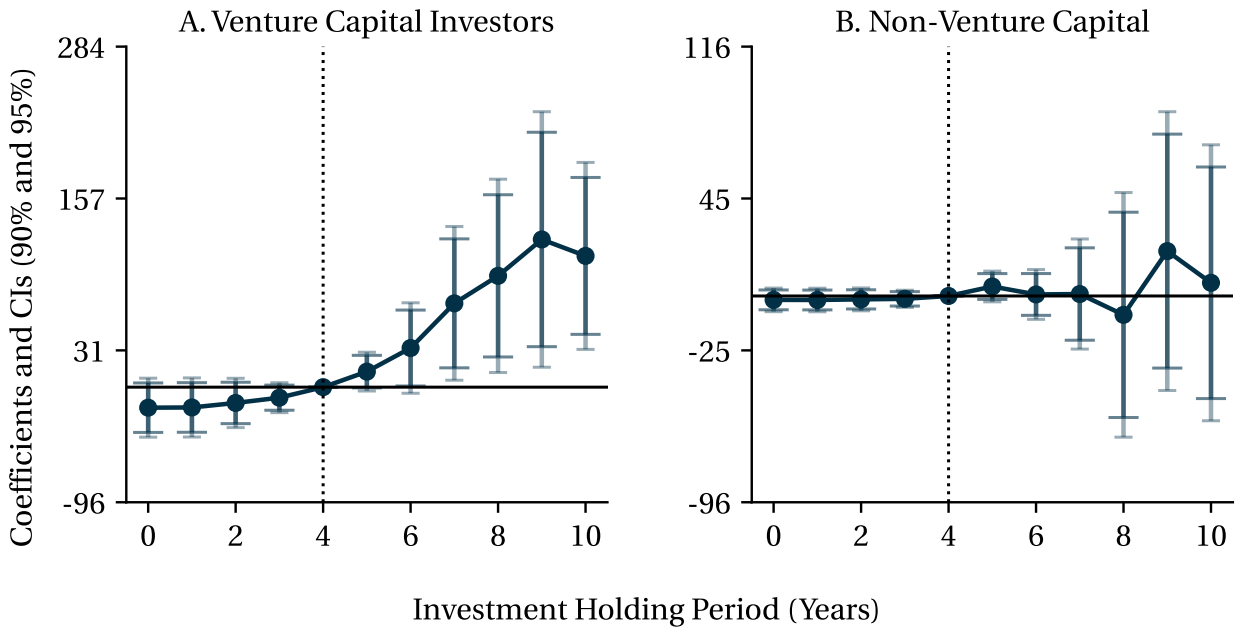
The valuation effects are accompanied by significant changes in exit patterns. Table 9 reveals that when investments qualify for tax benefits, venture capital investments become 114% more likely to exit through private equity buyouts (+0.008 relative to a mean of 0.007). However, these same investments become 47% less likely to exit through acquisitions (-0.024 relative to a mean of 0.051) and see a 117% decrease in IPO probability (-0.007 relative to a mean of 0.006). This shift in exit timing makes economic sense: PE buyouts typically occur later in a company's lifecycle, while IPOs and strategic acquisitions often represent earlier exit opportunities. The pattern suggests that venture capitalists use the five-year holding requirement to pursue more patient investment strategies.

The dynamic evolution of these valuation effects is particularly striking. Figure 8 shows that valuations of venture capital investments in eligible sectors begin diverging upward precisely at the five-year threshold when tax benefits become available. The effect grows steadily in subsequent years, reaching nearly $300 million by year 8, while non-venture investments show no such pattern. This persistent divergence makes economic sense given that firm exits typically involve multiple investors who complete their individual five-year holding periods at different times.

Panel B of Table 8 shows that tax benefits significantly affect extreme outcomes. When venture capital investments qualify for tax benefits, they become 26.7% more likely to achieve unicorn status (+0.008 relative to a mean of 0.030), with this effect strengthening to 30.9% (+0.017 relative to a mean of 0.055) in the exit sample. The effect is robust to alternative specifications—examining thresholds from $500 million to $3 billion and using non-interpolated valuations yields similar patterns (see Tables IA8 and IA9 in the Internet Appendix).

The response to tax benefits is unique to venture capital investors. Angel investors show no significant changes in valuations (−$1.807 million, t-stat −1.41) when their investments qualify for tax benefits, while corporate investors actually see declining valuations (−$8.223 million, t-stat −1.99). These patterns hold for extreme outcomes, where neither angel nor corporate investments

Figure 8: Dynamic DiD for Firm Valuations ($ M)



This figure illustrates the dynamic difference-in-differences coefficients for the natural firm valuations ($ millions), based on the following specification for all firms: $Y_{i,j,t} = \beta_0 + \sum_{k=0}^{10} \beta_k [\mathbb{1}\{\text{Holding Years} = k\}_{i,j,t} \times \mathbb{1}\{\text{Inv. Entry Year} \geq 2009\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j] + \text{Controls} + \epsilon_{i,j,t}$. The x-axis represents the investment holding period (in years), while the y-axis shows the estimated coefficients alongside 90% and 95% confidence intervals. All specifications include fixed effects (year, holding period, entry year, investor × firm) and standard errors clustered at the investor level. Results correspond to Table 8, Panel A, Column 3 and Panel A, Columns 5 and 7.

show increased probability of achieving unicorn status. This stark contrast with venture capital supports our framework's emphasis on organizational structure.

These results align with our conceptual framework. The combination of increased valuations ($105.674 million for exited investments), higher unicorn probability (+30.9%), and shifts in exit patterns toward PE buyouts (+114%) but away from acquisitions (−47%) suggests that venture capitalists use tax benefits to pursue longer-duration, high-risk strategies. This pattern makes economic sense: venture capitalists, who uniquely combine outside capital with incentive-based compensation through carried interest, have both the ability to share risk and the incentives to pursue extreme outcomes when protected by tax benefits.

7.4 Robustness: Excluding California Investors

Our results are robust to excluding California-based investors from the sample. As shown in Table IA10, removing California investors—who lost state-level QSBS benefits after 2012—yields similar patterns. In the non-California sample, venture capital investments that qualify for tax benefits still show increased business failures (+47% relative to a mean of 0.019), longer funding droughts (+23% relative to a mean of 1.208 years), and greater likelihood of achieving unicorn status, though this last effect is more modest than in the full sample. This robustness alleviates concerns that our results might be driven by California's unique venture capital ecosystem.

8 Heterogeneity in Tax Benefit Effects

We examine how the effect of tax benefits varies across two key dimensions: investor location and quality. To capture variation in tax exposure, we classify investors based on their headquarters state's maximum long-term capital gains tax rate using data from NBER TAXSIM. For each year, we rank states by their statutory rates and create an indicator for investors based in below-median tax rate states. There is substantial variation in these rates—in 2014, for instance, they ranged from 0% in states with no capital gains tax to 14.1% in California. To identify top venture capital investors, we rank firms based on their number of successful exits (IPOs or acquisitions above $100 million) for U.S.-based portfolio companies between 2004 and 2022, creating an indicator for those ranking in the top 50.

The response to tax benefits varies systematically with state-level tax exposure. Table IA11 shows that when venture capital investments qualify for tax benefits, as captured by the key triple interaction term ($\mathbb{1}\{\text{Holding} \geq 5\}i, j, t \times \mathbb{1}\{\text{Post}\}i, j, t \times \mathbb{1}\{\text{Eligible}\}_j$), they experience significant increases in both valuations (+$76.554 million) and unicorn probability (+0.010, representing a 33% increase relative to the mean of 0.030). For investors in low-tax states, the quadruple interaction term shows that these effects are partially offset: their valuations decrease by an additional $66.321 million and their unicorn probability declines by an additional 0.010. This pattern also appears in the sample with exited investments only. Given that most states conform with the federal

QSBS exemption, this pattern aligns with the economic magnitude of the incentives—investors in high-tax states receive substantially larger total benefits when their investments qualify for both federal and state-level exemptions.

The effects also vary with investor quality. Table 10 shows that when investments qualify for tax benefits, the baseline triple interaction effect indicates a significant increase in failure rates (+0.014 relative to a mean of 0.017, representing a 82% increase). Top 50 venture capital firms have a quadruple interaction term of 0.012 in failure rates, capturing just an 18% increase in failure relative to the mean. In the exit sample, top firms capture −0.41 less of the +0.049 baseline. For valuation outcomes, while the baseline shows significant increases in both valuations (+$60.066 million) and unicorn probability (+0.006), the quadruple interactions are not statistically significant, suggesting that top and non-top firms respond similarly along the value creation dimension.

This stronger risk-taking response from non-top venture capitalists likely reflects competitive dynamics in entrepreneurial finance markets. While top-tier venture capitalists have preferential access to the most promising deals, lower-tier venture capitalists face greater competitive pressure. Tax benefits effectively subsidize risk-taking for these investors, allowing them to pursue more experimental ventures that might otherwise be too costly given their constraints. This interpretation aligns with the observed increase in failure rates—tax benefits appear to help these investors compete more aggressively by backing innovative but uncertain ventures.

9 Sources of Value Creation: Funding vs. Monitoring

Our conceptual framework predicts that tax benefits should primarily affect venture capitalists' risk-taking in project selection rather than their value-added activities, since both the benefits and costs of monitoring scale proportionally with tax rates. We test this prediction by examining two key channels through which venture capitalists create value beyond providing capital: direct monitoring through board representation and value creation as measured by exit performance.

We first analyze monitoring intensity through three measures. Board voting rights, which we observe from PitchBook's deal-level data, capture investors' formal oversight capacity and

ability to influence major corporate decisions. CEO turnover and broader C-suite turnover, constructed from PitchBook's individual-level employment records, represent perhaps the most significant governance actions investors can take. Table 11 shows that when venture capital investments qualify for tax benefits, there are no statistically significant changes in any of these monitoring activities. The triple interaction coefficients are insignificant for board voting rights (0.018, t = 0.81), CEO turnover (0.002, t = 0.24), and C-suite turnover (-0.020, t = -1.12). This pattern holds both in the full sample and among exited investments.

We complement this governance analysis by examining exit multiples, which provide a comprehensive measure of value creation relative to capital invested. Table 12 tracks both the average exit multiple (exit value divided by total capital raised) and the probability of achieving various return thresholds from 5× to 50×. When investments qualify for tax benefits, we find no significant changes in any of these performance measures. The triple interaction coefficients are statistically insignificant for both the average exit multiple (0.077, t = 0.54) and indicators for exceeding key return thresholds: 5× (0.003, t = 0.77), 10× (0.001, t = 0.65), 20× (0.001, t = 0.52), and 50× (0.001, t = 0.52).

While our earlier analysis showed substantial changes in risk-taking behavior and investment outcomes, we find no evidence that venture capitalists adjust either their formal monitoring intensity or their ability to generate exit returns when investments qualify for tax benefits. This suggests that tax policy shapes capital allocation in entrepreneurial markets primarily by affecting which ventures receive funding rather than by changing how investors engage with their portfolio companies after investment. The pattern also aligns with our framework's prediction that both the benefits and costs of monitoring scale proportionally with tax rates, leaving the optimal level of post-investment engagement unchanged even as investors shift toward backing riskier ventures.

10 Conclusion

We examine how tax policy affects capital allocation in entrepreneurial markets through a triple-difference analysis of venture capital, angel, and corporate responses to a program that eliminated capital gains taxes on certain startup investments between 2004 and 2022, exploiting industry

eligibility rules, investment timing, and holding period requirements.

Our analysis yields three main findings. First, tax benefits significantly affect both the level and composition of venture capital investment. When tax benefits become available, venture capitalists shift toward riskier investments through multiple channels: they increase investment in firms at earlier development stages like product beta and stealth mode, take on more scientific uncertainty through early-stage clinical trials, and concentrate their portfolios in eligible sectors. These changes in investment strategy lead to both higher failure rates and larger successes—qualifying investments show increased business failures and funding droughts, but also higher valuations and greater likelihood of PE buyouts rather than quick strategic sales. Second, this response is unique to venture capital partnerships—we find no significant changes in investment behavior among angel investors or corporations. Third, tax benefits operate primarily through project selection rather than post-investment behavior—we find no evidence that venture capitalists adjust their governance approach through board representation or management turnover, nor do we find significant differences in value creation as measured by exit multiples.

These findings advance our understanding of how tax policy affects entrepreneurial finance markets in two important ways. First, we show that investor organizational structure plays a crucial role in policy transmission. Tax benefits work most effectively through venture capital partnerships, who uniquely combine risk-sharing capabilities with incentive-based compensation. Second, we provide evidence that tax policy can help overcome financing frictions by encouraging investors to fund marginally riskier ventures. The stronger response among venture capitalists in high-tax states suggests that tax benefits expand the set of experimental ventures receiving funding rather than simply increasing returns to existing investment strategies.

Our results have implications for ongoing policy debates about promoting entrepreneurship through the tax code. While critics argue that programs like QSBS primarily benefit sophisticated investors, our evidence shows that these benefits help address financing frictions in entrepreneurial markets by encouraging greater risk-taking in venture funding. The concentration of effects among venture capitalists—and their systematic shift toward riskier investment strategies—indicates that tax policy can effectively expand capital access for experimental ventures when channeled through intermediaries who combine risk-sharing with performance incentives.

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Table 1: Summary Statistics

	All Investments								Exited Investments							
	Mean	SD	P10	P25	P50	P75	P90	N	Mean	SD	P10	P25	P50	P75	P90	N
Panel A: Investment Characteristics																
Holding Years	3.286	2.639	0.000	1.000	3.000	5.000	7.000	1,080,754	2.576	2.337	0.000	1.000	2.000	4.000	6.000	492,468
$\mathbb{1}\{\text{Holding Years} \geq 5\}$	0.313	0.464	0.000	0.000	0.000	1.000	1.000	1,080,754	0.206	0.405	0.000	0.000	0.000	0.000	1.000	492,468
Investment Entry Year	2012.753	3.370	2007	2011	2014	2015	2017	1,080,754	2012.002	3.423	2007	2010	2013	2015	2016	492,468
$\mathbb{1}\{\text{Post}\}$	0.857	0.350	0.000	1.000	1.000	1.000	1.000	1,080,754	0.812	0.391	0.000	1.000	1.000	1.000	1.000	492,468
$\mathbb{1}\{\text{Eligible Sector}\}$	0.883	0.322	0.000	1.000	1.000	1.000	1.000	1,080,714	0.892	0.311	0.000	1.000	1.000	1.000	1.000	492,466
Panel B: Funding																
Deal Size ($M)	42.220	423.177	0.400	1.500	5.800	20.000	53.570	445,236	64.357	597.504	0.523	1.975	7.046	23.300	75.000	219,555
Number of Rounds	2.867	2.095	1.000	1.000	2.000	4.000	6.000	1,080,754	2.646	1.981	1.000	1.000	2.000	3.000	5.000	492,468
Number of Investors	5.051	5.650	1.000	1.000	3.000	7.000	12.000	481,535	4.425	5.052	1.000	1.000	3.000	6.000	10.000	264,027
Number of New Investors	3.669	5.187	0.000	1.000	2.000	5.000	9.000	481,535	3.035	4.700	0.000	0.000	1.000	4.000	8.000	264,027
$\mathbb{1}\{\text{Board Voting Rights}\}$	0.336	0.472	0.000	0.000	0.000	1.000	1.000	576,554	0.261	0.439	0.000	0.000	0.000	1.000	1.000	313,422
$\mathbb{1}\{\text{Five Years Without Funding}\}$	0.062	0.242	0.000	0.000	0.000	0.000	0.000	1,080,754	0.024	0.155	0.000	0.000	0.000	0.000	0.000	492,468
Panel C: Firm Characteristics																
Revenue ($M)	130.890	913.115	0.200	1.700	10.698	55.000	169.000	81,895	159.874	930.143	0.153	2.085	13.490	70.000	200.000	47,262
$\mathbb{1}\{\text{Pre-Revenue}\}$	0.315	0.465	0.000	0.000	0.000	1.000	1.000	576,554	0.257	0.437	0.000	0.000	0.000	1.000	1.000	492,468
Number of C-Suite Execs	3.239	2.651	1.000	2.000	3.000	4.000	6.000	916,111	3.385	3.133	1.000	1.000	2.000	4.000	7.000	373,493
$\mathbb{1}\{\text{CEO has MBA}\}$	0.229	0.420	0.000	0.000	0.000	0.000	1.000	576,554	0.230	0.421	0.000	0.000	0.000	0.000	1.000	313,422
$\mathbb{1}\{\text{CEO is Founder}\}$	0.707	0.455	0.000	0.000	1.000	1.000	1.000	802,791	0.567	0.495	0.000	0.000	1.000	1.000	1.000	314,896
$\mathbb{1}\{\text{CEO Turnover}\}$	0.044	0.206	0.000	0.000	0.000	0.000	0.000	916,111	0.068	0.252	0.000	0.000	0.000	0.000	0.000	373,493
$\mathbb{1}\{\text{C-Suite Turnover}\}$	0.345	0.475	0.000	0.000	0.000	1.000	1.000	916,111	0.418	0.493	0.000	0.000	0.000	1.000	1.000	373,493
Panel D: Exit Types																
$\mathbb{1}\{\text{Private Equity Buyout}\}$	0.007	0.082	0.000	0.000	0.000	0.000	0.000	1,080,754	0.015	0.122	0.000	0.000	0.000	0.000	0.000	492,468
$\mathbb{1}\{\text{Acquisition}\}$	0.043	0.203	0.000	0.000	0.000	0.000	0.000	1,080,754	0.095	0.293	0.000	0.000	0.000	0.000	0.000	492,468
$\mathbb{1}\{\text{IPO}\}$	0.005	0.069	0.000	0.000	0.000	0.000	0.000	1,080,754	0.010	0.102	0.000	0.000	0.000	0.000	0.000	492,468
$\mathbb{1}\{\text{Out of Business}\}$	0.018	0.133	0.000	0.000	0.000	0.000	0.000	1,080,754	0.040	0.195	0.000	0.000	0.000	0.000	0.000	492,468
Panel E: Performance																
Valuation ($M)	1353.426	6541.544	10.000	38.926	174.099	543.520	1781.000	152,629	1328.005	6620.390	9.600	37.150	161.921	525.000	1734.000	138,363
$\mathbb{1}\{\text{Unicorn}\}$	0.025	0.156	0.000	0.000	0.000	0.000	0.000	1,080,754	0.171	0.377	0.000	0.000	0.000	0.000	1.000	138,363
Exit Multiple	9.154	124.820	0.290	0.860	2.992	6.611	13.383	19,008	9.154	124.820	0.290	0.860	2.992	6.611	13.383	19,008
$\mathbb{1}\{\text{Exit Multiple} > 5\times\}$	0.343	0.475	0.000	0.000	0.000	1.000	1.000	19,008	0.343	0.475	0.000	0.000	0.000	1.000	1.000	19,008
$\mathbb{1}\{\text{Exit Multiple} > 10\times\}$	0.151	0.358	0.000	0.000	0.000	0.000	1.000	19,008	0.151	0.358	0.000	0.000	0.000	0.000	1.000	19,008
$\mathbb{1}\{\text{Exit Multiple} > 20\times\}$	0.049	0.216	0.000	0.000	0.000	0.000	0.000	19,008	0.049	0.216	0.000	0.000	0.000	0.000	0.000	19,008
$\mathbb{1}\{\text{Exit Multiple} > 50\times\}$	0.018	0.135	0.000	0.000	0.000	0.000	0.000	19,008	0.018	0.135	0.000	0.000	0.000	0.000	0.000	19,008

This table presents summary statistics for our sample of startup investments from 2004 to 2022. The data are at the investor-firm-year level. Statistics are presented separately for all investments and those that experienced any exit. Panel A reports investment characteristics. Panel B presents funding patterns. Panel C shows firm characteristics. Panel D shows the frequency of different exit types. Panel E reports performance metrics. All indicator variables are denoted by $\mathbb{1}$. Exit Multiple is the ratio of exit value to total investment. Valuation is post-money. Revenue are in millions of dollars. Data are from PitchBook.

Table 2: Mean Differences in Sectors Eligible and Non-Eligible for QSBS Exemption

	Full Sample (Investor Entry from 2004–2017)						Pre-Period (Investor Entry from 2004–2008)					
	Mean		t-Test		N		Mean		t-Test		N	
	Elig.	Non-Elig.	Diff.	t-stat	Elig.	Non-Elig.	Elig.	Non-Elig.	Diff.	t-stat	Elig.	Non-Elig.
Panel A: Investment Characteristics												
Holding Years	3.297	3.207	0.090	8.009	953,789	126,925	3.796	3.747	0.049	1.467	140,475	14,352
$\mathbb{1}\{\text{Holding Years} \geq 5\}$	0.313	0.308	0.005	3.211	953,789	126,925	0.380	0.384	-0.004	-0.924	140,475	14,352
Investment Entry Year	2012.701	2013.147	-0.446	-14.173	953,789	126,925	2006.350	2006.475	-0.125	-3.725	140,475	14,352
$\mathbb{1}\{\text{Post}\}$	0.853	0.887	-0.034	-10.703	953,789	126,925	0.000	0.000	0.000	0.000	140,475	14,352
Panel B: Firm Characteristics												
Revenue ($M)	115.226	235.575	-120.349	-6.561	71,236	10,659	62.957	102.343	-39.386	-1.105	11,337	1,417
$\mathbb{1}\{\text{Pre-Revenue}\}$	0.321	0.273	0.048	16.572	508,320	68,223	0.439	0.423	0.016	1.711	72,377	6,716
Number of C-Suite Execs	3.229	3.318	-0.089	-3.651	809,673	106,408	3.269	3.287	-0.018	-0.237	103,216	9,993
$\mathbb{1}\{\text{CEO has MBA}\}$	0.229	0.228	0.001	0.360	508,320	68,223	0.251	0.238	0.012	1.250	72,377	6,716
$\mathbb{1}\{\text{CEO is Founder}\}$	0.704	0.728	-0.023	-5.178	710,509	92,281	0.444	0.452	-0.008	-0.476	89,367	8,677
$\mathbb{1}\{\text{CEO Turnover}\}$	0.045	0.040	0.005	5.926	809,673	106,408	0.061	0.048	0.013	3.873	103,216	9,993
$\mathbb{1}\{\text{C-Suite Turnover}\}$	0.344	0.352	-0.008	-2.702	809,673	106,408	0.410	0.394	0.017	1.863	103,216	9,993
Panel C: Performance												
Valuation ($M)	1265.965	2203.532	-937.567	-5.153	138,391	14,238	625.932	807.610	-181.678	-0.836	42,299	3,520
$\mathbb{1}\{\text{Unicorn}\}$	0.024	0.034	-0.010	-6.198	953,789	126,925	0.030	0.039	-0.009	-1.786	140,475	14,352
Exit Multiple	7.947	22.640	-14.693	-1.407	17,447	1,561	5.500	6.722	-1.222	-1.609	4,244	288
$\mathbb{1}\{\text{Exit Multiple} > 5\times\}$	0.341	0.370	-0.029	-2.287	17,447	1,561	0.303	0.333	-0.030	-1.068	4,244	288
$\mathbb{1}\{\text{Exit Multiple} > 10\times\}$	0.147	0.191	-0.044	-4.260	17,447	1,561	0.130	0.194	-0.065	-2.711	4,244	288
$\mathbb{1}\{\text{Exit Multiple} > 20\times\}$	0.047	0.071	-0.024	-3.751	17,447	1,561	0.036	0.056	-0.020	-1.470	4,244	288
$\mathbb{1}\{\text{Exit Multiple} > 50\times\}$	0.017	0.029	-0.012	-2.813	17,447	1,561	0.009	0.003	0.006	1.569	4,244	288

This table presents summary statistics and mean differences between eligible and non-eligible sectors in our sample of startup investments. The data are at the investor-firm-year level. The full sample includes investor entry from 2004 to 2017, while the pre-period includes investor entry from 2004 to 2008. Panel A reports investment characteristics. Panel B presents funding patterns. Panel C presents firm characteristics including management team attributes. Panel D shows the frequency of different exit types. Panel E reports performance metrics. The t-statistics are based on standard errors clustered by investor. Exit Multiple is the ratio of exit value to total investment. Valuation is post-money and is linearly interpolated in between rounds. Employee Count and Valuation are in millions of dollars. Data are from PitchBook.

Table 3: Impact of QSBS on Ex-Ante Risk-Taking: Firm Stage (Investor-Firm Sample)

	All Investors	Venture Capital	Angel	Corporate
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable $= \mathbb{1}\{$*Firm in Product Beta Stage*$\}$				
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$	0.003***	0.003***	0.006***	0.001
	(4.83)	(2.77)	(4.51)	(0.36)
$\mathbb{1}\{\text{Eligible Sector}\}_j$	−0.000	0.000	−0.000	−0.002
	(−0.74)	(0.06)	(−0.39)	(−1.04)
Observations	147,567	66,433	30,490	11,306
Adjusted R^2	−0.014	−0.004	0.001	−0.108
Mean Dependent Variable	0.005	0.005	0.006	0.003
Panel B: Dependent Variable $= \mathbb{1}\{$*Firm in Stealth Mode*$\}$				
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$	0.003***	0.005**	−0.000	0.002**
	(2.70)	(2.25)	(−0.05)	(2.00)
$\mathbb{1}\{\text{Eligible Sector}\}_j$	0.001	0.001	0.006**	−0.001
	(0.70)	(0.43)	(2.03)	(−0.67)
Observations	147,567	66,433	30,490	11,306
Adjusted R^2	−0.032	−0.002	−0.039	−0.042
Mean Dependent Variable	0.004	0.005	0.004	0.001
Panel C: Dependent Variable $= \mathbb{1}\{$*Seed Stage Funding Round*$\}$				
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$	0.004	−0.008	0.079**	−0.063
	(0.54)	(−0.87)	(2.49)	(−1.25)
$\mathbb{1}\{\text{Eligible Sector}\}_j$	−0.008	−0.002	−0.068**	0.031
	(−1.37)	(−0.21)	(−2.32)	(0.71)
Observations	75,238	46,218	16,626	1,734
Adjusted R^2	0.197	0.206	0.139	0.008
Mean Dependent Variable	0.185	0.170	0.282	0.073
Investor FE	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓
State × Entry Year FE	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on ex-ante risk-taking through investment stage. The sample is at the investor-firm level and includes investments in C-corporations part of QSBS eligible sectors from 2004 to 2017 where the investor joined in a round under $50 million. Panel A examines investments in firms at product beta stage. Panel B examines investments in stealth mode companies. Panel C examines investments in seed stage companies. The interaction term measures the differential effect for eligible sectors after 2009. Results are shown by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 4: Impact of QSBS on Ex-Ante Risk-Taking: Clinical Trials (Investor-Year Sample)

	All Investors	Venture Capital	Angel	Corporate
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable = Fraction of Pre-Clinical Stage Deals				
$\mathbb{1}\{\text{Post-2009}\}_{i,t}$	0.003***	0.005***	0.000	0.002
	(5.11)	(5.26)	(0.13)	(0.96)
Observations	67,158	27,294	14,164	8,028
Adjusted R^2	0.194	0.238	0.213	0.084
Mean Dependent Variable	0.004	0.005	0.002	0.002
Panel B: Dependent Variable = Fraction of Discovery Stage (Phase 1) Deals				
$\mathbb{1}\{\text{Post-2009}\}_{i,t}$	0.004***	0.005***	0.001	0.002
	(5.32)	(4.02)	(1.08)	(1.26)
Observations	67,158	27,294	14,164	8,028
Adjusted R^2	0.184	0.218	0.131	0.285
Mean Dependent Variable	0.004	0.006	0.002	0.004
Panel C: Dependent Variable = Fraction of Research Stage (Phases 2-3) Deals				
$\mathbb{1}\{\text{Post-2009}\}_{i,t}$	0.006***	0.009***	0.002*	0.005**
	(6.67)	(5.61)	(1.65)	(2.21)
Observations	67,158	27,294	14,164	8,028
Adjusted R^2	0.137	0.112	0.263	0.299
Mean Dependent Variable	0.006	0.009	0.002	0.005
Panel D: Dependent Variable = Fraction of FDA Approval Stage (Phase 4) Deals				
$\mathbb{1}\{\text{Post-2009}\}_{i,t}$	−0.000	−0.000	−0.000	0.000
	(−1.47)	(−1.00)	(−1.00)	(1.00)
Observations	67,158	27,294	14,164	8,028
Adjusted R^2	−0.025	0.037	−0.171	−0.097
Mean Dependent Variable	0.000	0.000	0.000	0.000
Investor FE	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓

This table presents estimates of the impact of QSBS tax benefits on clinical trial investment patterns. The sample is at the investor-year level and includes investments in C-corporations part of QSBS eligible sectors from 2004 to 2017 where the investor joined in a round under $50 million. The dependent variables measure the fraction of an investor's deals in different clinical trial stages as identified from PitchBook's business status classification: pre-clinical trials (Panel A), discovery/Phase 1 (Panel B), research/Phases 2-3 (Panel C), and FDA approval/Phase 4 (Panel D). Post-2009 is an indicator variable equal to one in deal years 2009 and after. Results are shown by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 5: Impact of QSBS on Ex-Ante Risk-Taking: Concentration (Investor-Firm Sample)

	All Investors	Venture Capital	Angel	Corporate
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable = Industry HHI (QSBS-Eligible Sectors)				
$\mathbb{1}\{\text{Post-2009}\}_{i,t}$	0.232***	0.165***	0.369***	0.057**
	(5.23)	(3.52)	(6.20)	(1.97)
Observations	67,158	27,294	14,164	8,028
Adjusted R^2	0.364	0.367	0.111	0.025
Mean Dependent Variable	1.519	1.834	1.243	1.138
Panel B: Dependent Variable = Industry HHI (Non-Eligible Sectors)				
$\mathbb{1}\{\text{Post-2009}\}_{i,t}$	0.026*	0.027	−0.015	0.029
	(1.68)	(1.11)	(−0.45)	(0.90)
Observations	13,587	5,524	2,254	1,541
Adjusted R^2	0.044	0.027	−0.099	0.126
Mean Dependent Variable	1.086	1.072	1.015	1.136
Investor FE	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓

This table presents estimates of the impact of QSBS tax benefits on the industry concentration of investment portfolios. The sample includes investments in C-corporations from 2004 to 2017 where the investor joined in a round under $50 million. The dependent variable is the Herfindahl-Hirschman Index (HHI) measuring the concentration of an investor's investments across PitchBook industry sectors in a given year. For each investor-year, the HHI is calculated in three steps: (1) computing the number of deals in each industry sector ($N_{i,s,t}$), (2) calculating the share of deals in each sector relative to the investor's total deals that year, separaely for eligible and non-eligible sectors ($Share_{i,s,t} = N_{i,s,t} / \sum_s N_{i,s,t}$), and (3) summing the squared shares across all sectors ($HHI_{i,t} = \sum_s Share^2_{i,s,t}$). Higher values indicate greater concentration in fewer industries. Results are shown separately for QSBS-eligible and non-eligible sectors, and by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 6: Impact of QSBS Tax Benefits on Funding Patterns

	All Investors		Venture Capital		Angel		Corporate	
	All	Exited	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent Variable = Deal Size ($ millions)								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	30.495*	29.443	54.063**	94.668*	−52.356	−148.114	11.483	62.342
	(1.78)	(0.84)	(2.20)	(1.87)	(−1.20)	(−1.46)	(0.47)	(0.96)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−44.792***	−74.911***	−66.172***	−138.417***	30.188	52.882	14.714	13.808
	(−2.90)	(−2.82)	(−3.05)	(−3.43)	(0.73)	(0.61)	(0.90)	(0.33)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	45.109***	126.585***	−2.156	−6.027	211.748***	500.779***	−7.729	−56.655
	(2.62)	(3.67)	(−0.09)	(−0.12)	(4.82)	(5.03)	(−0.33)	(−0.92)
Observations	396,062	183,253	185,461	94,162	109,715	46,320	16,925	8,350
Adjusted R^2	0.063	0.059	0.022	0.019	0.149	0.162	−0.049	−0.085
Mean Dependent Variable	46.143	74.535	48.097	70.244	49.643	87.771	37.565	57.137
Panel B: Dependent Variable = Number of Investors								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	1.559***	1.207***	1.032***	1.374***	2.795***	1.549**	0.596	0.153
	(8.36)	(5.93)	(4.41)	(4.40)	(4.69)	(2.24)	(1.09)	(0.29)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−1.099***	−0.814***	−0.825***	−0.544**	−1.789***	−0.896	−0.700*	−0.394
	(−6.71)	(−5.13)	(−4.45)	(−2.20)	(−3.12)	(−1.37)	(−1.67)	(−1.09)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.315	0.462**	−0.041	0.121	−0.739	0.514	0.203	0.880
	(−1.55)	(2.11)	(−0.16)	(0.37)	(−1.20)	(0.71)	(0.37)	(1.56)
Observations	420,494	218,717	194,639	108,440	117,451	57,438	18,395	10,585
Adjusted R^2	0.246	0.243	0.237	0.229	0.291	0.322	0.258	0.234
Mean Dependent Variable	5.255	4.731	5.207	4.593	6.678	6.089	3.920	3.418
Panel C: Dependent Variable = Number of New Investors								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	1.171***	0.851***	0.873***	1.064***	2.033***	1.319**	0.380	−0.123
	(7.57)	(5.10)	(4.64)	(4.41)	(3.95)	(2.06)	(0.84)	(−0.33)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.809***	−0.551***	−0.621***	−0.347**	−1.363***	−0.884	−0.473	−0.020
	(−6.06)	(−4.55)	(−4.45)	(−1.97)	(−2.75)	(−1.47)	(−1.32)	(−0.08)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.229	0.426**	−0.035	0.095	−0.521	0.198	0.263	0.989**
	(−1.34)	(2.31)	(−0.18)	(0.36)	(−0.98)	(0.30)	(0.57)	(2.42)
Observations	420,494	218,717	194,639	108,440	117,451	57,438	18,395	10,585
Adjusted R^2	0.265	0.274	0.277	0.280	0.325	0.361	0.245	0.211
Mean Dependent Variable	3.809	3.289	3.568	3.007	5.262	4.714	2.645	2.140
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor-Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on funding patterns. The dependent variables are deal size in millions of dollars (Panel A), total number of investors per funding round (Panel B), and number of new investors per funding round (Panel C). Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown for all investors (split between all firms and those that experienced any exit) and by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 7: Impact of QSBS Tax Benefits on Ex-Post Risk Taking: Failed Exits

	All Investors		Venture Capital		Angel		Corporate	
	All	Exited	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent Variable = $\mathbb{1}\{$Out of Business Outcome$\}$								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.011***	0.037***	0.013***	0.044***	0.001	0.023*	0.000	0.004
	(5.04)	(6.42)	(4.27)	(5.35)	(0.34)	(1.87)	(0.01)	(0.22)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.001	−0.004	0.001	−0.004	0.011***	0.018*	0.006	0.008
	(0.59)	(−0.83)	(0.47)	(−0.74)	(4.03)	(1.70)	(1.29)	(0.79)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.024***	−0.072***	−0.025***	−0.076***	−0.014***	−0.057***	−0.002	−0.014
	(−11.11)	(−12.39)	(−8.11)	(−9.29)	(−4.69)	(−4.72)	(−0.33)	(−0.75)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.108	0.108	0.107	0.102	0.106	0.104	0.089	0.092
Mean Dependent Variable	0.018	0.042	0.017	0.034	0.019	0.048	0.015	0.030
Panel B: Dependent Variable = $\mathbb{1}\{$Five Years Without Funding$\}$								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.080***	0.083***	0.081***	0.094***	0.048	0.017	0.040	0.044
	(6.16)	(5.73)	(4.77)	(5.18)	(1.36)	(0.42)	(0.91)	(0.80)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.108***	−0.100***	−0.076***	−0.080***	−0.045	−0.010	−0.175***	−0.172***
	(−8.82)	(−7.39)	(−4.69)	(−4.61)	(−1.31)	(−0.25)	(−4.45)	(−3.65)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.083***	−0.092***	−0.086***	−0.102***	−0.065*	−0.011	−0.040	−0.056
	(−6.54)	(−6.34)	(−5.11)	(−5.59)	(−1.95)	(−0.28)	(−0.94)	(−1.07)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.317	0.187	0.288	0.147	0.314	0.182	0.375	0.285
Mean Dependent Variable	0.064	0.026	0.049	0.019	0.069	0.025	0.088	0.048
Panel C: Dependent Variable = Consecutive Years Without Funding								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.382***	0.207***	0.360***	0.222**	0.511***	−0.106	0.135	0.247
	(5.55)	(3.09)	(3.89)	(2.47)	(2.75)	(−0.56)	(0.58)	(1.07)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.508***	−0.266***	−0.369***	−0.246***	−0.518***	0.070	−0.593***	−0.438**
	(−7.66)	(−4.26)	(−4.13)	(−2.98)	(−2.85)	(0.38)	(−2.82)	(−2.20)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.403***	−0.227***	−0.400***	−0.250***	−0.727***	−0.008	−0.049	−0.231
	(−6.08)	(−3.48)	(−4.43)	(−2.87)	(−4.17)	(−0.04)	(−0.22)	(−1.05)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.466	0.335	0.436	0.299	0.467	0.342	0.502	0.388
Mean Dependent Variable	1.145	0.763	0.994	0.675	1.203	0.746	1.363	1.008
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on measures of ex-post risk taking. Panel A examines business failures through an indicator for firms that went out of business. Panel B examines funding gaps through an indicator for firms that go five or more years without raising new funding. Panel C measures the length of funding droughts by counting the number of consecutive years a firm has gone without raising new funding (e.g., a value of 3 indicates the firm has not raised funding for three consecutive years at that point in time). Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown for all investors (split between all firms and those that experienced any exit) and by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 8: Impact of QSBS Tax Benefits on Firm Value Creation

	All Investors		Venture Capital		Angel		Corporate	
	All	Exited	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent Variable = Valuation ($ millions)								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	34.278**	59.674***	61.957**	105.674***	−1.807	−2.790	−8.223**	−10.386**
	(2.53)	(2.76)	(2.55)	(2.61)	(−1.41)	(−1.40)	(−1.99)	(−1.99)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−29.910**	−56.194***	−53.560**	−99.018**	1.820	2.800	7.051*	9.223*
	(−2.31)	(−2.65)	(−2.28)	(−2.48)	(1.41)	(1.41)	(1.74)	(1.75)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−31.676**	−57.335***	−55.337**	−98.520**	−0.179	−0.041	−3.190*	−3.265*
	(−2.38)	(−2.70)	(−2.33)	(−2.48)	(−0.38)	(−0.08)	(−1.74)	(−1.71)
Observations	152,344	138,082	81,919	73,914	32,338	29,665	8,122	7,411
Adjusted R^2	0.999	0.999	0.998	0.998	1.000	1.000	1.000	1.000
Mean Dependent Variable	1355.837	1330.576	1011.235	1020.297	2657.219	2584.310	491.275	484.105
Panel B: Dependent Variable = $\mathbb{1}\{$Unicorn$\}$								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.004**	0.010**	0.008**	0.017**	−0.000	−0.001	−0.002*	−0.005*
	(2.08)	(2.23)	(2.17)	(2.21)	(−1.00)	(−1.00)	(−1.73)	(−1.73)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.004**	−0.010**	−0.008**	−0.018**	0.000	0.001	0.003*	0.005*
	(−2.09)	(−2.28)	(−2.19)	(−2.29)	(1.00)	(1.00)	(1.73)	(1.73)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.005***	−0.011***	−0.008**	−0.018**	−0.000	−0.000	−0.001	−0.002
	(−2.65)	(−2.69)	(−2.27)	(−2.30)	(−1.00)	(−0.99)	(−1.53)	(−1.55)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.994	0.993	0.991	0.990	1.000	1.000	0.991	0.989
Mean Dependent Variable	0.026	0.051	0.030	0.055	0.027	0.059	0.017	0.030
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on firm valuations. Panel A examines firm valuation in millions of dollars, which is linearly interpolated between funding rounds (results without interpolation and with alternative valuation thresholds are available in Tables IA8 and IA9 of the Appendix). Panel B examines the likelihood of achieving unicorn status (valuation exceeding $1 billion), where unicorn status is determined based on interpolated valuations and appears for each investor-firm-year with the given status. Our sample contains 120 unique unicorn firms. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 9: Impact of QSBS Tax Benefits on Investment Exit Patterns

	All Investors		Venture Capital		Angel		Corporate	
	All	Exited	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent Variable $= \mathbb{1}\{$*Private Equity Buyout*$\}$								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.007***	0.020***	0.008**	0.022***	0.002	0.029**	0.001	0.001
	(3.06)	(3.37)	(2.54)	(2.68)	(0.57)	(1.99)	(0.18)	(0.04)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.006**	−0.021***	−0.005*	−0.018***	0.002	−0.015	−0.002	−0.007
	(−2.57)	(−3.88)	(−1.70)	(−2.74)	(0.47)	(−1.07)	(−0.29)	(−0.58)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.007***	−0.021***	−0.007**	−0.022***	−0.002	−0.029**	0.005	0.007
	(−2.90)	(−3.65)	(−2.08)	(−2.75)	(−0.64)	(−2.08)	(0.66)	(0.44)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.053	0.048	0.052	0.051	0.043	0.043	0.054	0.055
Mean Dependent Variable	0.007	0.016	0.007	0.015	0.005	0.014	0.008	0.016
Panel B: Dependent Variable $= \mathbb{1}\{$*Acquisition*$\}$								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.022***	−0.046***	−0.024***	−0.060***	−0.069***	−0.128***	0.023	0.053
	(−4.60)	(−4.18)	(−3.16)	(−3.38)	(−7.53)	(−4.44)	(1.20)	(1.38)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.019***	0.009	0.020***	0.008	0.057***	0.065**	−0.026	−0.080**
	(4.15)	(0.95)	(3.02)	(0.59)	(6.49)	(2.39)	(−1.51)	(−2.53)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	0.038***	0.031***	0.044***	0.048***	0.083***	0.097***	−0.004	−0.065*
	(7.54)	(2.86)	(5.84)	(2.73)	(8.75)	(3.39)	(−0.22)	(−1.70)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.116	0.144	0.118	0.149	0.117	0.154	0.114	0.138
Mean Dependent Variable	0.043	0.098	0.051	0.106	0.039	0.100	0.049	0.100
Panel C: Dependent Variable $= \mathbb{1}\{$*IPO*$\}$								
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.006***	−0.006	−0.007**	−0.008	−0.002	0.028	−0.007	−0.011
	(−2.94)	(−1.21)	(−2.16)	(−1.06)	(−0.34)	(1.14)	(−1.35)	(−0.89)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.008***	0.011**	0.009***	0.012*	0.004	−0.023	0.010**	0.019*
	(4.24)	(2.56)	(3.07)	(1.77)	(0.61)	(−0.96)	(2.20)	(1.90)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	0.004**	0.001	0.006*	0.002	−0.001	−0.036	−0.000	−0.006
	(2.39)	(0.30)	(1.84)	(0.28)	(−0.27)	(−1.50)	(−0.08)	(−0.50)
Observations	1,050,884	462,661	448,474	216,740	302,134	118,027	51,451	25,146
Adjusted R^2	0.053	0.025	0.050	0.024	0.013	−0.003	0.058	0.025
Mean Dependent Variable	0.005	0.011	0.006	0.013	0.003	0.007	0.005	0.011
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on successful exit types. Panel A examines private equity buyouts. Panel B examines acquisitions. Panel C examines initial public offerings (IPOs). These represent the three main paths to successful exits, complementing the analysis of business failures presented in Table **??**. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown for all investors (split between all firms and those that experienced any exit) and by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 10: Heterogeneity of Extreme Outcomes: Investor Quality

	𝟙{Out of Business}		Valuation ($ millions)		𝟙{Unicorn}	
	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j \times \mathbb{1}\{\text{Top 50 VC}\}_j$	−0.012**	−0.041**	48.319	23.217	0.015	0.037
	(−1.99)	(−2.04)	(0.73)	(0.25)	(0.90)	(1.00)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.014***	0.049***	60.066**	111.132**	0.006*	0.014*
	(4.00)	(5.29)	(2.12)	(2.12)	(1.85)	(1.90)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Top 50 VC}\}_j$	0.009	0.022	−14.441	10.768	−0.020	−0.045
	(1.54)	(1.17)	(−0.23)	(0.12)	(−1.21)	(−1.25)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j \times \mathbb{1}\{\text{Top 50 VC}\}_j$	0.008**	0.014*	−27.303	−4.369	−0.018	−0.045
	(2.29)	(1.78)	(−0.46)	(−0.05)	(−1.04)	(−1.26)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.001	−0.004	−52.400*	−105.140**	−0.006*	−0.013*
	(0.28)	(−0.54)	(−1.85)	(−2.00)	(−1.76)	(−1.79)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.027***	−0.080***	−58.454**	−108.799**	−0.005*	−0.013*
	(−7.41)	(−8.68)	(−2.11)	(−2.11)	(−1.69)	(−1.76)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Top 50 VC}\}_j$	−0.013***	−0.028***	36.277	15.222	0.023	0.054
	(−4.03)	(−3.92)	(0.61)	(0.18)	(1.36)	(1.52)
Observations	403,249	193,884	72,675	65,254	403,249	193,884
Adjusted R^2	0.109	0.104	0.998	0.998	0.991	0.989
Mean Dependent Variable	0.017	0.035	1045.024	1058.618	0.030	0.054
Year FE	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓

This table presents estimates of the heterogeneous effect of QSBS tax benefits on various outcomes by investor quality. The dependent variables are an indicator for business failure, firm valuation in millions of dollars, and an indicator for achieving unicorn status (valuation exceeding $1 billion). The sample includes Venture Capital firms only. Top 50 VC is an indicator for venture capital firms that rank among the top 50 with the highest number of IPO exits or successful M&A exits (above $100M) for US-based portfolio companies between 2004 and 2022. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown separately for all firms and those that experienced any exit. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 11: Sources of Venture Capital Value Creation: Monitoring

Dependent Variable:	𝟙{Board Voting Rights}		𝟙{CEO Turnover}		𝟙{C-Suite Turnover}	
	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.018	−0.007	0.002	−0.005	−0.020	−0.042
	(0.81)	(−0.22)	(0.24)	(−0.36)	(−1.12)	(−1.33)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.033	−0.048*	0.001	−0.002	0.017	0.029
	(−1.64)	(−1.77)	(0.09)	(−0.18)	(1.02)	(1.07)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.007	0.067**	−0.011	0.005	0.033*	0.042
	(−0.32)	(2.10)	(−1.25)	(0.34)	(1.81)	(1.32)
Observations	243,827	136,791	385,407	170,318	385,407	170,318
Adjusted R^2	0.390	0.397	0.195	0.190	0.281	0.276
Mean Dependent Variable	0.400	0.323	0.048	0.068	0.393	0.457
Year FE	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on venture capital monitoring activities. The sample includes Venture Capital firms only. Board Voting Rights indicates whether the investor has board voting rights, CEO Turnover indicates CEO replacement, and C-Suite Turnover indicates turnover among all C-suite executives. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown separately for all firms and those that experienced any exit. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 12: Sources of Venture Capital Value Creation: Value Beyond Funding

Dependent Variable:	Exit	Exit Multiple Thresholds			
	Multiple	$\mathbb{1}\{>5\times\}$	$\mathbb{1}\{>10\times\}$	$\mathbb{1}\{>20\times\}$	$\mathbb{1}\{>50\times\}$
	(1)	(2)	(3)	(4)	(5)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.077	0.003	0.001	0.001	0.001
	(0.54)	(0.77)	(0.65)	(0.52)	(0.52)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.023	0.000	0.001	0.000	0.000
	(0.25)	(0.10)	(0.40)	(0.02)	(0.02)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.114	−0.005**	−0.002	−0.002	−0.002
	(−1.03)	(−2.04)	(−1.40)	(−1.21)	(−1.21)
Observations	8,499	8,499	8,499	8,499	8,499
Adjusted R^2	0.997	0.998	0.998	0.996	0.986
Mean Dependent Variable	6.027	0.331	0.136	0.036	0.010
Year FE	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓
Investor FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on venture capital exit performance. The dependent variables are the exit multiple (Column 1) and indicators for achieving various exit multiple thresholds (Columns 2-5). Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Internet Appendix to

"Tax Incentives and Venture Capital Risk"

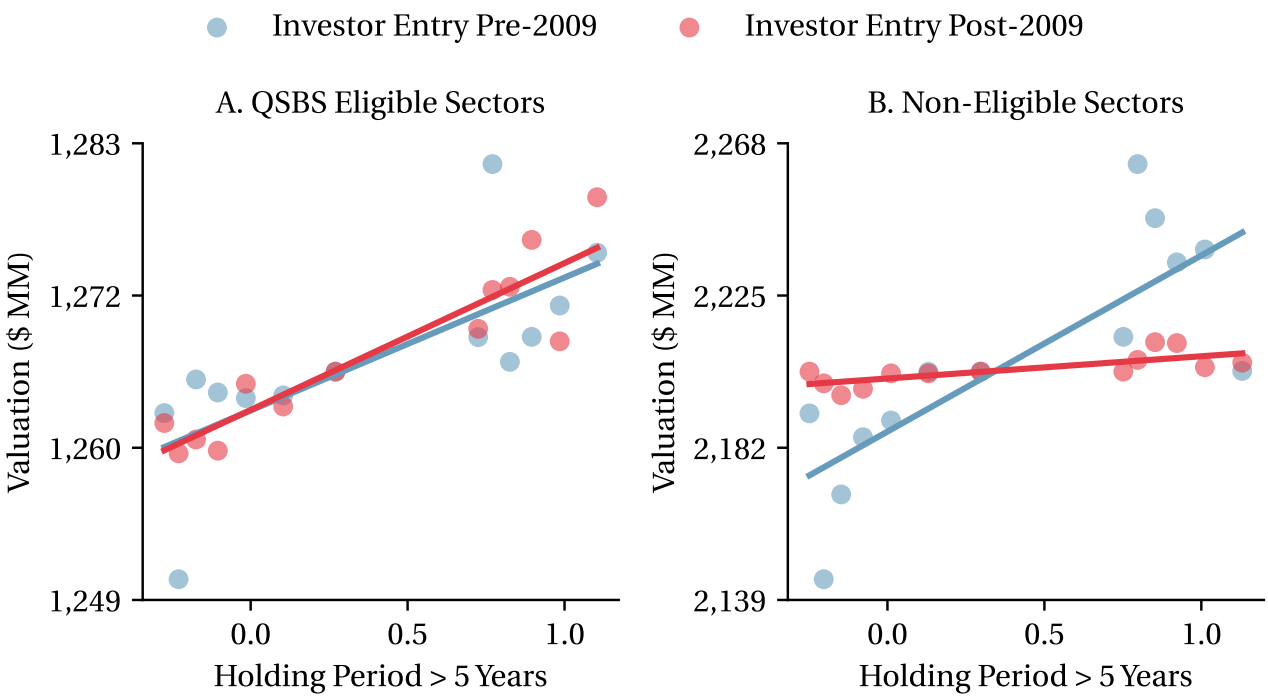
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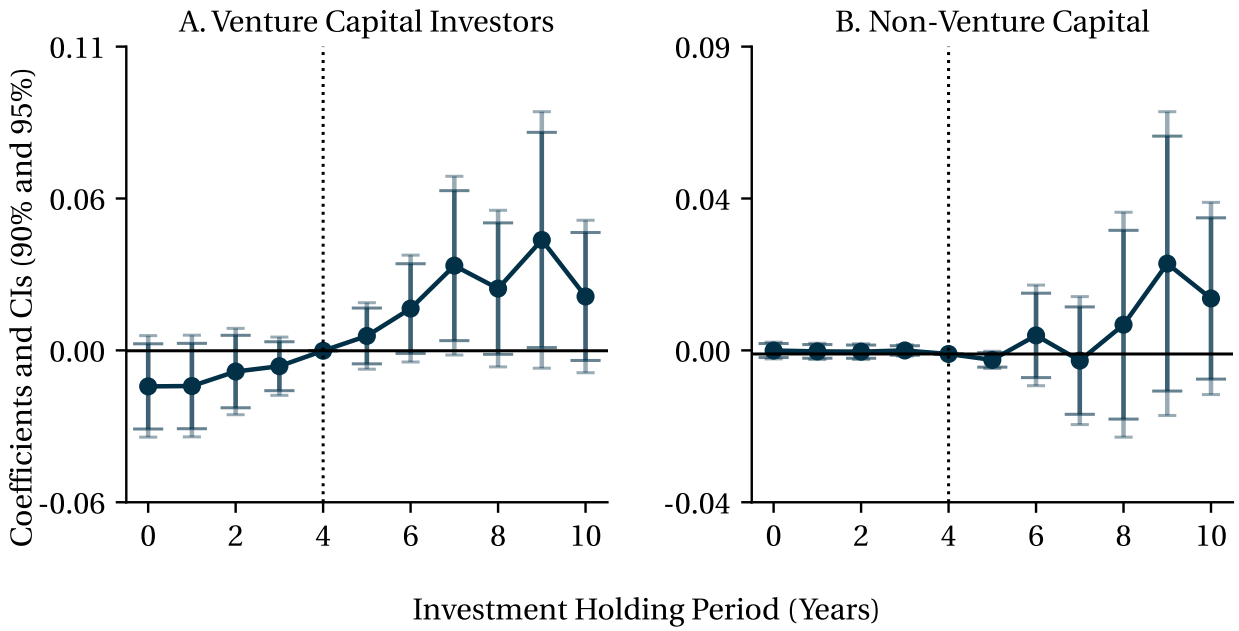
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Figure IA1: Binned Scatterplots of Holding Period on Investment Valuations



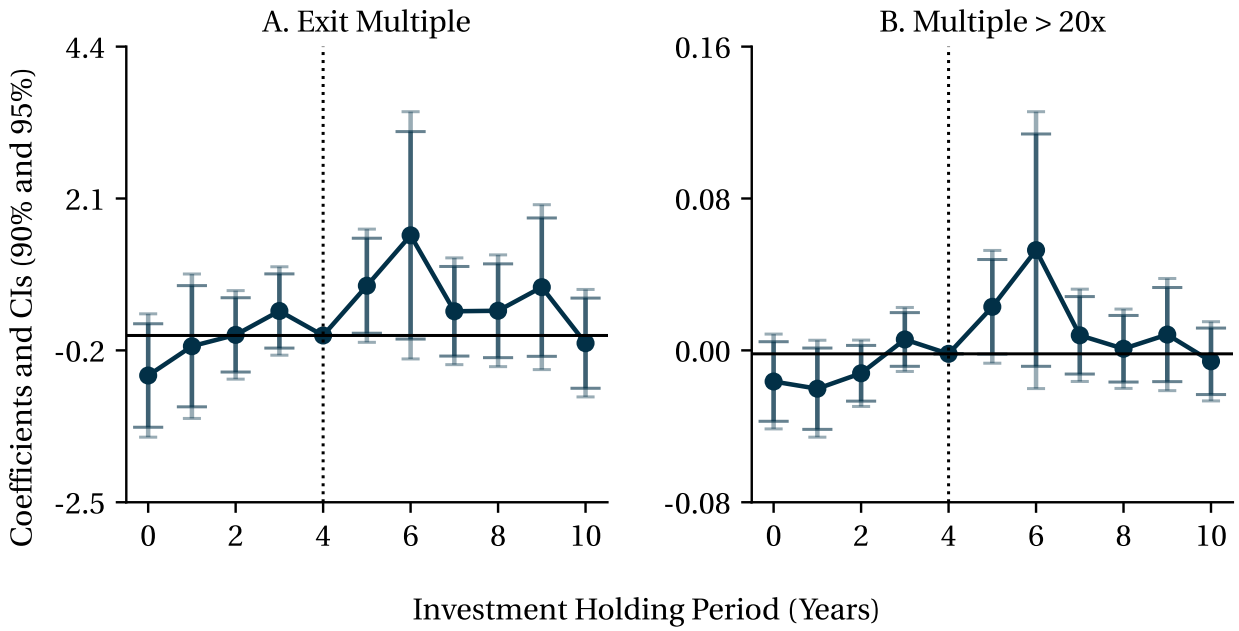
This figure shows the relationship between firm valuations and investment holding periods, separately for QSBS eligible sectors (Panel A) and non-eligible sectors (Panel B). The plots compare investments made pre- and post-2009. Each point shows the mean valuation within holding period bins after controlling for investor-firm fixed effects. The plots reflect within-firm variation in investment performance over different holding periods.

Figure IA2: Dynamic DiD for Likelihood of Achieving Unicorn Status



This figure illustrates the dynamic difference-in-differences coefficients for the likelihood of achieving unicorn status, based on the following specification for all firms: $Y_{i,j,t} = \beta_0 + \sum_{k=0}^{10} \beta_k [\mathbb{1}\{\text{Holding Years} = k\}_{i,j,t} \times \mathbb{1}\{\text{Inv. Entry Year} \geq 2009\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j] + \text{Controls} + \epsilon_{i,j,t}$. The x-axis represents the investment holding period (in years), while the y-axis shows the estimated coefficients alongside 90% and 95% confidence intervals. All specifications include fixed effects (year, holding period, entry year, investor × firm) and standard errors clustered at the investor level. Results correspond to Table 8, Panel B, Column 3 and Panel B, Columns 5 and 7.

Figure IA3: Dynamic DID for VC Exit Multiples



This figure illustrates the dynamic difference-in-differences coefficients for exit multiples (exit value divided by total investment) and the likelihood of a multiple above 20× the invested capital, based on the following specification: $Y_{i,j,t} = \beta_0 + \sum_{k=0}^{10} \beta_k [\mathbb{1}\{\text{Holding Years} = k\}_{i,j,t} \times \mathbb{1}\{\text{Inv. Entry Year} \geq 2009\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j] + \text{Controls} + \epsilon_{i,j,t}$. The x-axis represents the investment holding period (in years), while the y-axis shows the estimated coefficients alongside 90% and 95% confidence intervals. All specifications include fixed effects (holding period, investor × firm, and firm × year) and standard errors clustered at the investor level. Results correspond to Table 12, Columns 1 and 3.

Table IA1: Timeline of QSBS Exemptions at Federal and State Levels

Year	**Policy or Event**
1993	Federal QSBS program is introduced under Section 1202, fixing the tax rate on QSBS gains at 14%.
2009	Federal QSBS exclusion is increased to 75% for investments made after February 17, 2009.
2010	Federal QSBS exclusion is increased to 100% for investments made after September 27, 2010.
2012	California eliminates its QSBS exclusion after a court ruling citing constitutional issues.
2015	100% federal QSBS exemption is made permanent under the PATH Act.
2016	Utah adopts QSBS conformity, offering full exclusion at the state level.
2022	Massachusetts adopts QSBS conformity, providing state-level exemptions for qualifying investments.
Ongoing	New Jersey, Pennsylvania, Mississippi, and Alabama maintain non-conformity with federal QSBS.

This table provides a timeline of key events related to the Qualified Small Business Stock (QSBS) exemptions. The 1993 federal QSBS program established a flat 14% tax rate for qualifying gains, independent of the long-term capital gains tax rate. In contrast, the 2009 and 2010 changes introduced exclusions that tracked the long-term capital gains tax rate (75% and 100%, respectively). In all cases—both at the federal and state levels—investors must hold the stock for a minimum of 5 years to qualify for the exemptions. Unless otherwise noted, states complied with federal exclusions for QSBS, offering corresponding benefits at the state level.

Table IA2: Sectors Not Eligible for QSBS Tax Benefits

Accounting, Audit and Tax	Agriculture	Animal Husbandry
Aluminum Mining	Aquaculture	Asset Management
Automotive Insurance	Banking	BPO/Outsource Services
Brokerage	Casinos and Gaming	Outpatient Services
Coal Mining	Commercial Insurance	Construction/Engineering
Consumer Finance	Consulting Services (B2B)	Cultivation
Education Services (B2B)	Educational Services (B2C)	Elder and Disabled Care
Energy Traders/Brokers	Energy Exploration	Energy Refining
Environmental Serv. (B2B)	Fin. Mortgage/Thrifts	Forestry/Harvesting
Forestry Processing	Genetic	Gold Mining
Government	Health Care	Health Diagnostics
Health Insurance	Hedge Funds	Home Health Care
Hospitality	Horticulture	Hospital Services
Hotels and Resorts	Human Capital Services	Insurance Brokers
International Banks	Investment Banks	Iron and Steel Mining
IT Consulting	Lab Services (Healthcare)	Legal Services (B2B)
Legal Services (B2C)	Leisure Facilities	Life and Health Insurance
Managed Care	Multi-line Insurance	National Banks
Office Services (B2B)	Other Agriculture	Other Banking
Other Capital Markets	Other Commercial Banks	Other Cons. Prod./Serv.
Other Financial Services	Other Healthcare Services	Other IT Services
Other Insurance	Other Metals, Mining	Other Restaurants, Hotels
Other Services (B2C)	Outcome Management	Precious Metals/Mining
Private Equity	Property Insurance	REITs
Real Estate Services (B2C)	Regional Banks	Restaurants and Bars
Specialized Finance		

This table lists industries that do not qualify for QSBS tax benefits, based on PitchBook's industry code, which represents their most granular industry classification variable.

Table IA3: Summary Statistics: Cross-Sectional Sample

	Mean	SD	P10	P25	P50	P75	P90	N
Panel A: Investment Stage								
𝟙{Product Beta Stage}	0.005	0.071	0.000	0.000	0.000	0.000	0.000	183,152
𝟙{Stealth Mode}	0.003	0.058	0.000	0.000	0.000	0.000	0.000	183,152
𝟙{Seed Stage}	0.186	0.389	0.000	0.000	0.000	0.000	1.000	89,857
Panel B: Contract Terms								
𝟙{Participating Preferred}	0.247	0.431	0.000	0.000	0.000	0.000	1.000	73,773
𝟙{Cumulative Dividends}	0.168	0.374	0.000	0.000	0.000	0.000	1.000	61,389
𝟙{Equal Footing (Pari-Passu)}	0.331	0.471	0.000	0.000	0.000	1.000	1.000	62,163

This table presents summary statistics for our cross-sectional sample of investor-firm pairs. Panel A reports summary statistics. Panel B presents mean differences between QSBS-eligible and non-eligible sectors. The sample includes investments in C-corporations from 2004 to 2017 where the investor joined in a round under $50 million. All indicator variables are denoted by 𝟙. t-statistics based on standard errors clustered at the investor level are shown in Panel B. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Data are from PitchBook.

Table IA4: Mean Differences in Ex-Ante Investment Decisions: Cross-Sectional Sample

	Full Sample (Investor Entry from 2004–2017)						Pre-Period (Investor Entry from 2004–2008)					
	Mean		t-Test		N		Mean		t-Test		N	
	Elig.	Non-Elig.	Diff.	t-stat	Elig.	Non-Elig.	Elig.	Non-Elig.	Diff.	t-stat	Elig.	Non-Elig.
Panel A: Investment Stage												
1{Product Beta Stage}	0.006	0.002	0.004***	12.21	158,088	25,058	0.001	0.000	0.001***	3.38	21,754	2,838
1{Stealth Mode}	0.004	0.001	0.003***	10.51	158,088	25,058	0.002	0.001	0.001	0.68	21,754	2,838
1{Seed Stage}	0.182	0.224	-0.042***	-8.97	81,013	8,844	0.007	0.010	-0.003	-1.05	14,542	1,027
Panel B: Contract Terms												
1{Equal Footing (Pari-Passu)}	0.329	0.350	-0.022***	-3.47	55,539	6,624	0.242	0.168	0.074***	3.87	5,944	440
1{Cumulative Dividends}	0.169	0.159	0.010*	1.83	55,574	5,815	0.238	0.366	-0.128***	-5.88	7,886	547
1{Participating Preferred}	0.257	0.160	0.097***	19.73	66,206	7,567	0.584	0.578	0.006	0.29	8,310	588

This table presents mean differences between eligible and non-eligible sectors in our cross-sectional sample of investor-firm pairs. The sample includes investments in C-corporations from 2004 to 2017 where the investor joined in a round under $50 million. The full sample includes all investor entries, while the pre-period includes entries from 2004 to 2008. Panel A reports differences in investment stage characteristics. Panel B presents differences in contractual terms. The t-statistics are based on standard errors clustered by investor. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Data are from PitchBook.

Table IA5: Summary Statistics: Investor-Year Sample

	Mean	SD	P10	P25	P50	P75	P90	N
Panel A: Eligible Sectors								
Fraction of Pre-Clinical Stage Deals	0.005	0.068	0.000	0.000	0.000	0.000	0.000	67,158
Fraction of Discovery Stage (Phase 1)	0.004	0.061	0.000	0.000	0.000	0.000	0.000	67,158
Fraction of Research Stage (Phases 2-3)	0.006	0.074	0.000	0.000	0.000	0.000	0.000	67,158
Industry Concentration (HHI)	1.519	0.891	0.345	0.667	1.234	2.345	3.123	67,158
Panel B: Non-Eligible Sectors								
Industry Concentration (HHI)	1.086	0.567	0.234	0.456	0.890	1.567	2.345	13,587

This table presents summary statistics for our investor-year sample. The sample includes investments in C-corporations from 2004 to 2017 where the investor joined in a round under $50 million. Panel A reports statistics for investments in QSBS-eligible sectors. Panel B reports statistics for investments in non-eligible sectors. Industry Concentration (HHI) measures the concentration of an investor's investments across industries, calculated for each investor-year as $\sum_s Share^2_{i,s,t}$ where $Share_{i,s,t}$ is the fraction of investor i's deals in sector s in year t. Data are from PitchBook.

Table IA6: Robustness: Clinical Trial Stage Funding (Using Investor-Firm Sample)

	All Investors	Venture Capital	Angel
	(1)	(2)	(3)
Panel A: Dependent Variable $= \mathbb{1}\{\textit{Pre-Clinical Stage}\}_j$			
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_t$	0.002***	0.003***	−0.001
	(3.23)	(3.10)	(−0.63)
Observations	127,191	59,948	26,533
Adjusted R^2	0.020	0.043	0.084
Mean Dependent Variable	0.003	0.004	0.001
Panel B: Dependent Variable $= \mathbb{1}\{\textit{Discovery Stage (Phase 1)}\}_j$			
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j}$	0.002***	0.002***	0.002***
	(4.36)	(3.06)	(3.10)
Observations	127,191	59,948	26,533
Adjusted R^2	0.037	0.082	0.079
Mean Dependent Variable	0.003	0.003	0.001
Panel C: Dependent Variable $= \mathbb{1}\{\textit{Research Stage (Phases 2-3)}\}_j$			
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j}$	0.003***	0.003***	0.001**
	(4.93)	(3.26)	(2.51)
Observations	128,737	59,973	26,534
Adjusted R^2	0.044	0.061	0.053
Mean Dependent Variable	0.003	0.004	0.001
Panel D: Dependent Variable $= \mathbb{1}\{\textit{FDA Approval Stage (Phase 4)}\}_j$			
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j}$	−0.000	−0.000	−0.000
	(−1.65)	(−0.96)	(−0.94)
Observations	128,737	59,973	26,534
Adjusted R^2	−0.002	0.053	−0.083
Mean Dependent Variable	0.000	0.000	0.000
Investor FE	✓	✓	✓
Firm Industry FE	✓	✓	✓
Firm State FE	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓

This table presents estimates of the impact of QSBS tax benefits on clinical trial investment patterns. The sample includes investments in C-corporations part of QSBS eligible sectors from 2004 to 2017 where the investor joined in a round under $50 million. The dependent variables measure the fraction of an investor's deals in different clinical trial stages as identified from PitchBook's business status classification: pre-clinical trials (Panel A), discovery/Phase 1 (Panel B), research/Phases 2-3 (Panel C), and FDA approval/Phase 4 (Panel D). Post-2009 is an indicator variable equal to one in deal years 2009 and after. Results are shown by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, and Angel includes individual angel investors and angel groups. Corporate investors are omitted due to insufficient observations under the fixed effects specification. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table IA7: Impact of QSBS on Investor Protection: Contract Terms (Investor-Firm Sample)

	All Investors	Venture Capital	Angel	Corporate
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable = $\mathbb{1}\{$*Equal Footing in Liquidation (Pari-Passu)*$\}$				
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$	−0.062**	−0.074**	−0.175***	0.151
	(−2.46)	(−2.38)	(−3.49)	(1.01)
$\mathbb{1}\{\text{Eligible Sector}\}_j$	0.056**	0.065**	0.205***	−0.122
	(2.34)	(2.17)	(4.17)	(−1.06)
Observations	50,574	31,151	11,963	826
Adjusted R^2	0.073	0.067	0.087	0.008
Mean Dependent Variable	0.339	0.341	0.368	0.291
Panel B: Dependent Variable = $\mathbb{1}\{$*Cumulative Dividends*$\}$				
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$	0.072***	0.077***	0.029	−0.364***
	(3.68)	(3.24)	(0.88)	(−2.75)
$\mathbb{1}\{\text{Eligible Sector}\}_j$	−0.067***	−0.073***	0.006	0.229**
	(−3.61)	(−3.23)	(0.18)	(1.98)
Observations	50,773	31,738	11,502	946
Adjusted R^2	0.289	0.287	0.286	0.262
Mean Dependent Variable	0.160	0.155	0.127	0.153
Panel C: Dependent Variable = $\mathbb{1}\{$*Participating Preferred*$\}$				
$\mathbb{1}\{\text{Investor Entry Post-2009}\}_{i,j} \times \mathbb{1}\{\text{Eligible Sector}\}_j$	0.027	0.060*	−0.195***	0.039
	(1.09)	(1.95)	(−2.98)	(0.14)
$\mathbb{1}\{\text{Eligible Sector}\}_j$	0.011	−0.024	0.237***	−0.017
	(0.42)	(−0.78)	(3.68)	(−0.06)
Observations	61,116	37,499	14,530	1,136
Adjusted R^2	0.275	0.294	0.204	0.179
Mean Dependent Variable	0.248	0.263	0.160	0.292
Investor FE	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓
Firm State×Investor Entry Year FE	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on cash flow rights. Panel A examines equal footing rights in liquidation. Panel B examines cumulative dividend rights. Panel C examines participating preferred rights (i.e., "double-dipping" in liquidation). The interaction term measures the differential effect for eligible sectors after 2009. Results are shown by investor type, where Venture Capital includes traditional VC firms and corporate venture capital, Angel includes individual angel investors and angel groups, and Corporate includes corporations and holding companies. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table IA8: Impact of QSBS Tax Benefits on Firm Valuations (Alternative Measures)

	All	Exited
	(1)	(2)
Panel A: Dependent Variable = Valuation ($ millions), Non-Interpolated		
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	2456.037***	2305.749**
	(2.65)	(2.26)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−1432.219***	−1477.743***
	(−2.81)	(−2.84)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−1822.038**	−1589.671
	(−2.10)	(−1.59)
Observations	505	480
Adjusted R^2	0.889	0.887
Mean Dependent Variable	1754.657	1835.089
Panel B: Dependent Variable = ln(Valuation)		
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.025**	0.047**
	(2.08)	(2.41)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.028**	−0.051***
	(−2.47)	(−2.70)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.026**	−0.048**
	(−2.18)	(−2.52)
Observations	152,312	138,050
Adjusted R^2	0.999	0.999
Mean Dependent Variable	5.016	4.977
Year FE	✓	✓
Holding Period FE	✓	✓
Entry Year FE	✓	✓
Investor × Firm FE	✓	✓
Clustered SE (Investor)	✓	✓

This table presents estimates of the effect of QSBS tax benefits on firm valuations. This is a robustness of our main regression results using interpolated valuations, presented in Panel A of Table 8 (columns 1 and 2). Panel A examines firm valuation in millions of dollars at the time of funding rounds. Panel B examines the natural logarithm of firm valuation linearly interpolated between funding rounds. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown for all investors split between all firms and those that experienced any exit. Column (1) includes separate investor and company fixed effects, while column (2) includes investor-firm pair fixed effects. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table IA9: Impact of QSBS on Firm Value Creation: Alternative Valuation Thresholds

	Dependent Variable: $\mathbb{1}\{\text{Valuation} > X\}$					
	\$500M		\$2,000M		\$3,000M	
	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.004**	0.010**	0.003**	0.008**	0.001	0.002*
	(2.08)	(2.04)	(2.44)	(2.48)	(1.42)	(1.68)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−0.004**	−0.011**	−0.003**	−0.008***	−0.001	−0.002
	(−2.22)	(−2.31)	(−2.48)	(−2.60)	(−1.32)	(−1.64)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.004**	−0.010**	−0.003**	−0.007**	−0.000	−0.001
	(−2.04)	(−2.05)	(−2.28)	(−2.32)	(−1.22)	(−1.36)
Observations	1,050,884	462,661	1,050,884	462,661	1,050,884	462,661
Adjusted R^2	0.997	0.996	0.995	0.994	0.996	0.996
Mean Dependent Variable	0.040	0.081	0.014	0.027	0.010	0.020
Year FE	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on firm valuations at various thresholds. This is a robustness of our main regression results using \$1 billion threshold (unicorn status), presented in Panel B of Table 8 (columns 1 and 2). The dependent variables are indicators for achieving different valuation thresholds (\$500 million, \$2 billion, and \$3 billion). Results are shown for all firms and those that experienced any exit. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table IA10: Robustness: Risk-Taking Results Excluding California-Based Investors

Dependent Variable:	𝟙{Out of Business}		Zero Funding Years		𝟙{5 Yrs. W/out Funding}		𝟙{Unicorn}	
	All	Exited	All	Exited	All	Exited	All	Exited
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.009***	0.030***	0.274***	0.189**	0.066***	0.070***	0.002	0.005
	(3.43)	(4.28)	(3.31)	(2.38)	(4.26)	(3.99)	(1.29)	(1.24)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	0.001	−0.000	−0.454***	−0.263***	−0.109***	−0.099***	−0.002	−0.005
	(0.57)	(−0.04)	(−5.73)	(−3.60)	(−7.39)	(−6.14)	(−1.35)	(−1.39)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−0.021***	−0.061***	−0.237***	−0.174**	−0.069***	−0.083***	−0.003	−0.006
	(−7.93)	(−8.82)	(−2.99)	(−2.25)	(−4.62)	(−4.81)	(−1.54)	(−1.47)
Observations	706,352	297,376	706,352	297,376	706,352	297,376	706,352	297,376
Adjusted R^2	0.107	0.111	0.476	0.346	0.327	0.202	0.994	0.993
Mean Dependent Variable	0.019	0.044	1.208	0.809	0.070	0.030	0.019	0.041
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓	✓	✓	✓	✓

This table presents estimates of the effect of QSBS tax benefits on various firm outcomes after excluding California-based investors from the sample. The dependent variables are an indicator for business failure, count of consecutive years without new funding, an indicator for firms that go five or more years without raising new funding, and an indicator for firms achieving unicorn status (valuation exceeding $1 billion). Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown separately for all firms and those that experienced any exit. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table IA11: Heterogeneity of Extreme VC Outcomes: State-Level Tax Rate

	Valuation ($ millions)		𝟙{Unicorn}	
	All	Exited	All	Exited
	(1)	(2)	(3)	(4)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j \times \mathbb{1}\{\text{Below Med Tax}\}_{i,t-1}$	−66.321**	−101.525**	−0.010**	−0.022**
	(−2.09)	(−2.04)	(−2.15)	(−2.16)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	76.554**	124.157**	0.010**	0.022**
	(2.51)	(2.57)	(2.20)	(2.25)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t} \times \mathbb{1}\{\text{Below Med Tax}\}_{i,t-1}$	63.621**	101.453**	0.011**	0.025**
	(2.02)	(2.03)	(2.43)	(2.42)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j \times \mathbb{1}\{\text{Below Med Tax}\}_{i,t-1}$	64.001**	102.578**	0.010**	0.024**
	(2.08)	(2.09)	(2.28)	(2.38)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Eligible}\}_j$	−67.743**	−117.510**	−0.010**	−0.023**
	(−2.27)	(−2.45)	(−2.23)	(−2.35)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Post}\}_{i,j,t}$	−69.657**	−117.016**	−0.010**	−0.024**
	(−2.32)	(−2.45)	(−2.33)	(−2.36)
$\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t} \times \mathbb{1}\{\text{Below Med Tax}\}_{i,t-1}$	−71.367**	−112.219**	−0.012**	−0.026***
	(−2.30)	(−2.27)	(−2.55)	(−2.61)
$\mathbb{1}\{\text{Eligible}\}_j \times \mathbb{1}\{\text{Below Med Tax}\}_{i,t-1}$	−11.953	−53.134*	−0.004*	−0.012*
	(−0.85)	(−1.95)	(−1.78)	(−1.92)
$\mathbb{1}\{\text{Below Med Tax}\}_{i,t-1}$	20.273	62.878**	0.005**	0.014**
	(1.46)	(2.30)	(2.22)	(2.18)
Observations	81,919	73,914	448,474	216,740
Adjusted R^2	0.998	0.998	0.991	0.990
Mean Dependent Variable	1011.235	1020.297	0.030	0.055
Year FE	✓	✓	✓	✓
Holding Period FE	✓	✓	✓	✓
Entry Year FE	✓	✓	✓	✓
Investor × Firm FE	✓	✓	✓	✓
Clustered SE (Investor)	✓	✓	✓	✓

This table presents estimates of the heterogeneous effect of QSBS tax benefits on firm valuations and unicorn status by investor state tax rates. The sample includes Venture Capital firms only. The dependent variables are firm valuation in millions of dollars and an indicator for achieving unicorn status (valuation exceeding $1 billion). Below Med Tax is an indicator for investors headquartered in states with below-median maximum long-term capital gains tax rate, lagged by one year. Post is an indicator for investments made after 2009, Eligible indicates QSBS-eligible sectors, and $\mathbb{1}\{\text{Holding} \geq 5\}_{i,j,t}$ indicates investments held for five or more years. The sample is at the investor-firm-year level and includes years from 2004–2022 and investment entry years from 2004–2017. Results are shown separately for all firms and those that experienced any exit. t-statistics based on standard errors clustered at the investor level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.