Capital Gains Tax Relief and Entrepreneurship: Evidence from the QSBS Exemption

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January 27, 2026

Abstract

Designing effective policy to foster entrepreneurship and innovation remains a pressing challenge. We analyze the 2010 expansion of the Qualified Small Business Stock (QSBS) exemption, which eliminated federal capital gains taxes on startup equity in eligible industries. The QSBS expansion increased firm births by 10%—especially in industries with high exit activity and skilled labor intensity—and startup patenting by 23%. In addition to raising expected returns for startup founders and investors, the reform increased the value of equity compensation. This led startups to expand equity grants to employees and strengthened their ability to compete for talent with established incumbents.

JEL classification: G24, G38, H25, L26

Keywords: Qualified Small Business Stock, Entrepreneurship, Innovation, Equity Compensation, Venture Capital

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Entrepreneurship and innovation are key drivers of job creation and economic growth (Haltiwanger, Jarmin, and Miranda, 2013; Adelino, Ma, and Robinson, 2017). Recognizing this, governments around the world have adopted a wide array of policies to foster entrepreneurial activity—often with limited or mixed success (Acs et al., 2016; Lerner, 2009). These range from establishing startup-friendly legal and regulatory frameworks, to supporting technology commercialization, providing training programs, offering direct subsidies, and introducing tax incentives. Among tax instruments, capital gains tax incentives have long been viewed as a theoretically appealing way to stimulate both the supply and the demand for entrepreneurial capital (Boar and Knowles, 2024; Poterba, 1989b). Yet empirical evidence that causally links capital gains taxation to entrepreneurial activity remains limited, raising questions about its effectiveness as a policy lever (Viswanathan, 2023). This paper helps fill this gap by providing causal evidence on the effects of a targeted capital gains tax exemption on entrepreneurship and innovation.

Ideally, identifying the causal effect of such a tax exemption would require a randomized experiment in which a subset of prospective entrepreneurs receives the exemption, and their subsequent firm formation is tracked. In practice, however, such individual-level randomization is unlikely to be implemented by policymakers. Instead, we exploit the 2010 expansion of the Qualified Small Business Stock (QSBS) exemption. The QSBS exemption allows U.S. entrepreneurs, as well as their employees and investors, to own "stock in a company where the price appreciates greatly, ... sell it, and pay no tax on profit" (Weltman, 2017)—but only if the company operates in certain eligible industries.

Enacted as part of the Small Business Jobs Act (SBJA), the 2010 QSBS expansion allows taxpayers to exclude 100% of eligible capital gains (at least \$10 million, potentially more) from federal taxes. To qualify, the stock must have been issued by a domestic C corporation with assets of up to \$50 million immediately after issuance, and held for at least five years.

Our identification strategy leverages the fact that shares issued by firms in certain industries are not eligible for the QSBS exemption. Specifically, firms in personal services (e.g., health, engineering, consulting), finance, natural resource extraction (e.g., mining), and hospitality are excluded. These excluded sectors serve as a natural counterfactual for estimating how entrepreneurship and innovation would have evolved in eligible industries absent the 2010 QSBS expansion.

Using industry-level panel data from the U.S. Census Business Dynamics Statistics (BDS) for 2006–2015, our difference-in-differences (diff-in-diff) analysis shows that the 2010 QSBS expansion led to an approximately 10% increase in firm births in QSBS-eligible industries relative to ineligible industries. This and all our other conclusions are robust to (1) estimating an OLS model with a log-transformed dependent variable (firm births), (2) modeling firm births using a Poisson model (Cohn, Liu, and Wardlaw, 2022), and (3) estimating an OLS model using each industry's firm birth rate as the outcome variable.

A potential concern with our identification strategy is that the 2010 QSBS expansion occurred in the aftermath of the 2008 financial crisis. If the treatment and control groups were differentially exposed to the crisis, the parallel trends assumption underlying our diff-in-diff approach may not hold. Several institutional features and empirical tests support the parallel trends assumption in our setting.

First, the classification of QSBS-eligible industries was introduced in 1993 under the original QSBS statute. Although the original QSBS version became largely irrelevant following the 2003 capital gains tax cut, Congress preserved its legal framework—including the eligibility criteria—when it reactivated the policy after the financial crisis. The fact that the excluded industries were designated 17 years prior to the 2010 expansion mitigates concerns that their selection was endogenous to contemporaneous economic or political conditions.

Second, our conclusions are robust to excluding those industries most affected by the financial crisis (finance, insurance, and construction), as well as to excluding the crisis years 2008–2010 from the sample. Third, dynamic diff-in-diff estimates reveal no evidence of diverging pre-trends between QSBS-eligible and ineligible industries prior to 2010. Fourth, placebo diff-in-diff tests assuming the QSBS expansion occurred in 2005 or 2006 also show no evidence of differential pre-trends. Taken together, these institutional features and empirical tests strengthen the validity of our identification strategy and support a causal interpretation of our diff-in-diff results.

Through what mechanisms does the QSBS exemption promote entrepreneurship? We consider three non-mutually exclusive channels, each linked to a key stakeholder in the entrepreneurial process—entrepreneurs, startup employees, and investors—and examine how the 2010 QSBS expansion altered their incentives to engage in and support entrepreneurship.

First, as noted by Poterba (1989b), potential entrepreneurs often choose between working for large firms or starting their own business. A reduction in capital gains taxes can increase the after-tax returns to entrepreneurship, thereby making entrepreneurial entry more attractive relative to salaried employment. Critically, if this channel is operative, we would expect the QSBS expansion to have a particularly pronounced effect in industries with high rates of startup exits—initial public offerings (IPOs) and acquisitions—where founders expect to generate a larger portion of returns through capital gains upon selling their shares.

This is precisely what we find: The QSBS expansion's impact on entrepreneurship is concentrated in industries with high rates of IPOs and private-firm acquisitions. Furthermore, using data from the Federal Reserve's Survey of Consumer Finances, we show that the 2010 QSBS expansion substantially increased the expected financial returns to starting a business—provided the entrepreneur could reasonably expect to eventually sell her equity stake. Following the 2010 QSBS expansion, eligible entrepreneurs with capital gains below the 99th percentile could expect to pay zero federal capital gains tax, while even those in the top 0.1% would see their expected tax rate cut by half—from 15% (under both the no-exemption baseline and the pre-2009 QSBS regime) to 7.4%.

Second, startups rely heavily on equity compensation to attract and retain skilled labor, particularly because more established firms can offer higher cash compensation and safer career paths (Aran and Murciano-Goroff, 2025; Marx and Fleming, 2012). The 2010 QSBS expansion increased the value of such equity awards to employees by substantially reducing the federal capital gains taxes owed upon sale. Consistent with this labor channel, we find that the expansion had a larger effect on entrepreneurship in industries that are more intensive in high-skill labor—and thus more reliant on equity-based compensation. This finding is important in its own right, given these industries' outsized role in driving innovation and economic growth (e.g., Guzman and Stern, 2020).

To directly test the labor channel, we use Form D filings to construct a dataset of startups that raise external financing and are thus likely to be affected by the QSBS exemption, which we link to novel data on equity compensation at California-based startups. Following the 2010 QSBS expansion, startups in QSBS-eligible industries increased their adoption of equity compensation plans by 9.4%. We then match the Form D data to hiring data from Revelio Labs and show that the expansion led to a 23.2% increase in high-skill hires at QSBS-eligible startups, often from large incumbents. By contrast, we find no change in low-skill hiring, where equity compensation is far less common. These firm-level findings support the hypothesis that by increasing the value of equity compensation, the QSBS expansion helped startups attract and retain talent, thereby fostering new business formation.

The third mechanism we explore is the financing channel. By reducing capital gains taxes for startup investors, the QSBS expansion could encourage greater investment in startups, thereby alleviating the financing constraints often faced by entrepreneurs (e.g., Adelino, Schoar, and Severino, 2015). Edwards and Todtenhaupt (2020) provide evidence consistent with this channel, showing that following the 2010 QSBS expansion, eligible startups raised larger *follow-on* equity funding rounds. We complement this intensive-margin evidence by documenting an extensive-margin effect: The expansion also helped more startups secure their *first* round of venture funding.

The distinction between first and follow-on rounds is important, as first-round funding decisions are shaped by heightened information asymmetry and uncertainty characteristic of early-stage investing (Farre-Mensa, Hegde, and Ljungqvist, 2020; Sahlman, 1990). Notably, the QSBS expansion's effect on entrepreneurship is not stronger in industries with greater financial or equity dependence (Rajan and Zingales, 1998), suggesting that the financing channel is not the only mechanism at play.

Our final tests examine the effect of the QSBS expansion on startup innovation—a key engine of economic growth (Akcigit and Kerr, 2018). We link our dataset of Form D filers to USPTO patent data and find that, following the 2010 QSBS expansion, startups in QSBS-eligible industries experienced a 22.5% increase in successful patent filings, with no evidence of a decrease in patent quality. These findings are consistent with the expansion easing key constraints faced by innovative startups, including access to high-skill labor and funding.

Our paper makes three key contributions. First, we contribute to a long-standing literature on how governments can use tax incentives and other public policy tools to foster entrepreneurship and innovation (see Bruce, Gurley-Calvez, and Norwood (2020) and Stantcheva (2023) for reviews). The contrast between the disappointing results produced by many of these policies (Acs et al., 2016; Lerner, 2009) and our findings raises the question: Why do targeted capital gains tax incentives succeed where many other policies have failed?

While a comprehensive comparison of all entrepreneurship policies is beyond the scope of this paper, it is helpful to highlight some key differences between capital gains tax incentives and two commonly used alternatives. The first involves governments providing direct financial support for startups—such as grants, subsidies, or public co-investments—often with underwhelming outcomes (Lerner, 2022). A fundamental distinction is that tax-based incentives, unlike direct support, do not require governments to "pick winners" and thus preserve market selection mechanisms.

Among alternative tax-based tools, angel investor tax credits—which provide investors with personal income tax credits proportional to their investment—are particularly popular. Over the past three decades, angel investor tax credits have been adopted by 31 U.S. states and at least 14 other countries. Yet Denes et al. (2023) find that while these credits increase angel investment, they do *not* significantly affect entrepreneurial activity.

Capital gains tax incentives differ from angel tax credits along two key dimensions. First, they reward only the shareholders of *successful* startups, whereas angel credits provide an upfront subsidy to all investors, regardless of outcomes. By tying benefits to realized success, capital gains incentives encourage more rigorous pre-investment screening and stronger post-investment value creation, making them particularly well suited for investments with fat-tailed, right-skewed return distributions, such as high-growth startups (see Internet Appendix VIII in Denes et al. (2023)). Second, whereas angel credits target only financial investors, capital gains incentives extend to all shareholders—including founders and employees who receive equity in exchange for their labor or intellectual capital.

Second, we contribute to the empirical literature on the effect of capital gains taxes on entrepreneurship. Prior studies—such as Dimitrova and Eswar (2023), Edwards and Todtenhaupt (2020), and Guenther and Willenborg (1999)—have focused primarily on the *financing* channel, examining how capital gains taxation affects the supply of startup funding. More recently, Campello and Junqueira (2025) shed further light on the financing channel by showing that the 2010 QSBS expansion encouraged VC investors to back riskier ventures. Our analyses reveal that, beyond the financing channel, capital gains tax incentives operate through two complementary mechanisms. First, by increasing the expected returns to entrepreneurship, these incentives make entrepreneurial careers more attractive. Second, by raising the value of equity compensation, they strengthen startups' ability to attract, retain, and motivate highly skilled workers.

While the entrepreneurial-returns channel has been emphasized in prior work (e.g., Poterba, 1989b; Gompers and Lerner, 1998), empirical identification has been elusive. By exploiting the 2010 QSBS expansion as a source of exogenous variation, we provide the first causal evidence on this channel. The labor channel, by contrast, has received relatively little attention in the literature. In particular, our equity compensation and hiring findings suggest that capital gains tax incentives can be a powerful tool to help startups compete for talent against established incumbents—a challenge many founders cite as a key constraint on growth (e.g., Bessen, Poege, and Röttger, 2023).

Third, we provide the first direct evidence that the 2010 QSBS expansion increased entrepreneurship and innovation—stated goals of the reform. Speaking in Congress in support of the expansion, Representative Langevin (RI) remarked: "This measure would exclude 100 percent of small business capital gains ... [This] will encourage the formation of new businesses and allow small businesses to grow and hire more workers" (U.S. House, 2010, p. E501). While Edwards and Todtenhaupt (2020) show that the QSBS expansion succeeded in helping startups raise larger follow-on funding rounds, Denes et al. (2023) offer a cautionary note: Policies that expand the supply of startup capital do not necessarily lead to more entrepreneurship. Our findings indicate that the QSBS expansion did both.

This evidence is particularly relevant in light of recent policy disagreements regarding the effectiveness of the QSBS exemption. The Build Back Better Act of 2021, proposed by President Biden and passed by the U.S. House in November 2021 but ultimately stalled in the Senate, would have reduced the exclusion from 100% to 50% for high-income individuals, trusts, and estates. This proposal emerged in a context where there was little empirical evidence on whether the exemption generated meaningful real effects on entrepreneurial activity. As noted in a January 2023 report by the Congressional Research Service, "Little research has been done on the [capital] gain exclusion's effects on QSBS issuers" (Guenther, 2023, p. 14). Reflecting this paucity of evidence, Viswanathan (2023) characterized the exemption as "money for nothing." Despite these concerns, the July 2025 One Big Beautiful Bill Act (OBBA)—passed through Senate reconciliation without any Democratic votes in either chamber—further expanded the exemption by increasing both its amount and the set of eligible firms (see Section 1.1 for details).

While our findings show that the QSBS exemption fosters entrepreneurial activity and innovation, it also entails substantial foregone tax revenue. Using internal U.S. Treasury tax data, Abdulrauf et al. (2025) estimate that between 2012 and 2022, capital gains excluded under the QSBS exemption totaled \$152 billion, or \$13.8 billion per year on average. Assuming for simplicity that these gains would all have been taxed at the post-2012 rate of 23.8%, this corresponds to \$36.2 billion in foregone tax revenue, or \$3.3 billion annually. The exemption may also have distributional implications, with Gocmen, Martínez-Toledano, and Mittal (2025) arguing that it contributes to rising economic inequality in the U.S.

We leave a comprehensive cost-benefit analysis of the QSBS exemption to future research. However, because the exemption targets small businesses, its fiscal cost is only a fraction of what broader capital gains tax relief would entail.[1] The targeted nature of the QSBS exemption thus helps address the concern raised by Poterba (1989a, p. 378) that "an across-the-board capital gains tax cut is ... a relatively blunt device" to promote entrepreneurship.

1 Institutional Background

1.1 The QSBS exemption

Section 1202 of the U.S. Internal Revenue Code (IRC), also known as the QSBS exemption, excludes from federal capital gains taxes certain gains from the sale of stock. Under the rules in effect during our sample period, gains are eligible for the exemption only if the following four conditions are met: (1) The stock must have been issued by a domestic C corporation; (2) the issuing firm's gross assets must not have exceeded \$50 million prior to

[1] Capital gains excluded under the QSBS exemption accounted for just 1.5% of the approximately \$10 trillion in total net capital gains reported on tax returns during 2012–2022 (Abdulrauf et al., 2025).

and immediately after the issuance of the stock (including the capital raised in the issuance); (3) the taxpayer must have acquired the stock directly from the firm in exchange for cash or services, and held it for more than five years; and (4) the firm must have used at least 80% of its assets in the active conduct of a qualified trade or business during substantially all of the taxpayer's holding period. A qualified trade or business for the purposes of condition (4) is one that does *not* belong to any of the 20 industry sectors listed under Section 1202(e)(3) of the IRC. These 20 excluded sectors—listed in column 1 of Table 1—fall into four broad industries: personal services, financial activities, extracting activities, and hospitality.[2]

If all four QSBS conditions are met, after the September 2010 QSBS expansion and until the enactment of the OBBA in July 2025, taxpayers can exempt from capital gains taxation 100% of their "Section 1202 eligible gains," defined as the greater of $10 million or 10 times the taxpayer's adjusted tax basis in the stock sold (typically, the purchase price).[3] Any capital gains exceeding these thresholds—referred to as non-Section 1202 gains—are taxed at standard capital gains rates, along with any non-QSBS gains. For long-term capital gains, the current top federal rate is 23.8%, which includes the 20% capital gains tax and the net investment income (NII) tax of 3.8%.

The OBBA has expanded the QSBS exemption beginning in July 2025 by increasing the firm size eligibility threshold to $75 million, expanding the $10 million lifetime cap to $15 million, and introducing a reduced exemption for stocks held between three and five years. These changes are too recent to be part of our empirical analyses. Accordingly, throughout the remainder of the paper, we focus on the pre-OBBA QSBS regimes.

[2] Farming businesses are also ineligible for the QSBS exemption, but we exclude them from all our analyses because they are not well covered in the Census datasets that form the basis of our empirical work.

[3] The $10 million cap is a lifetime limit, meaning that any gains from sales of stock of the same company that a taxpayer has excluded from tax in prior years count against the taxpayer's $10 million cap. By contrast, the 10 times tax basis cap is an annual limit that resets every tax year that stock is sold.

1.2 A brief history of the QSBS exemption

Section 1202 of the IRC was first enacted in August 1993, when the Revenue Reconciliation Act was signed by President Clinton.[4] Under the original 1993 version, Section 1202 eligible gains were defined as they were prior to the 2025 OBBA, but only 50% of such gains were exempt from federal capital gains taxes; the remaining 50% were taxed at the then-prevailing long-term capital gains rate of 28%. Moreover, the exempt 50% was not fully tax-free: 7% of those gains were subject to the alternative minimum tax (AMT) rate of 28%, implying an effective AMT burden of 1.96% (= 7% $\times$ 28%).

Over the following years, several changes to capital gains taxation all but eliminated the attractiveness of the QSBS exemption. Most notably, Congress reduced the top long-term capital gains tax rate from 28% to 20% in 1997, and then again to 15% in May 2003. However, the 50% portion of Section 1202 gains not covered by the exemption remained subject to the original 28% rate. As a result, the effective tax rate on Section 1202 gains was 14.98% (= 50% $\times$ 1.96% (AMT) + 50% $\times$ 28%), nearly identical to the post-May 2003 15% rate on regular long-term capital gains.[5]

The QSBS exemption regained its relevance in February 2009, when the American Recovery and Reinvestment Act raised the portion of Section 1202 gains excluded from capital gains taxation from 50% to 75% for stocks acquired after February 17, 2009. The remaining 25% of Section 1202 gains were still taxed at 28%, yielding an effective rate of 8.47% (= 75% $\times$ 1.96% (AMT) + 25% $\times$ 28%).

Less than 20 months later, in September 2010, the SBJA increased the QSBS exemption to 100% of Section 1202 gains for stocks acquired after September 27, 2010; in addition, it eliminated the Section 1202 gains' exposure to the AMT. Thus, since late September 2010, the effective federal tax rate on all Section 1202-eligible gains from stock held for at least

[4] Internet Appendix A describes the legislative history of the QSBS exemption and its 2010 expansion.

[5] Stock sales qualifying for the QSBS exemption still enjoyed some roll-over benefits and, in some states, state tax benefits.

five years has been 0%.[6] This 0% rate on QSBS-eligible capital gains compared favorably to the 15% top rate on regular long-term capital gains in effect from 2003 through 2012. The advantage became even larger in 2013, when the top capital gains rate rose to 20% and the 3.8% NII tax was introduced (QSBS-eligible gains are also exempt from the NII tax).

Our empirical analyses seek to identify the effects on entrepreneurship and innovation of the 2010 increase in the QSBS exemption from 75% to 100%. Our focus on the 2010 change is motivated by two facts. First, the 2010 change led to a larger cut—both in absolute and relative terms—in the effective capital gains tax rate on Section 1202 eligible gains than the preceding change in 2009. Second, Google search data show that interest in the QSBS exemption spiked in the fourth quarter of 2010, immediately after the 100% QSBS exemption came into effect on September 28, 2010 (see Figure 1). That said, it is important to recognize that our diff-in-diff estimates may reflect the combined impact of the 2009 and 2010 QSBS changes—a feature of our research design that we discuss further in Section 3.2.

1.3 Assessing the QSBS impact on entrepreneurial capital gains

Table 2 examines whether the 2010 QSBS exemption increase meaningfully altered the expected rewards for prospective entrepreneurs, using data from the Federal Reserve's 2010 Survey of Consumer Finances (SCF). Specifically, it reports the unrealized capital gains accrued by U.S. entrepreneurs most representative of those likely to benefit from the exemption.[7] We focus on individuals who (1) owned and actively managed a privately held business that (2) operated in a QSBS-eligible industry and (3) was founded in or before 2005.

To be clear, these entrepreneurs were not themselves eligible to take advantage of the

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[6] The changes made to the QSBS exemption in the SBJA were originally temporary, but they were first extended three times, and then finally made permanent in 2015. Congress often uses this gradual approach to legislation to reduce its initial fiscal impact, even when the legislation is a "rare example of bipartisan cooperation," as was the case of the 2010 QSBS expansion (Sorin, 2012).

[7] The SCF oversamples wealthy families (Bricker et al., 2012), and thus the 2010 SCF is well suited to describe U.S. entrepreneurs—including the most successful ones—at the time of the 2010 QSBS expansion. We use the SCF-provided weights to recover estimates representative of the full population of entrepreneurs.

2010 QSBS expansion—unless they acquired new stock in their business after September 2010. We use this historical data to approximate the distribution of expected gains for a hypothetical entrepreneur starting a QSBS-eligible firm after 2010.

Column 1 of Table 2 shows that 32.5% of these entrepreneurs had negative unrealized capital gains in their business at the time of the 2010 SCF and thus would owe no capital gains taxes upon its sale. Those between the 32.5th and 40th percentiles of the capital gains distribution had, on average, $1,848 in (pre-tax) unrealized gains, while those in deciles eighth and ninth had average gains of $151,148 and $410,008, respectively. The distribution exhibits a long right tail: Average gains rise to $1.01 million between percentiles 90 and 95, $3.09 million between 95 and 99, $9.5 million between 99 and 99.5, $21.4 million between 99.5 and 99.9, and $113.5 million above the 99.9th percentile. The mean across the full distribution is $486,199.

Columns 2–11 of Table 2 show how different capital gains tax regimes affect the distribution of *after-tax* gains (even columns) and implied tax rates (odd columns).[8] Under the pre-2009 QSBS regime, when only 50% of eligible gains were exempt, the after-tax gains distribution looks nearly identical with the exemption (column 4) and without (column 2), given the prevailing 15% capital gains rate.

By contrast, under the 100% QSBS exemption introduced in 2010, all eligible entrepreneurs with unrealized capital gains below the 99th percentile would owe no federal capital gains tax (column 7), compared to 15% without the exemption (column 3) or under the pre-2009 50% exemption (column 5). Notably, even the most successful entrepreneurs could expect to benefit substantially from the 100% exemption: the average effective tax rate for the top 0.1% of entrepreneurs drops from 15% to 7.4%. Across the full sample, mean after-tax capital gains increase from roughly $413,000 (with no or 50% exemption) to $472,000 with

[8] As we do throughout the paper, we focus on federal taxes. Some states also apply the QSBS exemption to state capital gains taxes, and thus Table 2 provides a lower bound of the exemption's expected benefits.

the 100% exemption—a 14% increase.

The expected benefits become even larger if we use the post-2012 23.8% top capital gains rate: average after-tax gains fall to \$370,483 with no exemption (column 8) but remain nearly unchanged at \$463,680 under the 100% exemption (column 10)—a 25% increase.

In sum, Table 2 shows that the 2010 QSBS expansion substantially increased the expected financial payoff to starting a business in an eligible industry. This strengthens the economic plausibility of a causal link between the 2010 QSBS reform and new firm formation—a hypothesis we formally test in the next sections.

2 Identification Strategy and Data

2.1 Identification strategy

Key to our identification strategy, the QSBS exemption applies only to shares issued by firms operating in qualified industries. Ineligible industries—listed in column 1 of Table 1—thus serve as a natural control group. We exploit this institutional feature to estimate the exemption's impact on entrepreneurship using the following diff-in-diff specification at the industry-year level:

$$Y_{it} = \beta \; QSBS\ eligible_i \times Post_t + \gamma \log\left(No.\ large\ incumbents\right)_{it-1} + \delta_i + \zeta_t + \epsilon_{it}, \qquad (1)$$

where i indexes 4-digit NAICS (henceforth, NAICS4) industries and t denotes years. The dependent variable Y captures different measures of entrepreneurial activity, discussed in Section 3 below. The treatment indicator, $QSBS\ eligible$, equals one if industry i is eligible for the QSBS exemption. *Post* equals one if year t is greater than or equal to 2011, the first full year when the 100% QSBS exemption was in effect. We control for the logarithm of the number of firms with at least 100 employees, lagged by one year ($\log\left(No.\ large\ incumbents\right)$), to absorb time-varying industry trends unrelated to the QSBS exemption.[9] We also include NAICS4 (δ) and year (ζ) fixed effects. Our baseline sample spans the 10-year period around 2011, from 2006 through 2015. Throughout the paper, we cluster standard errors at the NAICS4 level.

As with any diff-in-diff design, the key identifying assumption is parallel trends (Roberts and Whited, 2013): The industries that do not qualify for the QSBS exemption (our control group) provide a valid counterfactual for how entrepreneurship in eligible industries (our treatment group) would have evolved absent the 2010 QSBS exemption change. While this assumption cannot be tested directly, Section 3.2 provides supportive evidence.

Beyond documenting industry-level effects, we conduct three firm-level analyses based on Equation (1) that provide direct evidence on the impact of the 2010 QSBS expansion on startups' use of equity-based compensation and hiring (Section 4.2), as well as on innovation (Section 5).

2.2 Data

We rely on a variety of data sources at the industry and firm levels. Internet Appendix B provides additional details on these data sources, sample construction, and variables.

At the industry level, we use the U.S. Census BDS data to create several measures of entrepreneurial activity around the years of the 2010 QSBS expansion. We supplement the BDS datasets with data from the Census Quarterly Workforce Indicators (QWI) to measure industry-level employment at firms of different ages and sizes, broken down by educational attainment. In addition, we obtain information on STEM-related employment by industry from the Bureau of Labor Statistics (BLS).

We measure an industry-year's startup exit rate by combining data from SDC on M&As

[9] Firms of this size are unlikely to meet the $50 million asset threshold required for QSBS eligibility. For instance, Compustat data indicate that in 2010, U.S. public firms with 100 to 120 employees held, on average, $364 million in assets.

involving privately-held targets with IPO data from Compustat/CRSP, Donald Patton, and Jay Ritter. We use data from SDC's VentureXpert to measure venture capital (VC) investments at the NAICS4-year level.

We combine four firm-level data sources to investigate the firm-level response to the 2010 QSBS expansion. First, we use Form D filings to construct a dataset of startups that raise external financing and are thus likely to be affected by the QSBS exemption. When private firms raise capital, they typically rely on Regulation D to exempt the offering from SEC registration, which requires filing a Form D. These filings contain key firm characteristics (e.g., CIK number, legal name, year and state of incorporation, headquarters state, and industry), which we use to match Form D issuers to the equity compensation, hiring, and patent data described below.

Although our dataset of Form D filers does not cover the universe of startups, it allows us to identify a set of high-growth startups that rely on external financing to fund their growth. To more precisely target high-growth firms, we restrict the sample to startups incorporated in Delaware (Guzman and Stern, 2020). High-growth startups are of particular interest to policymakers and are disproportionately likely to use equity compensation and to innovate (Aran and Murciano-Goroff, 2025; Lerner and Nanda, 2020; Van Reenen, 2022). Importantly, Form D filers capture a broader set of startups than samples restricted to VC-backed firms.

We focus on Form D filers incorporated between 2007 and 2009 and follow them for up to six years—from age zero (the year of incorporation) through five—ensuring that our panel can include at least two pre-treatment and two post-treatment observations for each startup. We drop all observations after a startup has raised over $50 million according to its Form D filings, as these startup-years are unlikely to meet the QSBS $50 million asset threshold.

Second, we use California Employee Plan Exemption Notices (EPENs), which California firms are required to file pursuant to Section 25102(o) of the California Corporations Code when issuing compensatory equity (including stock options) under Securities Act Rule 701.

Given California's prominence in high-growth entrepreneurship and VC financing,[10] Section 25102(o) filings provide a valuable—if partial—measure of equity compensation practices.

Third, we measure startup hiring using individual-level data from Revelio Labs, which aggregate employment information from a variety of publicly accessible online data sources, including professional profiles (e.g., on LinkedIn) and job postings from company career pages (Revelio Labs, 2024). As noted by Hampole et al. (2025, p.8), "multiple studies suggest that these data provide broad and reliable coverage of the white-collar labor market," making them well suited to capture the types of workers that high-growth startups may seek to attract through equity compensation.

Finally, we measure startup innovation using patent and citation data from the USPTO's PatentsView files.

2.3 Sample, variable construction, and summary statistics

Our industry-level analyses use a balanced 10-year panel of 267 NAICS4 industries.[11] Columns 1 and 2 of Table 1 describe how we map the IRC industries that do not qualify for the QSBS exemption—our control group—into NAICS4 industries. In total, 42 NAICS4 industries (15.7%) in our sample do not qualify for the QSBS exemption.

Table 3, Panel A presents summary statistics for the variables we use in our NAICS4 industry-year sample to analyze the impact of the QSBS exemption on entrepreneurship and first-round VC financing. Our primary entrepreneurship outcome is the number of firm births—defined as firms of age zero—in each industry-year. The mean number of firm births is 1,515; the median is 332. Because this variable is highly skewed, we also use an industry's firm birth rate, defined as firm births divided by the beginning-of-year number of firms

[10] In 2010, California accounted for 50.3% of dollars invested by VC funds in the U.S. (NVCA, 2011).

[11] The BDS include several NAICS4 industries dominated by non-profit firms, which we exclude throughout the paper. We also exclude the agricultural sector (NAICS 11) from all our analyses, as it is not well covered in the BDS. See Internet Appendix B.2 for the full list of excluded industries.

(Lindsey and Stein, 2025). This measure is indeed less skewed: The mean is 7.3% and the median is 6.6%. The beginning-of-year number of large incumbents (firms with at least 100 employees) across the industries in our sample averages 563; the median is 288.

The mean number of firms raising their first VC round is 3.1; the median is 0. The total dollar amount raised in first VC rounds averages $22 million (in real 2012 dollars) across the industry-years in our sample; the median is $0. In the average (median) industry-year with at least one first-round VC investment, the size of the average first VC round is $13.2 million ($4.6 million).

Our firm-level analyses focus on three outcomes: equity compensation, hiring, and innovation. The equity compensation sample includes 5,802 startup-years from 993 California-based Form D filers. The hiring sample includes 6,083 startup-years from 1,457 Form D filers nationwide that we are able to successfully match to the Revelio Labs employment data. The innovation sample includes 17,117 startup-years from 2,916 Form D filers nationwide. Column 3 of Table 1 shows how we map QSBS-excluded industries into Form D industries, yielding control groups that comprise 8.8%, 9.2%, and 12.6% of the observations in the compensation, hiring, and patenting samples, respectively. The mean startup age across all three samples is just under 2.5 years, and the median is 2 years.

Table 3, Panels B, C, and D provide summary statistics for the outcome variables in the equity compensation, hiring, and innovation samples, respectively. In the compensation sample, 21.8% of startup-year observations adopt an equity compensation plan that provides stock and/or option grants to their employees, based on EPEN filings.

Table 3, Panel C shows the startups in our hiring sample hire an average of 5.1 high-skill employees per year (median = 2), but only 0.5 low-skill employees (median = 0).[12] This

[12] Our hiring analysis focuses on hires in a startup's headquarters state, where employees are more likely to be involved in innovation and other core functions. Following Belo et al. (2017) and Dey et al. (2025), we classify employees as high-skill if they are in occupations requiring considerable or extensive preparation (O*NET zones 4 and 5), and as low-skill if they require little or some preparation (zones 1 and 2).

pattern is consistent with the notion that our sample of Form D filers primarily comprises high-growth startups that rely heavily on high-skill labor. We further identify high-skill hires whose immediate prior employer was a large incumbent with at least 100 employees; startups in our sample recruit, on average, 2.4 such employees per year (median = 1).

Table 3, Panel D provides summary statistics for the patenting sample. Following the literature (e.g., Jaffe and Trajtenberg, 2002), we proxy innovation quantity and quality using patent counts and five-year forward citations. We measure patenting activity by filing year to more closely capture when the underlying innovation is developed. On average, startups file 0.3 successful patent applications per year. The median observation has no patents, as only 12.2% of startup-years file at least one successful application. The average startup-year receives a total of 2.9 citations to its patents over five years (median = 0, reflecting that most startup-years have no patents). Conditional on a startup-year filing at least one granted patent, the average number of citations per patent has a mean and median of 7.4 and 2.8, respectively.

3 The QSBS Expansion's Impact on Entrepreneurship

In this section, we first examine the baseline impact of the 2010 QSBS exemption change on industry-level entrepreneurship. We then address potential threats to our identification strategy and discuss how we mitigate them.

3.1 Baseline impact

Table 4 reports estimates from Equation (1) to study the impact of the QSBS exemption on entrepreneurship. Our main outcome variable—the annual number of firm births in each NAICS4 industry—is a right-skewed count variable. A common approach to handling such skewness is to log-transform the dependent variable and estimate OLS regressions. Column

1 follows this approach. We find that, following the 2010 QSBS exemption increase to 100% of eligible capital gains, QSBS-eligible industries experienced a 13.8% ($=e^{0.129}-1$) increase in the expected number of firm births relative to ineligible industries ($p = 0.004$). This corresponds to 209 and 46 additional firm births in the average and median industry-year, respectively. The results are similar when we omit the lagged number of large incumbents as a control (column 2, $p = 0.037$).

A limitation of the log-transformation is that it excludes observations with zero firm births. In this sample, this exclusion affects only five NAICS4 industry-years, making it unlikely to meaningfully influence results.[13] Still, for completeness, column 3 uses the log of one plus firm births as the dependent variable. This yields a similar diff-in-diff point estimate to those in columns 1 and 2 ($p = 0.005$).

One downside of the log-plus-one transformation is that its estimates lack meaningful economic interpretation. A standard alternative for count outcomes is the Poisson model, which preserves the semi-elasticity interpretation of log-linear models (Cohn et al., 2022). Column 4 presents Poisson estimates of Equation (1), with the number of firm births as the dependent variable. The results show a 6.3% ($=e^{0.061}-1$) increase in expected firm births in QSBS-eligible industries relative to the control group ($p = 0.033$).

As a final approach, we scale the number of firm births by the total number of firms in each industry at the beginning of the year, and estimate an OLS model using this firm birth rate as the dependent variable (Lindsey and Stein, 2025). Column 5 shows that following the 2010 QSBS expansion, QSBS-eligible industries experienced a 0.85 percentage point increase in their annual firm birth rate relative to ineligible industries ($p < 0.001$). This represents an 11.8% increase from the baseline mean birth rate of 7.2% in our sample.

Taken together, the results in Table 4 show that the 2010 QSBS reform increased annual

[13] Alternatively, the log models in columns 1 and 2 can be seen as capturing the intensive margin effect of the QSBS expansion on entrepreneurship.

firm births in QSBS-eligible industries by approximately 10% relative to excluded industries. The estimated effect ranges from 6.3% (Poisson model) to 13.8% (log-transformed OLS). In all subsequent entrepreneurship analyses, we continue to report results from the three main models in Table 4: log-transformed OLS, Poisson, and firm birth rate OLS.

3.2 Threats to identification

For our diff-in-diff estimates to identify the causal effect of the 2010 QSBS expansion, the parallel trends assumption must hold: In the absence of the QSBS expansion, QSBS-eligible and ineligible industries would have experienced similar changes in firm births after 2010 (Roberts and Whited, 2013). Although this assumption is not directly testable, in this section we present several pieces of evidence consistent with its validity.

First, we estimate a dynamic version of Equation (1) in which we replace the single post-treatment interaction term with a set of interactions between *QSBS eligible* and year indicators, using 2009 as the base year. Figure 2 plots the coefficient estimates and 95% confidence intervals from this dynamic specification, estimated using our three main models: log-transformed OLS (Panel A), Poisson (Panel B), and firm birth rate OLS (Panel C).

In Panel A, the interaction coefficients for 2006 through 2008 are close to zero (as is, by construction, the interaction for 2009), with only the 2008 coefficient marginally significant ($p = 0.09$); the others have p-values above 0.3. By contrast, starting in 2010—the year the QSBS exemption increased to 100%—the interaction terms become uniformly positive and significant at the 5% level or better, except for 2013 ($p = 0.148$).

Panels B and C show consistent results in the Poisson and firm birth rate models. Interaction terms for 2006–2008 are all small and statistically insignificant, with p values between 0.215 and 0.928. Conversely, after 2010, the interaction terms are uniformly positive, though the often large standard errors mean that not all individual year interactions are statistically significant. The largest discrepancy across models appears in 2010, when the interaction coefficient is only significant in the log model. The fact that the 100% exemption came into effect in late September 2010, following an interim increase from 50% to 75% in February 2009, likely explains why only some of our models begin to capture an impact in 2010.

Taken together, the estimates in Figure 2 support the parallel trends assumption: Prior to 2010, there is no evidence of differential trends in firm births across QSBS-eligible and ineligible industries. Moreover, the post-2010 patterns align with the average treatment effects estimated in Table 4, reinforcing our interpretation that the 2010 QSBS expansion increased entrepreneurship in eligible industries.

Second, we perform placebo tests by estimating Equation (1) under the false assumption that the QSBS exemption increased in either 2005 or 2006.[14] Table 5 reports results using 10-year samples centered around each pseudo-treatment year. Columns 1–3 show the 2005 placebo: Interaction terms in both the log and Poisson models are negative, and the firm birth rate estimate is positive but statistically insignificant ($p = 0.78$). Columns 4–6 report the 2006 placebo results, where all estimates are again statistically insignificant ($p = 0.483$, 0.628 and 0.192, respectively). These placebo tests confirm the absence of differential pre-trends in QSBS-eligible and ineligible industries, consistent with the identification assumption.

A related concern is that the estimated effects might reflect a post-crisis recovery rather than the 2010 QSBS change, since the change occurred in the aftermath of the 2008 financial crisis. While our diff-in-diff strategy accounts for aggregate macroeconomic trends, one might still worry that QSBS-eligible industries were hit harder by the crisis and rebounded more strongly thereafter.

Two facts help alleviate this concern. First, the list of QSBS-eligible industries has remained unchanged since it was first defined in 1993, making it unlikely that the 2010 QSBS reform was targeted toward industries disproportionately affected by the crisis. Second,

[14] We select 2005 and 2006 as the pseudo-treatment years to ensure no overlap (in the case of 2005) or only one year of overlap (in the case of 2006) between the post-pseudo-treatment period and the actual post-2010 treatment period.

the absence of differential pre-trends in Figure 2 suggests that QSBS-eligible and ineligible industries were similarly affected by the crisis.

Table 6 presents two additional robustness tests that directly address the threat to our identification strategy posed by the 2008 financial crisis. In columns 1–3, we exclude all NAICS4 industries in finance, insurance, and construction—sectors commonly viewed as central to the financial crisis (Demyanyk and Van Hemert, 2011; OECD, 2011). We continue to find an increase in firm births in QSBS eligible industries relative to ineligible industries following the 2010 QSBS expansion ($p = 0.067$, 0.064, and 0.005), with the point estimates only slightly smaller than their counterparts in Table 4. Second, columns 4–6 exclude the crisis years (2008–2010) from the sample; again, we find robust effects ($p = 0.040$, 0.093 and 0.0002), with point estimates that are, if anything, slightly larger than in Table 4.

Overall, the evidence from Figure 2 and Tables 5 and 6 supports the parallel trends assumption necessary for a causal interpretation of our baseline diff-in-diff estimates.[15] Based on these results, we conclude that the 2010 QSBS expansion increased annual firm births in eligible industries by approximately 10%. Taken together, these findings suggest that targeted capital gains tax relief can be an effective tool for fostering entrepreneurship.

Before turning to mechanisms, we briefly discuss potential general equilibrium effects of the QSBS expansion. One concern is that increased firm entry in eligible industries could crowd out incumbents, leading to higher exit rates. However, Table IA.1 shows no significant increase in firm deaths in QSBS-eligible industries following the reform. A second concern is that the rise in entrepreneurship in eligible industries may come at the expense of non-eligible ones, if talent or capital is reallocated away from them. While our diff-in-diff design cannot rule this out, its practical relevance is likely limited. First, entrepreneurial talent is often industry-specific, constraining mobility across sectors. Second, 84% of industries in

[15] See also Section 4.2 for a discussion of additional placebo tests reported in Table 10 and Internet Appendix Table IA.3, which further support our identification strategy.

our sample are QSBS-eligible (Table 3), so even if entry declined in ineligible industries, the QSBS expansion would likely still yield a net increase in economy-wide entrepreneurship.

4 Potential Channels

Having documented that the 2010 QSBS exemption change significantly increased entrepreneurship, we now turn to the mechanisms behind this effect. We examine three channels involving the main stakeholders in the entrepreneurial process—entrepreneurs, startup employees, and investors—and analyze how the expansion altered their incentives to engage in and support entrepreneurial activity.

4.1 After-tax returns to entrepreneurship

A key rationale behind the QSBS exemption when it was enacted in 1993 was "to encourage entrepreneurs and investors to start and operate businesses that would generate economic activity and employment" (Cantley, 2012, p. 1131). In a 1992 Senate floor speech supporting an early draft of the QSBS exemption, Senator Kerry (MA) emphasized: "We want to reward the startup entrepreneur who will commercialize the next generation of technology in the United States..." (U.S. Senate, 1992, p. 27819).

As noted by Poterba (1989b, p. 56), the theoretical argument for how lower capital gains taxes can incentivize more entry into entrepreneurship "involves the occupational decisions of potential entrepreneurs. These individuals can work as ... managers for large firms, or they can start their own firms ... Most of the compensation received ... in large firms is wage income, while much of the compensation in small start-up enterprises is likely to be taxed as capital gains. By altering the relative tax burdens on wage and capital gains income, reductions in the capital gains tax make entrepreneurship more attractive."

Our analysis of the 2010 SCF data in Table 2 shows that the 2010 QSBS expansion substantially increased entrepreneurs' expected after-tax capital gains: In particular, it eliminated federal capital gains taxes for all but the top 0.5% of entrepreneurs and halved the average rate for the top 0.1%. These findings support the hypothesis that the observed increase in firm births was partly driven by improved financial incentives to start a business. As Cantley (2012, p. 1157) argues, the QSBS expansion "may cause more potential business start-ups to commence because the owners who take the risk of starting and running a business will have a tax-free sale at the end of the line."

Not all prospective entrepreneurs, however, are equally sensitive to capital gains tax changes. Entrepreneurs can earn income from three main sources: (1) capital gains from selling their ownership stake, (2) profit distributions, and (3) salary and other compensation. A reduction in capital gains taxes primarily increases incentives for those who expect to derive a substantial portion of their income from selling their shares—usually through an IPO or a business sale. If the increase in firm births documented in Section 3 is partly driven by higher expected financial returns for prospective entrepreneurs, then the effect should be concentrated in industries where IPOs or M&A exits are more common.

Table 7 tests this prediction. For each NAICS4 industry, we define its exit rate as the average annual number of IPOs and private-firm acquisitions from 2006 to 2010 (the pre-treatment period) divided by the average annual number of firms aged one to ten over the same period.[16] We then compare the impact of the QSBS change on entrepreneurship in industries with above-median (columns 1–3) and below-median (columns 4–6) exit rates.

When focusing on industries with above-median exit rates, we find that the QSBS change had a positive and significant impact on entrepreneurship across our three models, with point estimates at least twice as large as their full-sample counterparts in Table 4. To illustrate, column 1 shows that, within the subsample of industries with above-median exit rates, the

[16] The denominator aims to capture the number of firms in the industry that are potential exit candidates. Our conclusions are robust to alternative definitions of the industry-level exit rate.

expected number of firm births in QSBS-eligible industries increased by 25.7% (=$e^{0.229} - 1$) relative to control industries after the 2010 QSBS change ($p = 0.003$).

By contrast, in industries with below-median exit rates, the QSBS change had a small and largely insignificant impact on firm births. Our triple-diff estimates in columns 7–9 confirm that the impact of the QSBS change was greater in industries with a higher exit rate: The coefficient on the interaction term *Exit rate* × *QSBS eligible* × *Post* is positive and significant across all three models ($p = 0.009$, 0.006, and 0.013, respectively).

In sum, the results in Table 7 show that the 2010 QSBS reform had a larger impact on entrepreneurship in industries where startup exits were more frequent before the change. Since exits are the primary mechanism by which entrepreneurs realize capital gains——and thus benefit from the QSBS exemption—these findings support the hypothesis that the QSBS expansion spurred business formation by increasing the after-tax returns to entrepreneurship.

4.2 Startups' ability to attract talent via equity compensation

Skilled labor is a critical, scarce resource for many startups, particularly high-growth, innovative ones. As Marx and Fleming (2012, p. 40) note: "New ventures rely on an influx of expertise skilled in the art in order to grow ... But even if skilled talent exists in a region, start-ups still face challenges in attracting key workers due to their uncertain life chances and limited resources," especially when competing with established incumbents.

VC-backed and other high-growth, innovative startups "rely heavily on equity compensation to attract, retain, and motivate employees" (Aran and Murciano-Goroff, 2025, p. 196).[17] This compensation can take the form of stock options, restricted shares, or outright stock grants.[18] The 2010 QSBS expansion increased the value of equity compensation to

[17] See also Hochberg and Lindsey (2010), Blasi, Freeman, and Kruse (2013), Chang et al. (2015), Aran (2018), Bernstein, Townsend, and Xu (2024), Davydova et al. (2024), and Jang, Kovacs, and Choi (2026).
[18] For stock options, the clock for the QSBS five-year holding period starts on the exercise date. See Schilling, Ross, and Auman (2019) for details on the QSBS holding test for different types of equity compensation.

employees—at no additional cost to the startup—by lowering the capital gains tax burden employees face upon sale. We therefore hypothesize that a second channel through which the QSBS expansion promoted entrepreneurship was by enhancing startups' ability to attract and retain skilled labor through more valuable equity-based pay.

We provide three complementary pieces of evidence in support of this labor channel. First, because equity compensation is typically reserved for highly skilled employees (Chang et al., 2015; Eisfeldt, Falato, and Xiaolan, 2023; Galustian, 2024), we test whether the 2010 QSBS expansion had a stronger effect on entrepreneurship in industries that are more reliant on high-skill labor. Second, we examine whether the expansion increased startups' use of equity compensation. Third, we assess whether it improved startups' ability to hire high-skill workers, particularly those recruited from large incumbent firms.

For the first test, we use two proxies for an industry's reliance on high-skill labor. The first is the fraction of workers in STEM-related job functions, as these workers tend to be more highly educated and skilled (Goldschlag and Miranda, 2020).[19] Table 8 (structured analogously to Table 7) shows the results. Columns 1–3 focus on industries with above-median STEM employment and show that the QSBS change significantly boosted entrepreneurship in these industries across all three empirical models. For instance, the log model in column 1 estimates a 26.2% ($=e^{0.233}-1$) increase in firm births in QSBS-eligible industries ($p = 0.004$). By contrast, columns 4–6 show no significant effect in industries with below-median STEM employment (e.g., column 4, $p = 0.278$). Triple-diff estimates in columns 7–9 confirm this pattern, with the estimated coefficient on $STEM\ \% \times QSBS\ eligible \times Post$ positive in all three models and at least marginally significant in two ($p = 0.091$, 0.019, and 0.141).

An alternative approach to identify industries heavily reliant on human capital is to focus

[19] We assume this fraction is constant within our sample period and measure it in 2013, the earliest year with the necessary BLS data. This assumption is unlikely to introduce significant bias, given the high stability of industry labor composition over time. For example, the correlation between an industry's STEM labor share in 2013 and 2014 is 99.4%.

on high-tech industries. We do this in Table IA.2, where our definition of high-tech industries follows Goldschlag and Miranda (2020, Table 7). Although results are noisier—only 14 of our 267 industries are classified as high-tech—the pattern is the same: The QSBS effect on entrepreneurship is stronger in more human-capital-intensive industries, where we expect the role of equity compensation to be more important.

The fact that the QSBS exemption has a particularly strong effect in human-capital-intensive and high-tech industries is notable in its own right, given the outsize role these industries play in driving innovation and economic growth (Guzman and Stern, 2020; Jones and Summers, 2022; Van Reenen, 2022). Section 5 builds on this evidence by examining the relationship between the QSBS expansion and innovation.

Next, we turn to our second test: Did startups actually increase their use of equity compensation following the 2010 QSBS expansion? This test differs from our prior analyses in that it is conducted at the firm rather than the industry level. Specifically, the test leverages firm-level data from California-based Form D filers and their 25102(o) EPENs, which California startups must file when they issue equity compensation.

In Table 9, we follow each California-based Form D filer for up to six years and estimate linear probability models in which the dependent variable is an indicator equal to one if the startup filed a 25102(o) EPEN adopting an equity compensation plan that year. Column 1 includes as controls the log of one plus firm age to account for lifecycle effects on equity grants, as well as Form D industry and year fixed effects. The estimate on $QSBS\ eligible \times Post$ implies that, following the 2010 QSBS expansion, startups in QSBS-eligible industries increased EPEN filings in a given year by 2.1 percentage points relative to startups in ineligible industries ($p = 0.022$)—a 9.4% increase relative to the sample mean of 21.8%.

Column 2 yields similar estimates when we control for time-invariant startup characteristics by including firm rather than industry fixed effects ($p = 0.081$). In columns 3 and 4, we replace the log of one plus firm age with firm age fixed effects, while otherwise mirroring the specifications in columns 1 and 2, and again obtain very similar results ($p = 0.027$ and $p = 0.065$, respectively).

Our third test of the labor channel directly examines whether the QSBS expansion improved startups' ability to attract high-skill talent. To do so, we leverage hiring data from Revelio Labs using the same sample of Form D filers as in Table 9, without restricting the sample to California-based startups but requiring them to be matched to Revelio.

The dependent variable in columns 1 and 2 of Table 10 is the number of high-skill hires by each startup in a given year. The sample includes a substantial number of startup-years with no hiring, so we estimate both a Poisson model (column 1), which captures changes along both the extensive and intensive margins, and a log-transformed OLS model (column 2), which captures changes in hiring intensity conditional on at least one high-skill hire. All specifications include firm and year fixed effects and control for lifecycle effects using the logarithm of one plus firm age.[20]

Column 1 shows that the QSBS expansion led to a 23.2% ($=e^{0.209} - 1$) increase in high-skill hires for startups in QSBS-eligible industries relative to the control group ($p = 0.005$). Column 2 yields a slightly smaller intensive-margin effect of 16% ($p = 0.027$). Taken together, these estimates indicate that the QSBS expansion increased high-skill hiring along both the extensive and intensive margins.

Columns 3 and 4 report analogous specifications for low-skill hiring. Consistent with the notion that equity compensation is primarily used to attract and retain skilled workers (Chang et al., 2015; Eisfeldt et al., 2023), we find no significant effect of the QSBS expansion on low-skill hiring ($p = 0.313$ and $p = 0.532$). The absence of any response among low-skill hires serves as a natural placebo test and helps rule out explanations based on generalized labor-demand shocks affecting QSBS-eligible industries.

Columns 5 and 6 directly test the hypothesis that the QSBS expansion improved startups'

[20] Results are similar when replacing this control with firm age fixed effects (not reported for brevity).

ability to attract high-skill talent from established, typically better-capitalized incumbents by making equity compensation more attractive relative to cash pay. We estimate analogous models to those in columns 1 and 2, but in these specifications, the dependent variable counts only high-skill hires whose previous employer was a large incumbent with at least 100 employees. Relative to the baseline estimates in columns 1 and 2, the Poisson estimate in column 5 is more than 50% larger ($p < 0.001$), while the log specification in column 6 remains economically meaningful and marginally significant ($p = 0.098$). These results support the interpretation that by increasing the expected after-tax value of equity compensation, the QSBS expansion helped startups better compete for high-skill talent with more established incumbents—particularly at the extensive margin.

While we do not observe individual compensation contracts, Table 10 complements the earlier evidence on human capital intensity and equity compensation. Taken together with the stronger QSBS effects in skill-intensive industries (Tables 8 and IA.2) and the increase in startups' use of equity compensation (Table 9), the hiring results point to a consistent pattern: The QSBS reform helped spur entrepreneurship by relaxing a key growth constraint faced by startups—their ability to attract, retain, and incentivize high-skill workers.

Table IA.3 provides additional industry-level evidence in support of the employment channel. It shows that the 2010 QSBS reform increased employment in treated industries at both young (Panel A) and small (Panel B) firms—but only among skilled workers with at least a bachelor's degree.[21] The small and insignificant QSBS effect on (1) employment among workers without a bachelor's degree and (2) skilled employment at large firms serve as additional placebo tests in support of our identification strategy.[22]

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[21] When we break down firms by age, the estimated coefficients follow the expected pattern—larger QSBS effects at younger firms—but are imprecisely estimated.

[22] In Panel B, large firms with over 250 employees are unlikely to meet the QSBS size eligibility threshold, making them a valid placebo group. The same is not true for mature firms in Panel A, as most mature firms remain small (Ge, Zhang, and Wang, 2020) and thus QSBS-eligible.

4.3 After-tax returns to startup investors

Lastly, the 2010 QSBS expansion increased the after-tax returns to startup investors—provided they were not tax-exempt. This introduces a third potential channel through which the change may have promoted entrepreneurship: By easing startups' access to equity financing and thus helping alleviate the financial constraints entrepreneurs often face (Adelino et al., 2015; Fracassi et al., 2016; Jensen, Leth-Petersen, and Nanda, 2022; Schmalz, Sraer, and Thesmar, 2017).

Edwards and Todtenhaupt (2020) provide evidence of this financing channel by comparing QSBS-eligible and non-eligible startups that had raised at least one equity round prior to the 2010 QSBS change and subsequently secured additional funding. They show that, after 2010, QSBS-eligible startups raised follow-on equity funding rounds that were, on average, 12% larger than those raised by their non-eligible counterparts. In this section, we complement their intensive-margin evidence by testing whether the 2010 QSBS expansion also had an extensive-margin effect—specifically, whether it increased the number of startups able to raise their *first* round of equity financing.

This distinction is important. The intensive-margin results in Edwards and Todtenhaupt (2020) do not necessarily imply that the QSBS expansion also broadened access to initial equity funding. Investors face the greatest information asymmetries and uncertainty when evaluating startups that have not yet raised capital from professional investors, making their decision-making process fundamentally different from that in later funding rounds (Farre-Mensa et al., 2020; Gompers, 1995; Sahlman, 1990). As a result, investors may be less responsive to tax incentives when making first-round investment decisions.

To examine whether the 2010 QSBS expansion increased startups' access to external equity financing, Table 11 estimates Equation (1) using measures of first-round VC activity at the NAICS4 industry-year level as the dependent variables. We focus on initial VC funding because raising venture capital represents a critical milestone for many entrepreneurs—

particularly for innovative startups (Gompers and Lerner, 2001). Beyond capital, VCs provide monitoring and advice (Bernstein, Giroud, and Townsend, 2016; Hellmann and Puri, 2000), access to networks (Hochberg, Ljungqvist, and Lu, 2007), and recruiting support (Bernstein et al., 2022; Gorman and Sahlman, 1989).

In column 1, we estimate an OLS model where the dependent variable is the logarithm of the number of first VC financings. This restricts the sample to industry-years where at least one firm raises venture capital. The coefficient estimate on the interaction term $QSBS\ eligible \times Post$ indicates that the 2010 QSBS expansion led to a 25.3% ($=e^{0.225} - 1$) increase in the number of firms raising their first VC round in QSBS-eligible industries ($p = 0.038$). This finding is robust to estimating a Poisson model in column 2 ($p < 0.001$), which allows us to include industry-years with zero first-round VC activity. The larger point estimate in column 2 suggests that the 2010 QSBS change may have expanded access to venture capital in industries that previously attracted little VC investment.

Columns 3 and 4 examine the impact of the 2010 QSBS expansion on the dollar amount of venture capital invested in first-round financings. Because the dependent variable is log-transformed, the sample is restricted to industry-years with VC activity. Column 3 shows that total first-round VC investment increased by 63.4% ($=e^{0.491} - 1$) in QSBS-eligible industries after 2010, though this increase is noisily estimated ($p = 0.060$). There is also some evidence that average first-round size increased, but this effect is not statistically significant (column 4, $p = 0.126$)—possibly because, conditional on investment, round size is largely driven by the startups' underlying capital needs and business models.

In sum, the evidence in Table 11 supports the hypothesis that a third channel through which the QSBS expansion spurred entrepreneurship was by facilitating entrepreneurs' access to capital—particularly to the critical first VC round. This effect is consistent with increased commitments to early-stage VC funds by taxable investors, such as high-net-worth individuals. In addition, to the extent that these investors also expanded direct angel investments, prior evidence suggests that this could have broadened the set of startups positioned to raise an initial VC round (Kerr, Lerner, and Schoar, 2014).

To assess whether the impact of the QSBS exemption is primarily driven by the financing channel, Table IA.4 examines whether the expansion's effect on entrepreneurship is concentrated in industries with high external financial or equity dependence, as defined by Rajan and Zingales (1998). The results suggest it is not: The QSBS effect remains strong even in industries with low external financial and equity dependence. This finding underscores the importance of considering not only how the QSBS exemption affects investors, but also how it shapes the incentives and behavior of startup founders and employees.

5 The QSBS Expansion's Impact on Innovation

The evidence in Sections 3 and 4 indicates that the 2010 QSBS expansion increased entrepreneurship and facilitated startups' access to key inputs—funding and, most notably, high-skill labor. An important open question is whether this expanded access to inputs translated into meaningful real outcomes for QSBS-eligible startups.

To shed light on this question, we next examine the impact of the 2010 QSBS expansion on startup innovation. Because patent data are available for private firms, we analyze innovation at the firm level using the sample of Form D filers introduced in Section 4.2.

We begin by estimating the effect of the 2010 QSBS expansion on the number of eventually granted patent applications filed by startups. Table 12 reports the results, which mirror the hiring analysis in Table 10. Column 1 reports a Poisson model, allowing us to include the many firm-years with no patenting activity, while column 2 estimates a log-transformed OLS model restricted to firm-years with at least one patent. As in Table 10, we control for the logarithm of one plus firm age and include both firm and year fixed effects.

Column 1 shows that following the 2010 QSBS expansion, startups in QSBS-eligible industries increased their successful patent filings by 22.5% (=$e^{0.203} - 1$) relative to those in ineligible industries ($p < 0.001$). The intensive margin effect in column 2 is smaller but still economically meaningful—an 8.4% (=$e^{0.081} - 1$) increase in patenting—and marginally significant ($p = 0.08$).

Figure 3 plots the dynamic version of the model in column 1. Consistent with the parallel trends assumption, the interaction terms for pre-2010 years are close to zero and statistically insignificant. Interestingly, the effect of the 2010 QSBS expansion on patent filings emerges only in 2012—one to two years after the observed impact on entrepreneurship (cf. Figure 2). This lag is consistent with the idea that R&D investments take time to yield patentable inventions (e.g., Wang and Hagedoorn, 2014).

Is the QSBS-induced increase in patenting driven by low-quality innovations? To address this question, column 3 re-estimates the model from column 1 using the total number of five-year citations received by a startup-year's patents as the dependent variable. We find no evidence that the increase in patenting reflects lower-quality innovations. If anything, the opposite holds: The point estimates in column 3 (Poisson, $p = 0.012$) and column 4 (log-transformed OLS, $p = 0.007$) are both larger than their counterparts in columns 1 and 2. To illustrate, column 3 implies a 33.2% (=$e^{0.287} - 1$) increase in citations for treated startups after 2010. Columns 5 and 6, which examine citations per patent, further support this conclusion: The Poisson model in column 5 yields a 17.6% (=$e^{0.162} - 1$) increase in citations per patent for treated startups post-2010, while the log-transformed OLS model in column 6 produces a smaller and noisier but still positive estimate ($p = 0.128$).

Taken together, the results in Table 12 indicate that the QSBS expansion increased startups' innovative output, with no evidence of a decline in innovation quality. Thus, the expansion not only increased entrepreneurial entry and startups' access to key inputs, but also translated into economically meaningful gains in startup innovation—a key engine of economic growth (Akcigit and Kerr, 2018).

6 Conclusions

We provide causal evidence that targeted capital gains tax relief can increase both entrepreneurship and innovation. Exploiting the 2010 expansion of the QSBS exemption, we find that firm births rose by approximately 10% in QSBS-eligible industries relative to ineligible ones. The increase is concentrated in sectors with high exit activity and greater reliance on skilled labor.

Our results point to three mutually reinforcing channels through which capital gains tax relief affects entrepreneurship. First, the QSBS expansion raised the expected after-tax returns to founders, making entrepreneurship a more attractive career path. Second, it enhanced the value of equity-based compensation for employees, helping startups attract and retain talent. Consistent with this labor channel, we show that the QSBS expansion increased both startups' use of equity compensation and their hiring of high-skill workers, particularly those recruited from established incumbents. Third, the expansion increased the after-tax returns to startup investors, easing entrepreneurs' financing frictions—especially those seeking their first VC round. Importantly, these QSBS-induced changes increased successful patent filings among eligible startups by 23%, with no decline in innovation quality.

Our findings underscore the potential for capital gains tax policy to boost entrepreneurship and innovation, especially when narrowly targeted at entrepreneurial firms. These findings are all the more relevant given that capital gains tax breaks remain a controversial policy tool for promoting entrepreneurship.[23] While our results highlight significant benefits, capital gains tax relief—even when narrowly targeted—also entails non-trivial fiscal costs and potential distributional consequences. We leave a full welfare analysis of the QSBS exemption—and of capital gains taxes as a broader policy tool to promote entrepreneurship and innovation—for future research.

[23] See, e.g., Austin and Johnson (2025) or Mitchell and Pomerleau (2025).

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Figure 1: Google searches for the QSBS exemption

This figure plots the quarterly trend in combined Google searches for the terms "QSBS" or "Qualified Small Business Stock" in the U.S. from 2006 to 2015. For each quarter, we sum the monthly Google Trends index values for the three months in the quarter. The series is normalized to 100 in Q4 2010, the quarter with the highest search volume during the sample period. The vertical line indicates Q4 2010—the first full quarter following the QSBS exemption increase to 100%. Search data are from `https://trends.google.com/trends/?geo=US`.

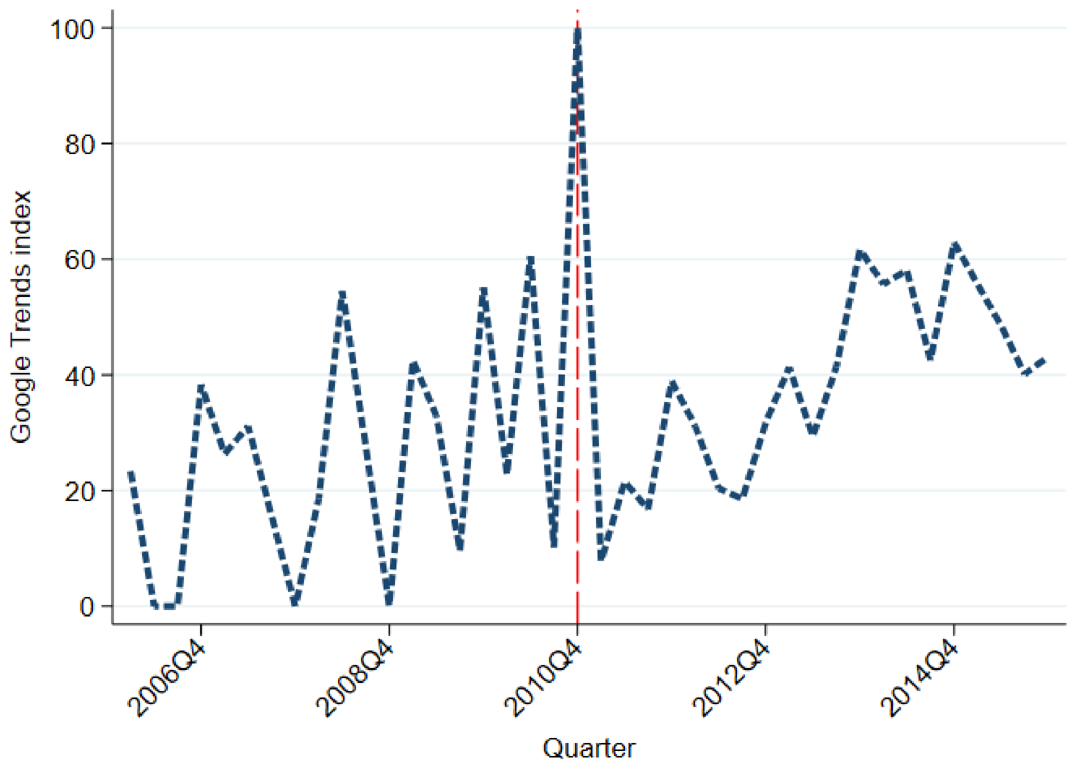
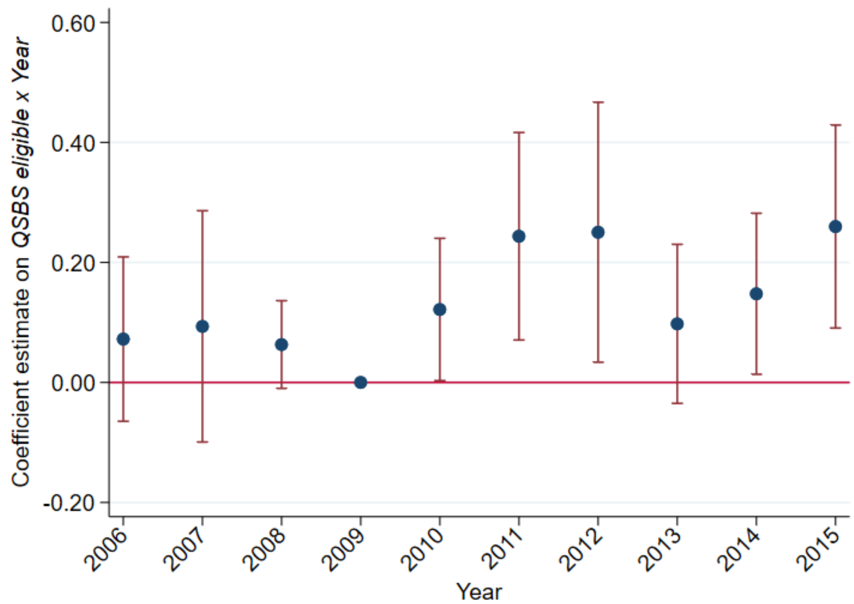


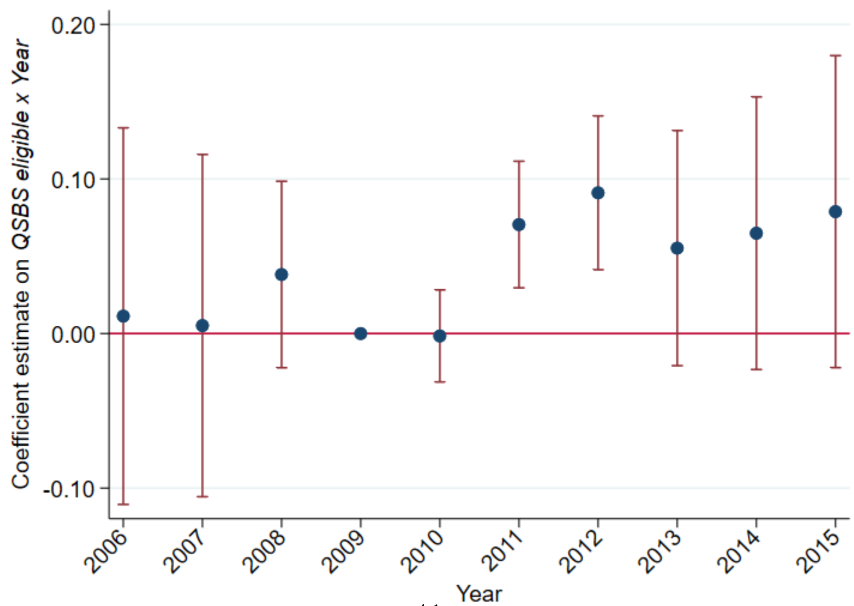
Figure 2: Dynamic estimates of the QSBS exemption's impact on entrepreneurship

This figure plots coefficient estimates and 95% confidence intervals from a dynamic version of Equation (1), where the treatment variable (*QSBS eligible*) is interacted with year indicators. Panels A and B use the number of firm births in each NAICS4 industry-year as the dependent variable. Panel A estimates a log-transformed OLS model, while Panel B estimates a Poisson model. Panel C reports results from an OLS model where the dependent variable is the firm birth rate in each industry-year. The omitted (base) year is 2009—the year before the QSBS exemption increased to 100%—and its interaction term is thus normalized to zero. Standard errors are clustered at the NAICS4 industry level.

Panel A: Log-transformed OLS model



Panel B: Poisson model



Panel C: Firm birth rate OLS model

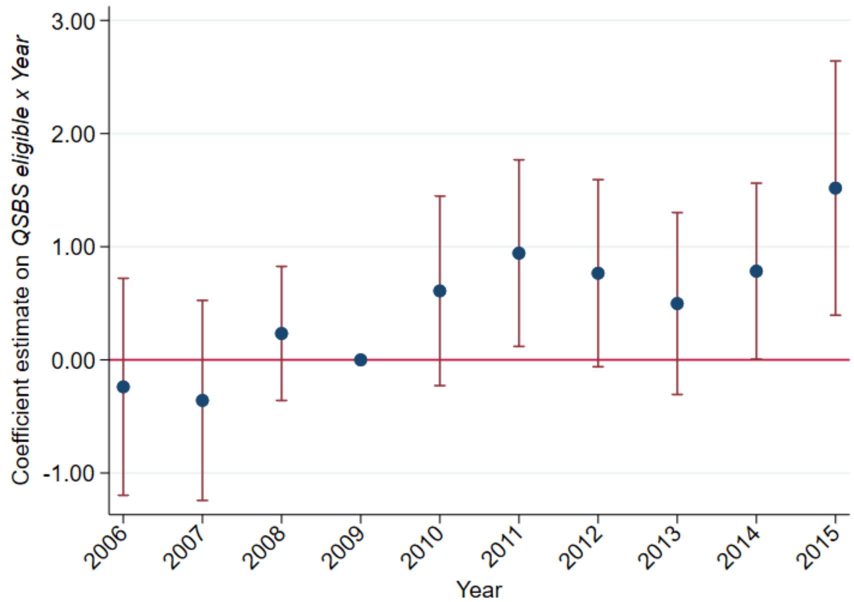


Figure 3: Dynamic estimates of the QSBS exemption's impact on patenting

This figure plots coefficient estimates and 95% confidence intervals from a dynamic version of the Poisson model in column 1 of Table 12, where the treatment variable (*QSBS eligible*) is interacted with year indicators. The dependent variable is the annual count of eventually-granted patent applications filed by each startup. The omitted (base) year is 2009—the year before the QSBS exemption increased to 100%—and its interaction term is thus normalized to zero. Standard errors are clustered at the Form D industry level.

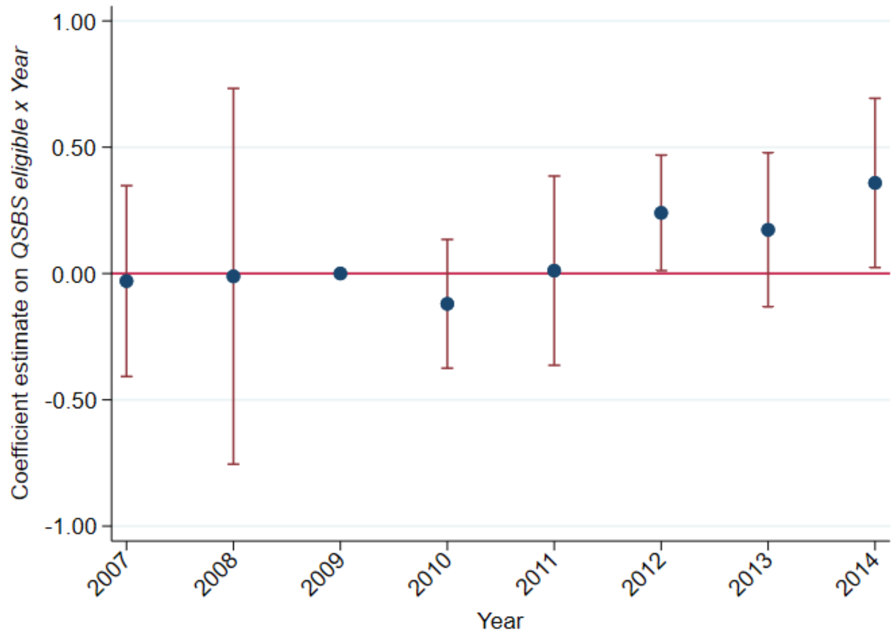


Table 1: Industries not eligible for the QSBS exemption

This table lists the industries excluded from the QSBS exemption under Section 1202(e)(3) of the Internal Revenue Code (IRC). Column 1 reports the non-eligible industries as defined in the statute. Columns 2 and 3 show how these industries are mapped to 2017 NAICS and Form D industry classifications, respectively. When an industry maps to a two- or three-digit NAICS code, all corresponding NAICS4 industries are classified as non-eligible.

	Excluded industries as listed in the IRC	**NAICS codes**	**Form D industries**
	(1)	(2)	(3)
Personal services	Health	621, 622, 6231	Hospitals & Physicians, Other Health Care
	Law	5411	
	Engineering	5413	
	Architecture	5413	
	Accounting	5412	
	Actuarial science	524	
	Performing arts	7111	
	Consulting	5416	
	Athletics	7112	
	Financial services	522, 523, 525	Other Banking & Financial Services
	Brokerage	523, 5312, 5313	
Financial activities	Banking	521, 522	Commercial Banking, Investment Banking
	Insurance	524	Insurance, Health Insurance
	Financing	522, 523, 525	REITS & Finance
	Leasing	53	Commercial Real Estate, Residential Real Estate, Other Real Estate
	Investing	523, 525	Investing
Extracting	Extracting Activities	21	Coal Mining, Oil & Gas
Hospitality	Hotels	7211	Lodging & Conventions
	Motels	7211	
	Restaurants	722	Restaurants

Table 2: Impact of the QSBS exemption expansion on entrepreneurial capital gains

This table uses data from the 2010 Survey of Consumer Finances to estimate the distribution of pre- and after-tax capital gains (CG) under various tax regimes for prospective entrepreneurs whose returns would likely be affected by the 2010 QSBS expansion. The sample includes individuals who (1) owned and actively managed a privately held business that (2) operated in a QSBS-eligible industry and (3) was founded in or before 2005. For these entrepreneurs, we report the distribution of unrealized capital gains as of 2010, along with estimates of after-tax gains and effective tax rates, assuming they sell their business under different tax regimes. Columns 2–7 present results using the 15% capital gains tax rate in effect before 2013, under three scenarios: no QSBS exemption, a 50% exemption (the prevailing policy until 2009), and the 100% exemption introduced in 2010. Columns 8–11 present analogous results using the 2013 23.8% capital gains rate (inclusive of the 3.8% net investment income tax), under no exemption and the 100% exemption. For each percentile group, we report average gains and rates. In computing the sample mean in the final row, capital gains are set to zero—and effective rates are treated as missing—for entrepreneurs with capital losses (i.e., whose business value falls below cost basis). All dollar values are expressed in 2010 real terms.

		Pre 2013 tax rates						2013 & later tax rates			
		Standard CG rates		50% QSBS exemption		100% QSBS exemption		Standard CG rates		100% QSBS exemption	
Percentile	Pre-tax CG	After-tax CG	CG tax rate	After-tax CG	CG tax rate	After-tax CG	CG tax rate	After-tax CG	CG tax rate	After-tax CG	CG tax rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
[0, 32.5]	≤ 0	≤ 0	n/a	≤ 0	n/a	≤ 0	n/a	≤ 0	n/a	≤ 0	n/a
(32.5, 40]	1,848	1,571	15.00%	1,571	14.98%	1,848	0.00%	1,408	23.80%	1,848	0.00%
(40, 50]	9,723	8,265	15.00%	8,267	14.98%	9,723	0.00%	7,409	23.80%	9,723	0.00%
(50, 60]	23,893	20,309	15.00%	20,313	14.98%	23,893	0.00%	18,206	23.80%	23,893	0.00%
(60, 70]	50,162	42,638	15.00%	42,648	14.98%	50,162	0.00%	38,223	23.80%	50,162	0.00%
(70, 80]	151,148	128,476	15.00%	128,506	14.98%	151,148	0.00%	115,175	23.80%	151,148	0.00%
(80, 90]	410,008	348,506	15.00%	348,588	14.98%	410,008	0.00%	312,426	23.80%	410,008	0.00%
(90, 95]	1,011,109	859,443	15.00%	859,645	14.98%	1,011,109	0.00%	770,465	23.80%	1,011,109	0.00%
(95, 99]	3,090,470	2,626,900	15.00%	2,627,518	14.98%	3,090,470	0.00%	2,354,938	23.80%	3,090,470	0.00%
(99, 99.5]	9,503,366	8,077,861	15.00%	8,079,731	14.98%	9,480,462	0.20%	7,241,565	23.80%	9,467,024	0.31%
(99.5, 99.9]	21,391,024	18,182,370	15.00%	18,185,414	14.99%	20,466,132	4.09%	16,299,960	23.80%	19,923,530	6.49%
(99.9, 100]	113,480,480	96,458,408	15.00%	96,467,320	14.99%	103,143,856	7.42%	86,472,128	23.80%	97,079,704	11.77%
Mean	486,199	413,269	15.00%	413,347	14.98%	472,006	0.04%	370,483	23.80%	463,680	0.06%

Table 3: Summary statistics

This table presents summary statistics for the variables used in the analysis of the QSBS expansion's effects on entrepreneurship and VC financing (Panel A), equity compensation (Panel B), high-skill hiring (Panel C), and innovation (Panel D). The unit of observation in Panel A is a NAICS4 industry-year; the number of observations (N) is 2,670, except for *Avg. $ raised in 1st VC rounds*, which is only defined for industry-years with at least one first-round VC investment ($N = 1,263$). The unit of observation in Panels B–D is a Form D-filing startup-year. Panel B focuses on California-based startups ($N = 5,802$). Panel C includes all startup-years, regardless of location, matched to Revelio Labs employment data ($N = 6,083$). In Panel D, the sample is again nationwide, with $N = 17,117$ for all variables except *Avg. no. citations*, which is only defined for startup-years with at least one granted patent ($N = 2,080$). All variables are defined in Internet Appendix B.1.

Panel A: Industry-year sample for the analysis of entrepreneurship and VC financing

	Mean	Std. dev.	5- %ile	25- %ile	50- %ile	75- %ile	95- %ile
No. firm births	1515	3533	15	69	332	1256	7626
Firm birth rate (%)	7.25	3.86	2.67	4.47	6.62	9.17	14.34
No. large incumbents	563	813	31	135	288	656	2048
No. firms raising 1st VC round	3.1	19.9	0.0	0.0	0.0	1.0	8.0
Total $ raised in 1st VC rounds	22.0	150.7	0.0	0.0	0.0	3.5	78.3
Avg. $ raised in 1st VC rounds	13.2	68.5	0.3	2.0	4.6	8.8	28.9
QSBS eligible	0.84	0.36	0.00	1.00	1.00	1.00	1.00
Post	0.50	0.50	0.00	0.00	0.50	1.00	1.00

Panel B: Startup-year sample for the analysis of equity compensation

	Mean	Std. dev.	5- %ile	25- %ile	50- %ile	75- %ile	95- %ile
Equity compensation plan adopted?	0.22	0.41	0.00	0.00	0.00	0.00	1.00
Firm age	2.46	1.70	0.00	1.00	2.00	4.00	5.00
QSBS eligible	0.91	0.28	0.00	1.00	1.00	1.00	1.00
Post	0.50	0.50	0.00	0.00	1.00	1.00	1.00

Panel C: Startup-year sample for the analysis of hiring

	Mean	Std. dev.	5-%ile	25-%ile	50-%ile	75-%ile	95-%ile
No. high-skill hires	5.13	15.52	0.00	1.00	2.00	5.00	16.00
No. low-skill hires	0.46	1.91	0.00	0.00	0.00	0.00	2.00
No. high-skill hires from large incumbents	2.38	8.43	0.00	0.00	1.00	3.00	8.00
Firm age	2.44	1.67	0.00	1.00	2.00	4.00	5.00
QSBS eligible	0.91	0.29	0.00	1.00	1.00	1.00	1.00
Post	0.49	0.50	0.00	0.00	0.00	1.00	1.00

Panel D: Startup-year sample for the analysis of innovation

	Mean	Std. Dev.	5-%ile	25-%ile	50-%ile	75-%ile	95-%ile
No. patents	0.31	1.35	0.00	0.00	0.00	0.00	2.00
No. patent citations	2.89	26.78	0.00	0.00	0.00	0.00	8.00
Avg. no. citations	7.37	16.69	0.00	0.71	2.80	8.00	29.00
Firm age	2.47	1.70	0.00	1.00	2.00	4.00	5.00
QSBS eligible	0.87	0.33	0.00	1.00	1.00	1.00	1.00
Post	0.50	0.50	0.00	0.00	1.00	1.00	1.00

Table 4: Impact of the QSBS expansion on entrepreneurship

This table presents diff-in-diff estimates of the impact of the 2010 QSBS expansion on entrepreneurial activity at the NAICS4-year level over the 2006–2015 period. The dependent variable in columns 1 and 2 is the natural logarithm of the number of firm births; in column 3, it is the natural logarithm of one plus the number of firm births; in column 4, it is the number of firm births; and in column 5, it is the firm birth rate (number of births divided by the number of firms at the beginning of the year, in percentage points). All columns report OLS regressions except column 4, which estimates a Poisson regression. *QSBS eligible* is an indicator equal to one for industries eligible for the QSBS exemption. *Post* equals one for years after 2010. *Log (no. large incumbents)* is the natural logarithm of the number of firms in each industry with at least 100 employees, lagged by one year. All regressions include NAICS4 industry and year fixed effects. Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Log (no. firm births)	Log (no. firm births)	Log (1 + no. firm births)	No. firm births	Firm birth rate
Model:	OLS	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)
QSBS eligible × Post	0.129***	0.101**	0.121***	0.061**	0.851***
	(0.045)	(0.048)	(0.043)	(0.029)	(0.217)
Log (no. large incumbents)	0.518***		0.517***	0.464***	0.157
	(0.074)		(0.073)	(0.121)	(0.462)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,665	2,665	2,670	2,670	2,670
F or χ^2 statistic	25.3	4.4	25.3	15.9	8.3

Table 5: Impact of the QSBS expansion on entrepreneurship – Placebo tests

This table reports results from placebo diff-in-diff models analogous to those in Table 4, estimated under the false assumption that the QSBS expansion occurred in either 2005 or 2006. Columns 1–3 present diff-in-diff analyses estimated over a 10-year sample centered on 2005 as the pseudo-treatment year; columns 4–6 do the same using 2006 as the pseudo-treatment year. The specifications mirror the baseline models in Table 4: Columns 1 and 4 correspond to column 1 (log-transformed OLS); columns 2 and 5 to column 4 (Poisson); and columns 3 and 6 to column 5 (firm birth rate OLS). *Post 2005* (*Post 2006*) equals one for years after 2005 (2006), respectively. All other variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects. Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Pseudo-treatment year:	2005			2006		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
QSBS eligible × Post 2005	–0.022	–0.041*	0.103			
	(0.034)	(0.022)	(0.369)			
QSBS eligible × Post 2006				0.028	–0.017	0.506
				(0.039)	(0.035)	(0.387)
Log (no. large incumbents)	0.510***	0.218**	–0.191	0.525***	0.329***	–0.058
	(0.070)	(0.100)	(0.488)	(0.064)	(0.093)	(0.489)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,669	2,670	2,670	2,668	2,670	2,670
F or χ^2 statistic	29.4	9.6	0.2	34.2	14.8	1.0

Table 6: Impact of the QSBS expansion on entrepreneurship – Financial crisis robustness

This table provides robustness checks for our baseline results in Table 4 by excluding from the sample either the industries or the years most affected by the 2008 financial crisis. Columns 1–3 exclude all NAICS4 industries in finance, insurance, and construction. Columns 4–6 exclude the years 2008–2010. The specifications mirror the baseline models in Table 4: Columns 1 and 4 correspond to column 1 (log-transformed OLS); columns 2 and 5 to column 4 (Poisson); and columns 3 and 6 to column 5 (firm birth rate OLS). All variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects. Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Exclude finance, insurance, construction			Exclude 2008–2010		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
QSBS eligible × Post	0.090*	0.054*	0.768***	0.122**	0.079*	1.220***
	(0.049)	(0.029)	(0.269)	(0.059)	(0.047)	(0.327)
Log (no. large incumbents)	0.486***	0.563***	−0.261	0.573***	0.592***	0.480
	(0.078)	(0.099)	(0.517)	(0.084)	(0.138)	(0.530)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,406	2,410	2,410	1,865	1,869	1,869
F or χ^2 statistic	19.3	32.6	5.3	23.0	19.6	7.0

Table 7: Heterogeneous impact of the QSBS expansion on entrepreneurship by industry exit rate

This table examines whether the impact of the QSBS expansion on entrepreneurship varies with an industry's exit rate. For each NAICS4 industry, the *Exit rate* is defined as the average annual number of IPOs and private-firm acquisitions from 2006 to 2010 (the pre-treatment period) divided by the average annual number of firms aged one to ten over the same period. Columns 1–3 estimate our baseline diff-in-diff models (corresponding to columns 1, 4, and 5 of Table 4) within the subsample of industries with an above-median exit rate. Columns 4–6 estimate the same models for industries with a below-median exit rate. Columns 7–9 report triple-differences estimates based on the models in columns 1, 4, and 5 of Table 4, respectively, augmented by adding an industry's exit rate as an additional interaction variable. All other variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects (not noted in the table to conserve space). Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	High exit rate			Low exit rate			High vs. low exit rate		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Exit rate × QSBS elig. × Post							4.034***	5.431***	49.290**
							(1.540)	(1.993)	(19.633)
QSBS eligible × Post	0.229***	0.104*	2.145**	0.029	0.058*	0.369	0.055	0.051*	0.275
	(0.075)	(0.062)	(0.862)	(0.042)	(0.032)	(0.314)	(0.036)	(0.030)	(0.291)
Exit rate × Post							–2.609**	–2.602	–35.295*
							(1.208)	(1.840)	(18.414)
Log (no. large incumbents)	0.489***	0.619***	0.498	0.571***	0.446***	0.490	0.521***	0.460***	0.345
	(0.104)	(0.142)	(0.866)	(0.102)	(0.136)	(0.642)	(0.073)	(0.121)	(0.495)
Observations	1,325	1,330	1,330	1,340	1,340	1,340	2,665	2,670	2,670
F or χ^2 statistic	12.7	20.0	4.2	16.6	12.0	0.8	15.5	33.1	4.5

Table 8: Heterogeneous impact of the QSBS expansion on entrepreneurship by industry STEM employment

This table examines whether the impact of the QSBS expansion on entrepreneurship varies with an industry's STEM employment. For each NAICS4 industry, we obtain the fraction of STEM-related employment (*STEM %*) from the BLS. Columns 1–3 estimate our baseline diff-in-diff models (corresponding to columns 1, 4, and 5 of Table 4) within the subsample of industries with an above-median fraction of STEM employment. Columns 4–6 estimate the same models for industries with below-median STEM employment. Columns 7–9 report triple-differences estimates based on the models in columns 1, 4, and 5 of Table 4, respectively, augmented by adding an industry's fraction of STEM employment as an additional interaction variable. All other variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects (not noted in the table to conserve space). Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	High STEM employment			Low STEM employment			High vs. low STEM employment		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
STEM % × QSBS elig. × Post							0.372*	0.214**	2.805
							(0.219)	(0.091)	(1.898)
QSBS eligible × Post	0.233***	0.118**	1.523***	0.039	0.033	0.432	0.085*	0.048	0.677**
	(0.079)	(0.050)	(0.294)	(0.036)	(0.030)	(0.302)	(0.044)	(0.032)	(0.261)
STEM % × Post							−0.150	−0.124*	−1.279
							(0.166)	(0.072)	(1.457)
Log (no. large incumbents)	0.686***	0.960***	1.467*	0.455***	0.348***	−0.731	0.522***	0.456***	0.083
	(0.119)	(0.197)	(0.840)	(0.081)	(0.130)	(0.606)	(0.075)	(0.127)	(0.516)
Observations	1,236	1,240	1,240	1,290	1,290	1,290	2,526	2,530	2,530
F or χ^2 statistic	17.6	29.9	13.7	15.8	7.9	1.9	12.9	34.1	4.6

Table 9: Impact of the QSBS expansion on equity compensation

This table presents diff-in-diff estimates of the impact of the QSBS expansion on startups' use of equity compensation at the startup-year level. The dependent variable is an indicator equal to one if the startup filed a California 25102(o) Employee Plan Exemption Notice (EPEN) adopting an equity compensation plan in a given year. All specifications are linear probability models. *Log(1 + firm age)* is the logarithm of one plus the startup's age. All other variables are defined as in Table 4. All regressions include year fixed effects. In addition, columns 1 and 3 include industry fixed effects, while columns 2 and 4 include firm fixed effects. In columns 3 and 4, we replace the firm age control with firm age fixed effects. Standard errors (in parentheses) are clustered at the Form D industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Equity compensation plan adopted?			
Model:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
QSBS eligible × Post	0.021**	0.020*	0.019**	0.020*
	(0.008)	(0.011)	(0.008)	(0.010)
Log(1 + firm age)	0.006	0.091		
	(0.033)	(0.062)		
Industry FE	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes
Firm age FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	5,802	5,802	5,802	5,802
F statistic	3.0	1.9	5.6	3.8

Table 10: Impact of the QSBS expansion on startup hiring

This table presents diff-in-diff estimates of the impact of the QSBS expansion on startup hiring at the startup-year level. We break down hiring by worker skill and prior employment. In columns 1 and 2, the dependent variable is the number of high-skill hires, defined as workers employed in occupations requiring considerable or extensive preparation (U.S. Department of Labor O*NET Job Zones 4 and 5), while columns 3 and 4 examine low-skill hires, defined as workers employed in occupations requiring little or some preparation (O*NET Job Zones 1 and 2). Columns 5 and 6 count only high-skill hires whose immediate prior employer was a large incumbent with at least 100 employees. Columns 1, 3, and 5 report Poisson regressions with the count of hires as the dependent variable. Columns 2, 4, and 6 report OLS regressions with the dependent variable log-transformed, which restricts the sample to startup-years with a positive number of hires. All control variables are defined as in Table 9. All regressions include firm and year fixed effects. Standard errors (in parentheses) are clustered at the Form D industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	High-skill hires		Low-skill hires		High-skill hires from large incumbents	
Dependent variable:	No. hires	Log (no. hires)	No. hires	Log (no. hires)	No. hires	Log (no. hires)
Model:	Poisson	OLS	Poisson	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
QSBS eligible × Post	0.209***	0.148**	0.135	−0.152	0.325***	0.122*
	(0.074)	(0.063)	(0.134)	(0.239)	(0.090)	(0.071)
Log(1 + firm age)	0.552***	0.288***	1.042***	0.032	0.531***	0.113
	(0.131)	(0.095)	(0.325)	(0.194)	(0.143)	(0.074)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,083	5,608	6,083	1,125	6,083	4,031
χ^2 or F statistic	18.3	4.8	10.8	0.2	19.2	2.3

Table 11: Impact of the QSBS expansion on startups' first-round VC financing

This table presents diff-in-diff estimates of the impact of the QSBS expansion on startups' ability to raise their first round of VC financing at the NAICS4-year level over the 2006–2015 period. The dependent variable in column 1 is the natural logarithm of the number of firms in the industry-year that raised a first VC round; this restricts the sample to industry-years with VC activity. Column 2 uses the number of such firms as the dependent variable. The dependent variable in column 3 is the natural logarithm of the aggregate amount of capital raised by startups in the industry-year that secured a first VC round. Column 4 uses the natural logarithm of the average amount of capital raised in these first rounds. The smaller sample size in columns 3–4 relative to column 1 reflects missing investment amounts in VentureXpert. All columns report OLS regressions except column 2, which estimates a Poisson regression. All control variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects. Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Log (no. firms raising 1st VC round)	No. firms raising 1st VC round	Log (total $ raised in 1st VC rounds)	Log (avg. $ raised in 1st VC rounds)
Model:	OLS	Poisson	OLS	OLS
	(1)	(2)	(3)	(4)
QSBS eligible × Post	0.225**	0.400***	0.491*	0.299
	(0.108)	(0.111)	(0.260)	(0.195)
Log (no. large incumbents)	−0.164	−0.038	−1.376**	−0.950**
	(0.315)	(0.409)	(0.596)	(0.425)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1,381	2,670	1,263	1,263
F or χ^2 statistic	2.3	13.1	5.0	3.8

Table 12: Impact of the QSBS expansion on startup patenting

This table presents diff-in-diff estimates of the impact of the QSBS expansion on startup patenting at the startup-year level. In columns 1 and 2, the dependent variable is the number of patent applications filed by each startup in a given year that are eventually granted. In columns 3 and 4, the dependent variable is the total number of forward citations received by these patents over five years (set to zero for startup-years with no granted patents), while columns 5 and 6 measure the average number of citations per patent (only defined for startup-years with at least one granted patent). The table structure is analogous to Table 10. Columns 1, 3, and 5 estimate Poisson regressions. Columns 2, 4, and 6 report OLS regressions with the dependent variable log-transformed, which restricts the sample to startup-years in which the dependent variable is positive. All control variables are defined as in Table 9. All regressions include firm and year fixed effects. Standard errors (in parentheses) are clustered at the Form D industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	No. patents		No. patent citations		Avg. no. citations	
Dependent variable:	No. patents	Log (no. patents)	No. patent citations	Log (no. patent citations)	Avg. no. citations	Log (avg. no. citations)
Model:	Poisson	OLS	Poisson	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
QSBS eligible × Post	0.203***	0.081*	0.287**	0.201***	0.162**	0.098
	(0.038)	(0.043)	(0.114)	(0.064)	(0.067)	(0.061)
Log(1 + firm age)	1.296***	−0.082	2.180***	0.125	0.334	0.294
	(0.231)	(0.178)	(0.487)	(0.292)	(0.412)	(0.425)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,117	2,080	17,117	1,655	2,080	1,655
χ^2 or F statistic	67.8	2.1	25.3	5.0	5.9	1.4

INTERNET APPENDIX

for

Capital Gains Tax Relief and Entrepreneurship: Evidence from the QSBS Exemption

(NOT INTENDED FOR PUBLICATION)

A Legislative History of the QSBS Exemption and the 2010 Expansion

A.1 Original enactment of the QSBS exemption in 1993

The original version of the Qualified Small Business Stock (QSBS) exemption—Section 1202 of the Internal Revenue Code—was enacted in August 1993 as part of the Revenue Reconciliation Act of 1993 (Title XIII of the broader Omnibus Budget Reconciliation Act of 1993). The provision was passed early in President Bill Clinton's first term, during a period when the Democratic Party controlled both chambers of Congress.

To our knowledge, the earliest version of what would eventually become the QSBS exemption appeared in the Tax Fairness and Economic Growth Act of 1992 (H.R. 4210). Introduced in the House of Representatives on February 11, 1992, H.R. 4210 passed both the House and Senate in March 1992 but was vetoed by President George H. W. Bush on March 20, 1992. The bill included a measure allowing "an income tax exclusion of 50 percent of the net capital gain from an investment in the stock of a qualified small business if the stock is ... held for at least five years."[1] This early version shared several core features with the version eventually enacted in 1993, including a similar set of excluded industries,[2] but differed in two important respects: It allowed qualifying firms to have up to \$100 million in assets (compared to \$50 million in the enacted version), and it imposed no ceiling on the amount of gains that could be exempted.

Following the veto of H.R. 4210,[3] Senator Dale Bumpers (D-AR) introduced a similar

[1] See `https://www.congress.gov/bill/102nd-congress/house-bill/4210`, Conference Report filed in House.

[2] The 1992 version excluded "the performance of personal services" as a broad category but, unlike the final version, did not enumerate specific professions or services. See `https://www.congress.gov/bill/102nd-congress/house-bill/4210/text/eas`.

[3] President Bush did not cite the capital gains tax exemption in his veto message, which focused on other measures that "would increase taxes by more than \$100 billion." See `https://www.senate.gov/legislative/vetoes/messages/BushGHW/HR4210-Hdoc-102-206.pdf`.

targeted capital gains tax exemption in September 1992 as an amendment to H.R. 11 (U.S. Senate, 1992, pp. 27815–2787). Co-sponsored by 14 other senators (12 Democrats and 2 Republicans), this version set the firm size threshold to qualify for the exemption at $5 million. The bill ultimately failed after receiving a pocket veto from President Bush.[4]

When President Clinton took office in January 1993, his administration signaled early support for a targeted capital gains exemption. In his first State of the Union address in February 1993, he stated:

> Because small businesses generate most of our nation's jobs, our plan includes the boldest targeted incentives for small business in history. We propose a permanent investment tax credit for small business, and new rewards for entrepreneurs who take risks.

Soon thereafter, the Clinton administration submitted to Congress its "Revenue Proposals," which included another precursor of the QSBS exemption under the title "Provide Targeted Capital Gains Exclusion."[5] This version closely resembled the final statute and retained the industry exclusions from earlier drafts. However, it proposed a lower firm-size cap ($25 million), and it limited the excluded gains to the greater of ten times the taxpayer's basis or $1 million—less generous than the $10 million cap ultimately enacted. The proposal justification emphasized the link between capital access and growth: "Small businesses are important to economic growth and job creation ... A preferential tax rate for long-term commitments of capital to small businesses would encourage investments in innovation and growth."

Several of President Clinton's revenue proposals—including the enacted 1993 version of the QSBS exemption described in Section 1—were incorporated into H.R. 2264, the Omnibus Budget Reconciliation Act of 1993, which was introduced in the House in May 1993.[6]

[4] See `https://www.congress.gov/bill/102nd-congress/house-bill/11`.
[5] See `https://home.treasury.gov/system/files/131/General-Explanations-FY1994.pdf`, pp. 11-12.
[6] See `https://www.congress.gov/bill/103rd-congress/house-bill/2264/text`, Title XIII, Section 13113; pp. 111-119.

While the QSBS exemption provided targeted tax relief, the broader bill aimed to raise federal revenue and reduce government spending—an approach that drew strong opposition from congressional Republicans. Nevertheless, with narrow Democratic majorities in both chambers, Congress passed the bill in early August, and President Clinton signed it into law on August 10, 1993.

A.2 Expansion of the QSBS exemption in 2009 and 2010

As discussed in Section 1.2, the QSBS exemption became largely irrelevant after the top federal long-term capital gains tax rate was reduced to 15% in May 2003. This changed in the aftermath of the 2008 financial crisis, when Congress expanded the exemption as part of broader efforts to support economic recovery and stimulate investment in small businesses.

This expansion occurred in two stages. First, the American Recovery and Reinvestment Act of 2009 (ARRA), introduced in the House as H.R. 1 on January 26, 2009, and signed into law by President Obama on February 17, 2009, increased the QSBS exemption from 50% to 75% for gains on Section 1202-eligible stock acquired after February 17, 2009. Importantly, the ARRA made no other modifications to Section 1202; in particular, it did not alter the eligibility criteria for qualifying small business stock.[7]

Second, the Small Business Jobs Act of 2010 (SBJA), introduced in the House as H.R. 5297 on May 13, 2010, and signed into law by President Obama on September 27, 2010, further increased the exemption to 100% for gains on Section 1202-eligible stock acquired after the date of enactment. The SBJA also eliminated the application of the alternative minimum tax (AMT) to QSBS gains. As with the ARRA, the SBJA left the eligibility criteria for the QSBS exemption unchanged.[8]

[7] See Section 1241 of the ARRA, available at `https://www.congress.gov/bill/111th-congress/house-bill/1/text`, p. 228.

[8] See Section 2011 of the SBJA, available at `https://www.congress.gov/bill/111th-congress/house-bill/5297/text`, p. 51.

The changes to the QSBS exemption introduced in the SBJA were initially temporary. After three successive short-term extensions, they were made permanent in December 2015 by the Protecting Americans from Tax Hikes (PATH) Act.[9] The QSBS expansion's bipartisan appeal—originally enacted by a Democratic Congress and President with substantial Republican support—helped facilitate these extensions and likely reduced, though did not eliminate, the uncertainty created by the expansion's initially limited duration.[10]

Importantly, the fact that neither the ARRA nor the SBJA (nor its subsequent extensions) modified the QSBS eligibility requirements helps rule out the possibility that the QSBS expansion was intended to selectively benefit industries most affected by the financial crisis. Moreover, although both the ARRA and the SBJA were omnibus measures that introduced a range of policy changes,[11] none of these other provisions was directed at the same set of industries as those eligible for the QSBS expansion. This supports the validity of our diff-in-diff identification strategy, which exploits cross-industry variation in eligibility under Section 1202—with the set of treated industries unique to the QSBS exemption—to isolate the causal effects of the 2010 QSBS expansion. Because Section 1202 eligibility was fixed by statute in 1993 and remained unchanged through the 2010 expansion and its extensions, treatment assignment in our setting is plausibly exogenous to post-financial crisis industry conditions.

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[9] See Section 126 of the PATH Act, `https://www.congress.gov/bill/114th-congress/house-bill/2029/text`, p. 813.

[10] Senator Grassley (R-IA), ranking member of the Senate Finance Committee, noted in a statement on September 16, 2010, following the Senate's passage of the SBJA: "There is a lot of tax relief in this bill that 80 or 90 senators support ... It increases access to capital by allowing 100 percent of gain from investment in qualified small business stock to be excluded from income." However, other provisions in the SBJA led him—and most other Republican senators—to vote against the bill. See `https://www.finance.senate.gov/ranking-members-news/small-business-tax-items-get-bogged-down-in-controversial-spending-program`.

[11] See Brown et al. (2025) for an analysis of one of the other provisions in the SBJA: Requiring the Small Business Administration to conduct regular reviews of its small business size standards.

B Additional Data Details

Section B.1 defines all variables used in our analyses—including the analyses reported in this Internet Appendix—and lists their data sources. Sections B.2 through B.5 provide additional details on U.S. Census Business Dynamics Statistics (BDS); California Employee Plan Exemption Notice (EPEN) and Securities and Exchange Commission (SEC) Form D filings; Revelio Labs hiring data; and U.S. Patent and Trademark Office (USPTO) patent records.

B.1 Variable definitions and data sources

No. firm births: Number of age-zero firms in each NAICS4-year cell. In regression analyses, this count variable is either winsorized at the 2% level (in industry-year level Poisson models) or log-transformed (in OLS models). Source: BDS.

Firm birth rate: Number of age-zero firms divided by the total number of firms at the beginning of the year in each NAICS4-year cell, multiplied by 100 (so the variable is expressed in percentage points). Following Lindsey and Stein (2025), the beginning-of-year total firm count is computed as the number of firms at year-end minus firm births plus firm deaths during the year. In regression analyses, this rate is winsorized at the 1% level. Source: BDS.

No. firm deaths: Number of firm deaths in each NAICS4-year cell. See `https://www.census.gov/programs-surveys/bds/about/faq.html` for the definition of firm death. In regression analyses, this count variable is either winsorized at the 2% level (in industry-year level Poisson models) or log-transformed (in OLS models). Source: BDS.

Firm death rate: Number of firm deaths divided by the total number of firms at the beginning of the year in each NAICS4-year cell, multiplied by 100 (so the variable is expressed in percentage points). The beginning-of-year total firm count is computed as the number of firms at year-end minus firm births plus firm deaths during the year. In regression analyses, this rate is winsorized at the 1% level. Source: BDS.

QSBS eligible: Indicator variable equal to one for QSBS-eligible industries, and zero otherwise. See Table 1 for the list of QSBS-eligible industries.

Post: Indicator variable equal to one for years greater than or equal to 2011 (the first full year the 100% QSBS exemption was in effect), and zero otherwise.

No. large incumbents: Number of firms with at least 100 employees in each NAICS4-year cell. In Equation (1), this variable is lagged by one year and log-transformed. Source: BDS.

Exit rate: For each NAICS4 industry, average annual number of IPOs and private-firm acquisitions from 2006 to 2010 (our pre-treatment period), divided by the average annual number of firms aged one to ten over the same period. This variable is expressed as a fraction ranging from 0 to 1. Source: Jay Ritter, Don Patton, CRSP (IPOs); SDC (M&As); BDS (firm counts).

STEM %: Fraction of STEM employment in each NAICS4 industry as of 2013 (the earliest year for which this information is available). It is available for 253 of the 267 NAICS4 industries in our sample (94.8%). This variable is expressed as a fraction ranging from 0 to 1. Source: Bureau of Labor Statistics (BLS), available at `https://www.bls.gov/oes/stem_13.xls`.

High-tech: Indicator variable equal to one for high-tech industries, and zero otherwise. High-tech industries are defined following Goldschlag and Miranda (2020, Table 7).

Equity compensation plan adopted?: Indicator variable equal to one if a California-based Form D filer submits an Employee Plan Exemption Notice (EPEN) under Section 25102(o) of the California Corporations Code adopting an equity compensation plan in a given year, and zero otherwise. Source: Public records request, California Department of Financial Protection and Innovation.

Firm age: Years since incorporation. Source: Form D filing.

No. high-skill hires: Number of high-skill hires by each startup in a given year. High-skill workers are defined as those employed in occupations requiring considerable or extensive preparation (U.S. Department of Labor O*NET Job Zones 4 and 5). In regression analyses, this count variable is either right-winsorized at the 1% level (in startup-year level Poisson models) or log-transformed (in OLS models). Source: Revelio Labs.

No. low-skill hires: Number of low-skill hires by each startup in a given year. Low-skill workers are defined as those employed in occupations requiring little or some preparation (U.S. Department of Labor O*NET Job Zones 1 and 2). In regression analyses, this count variable is either right-winsorized at the 1% level (in startup-year level Poisson models) or log-transformed (in OLS models). Source: Revelio Labs.

No. high-skill hires from large incumbents: Number of high-skill hires whose immediate prior employer was a firm with at least 100 employees. In regression analyses, this count variable is either right-winsorized at the 1% level (in startup-year level Poisson models) or log-transformed (in OLS models). Source: Revelio Labs.

No. firms raising 1st VC round: Number of firms that raised their first venture capital (VC) financing round in each NAICS4-year cell. Source: SDC VentureXpert.[12]

Total $ raised in 1st VC rounds: Total amount of capital raised in startups' first VC financing round in each NAICS4-year cell, in millions of 2012 dollars (deflated using the GDP deflator). Source: SDC VentureXpert.[12]

Avg. $ raised in 1st VC rounds: Average amount of capital raised by startups in their first VC financing round in each NAICS4-year cell, in millions of 2012 dollars (deflated using the GDP deflator). Source: SDC VentureXpert.[12]

No. patents: Number of patent applications filed by each startup in a given year that are eventually granted. In regression analyses, this count variable is either right-winsorized at the 1% level (in startup-year level Poisson models) or log-transformed (in OLS models). Source: USPTO.

No. patent citations: Total number of forward citations received by the eventually granted patent applications filed by each startup in a given year; citing patents must have been filed within five years of the cited patent's filing date. This variable is set to zero for startup-years with no granted patents. In regression analyses, this count variable is either right-winsorized at the 1% level (in startup-year level Poisson models) or log-transformed (in OLS models). Source: USPTO.

Avg. no. citations: Average number of forward citations per patent received by the eventually granted patent applications filed by each startup in a given year; citing patents must have been filed within five years of the cited patent's filing date. This variable is only defined for startup-years with at least one granted patent. In regression analyses, this count

[12] VentureXpert provides only SIC industry codes for startups. We use an employment-weighted crosswalk from SIC4 to NAICS4 industries to aggregate the VentureXpert data to the NAICS4-year level. See `https://www.bls.gov/ces/naics/sic-4-digit-to-naics-2002-ratios.htm`.

variable is either right-winsorized at the 1% level (in startup-year level Poisson models) or log-transformed (in OLS models). Source: USPTO.

Total employment in firms of specified age or size: Total number of employees with the indicated education level (e.g., bachelor's degree or higher) employed at firms of the specified age or size in each NAICS4-year cell. The U.S. Census Quarterly Workforce Indicators (QWI) data are originally reported at the NAICS4-state-quarter level. To construct a dataset at the same NAICS4-year level of aggregation as the BDS data, we proceed in two steps. First, we retain only third-quarter observations to align with the timing of the 2010 QSBS expansion, which applies to stock acquired after September 27, 2010. Using third-quarter data ensures that 2010 employment reflects the pre-QSBS-expansion period, while 2011 employment reflects conditions one year after the expansion took effect. Second, we aggregate the QWI data across states to obtain NAICS4-quarter observations. QWI data for Massachusetts only became available in 2010; to ensure that our NAICS4–quarter aggregates are based on a consistent set of states across all years, we exclude Massachusetts from the QWI sample in all years. This exclusion affects only the analyses in Table IA.3, which are the sole analyses in the paper that rely on QWI data. Source: QWI.

Total employment in large incumbents: Total number of employees (across all education levels) employed at firms with at least 250 employees in each NAICS4-year cell. (The size buckets used to break down employment in the QWI and the BDS datasets are different, which is why we use different cut-offs to define large incumbents in Tables 4 and IA.3.) In Table IA.3, this variable is lagged by one year and log-transformed. See above for a description of how we transform the QWI data into a NAICS4–year level dataset. Source: QWI.

External financial dependence (*Fin. dep*): For each NAICS4 industry, median external financial dependence among publicly-listed firms in that industry. Following Rajan and Zingales (1998), a firm's external financial dependence is calculated as its capital expenditures (Compustat variable *capx*) minus cash flow from operations over the 2006–2010 period, divided by capital expenditures over the same period. Cash flow from operations is computed as the sum of Compustat variables *ibc* + *dpc* + *txdc* + *esubc* + *sppiv* + *fopo* + *invch* + *recch* + *apalch*. Source: Compustat.

External equity dependence (*Equity dep*): For each NAICS4 industry, median external equity dependence among publicly-listed firms in that industry. Following Rajan and Zingales

(1998), a firm's external equity dependence is calculated as the ratio of net equity issuance (Compustat variables $sstk - prstkc$) over the 2006–2010 period to capital expenditures ($capx$) over the same period. Source: Compustat.

B.2 Census BDS data

We retrieve data from the 2019 release of the BDS, organized by 4-digit NAICS (NAICS4, 2017 vintage), firm age, and year, from the U.S. Census Bureau's website.[13]

We exclude the following industries from all our analyses, including those in Table IA.3 that rely on QWI data. First, we drop industries dominated by non-profit or governmental organizations: Monetary Authorities–Central Bank (NAICS4 code 5211); Individual and Family Services (6241); Community Food and Housing, and Emergency and Other Relief Services (6242); and Religious, Grantmaking, Civic, Professional, and Similar Organizations (8131–8139). We also exclude Independent Artists, Writers, and Performers (7115), as businesses in this category are unlikely to be incorporated. In addition, we drop two industries that pool QSBS-eligible and non-eligible firms: Management of Companies and Enterprises (5511) and Other Professional, Scientific, and Technical Services (5419). We further exclude NAICS 1100 (Agriculture, Forestry, Fishing and Hunting), due to poor coverage of the agricultural sector in the BDS,[14] and 5250 (Funds, Trusts, and Other Financial Vehicles).[15] Finally, we merge industries 4522 (Department Stores) and 4523 (General Merchandise Stores, including Warehouse Clubs and Supercenters) to ensure a consistent time series, as these two categories were introduced in the 2017 NAICS revision and exhibit unusually volatile patterns over our sample period.

When an industry–year cell contains only one or two firms, the BDS suppresses the exact count and reports it as "(D)." In these cases, we impute the firm count as 1.5.

[13] See `https://www.census.gov/data/datasets/time-series/econ/bds/bds-datasets.html`.

[14] See `https://www.census.gov/programs-surveys/bds/about.html`.

[15] When working with QWI data in Table IA.3, we also exclude the following NAICS4 industries, which are not present in the BDS: Private Households (8141) and Public Administration (9211–9299).

B.3 California EPEN and SEC Form D filings

The Securities Act of 1933 requires that every offer or sale of securities be registered with the SEC, unless an exemption applies. Privately-held companies may claim an exemption from federal registration under SEC Rule 701 when issuing stock or stock options to employees. However, such issuances may still be subject to state-level regulations in the states where the company operates.

In California, the counterpart to Rule 701 is Corporations Code Section 25102(o), which provides a state-level exemption from registration for companies offering equity compensation to California-based employees. To claim this exemption, companies must file a Section 25102(o) Notice—also known as an Employee Plan Exemption Notice (EPEN)—with the California Department of Financial Protection and Innovation.[16] We obtain the full universe of these filings from 2003 to 2017 through a public records request to the Department, yielding a total of 37,890 filings.

The Section 25102(o) exemption is a "transaction" exemption, meaning that all securities issued under a given equity compensation plan may be treated as part of a single transaction. In practice, this allows a single filing to cover all securities issuable under the same plan.[17] As a result, EPEN filings effectively capture the adoption of equity compensation plans by firms—not the issuance of equity to specific employees. Each filing includes basic firm-level information—such as the company name, state of incorporation, and address—as well as details on whether the plan includes stock, stock options, or a flexible combination of both.

We identify EPEN filings associated with startups by matching them to electronic SEC

[16] See `https://dfpi.ca.gov/rules-enforcement/laws-and-regulations/law-and-regulations-corporate-securities-law/securities-frequently-asked-questions-and-answers/`.

[17] A subsequent increase in the number of securities authorized under a plan may require an additional EPEN filing.

Form D filings.[18] Specifically, to construct our sample of Form D-filing startups, we proceed as follows. First, we restrict the Form D sample to operating startups by excluding filings submitted by pooled investment funds, business trusts, and REITs. For consistency with our other analyses, we also exclude Form D filers that list Agriculture as their industry.

Next, as explained in Section 2.2, we focus on corporate Form D filers incorporated in Delaware between 2007 and 2009, and follow each for up to six years, from age zero (the year of incorporation) through age five.[19] We drop all firm-year observations after a startup has raised more than $50 million (based on Form D filings), as such startup-years are unlikely to meet the $50 million asset threshold required for QSBS eligibility. Finally, given the California-specific nature of the EPEN data, we focus on Form D filers whose principal place of business is located in California.

We then match this sample of Form D filers to the EPEN dataset to identify whether a startup submitted any EPEN filings during its six-year observation window. The match is performed using a fuzzy string-matching algorithm applied to standardized company names. We retain only those matches for which the state of incorporation reported in the Form D and EPEN filings is the same, and we exclude any cases in which the EPEN filing predates the firm's incorporation year reported in the Form D. All remaining matches are manually reviewed to ensure accuracy.

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[18] Form D is used to file a notice of an exempt offering of securities with the SEC. The federal securities laws require the notice to be filed by companies that have sold securities without registration under the Securities Act of 1933 in an offering made under Rule 504 or 506 of Regulation D or Section 4(a)(5) of the Securities Act. (Source: `https://www.sec.gov/resources-small-businesses/exempt-offerings/filing-form-d-notice`.) Form D data are available at `https://www.sec.gov/data-research/sec-markets-data/form-d-data-sets`. Electronic filing of Form Ds began on a voluntary basis in September 2008 and became mandatory after March 16, 2009.

[19] Only form D filers incorporated within five years of their filing date are required to report their year of incorporation. Thus, our approach effectively limits the sample to startups that filed a Form D within five years of incorporation.

B.4 Revelio Labs hiring data

We obtain hiring data from Revelio Labs, which aggregates individual-level employment information from a variety of publicly accessible online data sources, including professional profiles (e.g., on LinkedIn) and job postings from company career pages (Revelio Labs, 2024). We match the Revelio Labs hiring data to the sample of Form D filers described in Section B.3, without restricting the sample to California-based firms.

To link the two datasets, we match firms using the CIK identifier supplied by Revelio Labs, which is also reported in Form Ds. (The CIK, or Central Index Key, is a unique identifier assigned by the SEC to each filer.) To capture employees who are more likely to be involved in innovation and other core startup functions, we retain only hires whose job location state listed in the Revelio Labs data matches the startup's headquarters state reported in the Form D. To accurately and consistently identify the location of hires, we restrict the sample to startups whose headquarters state, as indicated in their Form D filings, does not change over time.

B.5 USPTO patent data

We obtain patent data from PatentsView.[20] We match these data to our sample of Form D filers described in Section B.3, without restricting the sample to California-based firms.

The matching procedure closely follows the algorithm described in Section B.3. We apply a fuzzy string-matching algorithm to standardized company names. We retain only those matches for which the state of operation reported in the Form D matches the assignee's state of location in the patent data, and we exclude any cases in which the patent filing predates the firm's incorporation year reported in the Form D. All remaining matches are manually reviewed to ensure accuracy.

[20] The data are available at `https://patentsview.org/download/data-download-tables`.

C Additional Tables

Table IA.1: Impact of the QSBS expansion on firm deaths

This table presents diff-in-diff analyses examining the impact of the QSBS exemption on firm deaths at the NAICS4-year level over the 2006–2015 period. The table structure mirrors that of Table 4. The dependent variable in columns 1 and 2 is the natural logarithm of the number of firm deaths; in column 3, it is the natural logarithm of one plus the number of firm deaths; in column 4, it is the number of firm deaths; and in column 5, it is the firm death rate (number of firm deaths divided by the number of firms at the beginning of the year, in percentage points). All columns report OLS regressions except column 4, which estimates a Poisson regression. All control variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects. Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Log (no. firm deaths)	Log (no. firm deaths)	Log (1 + no. firm deaths)	No. firm deaths	Firm death rate
Model:	OLS	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)
QSBS eligible × Post	–0.023	–0.064	0.028	–0.001	0.357
	(0.038)	(0.046)	(0.058)	(0.045)	(0.386)
Log (no. large incumbents)	0.688***		0.756***	0.637***	2.648***
	(0.071)		(0.092)	(0.133)	(0.543)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,649	2,649	2,670	2,670	2,670
F or χ^2 statistic	49.7	1.9	43.9	24.2	14.5

Table IA.2: Heterogeneous impact of the QSBS expansion on entrepreneurship by technology intensity

This table examines whether the impact of the QSBS expansion on entrepreneurship varies with an industry's technological intensity. High-tech industries are defined following Goldschlag and Miranda (2020, Table 7), resulting in 14 of the 267 NAICS4 industries in our sample being classified as high-tech. Columns 1–3 estimate our baseline diff-in-diff models (corresponding to columns 1, 4, and 5 of Table 4) within the subsample of high-tech industries. Columns 4–6 estimate the same models for low-tech industries (i.e., those not classified as high-tech). Columns 7–9 report triple-differences estimates based on the models in columns 1, 4, and 5 of Table 4, respectively, augmented by adding a high-tech industry indicator (*High-tech*) as an additional interaction variable. All other variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects (not noted in the table to conserve space). Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	High-tech industry			Low-tech industry			High vs. low tech		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High-tech × QSBS elig. × Post							0.112	0.156***	0.353
							(0.084)	(0.053)	(0.755)
QSBS eligible × Post	0.231***	0.157***	1.566**	0.122***	0.050	1.222**	0.123***	0.050	1.225**
	(0.074)	(0.045)	(0.619)	(0.047)	(0.031)	(0.487)	(0.047)	(0.031)	(0.486)
High-tech × Post							0.009	−0.089***	0.290
							(0.049)	(0.023)	(0.539)
Log (no. large incumbents)	0.800***	0.751***	1.144	0.491***	0.440***	0.246	0.506***	0.446***	0.297
	(0.158)	(0.162)	(1.378)	(0.075)	(0.128)	(0.561)	(0.073)	(0.125)	(0.541)
Observations	140	140	140	2,525	2,530	2,530	2,665	2,670	2,670
F or χ^2 statistic	13.9	125.2	3.3	21.9	12.0	3.6	15.1	183.8	4.4

Table IA.3: Heterogeneous impact of the QSBS expansion on employment, by firm age and size

This table examines the heterogeneous impact of the QSBS expansion on industry-level employment by firm age (Panel A) and firm size (Panel B). Panel A breaks down employment by employee educational attainment: Columns 1–3 focus on employees with a bachelor's degree or higher, while columns 4–6 focus on all other employees. Within each education group, we further break down employment by firm age: 0–3 years (columns 1 and 4), 4–10 years (columns 2 and 5), and 11 or more years (columns 3 and 6). Panel B focuses on employees with a bachelor's degree or higher, breaking down their employment by firm size: firms with 0–19 employees (columns 1 and 2), 20–49 (column 3), 50–249 (column 4), 250–499 (column 5), and 500 or more (column 6). The sample size differs slightly from Table 4 due to differences in NAICS4 industry coverage between the QWI (used here) and BDS (used in Table 4) datasets. All columns report OLS regressions with the dependent variable log-transformed. *Log(total employment in large incumbents)* is the natural logarithm of total employment (across all education levels) in each industry at firms with at least 250 employees, lagged by one year. All other control variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects. Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Breakdown by firm age

Employee education:	Employees with a bachelor's degree or higher			All other employees (no bachelor's degree)		
Dependent variable:	Log (total employment in firms of age...)			Log (total employment in firms of age...)		
Firm age (years):	0–3 yrs	4–10 yrs	11+ yrs	0–3 yrs	4–10 yrs	11+ yrs
	(1)	(2)	(3)	(4)	(5)	(6)
QSBS eligible × Post	0.094	0.088	0.054*	0.020	0.022	−0.015
	(0.057)	(0.073)	(0.032)	(0.047)	(0.063)	(0.021)
Log (total employment in large incumbents)	0.330***	0.466***	0.427***	0.333***	0.497***	0.419***
	(0.090)	(0.084)	(0.058)	(0.086)	(0.091)	(0.048)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,697	2,699	2,708	2,705	2,705	2,708
F statistic	7.1	15.5	28.9	7.5	15.8	38.7

Panel B: Breakdown by firm size

Employee education:	Employees with a bachelor's degree or higher					
Dependent variable:	Log (total employment in firms of size...)					
Firm size (employees):	0–19 emp	0–19 emp	20–49 emp	50-249 emp	250-499 emp	500+ emp
	(1)	(2)	(3)	(4)	(5)	(6)
QSBS eligible × Post	0.119***	0.102**	0.056	0.088	0.001	0.022
	(0.042)	(0.045)	(0.046)	(0.073)	(0.053)	(0.083)
Log (total employment in large incumbents)	0.208***					
	(0.057)					
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,708	2,710	2,684	2,694	2,631	2,703
F statistic	7.3	5.1	1.5	1.5	0.0	0.1

Table IA.4: Heterogeneous impact of the QSBS expansion on entrepreneurship by external financing needs

This table examines whether the impact of the QSBS expansion on entrepreneurship varies with an industry's external financing needs. We consider two measures of external financing needs, both from Rajan and Zingales (1998): dependence on external finance (Panel A) and dependence on external equity (Panel B). A firm's dependence on external finance is defined as its capital expenditures minus cash flow from operations over the 2006–2010 period, divided by capital expenditures over the same period. External equity dependence is measured as the ratio of net equity issuance over the 2006–2010 period to capital expenditures over the same period. For each NAICS4 industry, external financial dependence (*Fin. dep.*) and external equity dependence (*Equity dep.*) are defined as the median of the respective firm-level measures among publicly listed firms in that industry. Columns 1–3 estimate our baseline diff-in-diff models (corresponding to columns 1, 4, and 5 of Table 4) within the subsample of industries with above-median dependence on external finance (Panel A) or external equity (Panel B). Columns 4–6 estimate the same models for industries with below-median dependence. Columns 7–9 report triple-differences estimates based on the models in columns 1, 4, and 5 of Table 4, respectively, augmented by adding an industry's external financial dependence (Panel A) or external equity dependence (Panel B) as an additional interaction variable. All other variables are defined as in Table 4. All regressions include NAICS4 industry and year fixed effects (not noted in the table to conserve space). Standard errors (in parentheses) are clustered at the NAICS4 industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: External financial dependence

	High external financial dependence			Low external financial dependence			High vs. low ext. financial dependence		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fin. dep. × QSBS elig. × Post							−0.025**	−0.023***	−0.146
							(0.011)	(0.005)	(0.127)
QSBS eligible × Post	0.058	0.028	0.796**	0.250***	0.101***	2.293**	0.082*	−0.001	1.116***
	(0.045)	(0.048)	(0.335)	(0.081)	(0.038)	(0.914)	(0.044)	(0.034)	(0.307)
Fin. dep. × Post							0.019**	0.010***	0.112
							(0.009)	(0.004)	(0.121)
Log (no. large incumbents)	0.634***	0.564***	0.361	0.722***	0.452*	2.113*	0.679***	0.577***	1.265
	(0.128)	(0.187)	(0.832)	(0.135)	(0.232)	(1.217)	(0.096)	(0.114)	(0.780)
Observations	1,029	1,030	1,030	1,039	1,040	1,040	2,068	2,070	2,070
F or χ^2 statistic	12.4	9.1	2.9	14.9	7.7	3.2	13.9	46.4	3.8

Panel B: External equity dependence

	High external equity dependence			Low external equity dependence			High vs. low ext. equity dependence		
Dependent variable:	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate	Log (no. firm births)	No. firm births	Firm birth rate
Model:	OLS	Poisson	OLS	OLS	Poisson	OLS	OLS	Poisson	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Equity dep. × QSBS elig. × Post							0.035	–0.015	–0.340
							(0.052)	(0.013)	(0.518)
QSBS eligible × Post	0.136**	0.095**	0.942***	0.180**	0.096**	2.244**	0.166***	0.067**	1.464***
	(0.063)	(0.046)	(0.336)	(0.074)	(0.042)	(1.008)	(0.052)	(0.033)	(0.415)
Equity dep. × Post							–0.038	0.010	0.349
							(0.051)	(0.013)	(0.515)
Log (no. large incumbents)	0.574***	0.272	–0.146	0.760***	0.769***	2.385**	0.669***	0.478***	1.237
	(0.138)	(0.204)	(0.895)	(0.133)	(0.157)	(1.179)	(0.094)	(0.173)	(0.762)
Observations	1,029	1,030	1,030	1,039	1,040	1,040	2,068	2,070	2,070
F or χ^2 statistic	10.0	7.0	4.2	16.9	24.6	2.8	14.2	19.4	4.6