

Return-based Crowdfunding and Entrepreneurship*

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Job Market Paper

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Abstract

I study whether access to return-based crowdfunding decreases the importance of local financial market development for entrepreneurial activities. Using both the staggered adoption of intrastate equity crowdfunding across U.S. states and the 2016 passage of Regulation CF, I find that access to crowdfunding increases the number of business applications, and this effect is stronger in states where local financial markets are less developed. Moreover, the increase in the number of business applications is not driven by corporations, but rather by sole proprietorships, partnerships, and limited liability firms. I also find that by reducing local bias in entrepreneurship, intrastate crowdfunding benefits entrepreneurs who work in states where they were not born. Interestingly, intrastate crowdfunding, but not Regulation CF, increases the number of business applications that turn into employer businesses. While intrastate crowdfunding increases job creation and self-employment and decreases job destruction, Regulation CF decreases establishment entry and exit. Overall, the findings suggest that financial innovation mitigates the frictions entrepreneurs face in access to financing.

Keywords: Return-based Crowdfunding, Regulation Crowdfunding, Intrastate Crowdfunding, Entrepreneurship, Local Financial Development, Business Dynamics, Real Economic Outcomes

JEL Classification: L26, G18, K22, O1

*I am very grateful to my advisor Nadya Malenko as well as Michael Ewens, Amiyatosh Purnanandam, and Uday Rajan for the continuous support and guidance. I want to thank Sugato Bhattacharyya, Andreas Hagemann, Andrey Malenko, Shane Miller, M.P. Narayanan, Paolo Pasquariello, Mirela Sandulescu, Emmanuel Yimfor and WEFI fellows for useful comments and suggestions.

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1 Introduction

Entrepreneurship plays an important role in the process of creative destruction, economic growth, and job creation (King and Levine, 1993a,b; Levine, 1997; Levine and Zervos, 1998; Haltiwanger et al., 2013). One of the biggest barriers to entrepreneurial activities is access to capital (Kerr and Nanda, 2011). Because of financing frictions, local financial market development can play an important role for entrepreneurship and economic growth, even in well-developed and integrated financial markets (Jayaratne and Strahan, 1996; Dehejia and Lleras-Muney, 2003; Guiso et al., 2004; Nguyen, 2019). For example, the literature shows that in regions with more developed local financial markets, the entry and growth of new firms and the propensity of individuals to start new businesses are higher (Guiso et al., 2004; Kerr and Nanda, 2009). Moreover, these effects are more significant for small firms because high levels of uncertainty and information asymmetry can make it harder for them to access financing outside of their local areas (Guiso et al., 2004).

Innovations in the financial sector can help reduce the effect of local financial market development on entrepreneurship. A prominent example of such innovations is return-based crowdfunding, which is an online method of financing private ventures from the crowd through the issuance of equity or debt. This method of financing is unique in that retail (non-accredited) investors can invest in private firms. In this paper, I examine whether access to return-based crowdfunding decreases the importance of local financial market development for entrepreneurial activities. I show that return-based crowdfunding regulations mitigate the effect of local financial market development on business initiation and spur entrepreneurial activities. However, my results also show that state-level and federal-level return-based crowdfunding regulations have very different effects on employer business formation and dynamics and real economic outcomes, suggesting that frictions such as information asymmetry continue to play an important role for this method of financing as well.

Access to return-based crowdfunding can make local financial market development less important for entrepreneurs and small businesses for two reasons: 1) it provides a source of capital outside of entrepreneurs' local areas; and 2) crowdfunding platforms decrease search costs for investors.¹ However, given the high level of uncertainty and information asymmetry surrounding

¹For example, Kerr and Nanda (2011) write: "Thus, innovations within the financial sector that lower information costs can have important effects on reducing financing constraints for entrepreneurs."

businesses that use return-based crowdfunding and the fact that many investors in return-based crowdfunding campaigns are not professional investors, it is possible that return-based crowdfunding does not provide entrepreneurs with a viable source of financing. Many commentators have expressed the view that the risk of fraud, the riskiness of these investments, and the possibility that low-quality businesses use return-based crowdfunding would deter individuals from investing in these campaigns. For example, according to the founder and CEO of the crowdfunding service Wefunder, “Small business owners that have ambition and intend to grow are less likely to crowdfund. Unaccredited investors can only invest in companies that don’t have dreams to grow. Adverse selection at its finest.”² Similarly, Catalini et al. (2016) argue that return-based crowdfunding is not likely to provide average investors (non-accredited investors) with the chance to fund the “next great idea” and that return-based crowdfunding platforms need to improve their market design rules if they want to attract higher-quality startups.

To study whether access to return-based crowdfunding reduces the role of local financial market development in entrepreneurship, I examine the effects of return-based crowdfunding regulations in the United States at both the state level and the federal level. In particular, I use the staggered adoption of intrastate crowdfunding by 35 states/territories in the U.S. and the 2016 passage of Regulation Crowdfunding (Title III of the JOBS Act) at the federal level as empirical settings to test the differential effect of access to return-based crowdfunding across states depending on the depth of local financial markets. These regulations allow average (non-accredited) investors to invest in private firms and exempt firms from registration with the SEC and state regulators before issuing securities. Intrastate crowdfunding allows issuers to raise capital only from the residents of the state where their principal place of business is located. By contrast, Regulation Crowdfunding (Regulation CF) allows them to raise capital from all interested investors. The financing limit under Regulation CF was \$1.07 million over the 2009-2019 sample period, whereas the financing limit under intrastate crowdfunding differs across the U.S. states and ranges from \$1 million to an unlimited amount.

I use the Business Formation Statistics (BFS) dataset provided by the U.S. Census Bureau to study the changes in business initiation after the passage of return-based crowdfunding

²See <https://www.crowdfundinsider.com/2015/11/76979-wefunder-to-sec-title-iii-critical-aw-harms-investors/>. See also <https://www.sec.gov/comments/jobs-title-iii/jobstitleiii-260.htm> for a discussion of potential fraud by the SEC and The *New York Times* article “S.E.C. Gives Small Investors Access to Equity Crowdfunding” from October 31, 2015 for other skeptical views.

regulations over the 2009-2019 sample period. In particular, the BFS dataset provides information on the number of business applications for tax IDs. Studying this outcome variable helps understand whether or not entrepreneurs perceive access to crowdfunding to be helpful in establishing a business. However, I also examine whether these businesses actually survive and turn into employer businesses using business formation measures in subsequent tests described below (business formation measures show how many of the business applications turn into employer businesses within one or two years after business applications are filed.)

Following King and Levine (1993) and Kerr and Nanda (2009), I consider five measures of state-level financial market development: the number and dollar volume of loans with origination amounts less than or equal to \$1 million; the number and dollar volume of loans to businesses with annual revenues less than or equal to \$1 million (all four from the Community Reinvestment Act (CRA) data); and the level of bank deposits reported by the Federal Deposit Insurance Corporation (FDIC). My results are broadly robust across all these measures.

My main results show that both intrastate crowdfunding and Regulation CF have a positive and significant effect on the total number of business applications. Moreover, this effect is larger in states with less developed local financial markets. For example, the number of business applications in a state with an average pre-treatment amount of loans to small businesses increases by 2% after the passage of intrastate crowdfunding laws and by 35.7% after the passage of Regulation CF. A 10% decrease in the pre-treatment amount of loans to small businesses increases the effect of intrastate crowdfunding by 0.62% and the effect of Regulation CF by 0.40%.

The increase in the total number of business applications after the passage of return-based crowdfunding laws suggests that entrepreneurs perceive return-based crowdfunding as a viable method of financing, and, as a result, become motivated to pursue entrepreneurial activities. Regulation CF has a much stronger effect on spurring entrepreneurial activities than intrastate crowdfunding. This could be because the passage of Regulation CF at the federal level provides access to a larger pool of potential investors than the passage of intrastate crowdfunding laws. In addition, issuers who want to use intrastate crowdfunding should satisfy at least one “doing business” requirement under Rule 147 (more recently Rule 147A) to prove the in-state nature of the business.³ Satisfying these requirements strongly limits the operation of a business to the

³In particular, the issuers have to satisfy at least one of the following requirements to be deemed to be doing business within a state or territory: (1) at least 80% of consolidated gross revenue of the issuer originates from operations or rendering services in that state; (2) at least 80% of issuer’s assets and those of its subsidiaries on a

state where it wants to use intrastate crowdfunding and may prevent some entrepreneurs from considering this method of financing.

There are two types of firms that could benefit from access to return-based crowdfunding: corporations and non-corporations (such as sole-proprietorships, partnerships, and limited liability companies). Studying these subsamples of business applications using the BFS dataset, I find that both intrastate crowdfunding and Regulation CF have a particularly strong effect on the number of business applications by non-corporations. These positive effects are stronger in states with less developed financial markets. In Section 5.2, I discuss several possible reasons why return-based crowdfunding can alleviate the frictions in access to financing for this group of firms.

Next, I investigate whether return-based crowdfunding can help alleviate constraints uniquely faced by non-local entrepreneurs. Michelacci and Silva (2007) show that individuals who work in states where they were born (locals) are more likely to be entrepreneurs and that local financial market development benefits local entrepreneurs more than non-locals. They call this phenomenon local bias in entrepreneurship (LBE).⁴ The presence of the LBE suggests that entrepreneurship may not be a mobile factor of production that gets optimally allocated to take advantage of technological differences. I therefore examine whether return-based crowdfunding can alleviate the LBE, i.e., whether it increases the probability that entrepreneurs start businesses in states where they were not born.

It is a priori unclear whether access to return-based crowdfunding will increase or decrease the LBE. On the one hand, it may decrease the LBE because it provides entrepreneurs with a source of financing outside of their local area and crowdfunding investors may not consider where the entrepreneur is born. On the other hand, high information asymmetry and uncertainty surrounding crowdfunding campaigns may encourage investors to invest locally (Hornuf et al., 2020). I find that the local bias in entrepreneurship decreases after the passage of intrastate crowdfunding. This observation suggests that intrastate crowdfunding investors are more willing

consolidated basis are located in that state; (3) the issuer intends to use at least 80% of crowdfunding campaign net proceeds in relation to operations or rendering services in that state; (4) a majority of the issuer's employees are based in that state.

⁴Michelacci and Silva (2007) argue that LBE is caused by the combination of two factors. Not only distance to financiers plays an important role in access to financing (Berger et al., 2005; Petersen and Rajan, 2002; Williamson, 1987) but also locals may have region specific collateral. For example financial intermediaries such as banks and VCs may have more information about locals or may believe that locals are less likely to engage in moral hazard because of local social pressure or peer effects (Arnott and Stiglitz, 1991).

to invest in startups by non-locals that they find viable. This could be because intrastate crowdfunding investors may care about employment and growth at the state level and are not biased toward locals.

A potential concern is that the adoption of intrastate crowdfunding in a given state could be response to expectations of future economic growth in that state. If that were the case, a positive correlation between the adoption of intrastate crowdfunding and measures of entrepreneurship could not be interpreted as the causal effect of access to crowdfunding. I mitigate this concern in two ways. First, I examine the reasons mentioned by regulators for passing intrastate crowdfunding. I do not find any evidence that these regulations were a response to observed or expected economic growth. In fact, many state regulators mention the decline in bank lending, venture capital investments, and small business activity after the 2008 financial crisis, and the delay in the passage of Regulation CF at the federal level as reasons for adopting intrastate crowdfunding. The passage of these regulations after the financial crisis thus seems to be the response of state-level regulators to a decrease in the supply of capital, rather than an increase in demand for capital.⁵ Next, to alleviate the concern that intrastate crowdfunding was a response to economic growth (increase in demand for capital by entrepreneurs), I conduct tests of the parallel trend assumption and find no evidence of significant pre-trends in the outcome variables of interest.

After establishing that access to return-based crowdfunding encourages entrepreneurship, I examine whether it has a positive effect on the formation of successful businesses and real economic outcomes. In particular, the positive effect of intrastate crowdfunding and Regulation CF on the number of business applications suggests that entrepreneurs perceive access to crowdfunding to be helpful in establishing a business. However, it is not clear whether these businesses survive, turn into employer businesses, and/or have real economic effects. Interestingly, I find that intrastate crowdfunding and Regulation CF have distinguishably different effects on these factors.

First, although the positive effect of intrastate crowdfunding on the number of business applications (2%) is smaller than that of Regulation CF ($\approx 35\%$), it appears that only intrastate crowdfunding has a strong effect on the formation of employer businesses. In particular, I

⁵In addition, most of the intrastate crowdfunding laws are tied to the federal “intrastate offering exemption” and its Rule 147. Given that Rule 147 of the Securities Act was adopted in 1974, states had a lot of time to pass intrastate crowdfunding regulations in response to economic growth.

find that intrastate crowdfunding leads to a 2.8% (4.6%) increase in the number of business applications that turn into employer businesses one (two) year(s) after business applications are filed, especially in states with less developed financial markets. In contrast to intrastate crowdfunding, Regulation CF does not have any detectable effect on the formation of employer businesses one (two) year(s) after business applications are filed. There are several reasons that can explain why Regulation CF does not lead to employer business formation. First, businesses initiated after the passage of Regulation CF cannot raise capital through Regulation CF due to factors that negatively affect attracting investors, such as the low perceived quality of their business plans. Second, they fail after raising capital through Regulation CF because of the competition from other businesses or even competition from other entrants, or because of the quality of their business plans. Third, they raise capital through Regulation CF but they never had the intention or capacity to become employer businesses.

The third explanation is possible because I also observe that intrastate crowdfunding, but not Regulation CF, has positive and significant effects on the number of applications by businesses that pay or plan to pay wages to their employees⁶ and on the number of business applications that are classified as having a high probability of becoming employer businesses.⁷ One possible reason for these differences between intrastate crowdfunding and Regulation CF is relocation of entrepreneurs from states without intrastate crowdfunding laws to states that provide access to this method of financing. The financing limit under intrastate crowdfunding, in some states, is higher than the \$1.075 million financing limit under Regulation CF over the sample period. This may encourage businesses with planned wages or with the goal to become employer businesses to move to states with intrastate crowdfunding or start their business in those states.⁸

Next, to investigate how impactful the passage of intrastate crowdfunding and Regulation CF are, I examine their effect on business dynamics and real economic outcomes. I find that intrastate CF has a 1.4% positive effect on job creation (excluding self-employment). It also

⁶The BFS dataset refers to these applications as “business applications with planned wages.” More precisely, this is the subsample of business applications in the BFS dataset that indicate the first date that wages were or will be paid to employees. If the business does not plan to have employees, the applicant should enter “N/A,” and the BFS dataset then does not classify this business as business applications with planned wages

⁷This subsample of business applications in the BFS dataset is called “high propensity business applications”. High propensity business applications include applications by corporations, applications that indicate the business is hiring employees, applications with a first wages-paid date, and applications from industries such as manufacturing, retail, health care, etc.

⁸Given that the effect on the number of high propensity business applications is larger than the effect on the number of business applications with planned wages, many of these businesses should be active in industries categorized as high propensity industries by the Census.

increases self-employment by 0.14%, increases the number of non-employer establishments by 0.32%, and decreases job destruction by 4% to 5% in a state with an average pre-treatment level of bank deposits. However, I do not find any robust evidence that Regulation CF has a significant causal effect on these variables.

While intrastate crowdfunding improves job creation and self-employment, Regulation CF affects establishment entry and exit. In particular, my results suggest that Regulation CF helps small businesses survive longer but prevents other types of businesses from entering or expanding. This conclusion follows from two sets of results. First, in the entire sample, the passage of Regulation CF leads to a 14.5% (21%) decrease in establishment entry (exit). Second, focusing on small businesses (those with fewer than 20 employees), I find that Regulation CF does not have any significant effect on establishment entry by small businesses, but that it decreases establishment exits by these firms. In addition, I find evidence suggesting that more established firms are successful in using Regulation CF, while non-employer businesses that want to grow are not.

In summary, this paper shows that return-based crowdfunding regulations can decrease the importance of local financial market development in business initiation, mitigating the disparities in entrepreneurial activities across the U.S. states. However, it underscores that state-level (intrastate crowdfunding) and federal-level (Regulation CF) return-based crowdfunding regulations have significantly different effects on business formation, business dynamics, and real economic outcomes. Intrastate crowdfunding is more effective in helping businesses turn into employer businesses, increasing job creation, and decreasing job destruction. Instead, Regulation CF helps businesses that are already employer businesses to avoid shrinking their businesses and prevent other businesses from expansion or entry. A potential reason for these different effects is that the relatively larger geographical distance between business owners and investors in Regulation CF campaigns (compared to intrastate crowdfunding campaigns) exacerbates information asymmetry, and only the more established businesses can mitigate its negative effect on fundraising.⁹

⁹Consistent with this explanation, I observe that Regulation CF affects the business dynamics of firms that are active one to five years after becoming employer businesses rather than the business dynamics of firms that just became employer businesses. This observation suggests that more established firms may find raising capital through Regulation CF viable because their track record helps them mitigate information asymmetry concerns.

Related Literature

This paper contributes to the nascent literature on return-based crowdfunding. The theoretical papers in this area concentrate on three main topics: 1) determinants of entrepreneurs' decisions, such as choosing between reward-based crowdfunding (pre-ordering of product) and equity crowdfunding (Belleflamme et al., 2014) or determining the offering price in an equity crowdfunding campaign (Tzur and Segev, 2022); 2) the possibility of optimal allocation of capital through crowdfunding (Grüner and Siemroth, 2019);¹⁰ and 3) optimal policies in crowdfunding offerings, such as optimal time-varying transparency policy (Glazer et al., 2021).

To the best of my knowledge, I am the first to empirically examine how access to return-based crowdfunding affects entrepreneurial activities and the importance of local financial market development in spurring these activities. In the empirical literature on equity crowdfunding, one of the main questions is whether or not equity crowdfunding attracts high-quality and innovative ventures. Catalini et al. (2016) conclude that Regulation CF may not provide high-growth startups with a viable source of financing. They argue that the high information asymmetry between entrepreneurs and investors in these financing campaigns may lead investors to discount the value of ventures or projects, deterring high-quality businesses from using Regulation CF to raise capital. Relatedly, Blaseg et al. (2021) investigate whether or not equity crowdfunding attracts low-quality entrepreneurs and show that entrepreneurs connected to distressed banks are more likely to use this source of financing.

The argument by Catalini et al. (2016) may provide a plausible explanation for my results that intrastate crowdfunding, but not Regulation Crowdfunding, spurs high propensity business applications and increases business formation. Information asymmetry may be lower in intrastate crowdfunding campaigns because within-state investors are typically better equipped to acquire information about the issuers.

Another strand of empirical research on equity crowdfunding concentrates on factors and signals that determine the success of crowdfunding campaigns (Ahlers et al., 2015; Vismara, 2018; Ralcheva and Roosenboom, 2020; Donovan, 2021; Kleinert et al., 2022) and the effect of successful crowdfunding campaigns on future firm performance (Dolatabadi et al., 2021). Using a regression discontinuity design (RDD), Dolatabadi et al. (2021) show that a successful equity

¹⁰In addition, there are theoretical papers, such as Strausz (2017) and Lee and Parlour (2022), that show crowdfunding from consumers can improve efficiency and welfare.

crowdfunding campaign has a positive effect on the future performance of the firm. They also provide suggestive evidence that firms that raise capital through Regulation CF are less likely than angel-backed firms to have subsequent funding rounds. This observation is in line with my findings that the passage of Regulation CF significantly increases the number of business applications but has no effect on business formation within two years after business applications are filed. Differently from Dolatabadi et al. (2021), I also explore the effect of intrastate crowdfunding and show that unlike Regulation CF, it has a positive effect on business formation and employment. My key contribution to both Dolatabadi et al. (2021) and other papers in this literature is to show that return-based crowdfunding decreases the role of local financial market development for entrepreneurship.

This paper also contributes to the literature on financial development, entrepreneurship, and growth. Several papers show that financial system development promotes economic growth at the country level (King and Levine, 1993a,b; Levine, 1997; Levine and Zervos, 1998; Rajan and Zingales, 1998) and particularly benefits small businesses (Beck et al., 2008). Other papers highlight the importance of local financial market development (Guiso et al., 2004) and the continued role of local branches (Nguyen, 2019) and branch networks (Gilje et al., 2016) on entrepreneurial activities and the supply of capital to small businesses. Improved local financial market development after the deregulation of the banking system spurs entrepreneurship and economic growth (Jayaratne and Strahan, 1996; Kerr and Nanda, 2009), decreases the size of the typical establishment because of the increased banking competition (Cetorelli and Strahan, 2006), decreases the cost of credit for small businesses (Rice and Strahan, 2010), and increases the total factor productivity (TFP) of small businesses (Krishnan et al., 2015). My paper shows that innovations in financing for start-ups and small businesses can decrease the importance of local financial market development and may decrease the disparities in entrepreneurial activities across states in the U.S.

My paper also contributes to the literature on the role of technological and financial innovations in access to financing and their effect on entrepreneurial activities. Barrios et al. (2020) show that access to gig economy platforms spurs entrepreneurial entry by providing a complementary source of income to entrepreneurs and a form of insurance against the risk of losing entrepreneurial income. Gopal and Schnabl (2022) show that FinTech lending to small businesses increased after the 2008 financial crisis and most of this increase substituted the decrease

in bank lending after the crisis. In addition, Erel and Liebersohn (2020) show that FinTech lending expanded the supply of credit post COVID-19 rather than substituting PPP lending by banks. I find that both intrastate crowdfunding and Regulation CF increase the number of business applications by non-corporations, suggesting that return-based crowdfunding may play a complementary role to banks by attracting individuals and businesses that may have difficulty in accessing bank financing because they lack large assets or long track records. However, I also find that the passage of Regulation CF decreases establishment exits by small businesses, suggesting that this method of financing may be a viable alternative for bank lending after the 2008 financial crisis.

This paper is also related to the literature on the effects of the Jumpstart Our Business Startups (JOBS) Act. Dambra et al. (2015) and Lewis and White (2020) document an increase in the number of IPOs, proceeds of IPOs, and employment by emerging growth companies (EGCs) after Title I of the JOBS Act. Other papers that investigate the effect of Title I of the JOBS ACT on the IPO market and behavior of market participants are Barth et al. (2017), Chaplinsky et al. (2017), and Agarwal et al. (2022). Chu et al. (2022) show that after Title I of the JOBS Act the abnormal cumulative return of acquirers in acquisitions of private targets decreased. Gupta and Israelsen (2014) show that lower disclosure requirements under Title I of the JOBS Act increases IPO underpricing and post-IPO illiquidity. My paper provides evidence on the effects of Regulation CF (Title III of the JOBS Act) on entrepreneurial activities, business formation, and real economic outcomes.

2 Institutional Details

Under the Securities Act of 1933 in the U.S., all issuers must register securities with the Securities and Exchange Commission (SEC) unless an exemption is available. A registered offering may take up to six months or longer and can cost over 10% of the offering amount (U.S. Government Accountability Office, 2000; Cohn and Yadley, 2007). The cost of a registered offering may not be manageable for small firms.¹¹ In order to facilitate capital formation for small businesses, federal and state securities regulators provide several exemptions from the securities

¹¹The results of analysis of IPO offerings by the U.S. Government Accountability Office indicate that “the average total cost to conduct a small business IPO during 1994-99 was about 10 percent of total offering proceeds, while the average total cost for a large business IPO was about 8 percent.” (U.S. Government Accountability Office, 2000)

registration. These exemptions are provided by Regulation D, Regulation A, Regulation CF, and intrastate crowdfunding.

Regulation A and Regulation D provide exemption from registration with the SEC. While there is no limit on the financing amount under Regulation D, an issuer can sell securities only to accredited investors. Under Regulation A, issuers had to get approved for blue sky laws in all states they wanted to raise capital in, a requirement of Regulation A that is lifted under Regulation A+ (Title IV of the JOBS Act). While Regulation A+ allows issuers to raise capital from both accredited and non-accredited investors in the form of debt or equity, the financing amount is limited to \$50 million per year.¹² In contrast to Regulation D, Regulation CF and intrastate crowdfunding allow issuers to raise capital from both accredited and non-accredited investors. Although the financing limit under Regulation CF and in many states under intrastate crowdfunding is lower than the financing limit under Regulation A+, the disclosure requirements for Regulation CF and intrastate crowdfunding are less restrictive. As a result, Regulation CF and intrastate crowdfunding can be used at earlier stages of financing.

1. Regulation Crowdfunding (CF). Under Regulation CF, issuers are exempted from registration with the SEC and from complying with state-level blue sky laws, and can offer and sell securities nationwide. Regulation CF, Title III of the JOBS Act, went into effect on May 16, 2016 and allows startups to raise up to \$1.07 million¹³ from both accredited and non-accredited investors. According to SEC guidelines for Regulation CF, there is no limit on the number of investors, and the amounts that individual investors are allowed to invest in all Regulation CF offerings over a 12-month period are determined based on investor’s annual income or net worth.

2. Intrastate Crowdfunding. This regulation allows businesses to raise capital from both accredited and non-accredited in-state investors. Thirty-four states and the District of Columbia provide firms with exemption from state level registration through intrastate crowdfunding laws. Table 1 provides information on the intrastate crowdfunding laws in these 34 states and District of Columbia.

Most of the intrastate crowdfunding laws are tied to the federal “intrastate offering exemption,” Section 3(a)(11) of the Securities Act of 1933 (“Securities Act”) and its Rule 147. A few of them are tied to the federal exemption in Rule 504 of Regulation D. Rule 147, which is a “safe

¹²The financing limit was raised to \$75 million in 2020.

¹³The financing limit was raised to \$5 million in 2020.

harbor” under Section 3(a)(11), provides the requirements that issuers should meet in order to use the “intrastate offering exemption.” According to the Rule 147,¹⁴ the issuer must be organized and have its principal place of business¹⁵ in the state where it offers and sells securities. The issuer can offer and sell securities only to in-state residents and it is the responsibility of the firm to determine the residence of each offeree and purchaser. In 2016, the SEC established Rule 147a as an amendment to Rule 147. Rule 147a allows firms to offer securities to out-of-state residents as long as the sales are only made to in-state residents. Also a firm can use intrastate crowdfunding even if it is incorporated or organized out-of-state as long as its principal place of business is in-state.

Comparison between Regulation CF and Intrastate Crowdfunding. While Regulation CF allows issuers to sell securities nationwide and raise more awareness about their businesses, intrastate crowdfunding rules may allow higher financing limits, require less-stringent filing requirements, and allow higher investment limits by accredited and non-accredited investors.

3 Data

3.1 Outcomes

I use the Business Formation Statistics (BFS) provided by the U.S. Census Bureau. This dataset provides information on new business applications and formations in the U.S., and can be used to study business initiation activity and realized business formation.

The BFS dataset includes information from applications for an Employer Identification Number (EIN)¹⁶ through the IRS Form SS-4.¹⁷ On this form, an applicant includes information on the state and county of the principal place of business, the type of entity,¹⁸ and whether or not the reason for application is starting a new business.

¹⁴See <https://www.ecfr.gov/current/title-17/chapter-II/part-230#230.147>.

¹⁵The firm should satisfy at least one “doing business” requirement mentioned in Rule 147.

¹⁶EINs are IDs used by business entities for tax purposes. Business owners need EINs to open business bank accounts, apply for business licenses, and for tax purposes. Any employer business (including sole proprietors) needs an EIN. A non-employer business that operates as a corporation, a partnership, or a multi-member LLC is required to have an EIN. Self-employers that have Keogh plans or solo 401(k) retirement plans must have EINs. Also, some self-employers get EINs to avoid using their SSN and prevent identity theft.

¹⁷This form can be found here: <https://www.irs.gov/forms-pubs/about-form-ss-4>

¹⁸Among possible options, I can mention limited liability company (LLC), sole proprietorship, partnership, corporation, nonprofit organization, etc.

The BFS dataset provides information on four different subsets of the applications for EINs. I use these four data series at the state level from 2009 to 2019. The data after 2019 are not included in the analysis so that the results are not affected by outcomes from the COVID-19 pandemic. These four data series are explained below and Figure 1 illustrates the relationship between these series.

- Business Applications (BAs): This series provides the number of applications for EINs.
- High-propensity Business Applications (HBAs): This series provides the number of business applications that have a high propensity of turning into businesses with payroll.¹⁹
- Business Applications with Planned Wages (WBAs): This series provides the number of HBAs that indicate a planned date to pay wages or a first wages-paid date on IRS Form SS-4.
- Business Applications from Corporations (CBAs): This series provides the number of HBAs by entities marked as a corporation or personal service corporation on IRS Form SS-4.

The BFS dataset also provides data on business formation, i.e. the number of business applications that turn into employer businesses within one(two) year(s) after business applications are filed. In order to identify employer business formation, the Census uses the first instance of payroll tax liabilities on the business applications. The data on business formation within one(two) year(s) after business applications are filed is available until the end of 2018 (2017).

I also use the Business Dynamics Statistics (BDS) database provided by the U.S. Census Bureau. This database tracks establishments' job flow,²⁰ entry, and exit for the whole economy or by firm or establishment characteristics. I use the data on job creation and destruction, and establishment entry and exit for the whole sample and by firm age and size. I consider firms with fewer than 20 employees as small businesses. I also use firm age data to investigate whether

¹⁹The Census website states that “The identification of high-propensity applications is based on the characteristics of applications revealed on the IRS Form SS-4 that are associated with a high rate of business formation. High-propensity applications include applications: (a) for a corporate entity, (b) that indicate they are hiring employees, (c) that provide a first wages-paid date (planned wages); or (d) that have a NAICS industry code in accommodation and food services (72) or in portions of construction (237, 238), manufacturing (312, 321, 322, 332), retail (44, 452), professional, scientific, and technical services (5411, 5413), educational services (6111), and health care (621, 623).”

²⁰This database excludes self-employment, as well as proprietors and partners of unincorporated businesses.

return-based crowdfunding methods mostly help non-employer businesses that want to grow or businesses that are already employer businesses.

To investigate the effect of access to crowdfunding on non-employer and small employer businesses, I use the Nonemployer Statistics (NES) dataset, County Business Pattern (CBP) dataset, and non-farm proprietors' employment data from 2009 to 2019.

The NES provide the number of and total receipts by businesses that have no paid employees and are subject to federal income tax. Studying this group of businesses is important because based on the Census information, 72.6% of establishments in the U.S. in 2016 were nonemployers or businesses with no paid employees.²¹

However, in order to get a complete picture of businesses in the U.S., I use the County Business Pattern (CBP) dataset provided by the U.S. Census Bureau, which includes the following data points on businesses with paid employees: the number of establishments, employment during the week of March 12, and annual payroll. Given that these data points are provided for all employee size classes, I can concentrate on small businesses. In addition, non-farm proprietors' employment data is provided by the Bureau of Economic Analysis (BEA), and includes the number of non-farm sole proprietorships and the number of individual general partners in non-farm partnerships.²²

I use the American Community Survey (ACS) data from 2009 to 2019 provided by the U.S. Census to test the effect of access to return-based crowdfunding on local bias in entrepreneurship. These data provide information on an individual's place of birth, place of work, age, sex, education, marital status, race, and whether or not they are self-employed. If an individual is self-employed, it is determined whether the business is incorporated or not. Following Michelacci and Silva (2007), I consider individuals as locals if they are working in the states where they were born. This dataset allows me to test whether the relation between being a local and self-employment changes after the passage of crowdfunding regulations.

²¹See <https://www.census.gov/library/stories/2018/09/three-fourths-nations-businesses-do-not-have-paid-employees.html>.

²²See <https://www.bea.gov/system/files/methodologies/LAPI-Methodology.pdf> for a detailed explanation on how these numbers are calculated.

3.2 Measures of Local Financial Market Development

Some measures of financial market development (depth) proposed in previous studies are scaled measures of credit issued to non financial private firms (King and Levine, 1993a) or bank deposits (Kerr and Nanda, 2011).

In order to define measures of local financial market development (depth) based on the supply of capital to the private sector (small businesses), I use the Community Reinvestment Act (CRA) data published by the Federal Financial Institutions Examination Council (FFIEC). Under the CRA, all insured depository institutions with assets greater than \$1 billion²³ must disclose annual data on the number and dollar volume of loans with origination amounts less than or equal to \$1 million and on the number and dollar volume of loans originated to businesses with gross annual revenues less than or equal to \$1 million. These data are reported based on the location of the borrower, not the location of the bank. Although the CRA data only covers small business lending by banks with total assets above a certain threshold, these depository institutions account for 86% of total small business lending (Greenstone et al. (2020)).

I also measure local financial market development using bank deposit data at the state level. I use the summary of deposits data provided by the Federal Deposit Insurance Corporation (FDIC). This database provides the amount of branch deposits as of June 30 of each year.

4 Methodology

To test the effect of access to crowdfunding on dependent variables of interest, I use two empirical settings: 1) staggered adoption of intrastate crowdfunding by 34 states and the District of Columbia; and 2) the passage of Regulation CF in 2016.

Studying the effect of access to crowdfunding on entrepreneurial activities and real economic outcomes by running a naive regression of an outcome variable of interest on the amount of capital raised through crowdfunding faces several obstacles. States that tap more into crowdfunding to raise capital may differ on unobservable time-variable dimensions from states that use crowdfunding less. As a result, comparing measures of entrepreneurial activities between states that use crowdfunding more and states that use it less may capture the effect of these unobservable factors. For example, entrepreneurs may relocate to a certain state for unobservable reasons

²³The exact threshold for each year can found at: <https://www.ffiec.gov/cra/reporter.htm> .

and use crowdfunding to finance their ventures. Running a naive regression in this case overestimates the effect of access to crowdfunding on measures of entrepreneurial activities. Also, the changes in the amount of capital raised through crowdfunding can be driven or accompanied by unobservable factors, such as unobservable economic growth that at the same time affects the dependent variable of interest. If states experience unobservable economic growth after the passage of intrastate crowdfunding, the naive regression will overestimate the effect of access to crowdfunding on measures of entrepreneurial activities.

In the following subsections, I will explain how each of the empirical settings considered in this paper can address these issues, what are possible concerns in each setting, and how these concerns can be alleviated. I also explain the estimation strategies used in each setting.

4.1 Intrastate Crowdfunding

I employ a staggered differences-in-differences (DiD) design to examine the staggered adoption of intrastate crowdfunding by 35 states/territories in the U.S. over the period of 2009 to 2019. One advantage of the staggered adoption of these regulations is that at each point in time there is a control group that helps to control for aggregate changes in the economy that affect both the treatment and control groups. The parallel trend assumption makes controlling for changing economic conditions possible. If the parallel trend assumption holds, it means that changes in the outcome variable over time would have been exactly the same in both the treatment and control groups in the absence of the intervention. Another advantage of a staggered DiD approach over a simple DiD approach is that it is harder to claim that an event occurred at the passage of each regulation and drove the changes in the dependent variables.

However, the passage of these regulations mitigates endogeneity concerns to the extent that states did not pass them in response to demand by entrepreneurs or in expectation of changing economic climate. As a result, the political economy of these state-level laws becomes important.

Gathering information on the reasons mentioned for the passage of intrastate crowdfunding laws, I find that the intrastate crowdfunding laws were passed as a response to the 2008 financial crisis. The 2008 financial crisis decreased bank lending and venture capital investments, leading to a decrease in small businesses' activities. The Jumpstart Our Business Startups (JOBS) Act was an effort to increase entrepreneurs' and businesses' access to capital after the 2008 financial

crisis. However, the delay in the passage of title III of the JOBS Act (Regulation CF) made many states pass intrastate crowdfunding laws. I do not find evidence that these laws were passed in expectation of changing economic climate at the state level; they were passed in response to capital supply shock, to provide an alternative to Regulation CF with less stringent compliance and disclosure requirements, or to encourage entrepreneurial activities and increase employment at the state level.

Another argument to support the claim that intrastate crowdfunding regulations were a response to the consequences of the 2008 capital supply shock is as follows: Most of the intrastate crowdfunding laws are tied to the federal “intrastate offering exemption,” Section 3(a)(11) of the Securities Act and its Rule 147. Rule 147 was adopted in 1974. As a result, it is not clear why states had to wait until after the 2008 financial crisis if they wanted to pass intrastate crowdfunding laws in response to increased demand for capital by entrepreneurs or in response to expected economic growth.

Another concern about endogeneity of passage of intrastate crowdfunding laws may be that states that were more seriously affected by the 2008 financial crisis may be more likely to pass intrastate crowdfunding regulations. However, the economic activity in those states should be more negatively affected by the financial crisis and this bias would work against finding a positive effect of access to crowdfunding on the measures of entrepreneurship. As a result, the positive effects found through regression specifications in this paper are likely to be lower bounds for the effect of access to crowdfunding on entrepreneurial activities.

4.1.1 Estimation Strategies

To study the effect of intrastate crowdfunding on outcome variables, I employ two regression specifications: 1) staggered DiD and 2) staggered DiD with continuous treatment, where the treatment intensity is a measure of local financial market development before treatment.

Staggered Differences-in-Differences. The staggered DiD specification in equation 1 allows me to estimate the average effect of intrastate crowdfunding laws on dependent variables. The outcome variables of interest are: 1) the number of business applications from the BFS dataset; 2) the number of business applications that turn into employer businesses one (two) year(s) after the applications are filed (BFS dataset); 3) the number of and total receipts by nonemployer businesses from the NES dataset; 4) employment by non-farm proprietors provided

by the BEA; 5) the number of establishments, employment during the week of March 12, and annual payroll by employer businesses from the CBP dataset; and 6) job creation and destruction, and establishment entry and exit from the BDS dataset.

$$\text{Ln}(Y_{st}) = \beta * D_{st} + \tau_t + \pi_s + \epsilon_{st}, \quad (1)$$

In equation (1), $\text{Ln}(Y_{st})$ denotes the logarithmic transform of a dependent variable in state s at time t . D_{st} denotes a dummy variable that takes a value of 1 if state s has intrastate crowdfunding regulations at time t , otherwise, it is equal to zero. τ_t and π_s denote respectively, time fixed effects and state fixed effects. Given that the outcome variables can be serially correlated at the state level, standard errors are clustered at the state level. In equation (1), the coefficient of interest is β , which shows on average how many percentage points an outcome variable changes in a state when an intrastate crowdfunding law is passed.

First, I consider equation (1) and test the parallel trend assumption without including any controls in the regression. If the parallel trend assumption can not be rejected even without conditioning on control variables, I can more strongly argue that the passage of intrastate crowdfunding laws were exogenous to the state-level conditions. Then I add controls for the percentage change in population ($\text{Ln}(Pop_{st})$) and the percentage change in GDP ($\text{Ln}(GDP_{st})$). Given that I am using a staggered DiD design, the specification in equation (1) is accurate as long as there is no abnormal change in the population or GDP growth rate of a treated or non-treated state over time.

Staggered Differences-in-Differences with Continuous Treatment. Equation (2) presents the baseline specification for the case of staggered DiD with continuous treatment. As in equation (1), the control variables are not included for similar reasons. Later they are added to equation (2) to capture heterogeneity among states that may affect outcome variables.

$$\text{Ln}(Y_{st}) = \beta * D_{st} + \zeta * \text{Ln}(Measure_{s,pretreatment}) * D_{st} + \tau_t + \pi_s + \epsilon_{st} \quad (2)$$

$Measure_{s,pretreatment}$ is a measure of local financial market development (depth) in the year before the adoption of an intrastate crowdfunding law by state s . I consider the following measures of local financial market development: pre-treatment level of bank deposits, pre-treatment number of loans to small businesses, and pre-treatment amount of loans to small businesses. I

have access to the data on two types of small business loans: 1) loans with origination amounts below \$1M; and 2) loans to businesses with revenue below \$1M. As a result, I consider five measures of local financial market development.

Equation (2) allows me to estimate the differential effect of passage of intrastate crowdfunding on the dependent variable (Y_{st}) depending on the pre-treatment level of local financial market development. If access to return-based crowdfunding is less important to entrepreneurs in more financially developed states, then the coefficient ζ should be significant and negative. Note that the coefficient β alone is not informative in this setting. But, if $\beta + \zeta * Ln(Measures_{s,pretreatment})$ for the average pre-treatment level of local financial market development is positive, then on average the passage of intrastate crowdfunding spurs entrepreneurial activities or improves real economic outcomes at the state level.

Testing the parallel trend assumption. The parallel trend assumption is a key identifying assumption in the staggered DiD design. Although it is not possible to prove in any DiD approach that the parallel trend assumption holds, I estimate the dynamic versions of equations (1) and (2) with/without controlling for $Ln(Pop_{s,t})$ and $Ln(GDP_{s,t})$ to show that the parallel trend assumption cannot be rejected. I also use the method proposed by Sun and Abraham (2021) to make sure that the parallel trend assumption cannot be rejected even after using their recently proposed estimator.

4.2 Regulation CF

I use the passage of Regulation CF at the federal level in 2016 in a DiD empirical design with continuous treatment. The treatment intensity is a measure of local financial market development (depth) before treatment. Access to financing through crowdfunding should be more important in states with lower levels of financial development.

Given that Regulation CF is a federal regulation, it shouldn't be correlated with changing local economic situations at the state level. In addition, one key assumption for identification of treatment effect is that there was no other change in 2016 that affected the dependent variables across the states in precisely the same way as Regulation CF affected them through local financial market development.

The parallel trend assumption in this case is that an outcome variable in states with different

levels of local financial market development would have changed in the same way if Regulation CF had not been passed. If the parallel trend assumption holds, then states with different levels of local financial market development would play the role of control group for each other to help control for changes in economic conditions that affect states with different levels of local financial market development.

To estimate the effect of Regulation CF on measures of entrepreneurship or real economic outcomes, I use a regression specification similar to equation (2) with the exception that D_{st} is a dummy variable that takes a value of 1 for all states from 2016 onward. Also, treatment intensity ($\text{Ln}(\text{Measure}_{s,\text{pretreatment}})$) is the level of local financial market development at the state level in 2015. I use a dynamic version of equation (2) to test the parallel trend assumption. For the reasons mentioned above, I first test the parallel trend assumption without considering any control variables and then step by step I add control variables for population growth ($\text{Ln}(\text{Pop}_{st})$) and GDP growth ($\text{Ln}(\text{GDP}_{st})$).

4.3 Local Bias in Entrepreneurship

I use equations (3) and (4) to test whether access to intrastate crowdfunding changes the level of local bias in entrepreneurship documented by Michelacci and Silva (2007).

$$\text{Local}_{ist} = \lambda * \text{En}_{ist} + \alpha * D_{st} + \beta * \text{En}_{ist} * D_{st} + \delta * X_i + \tau_t + \pi_s + \epsilon_{ist}, \quad (3)$$

$$\begin{aligned} \text{Local}_{ist} = & \lambda * \text{En}_{ist} + \alpha * D_{st} + \beta * \text{En}_{ist} * D_{st} + \zeta * \text{En}_{ist} * \text{Ln}(\text{Measure}_{\text{pretreatment}}) + \\ & \rho * \text{Ln}(\text{Measure}_{\text{pretreatment}}) * D_{st} + \gamma * \text{En}_{ist} * \text{Ln}(\text{Measure}_{\text{pretreatment}}) * D_{st} + \\ & \delta * X_i + \tau_t + \pi_s + \epsilon_{ist}, \quad (4) \end{aligned}$$

Where Local_{ist} denotes a dummy variable that is set equal to one if, in year (t), the head of household (i) works in the state (s) that he (she) was born in. En_{ist} is a dummy variable that is set equal to one if the head of household (i) is self-employed in state (s) and year (t) independent of whether the business is incorporated or unincorporated. X_i denotes the set of individual level control variables, such as age, sex, marital status, number of children, dummies for race, and dummies for educational achievements. In both equations (3) and (4), D_{st} is a dummy variable

that is equal to 1 if state s has intrastate crowdfunding laws in year t . $Measure_{s,pretreatment}$ is a measure of the pre-treatment level of local financial market development as defined in the previous subsection.

In equation (3), where I use a staggered DiD design, the coefficient λ estimates the magnitude of local bias in entrepreneurship before the passage of intrastate crowdfunding. If λ is positive and significant, it means that individuals who work in the states they were born are more likely to be self-employed (i.e. there is local bias in entrepreneurship). The coefficient α measures the changes in the probability that individuals in state s work in that state after the passage of intrastate crowdfunding. β is the coefficient of interest in equation (3) and it shows whether the magnitude of local bias in entrepreneurship changes after the passage of intrastate crowdfunding laws.

In equation (4), I use a triple DiD design to estimate whether there is a differential effect of access to intrastate crowdfunding on local bias in entrepreneurship depending on the pre-treatment level of local financial market development. The coefficient γ in equation (4) measures this differential effect. Michelacci and Silva (2007) show that LBE is more present in states with a high level of local financial market development.²⁴ A negative and significant value for coefficient γ implies that access to intrastate crowdfunding encourages non-locals to become self-employed more in states with higher levels of local financial market development.

Next, to test the effect of Regulation CF on local bias in entrepreneurship, I use regression specifications similar to equations (3) and (4) with the exception that D_{st} is a dummy variable that takes value of 1 for all states from 2016 onward. The definition of other variables and coefficients are similar to what is mentioned above.

5 Results

In this section, I document the effect of access to return-based crowdfunding on the total number of business applications. Then, to understand what type of businesses or who benefits most from decreased frictions in access to financing, I study sub-samples of business applications and sub-samples of entrepreneurs based on where they were born. Finally, I investigate the effect of these regulations on business formation and real economic outcomes to assess the effectiveness

²⁴One reason might be that locals have better connections to access local sources of financing.

of these regulations and the quality of businesses that are spurred by them.

5.1 Business Applications

I do not find any significant effect of intrastate crowdfunding on the total number of business applications in equation (1). However, this result masks an important heterogeneity across states. Conditioning on the pre-treatment level of local financial market development (depth) in regression equation (2), I find that intrastate crowdfunding has a positive and significant effect on the total number of business applications and that this effect is larger in states with less developed local financial markets. Table 2 shows the regression results for two measures of local financial market development: the total amount of loans with origination amounts less than or equal to \$1 million and the level of bank deposits. Tables OA-1 and OA-2 in the Online Appendix show that this observation is robust to using other measures of local financial market development (depth) defined based on the supply of capital to small businesses.

Figures (2) to (4) show that the parallel trend assumption cannot be rejected when local financial market development is measured by the amount of loans with origination amounts less than or equal to \$ 1 million (columns (1) to (3) in Table 2). These figures show the coefficient on the interaction between the pre-treatment level of local financial market development and the dummy for the passage of intrastate crowdfunding. This coefficient is close to zero and insignificant in the years before the adoption of intrastate crowdfunding laws. However, there is a sudden drop in the coefficient after the passage of intrastate crowdfunding, showing that the passage of these laws has a smaller effect on the number of business applications in states with higher pre-treatment levels of local financial market development. Figures OA-1 to OA-12 in the Online Appendix show similar results when other measures of local financial market development are used.

Table 2 also shows that the average effect and the differential effect of intrastate crowdfunding on the total number of business applications depending on the pre-treatment level of local financial market development are economically significant. For example, in column (2) of Table 2, the average treatment effect on the treated states is 1%.²⁵ The total number of business

²⁵In specification (2) of Table OA-1 in the Online Appendix, where the measure of local financial market depth is the amount of loans to businesses with less than \$1 million in revenue, the average treatment effect on the treated states is 2%. A 10% decrease in the pre-treatment amount of such loans increases the effect of access to intrastate crowdfunding on the total number of business applications by 0.62%

applications in a state with an average level of pre-treatment amount of loans with origination amounts less than or equal to \$1 million increases by 326 in one year. In addition, a 10% decrease in the pre-treatment amount of such loans increases the effect of access to intrastate crowdfunding on the total number of business applications by 0.68%.

Table 3 similarly shows that the passage of Regulation CF has a positive effect on the number of business applications, and that this effect is stronger in states with a lower pre-treatment amount of loans with origination amounts below \$1 million or with lower pre-treatment levels of bank deposits. Tables OA-3 and OA-4 in the Online Appendix show that this result is robust to considering other measures of local financial market development. Tests of the parallel trend assumption for specifications (1) to (3) in Table 3 are presented in Figures 5 to 7. The coefficients on the interaction between the pre-treatment measure of local financial market development and the dummies for time relative to the passage of Regulation CF are presented in these figures. These coefficients are not statistically significant at the 5% level in any of the pre-treatment periods. As a result, the parallel trend assumption cannot be rejected. Figures OA-13 to OA-24 in the Online Appendix show that the parallel trend assumption holds for all measures of local financial market development when I do not include any control variable in the regressions or if I only control for $\ln(Pop_{s,t})$. However, controlling for both $\ln(Pop_{s,t})$ and $\ln(GDP_{s,t})$ makes the coefficient on the interaction term significant at the 5% level in one pre-treatment period when the measure of local financial market development is the number of loans with origination amounts below \$1 million or the amount of loans to businesses with revenue less than or equal to \$1 million.

The results in column (2) of Table 3 show that, in a state with an average pre-treatment amount of loans with origination amounts less than or equal to \$1 million, the number of business applications increases by 36.8% ($\approx 12,000$ business applications) after the passage of Regulation CF. A 10% decrease in the amount of these loans increases the positive effect of Regulation CF by 0.44%.²⁶

²⁶If the amount of loans to businesses with less than \$1 million in revenue is used as the measure of local financial market development, then the number of business applications increases by 35.7% after the passage of Regulation CF. A 10% decrease in the amount of these loans increases the positive effect of Regulation CF by 0.4% (specification (2) of Table OA-3 in the Online Appendix).

5.2 Subsamples of Business Applications

It is important to understand what type of entrepreneurial activities are spurred by return-based crowdfunding and what type of organizations use this method of financing. Answers to these questions clarify how impactful this method of financing is and what type of businesses benefit most from decreasing frictions in access to financing.

The results in tables 4 and 5 show that intrastate crowdfunding and Regulation CF have a positive effect on the number of business applications by non-corporations, such as sole proprietorships, LLPs, and LLCs.²⁷ This positive effect is stronger in states with lower pre-treatment levels of local financial market development. For example, the results in column (2) of Table 4 and column (2) of Table 5 show that the passage of intrastate crowdfunding and Regulation CF, on average, increase the number of business applications by non-corporations by 0.39% (≈ 107) and 49.8% ($\approx 13,717$). In addition, with a 10% decrease in the pre-treatment level of the amount of loans with origination amounts below \$1 million, the positive effect of intrastate crowdfunding on the number of business applications by non-corporations increases by 0.64% (≈ 176) and 0.48% (≈ 132). Figures OA-25 to OA-30 in the Online Appendix show that the parallel trend assumption cannot be rejected for any of the specifications in Table 4. Figures OA-31 to OA-36 in the Online Appendix lead to a similar conclusion regarding specifications in Table 5. I also find that intrastate crowdfunding does not have a significant effect on the number of business applications by corporations. Table OA-5 in the Online Appendix shows that Regulation CF exerts a weak effect on the number of business applications by corporations, which is not robust to using different measures of local financial market development. In summary, both methods of return-based crowdfunding have a strong effect on the number of business applications by non-corporations. This observation shows that frictions in access to financing have mainly prevented the market entry of individuals and small entities.

There are possible scenarios on how return-based crowdfunding may mitigate the frictions in access to financing for non-corporations. It is possible that the market power of banks in some locations leads to high interest rates on loans offered to these small entities, making it nearly impossible for them to borrow money. However, return-based crowdfunding may compete with

²⁷According to Form SS-4 instructions, by default, a domestic LLC with only one member is disregarded as an entity separate from its owner and the owner should choose "Other" as the type of entity. Also a domestic LLC with two or more members is treated as a partnership. However, a domestic LLC can avoid either default classification by filing Form 8832 to elect to be classified as a corporation for tax purposes.

banks in supply of capital and incentivizes them to offer lower rates to small entities.

Also, these small entities may not have the collateral necessary to borrow money from banks²⁸ or long enough track record²⁹ to convince banks or other sophisticated investors about the quality of their businesses. As a result, competition from larger businesses to raise capital may prevent banks or other sophisticated investors from investing in these small entities. However, return-based crowdfunding provides a new source of financing and investors in return-based crowdfunding campaigns may not have access to the same investment opportunity sets as those of banks or venture capitalists (VCs) and may be more willing to invest in younger and more risky projects. Risk sharing among return-based crowdfunding investors by investing small amounts in these projects may increase the possibility that they invest in these projects. In addition, many crowdfunding investors are not sophisticated and may not evaluate projects as accurately as banks or other sophisticated investors.

The results in table 6 show that the passage of intrastate crowdfunding has a positive and significant effect on the number of business applications with planned wages and on the number of high-propensity business applications. The results also show that this method of financing is more effective in states with lower levels of local financial market development. The results in columns (3) and (6) show that the passage of intrastate crowdfunding, on average, increases the number of business applications with planned wages by 0.8% (≈ 49) and the number of high-propensity business applications by 2.55% (≈ 353). Also, with a 10% decrease in the amount of loans with an origination amount below \$1 million, the positive effect of intrastate crowdfunding on the number of business applications with planned wages increases by 0.38% (≈ 23) and on the number of high-propensity business applications increases by 0.34% (≈ 47). I do not find that Regulation CF has a significant effect on these types of business applications. Figures OA-37 to OA-42 in the Online Appendix show that the parallel trend assumption cannot be rejected in any of the specifications in Table 6.

It appears that intrastate crowdfunding has a higher chance of affecting real economic out-

²⁸An excerpt from a public comment about Regulation CF on the SEC website: “I believe - through my own many-fold experiences in the U.S.A as an immigrated minority with zero personal Credit-score nor local so-called “networking”, that crowdfunding, the system of collaborative or shared financing, can not only help close the gap between entrepreneurs who desperately need equity capital to start or expand their businesses and too big to fail Corporations.” Please refer to <https://www.sec.gov/comments/jobs-title-iii/jobstitleiii-254.htm>.

²⁹An excerpt from a public comment about Regulation CF on the SEC website: “VCs, super angels and angel groups have all migrated to later stage investments often demanding companies already have substantial revenues before they will invest.” Please refer to <https://www.sec.gov/comments/jobs-title-ii/jobstitleii-91.pdf>.

comes such as employment. Businesses with planned wages may use intrastate crowdfunding instead of Regulation CF because raising capital through intrastate crowdfunding is cheaper due to less stringent requirements³⁰ and in the period I consider, several states have financing limits above the \$1.07 million financing limit under Regulation CF. Also, intrastate crowdfunding campaigns focus more on employment and economic growth at the state level. Figures OA-155 and OA-156 in the Online Appendix present quotes from two companies that used intrastate crowdfunding in Michigan. However, it is also possible that businesses with high propensity to become employer businesses relocate to states with intrastate crowdfunding, increasing the number of business applications with planned wages or with high propensity in these states. Given that Regulation CF was adopted at the federal level businesses do not need to relocate to use this method of financing.³¹

5.3 Local Bias in Entrepreneurship

Table OA-6 in the Online Appendix reports the results from running the main regression specification in Michelacci and Silva (2007) using the American Community Survey samples from 2009 to 2019. In contrast to Michelacci and Silva (2007), I do not find a significant relation between being a local and an entrepreneur in the sample that includes all races. However, for the sample of white and black individuals, I observe significant local bias in entrepreneurship. The magnitude of local bias in entrepreneurship is larger for white individuals, showing that white individuals can better exploit local financing sources than local black individuals. In general, the significance and magnitude of local bias in entrepreneurship is lower in my sample than in the U.S. Census 2000 1% file data used by Michelacci and Silva (2007), suggesting that local bias in entrepreneurship has decreased overtime.

The results from the DiD regression in equation (3) are not significant in both cases of intrastate crowdfunding and Regulation CF. However, the results in Tables 7 and OA-7 show that

³⁰An excerpt from an article on why intrastate crowdfunding is beating Regulation CF: “Intrastate based investment crowdfunding today is superior to the interstate Regulation Crowdfunding aka REG-CF option representing lower friction, a lower cost of capital and access to larger investment amounts from everyday people.” Please see <https://www.crowdfundinsider.com/2019/02/144160-the-state-of-investment-crowdfunding-how-intrastate-crowdfunding-is-beating-reg-cf-on-the-cost-of-capital-and-how-to-fix-it/>.

³¹“Georgia is one of the leaders in this area. The Invest Georgia Exemption (“IGE”) provides a broad crowdfunding exemption that allows issuers to raise amounts up to \$5 million (with integration of all investment funds received in the previous twelve months). This is the largest cap of any of the various state crowdfunding exemptions and has been a major benefit to local companies raising equity funds. It has also helped attract companies from out of state to relocate to Georgia.” Quoted from <https://www.techfundingandlegal.com/securities-law/state-crowdfunding-and-the-invest-georgia-exemption/>.

conditioning on measures of local financial market development in the triple DiD regression in equation (4) leads to a negative and significant effect of intrastate crowdfunding on the local bias in entrepreneurship independent of the pre-treatment level of local financial market development.³² After the passage of intrastate crowdfunding, the probability that an entrepreneur is located in the state where they were born decreases by 0.007. Moving from the sample that includes all races to the sample that includes only white individuals, this probability decreases by 0.008. This result shows that investors in intrastate crowdfunding campaigns are willing to finance viable start-ups founded by non-local entrepreneurs. This may be because issuers that use intrastate crowdfunding should operate mainly in the state in which they raise capital, helping to increase employment in that state. However, the results in Tables OA-8 and OA-9 show that the passage of Regulation CF does not have a significant effect on the local bias in entrepreneurship. This might be because many states passed intrastate crowdfunding before the passage of Regulation CF.

5.4 Business Formation

I next study the effect of access to intrastate crowdfunding and Regulation CF on the number of business applications that lead to employer businesses in one (two) year(s) after business applications are filed. Running the DiD regression in equation (1), I do not find significant effects of intrastate crowdfunding and Regulation CF on these measures of employer business formation. However, results from DiD regressions with continuous treatment (equation (2)) show that intrastate crowdfunding has a positive and significant effect on business formation while Regulation CF has no effect.

The results in columns (3) and (6) of Table 8 show that in a state with an average pre-treatment amount (number) of loans with origination amounts below \$1 million, the passage of intrastate crowdfunding leads to a 2.8% (1.9%) increase in business formation one year after business applications are filed. A 10% decrease in the pre-treatment level of local financial market development leads to a 0.2% increase in these positive effects, suggesting that these effects are stronger in states with less developed financial markets. Table OA-10 in the Online Appendix shows similar but less significant results when other measures of local financial market

³²The coefficient on the interaction term $En_{ist} * D_{st}$ is negative and significant in all specifications. However, the coefficient on the triple interaction term is not significant.

development are used. Figures OA-43 to OA-48 and OA-49 to OA-54 in the Internet Appendix present results of testing the parallel trend assumptions for all specifications in Tables 8 and OA-10. Note that the coefficient related to one of the pre-treatment periods is marginally significant at the 5% level in these tests.

In addition, the results in columns (3) and (6) of Table 9 show that after the passage of intrastate crowdfunding in a state with an average pre-treatment amount of loans with origination amounts less than \$1 million (average pre-treatment level of bank deposits), business formation within two years after business applications are filed increases by 4.6% (3.4%). These effects increase by 1.1% (0.8%) if the pre-treatment level of local financial market development decreases by 10%. Table OA-11 in the Online Appendix presents similar results but they are less statistically significant for other measures of local financial market development. Figures OA-55 to OA-60 and figures OA-61 to OA-66 show that the parallel trend assumptions can not be rejected for any of the specifications in Tables 9 and OA-11.

These results are consistent with the observation that intrastate crowdfunding spurs business applications with planned wages and high propensity business applications but Regulation CF does not have any effect on these type of business applications. In addition, the finding that Regulation CF significantly affects the number of business applications by non-corporations but does not affect employer business formation can help in making some conclusions about these businesses. It is possible that these businesses are not able to raise capital through Regulation CF, that they fail after raising capital through Regulation CF, or that they do not aim at growing (can not grow) to employer businesses.

5.5 Business Dynamics and Real Economic Outcomes

In this section, I investigate whether access to return-based crowdfunding affects business dynamics and real economic outcomes. The dependent variables are establishment entry, establishment exit, job creation, job destruction, employment by non-farm proprietorships, number of non-employer establishments, and total employment and total annual payroll of employer businesses.

5.5.1 Intrastate Crowdfunding

Table 10 shows the effect of access to intrastate crowdfunding on employment by non-farm proprietors³³ and on the number of establishments by non-employer businesses. Figures OA-67 to OA-72 in the Online Appendix show that the parallel trend assumption cannot be rejected for any of the regression results in Table 10. The results in columns (2) and (5) show that the passage of intrastate crowdfunding in a state with an average pre-treatment level of deposits increases non-farm proprietors' employment by 0.14% ($\approx 1,064$) and non-employer business establishments by 0.32% ($\approx 1,403$). These effects are stronger in states with higher pre-treatment levels of bank deposits. A 10% increase in the pre-treatment level of deposits increases the effect of intrastate crowdfunding on employment by non-farm proprietorships by 0.17% and increases the effect of intrastate crowdfunding on the number of non-employer establishments by 0.13%.

Next, I examine employer business dynamics. The results in columns (2) and (5) in Table 11 show that after the passage of intrastate crowdfunding, a state with an average pre-treatment number of loans with origination amounts less than \$1 million (average pre-treatment level of bank deposits) experiences a 1.3% (1.4%) increase in job creation by employer businesses. These positive effects increase as the level of local financial market development increases. A 10% increase in the pre-treatment number of loans with origination amounts less than or equal to \$1 million (average pre-treatment level of bank deposits) increases these positive effects by 0.26% (0.25%). The results in columns (3) and (6) show that adding $\ln(GDP_{st})$ to the regressions makes coefficients on all the other variables including $\ln(Pop_{st})$ insignificant. Given that state-level labor income is used in the estimation of state-level GDP, there is a high correlation between the growth in job creation by employer businesses and the growth in state-level GDP. As a result, adding $\ln(GDP_{st})$ to these regressions makes coefficients on other variables insignificant. Tables OA-12 and OA-13 in the Online Appendix present similar patterns in results when other measures of local financial market development are used. These results show that intrastate crowdfunding exerts a positive effect on job creation by employer businesses. Figures OA-73 to OA-87 show that the parallel trend assumption can not be rejected in any of the specifications in Tables 11, OA-12, and OA-13. I also find that intrastate crowdfunding does not have a significant effect on establishment exit or job destruction by all firms. The effect of intrastate

³³Non-farm proprietor employment consists of the number of non-farm sole proprietorships and the number of individual general partners in non-farm partnerships. In addition, proprietors can hire employees and there is no limit on the number of employees.

crowdfunding on establishment entry by all firms can not be interpreted because the parallel trend assumption does not hold.

Given that the return-based crowdfunding methods under study are aimed at small businesses, I next examine whether or not the effects on business dynamics are driven by small businesses. Using a sub-sample of firms with fewer than 20 employees, I find that intrastate crowdfunding does not have any effect on job creation, job destruction, or establishment exits by these type of firms. This observation suggests that the positive effect of intrastate crowdfunding on job creation is not driven by small businesses.

It is also important to investigate whether these regulations help non-employer startups to grow and become employer businesses or if it helps firms that are already employer businesses to expand or avoid shrinking. The Business Dynamics Statistics (BDS) dataset provides data on establishment entry, establishment exit, job creation, and job destruction for firms at different ages. In this dataset age is the number of years a firm operates after it becomes an employer business. I do not find robust evidence that intrastate crowdfunding has an effect on job creation by firms that just became employer businesses (age zero).³⁴ Considering the sub-sample of firms that operate one to five years after they become employer businesses, I find that intrastate crowdfunding has a negative effect on job destruction and a small positive effect on job creation. The results in columns (2) and (5) of Table 12 show that in a state with average pre-treatment level of bank deposits, the passage of intrastate crowdfunding increases (decreases) job creation (job destruction) by firms operating one to five years after becoming an employer business by 0.05% (5%). Figures OA-88 to OA-93 in the Online Appendix show that the parallel trend assumption holds in all columns in Table 12. A 10% decrease in the pre-treatment level of bank deposits decreases the positive effect on job creation by 0.6% and increases the negative effect on job destruction by 0.6%.

Interestingly, the results about the effect of intrastate crowdfunding on non-farm proprietor employment (Table 10), the number of non-employer establishments (Table 10), and job creation (Tables 11 and 12) are stronger in states with more developed local financial markets. One possible explanation can be that it is easier to attract workers and entrepreneurs to more financially developed areas, hence labor growth is stronger in these states. It is also possible that the negative effect of competition among entrepreneurs caused by access to crowdfunding is

³⁴Only two variables of job creation and establishment entry are defined for firms with age zero.

less severe in more financially developed states because businesses have access to other sources of financing. In addition, the supply of capital through crowdfunding may make other sources of financing more affordable for small businesses. Observing that the effect of intrastate crowdfunding on these outcome variables is stronger in states with higher levels of bank deposits suggests that this method of financing may be a channel to transfer funds from wealthier individuals to entrepreneurs in their own states.

Tables OA-16 and OA-17 in the Online Appendix present the results regarding the effect of access to intrastate crowdfunding on total employment by employer businesses and on total annual payroll. However, calculating the average treatment effect on treated states, I do not find a persistent positive or negative effect using all measures of local financial market development. Also, the results in Table OA-18 shows that the effect of access to intrastate crowdfunding on the total amount of payroll at businesses with fewer than 20 employees is significant in only one specification when the level of bank deposits is used to measure local financial market development. Using other measures of local financial market development I do not find any significant effects.

5.5.2 Regulation CF

The results in Table 13 show that access to Regulation CF leads to a 14.5% (21%) decrease in establishment entry (exit). These effects do not depend on the pre-treatment number of loans to small businesses. Figures OA-94 to OA-102 in the Online Appendix show that tests of the parallel trend assumption can not reject it for the specifications in Table 13. In the sub-sample of firms with fewer than 20 employees, I find that Regulation CF only decreases establishment exits and not establishment entry. In other words, Regulation CF helps small businesses avoid shrinking while not preventing other small businesses from growing. The results in Table 14 show that after the passage of Regulation CF, establishment exits by firms with fewer than 20 employees decreases on average by 20.8%. I do not find evidence that this effect depends on the level of local financial market development. Figures OA-103 to OA-108 show that the parallel trend assumption can not be rejected for the results in Table 14. I also find that the passage of Regulation CF does not have any effect on establishment entry or job creation by firms that just became employer businesses (age zero). However, the results in Table 15 show that Regulation CF decreases establishment entry and establishment exit at firms operating for

one to five years after becoming employer businesses by 27.8% and 38.4%, respectively. Tables OA-14 and OA-15 provide similar results regarding the effect of Regulation CF on establishment entry and exit by these type of firms. The results of parallel trend analysis for Tables 15, OA-14, and OA-15 are presented in Figures OA-109 to OA-126. The finding that Regulation CF affects the entry and exit of firms operating one to five years after becoming an employer businesses suggest that more established businesses are more successful in using Regulation CF to avoid losing their businesses and preventing other businesses from growing. More established firms can likely provide information about their past performance, decreasing information asymmetry and attracting investors.

No results are reported regarding the effect of Regulation CF on employment by non-farm proprietorships, number of non-employer establishments, and total employment and total annual payroll of employer businesses because either parallel trend assumptions do not hold or the results are not significant.

6 Robustness

In this section, I examine whether the parallel trend assumption can be rejected using the recently proposed estimator by Sun and Abraham (2021). According to these authors, when treatment timing is staggered, it is possible that the treatment effect in one period contaminates the coefficient on a lead or a lag variable in another period, leading to a false pretrend or posttrend. They propose the interaction weighted (IW) estimator to solve this issue. The IW estimator package can be easily used for the dynamic version of equation (1) but to use it for the case with continuous pre-treatment variable in equation (2) I define a dummy variable that takes a value of 1 when the pre-treatment measure of the local financial market depth is above its median, otherwise it is 0. Then I estimate the following dynamic regression using the IW estimator:

$$\begin{aligned} \ln(Y_{st}) = & \sum_{l,l \neq -1} \mu_l * \mathbb{1}\{Measure_{s,l=-1} > Median(Measure_{l=-1})\} * \mathbb{1}\{t - E_s = l\} + \\ & \sum_{l,l \neq -1} \gamma_l * \mathbb{1}\{Measure_{s,l=-1} \leq Median(Measure_{l=-1})\} * \mathbb{1}\{t - E_s = l\} + \tau_t + \pi_s + \epsilon_{st}, \end{aligned} \quad (5)$$

Where E_s is the year in which state s adopts intrastate crowdfunding; l denotes the distance

between year t and the first treatment year for state s ; and $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that takes a value equal to one when the distance between year t and the first treatment year for state s is equal to l . I drop the dummy variable $\mathbb{1}\{t - E_s = -1\}$ for the period before the treatment year to avoid co-linearity. I also add controls for $\ln(Pop_{st})$ and $\ln(GDP_{st})$ step-by-step and check at each step whether or not the parallel trend assumption can be rejected.

Figures (8) and (9) present the results of testing the parallel trend assumption for column (1) in Table 2 using the estimator proposed by Sun and Abraham (2021). These results show the coefficients on the interaction terms in equation (5) for states with above and below median pre-treatment amounts of bank loans with origination amounts less than or equal to \$1 million. They show that there are no significant pre-trends and that the significant differential effect of intrastate crowdfunding on the total number of business applications comes from the states with a below median pre-treatment level of local financial market development. Figures OA-127 to OA-154 in the Online Appendix show similar results for all other columns in Tables 2, OA-1, and OA-2.

7 Conclusion

The role of local financial market development in entrepreneurship and firm growth (Guiso et al., 2004) can lead to disparities in entrepreneurial activities across the U.S. This paper shows that democratizing entrepreneurs access to financing through return-based crowdfunding decreases the importance of local financial market development in entrepreneurship, in contrast to predictions that return-based crowdfunding would not be a viable source of financing. In this paper, I investigate intrastate crowdfunding at the state level and Regulation CF at the federal level. These regulations allow raising capital through return-based crowdfunding. I find that both methods lead to an increase in the number of business applications. These effects are stronger in states with less developed financial markets.

Looking at the sub-samples of business applications shows that both methods spur business applications by non-corporations, such as sole-proprietorships, partnership, and limited liability companies (LLCs), with stronger effects in states with lower levels of local financial market development. This finding suggests that individuals and small firms were prevented from market entry due to frictions in access to financing. I also find that access to intrastate crowdfunding

decreases local bias in entrepreneurship (i.e. individuals that work in states other than where they were born are more likely to be self-employed).

The results show that the effects of intrastate crowdfunding and Regulation CF on business formation, business dynamics, and real economic outcomes show considerable differences between the real effects of these two methods of financing. While the effect of intrastate crowdfunding on the number of business applications is considerably smaller than that of Regulation CF, only intrastate crowdfunding has a positive and significant effect on the number of business applications that turn into employer businesses within two years after business applications are filed. This finding suggests that businesses attracted by intrastate crowdfunding may be higher quality or that with-in state investors are more successful at recognizing businesses with more growth prospects.

In addition, the finding that business applications spurred by the passage of Regulation CF do not turn into employer businesses suggests several explanations: 1) these businesses were not successful in raising capital through Regulation CF; 2) these businesses failed after raising capital through Regulation CF; or 3) these businesses do not have the potential to or do not aim to grow to employer businesses. The last explanation is possible because I find that Regulation CF does not have any detectable effect on the number of business applications with planned wages or high-propensity business applications. However, these types of business applications significantly increase after the passage of intrastate crowdfunding. Intrastate crowdfunding may attract businesses with more growth prospects because in several states the maximum financing limit under intrastate crowdfunding is larger than that under Regulation CF. However, it is possible that the observed increase is a result of business relocation from states without intrastate CF to states with intrastate CF.

The results show that intrastate crowdfunding is more effective in increasing job creation, self-employment, and number of establishments by non-employer businesses, and in decreasing job destruction by employer businesses, while Regulation CF decreases establishment exits for small businesses and establishment entry for other businesses. In addition, I find that established firms are more likely to use Regulation CF. This can happen because these types of firms can alleviate information asymmetry in Regulation CF campaigns and attract investors.

In summary, this paper shows that return-based crowdfunding increases entrepreneurial entry by individuals and small businesses, especially in states with less developed financial markets. By

comparing the effects of state level and federal level regulations on business formation, business dynamics, and real economic outcomes, this paper provides some guidance for future policies aimed at spurring entrepreneurial activities and the growth of small businesses.

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8 Tables

Table 1: List of States/Territories with Intrastate Crowdfunding

This table lists the 35 states/territories in the U.S. that adopted intrastate crowdfunding from 2009 to 2019.

State	Effective Year	State	Effective Year
Alabama (AL)	2014	Michigan (MI)	2013
Alaska (AK)	2016	Minnesota (MN)	2016
Arizona (AZ)	2015	Mississippi (MS)	2015
Arkansas (AR) ³⁵	2017	Montana (MO)	2015
Colorado (CO)	2015	Nebraska (NE)	2015
Delaware (DE)	2016	New Jersey (NJ)	2016
District of Columbia (DC)	2014	North Carolina (NC)	2017
Florida (FL)	2015	Oregon (OR)	2015
Georgia (GA)	2011	South Carolina (SC)	2015
Idaho (ID)	2012	Tennessee (TN)	2015
Illinois (IL)	2016	Texas (TX)	2014
Indiana (IN)	2014	Vermont (VT)	2014
Iowa (IA)	2016	Virginia (VA)	2015
Kansas (KS)	2011	Washington (WA)	2014
Kentucky (KY)	2015	West Virginia (WV)	2016
Main (ME)	2015	Wisconsin (WI)	2014
Maryland (MD)	2014	Wyoming (WY)	2017
Massachusetts (MA)	2015		

□

³⁵HB 1800 was signed into law on March 28, 2017, and became effective on August 1, 2017. See legiscan.com/AR/text/HB1800/id/1576555/Arkansas-2017-HB1800-Chaptered.pdf.

Table 2: The Effect of Intrastate Crowdfunding on the Total Number of Business Applications

This table reports the differences-in-differences estimates for the effect of intrastate crowdfunding on the number of business applications conditional on the pre-treatment measures of local financial market development. The dependent variable is log number of business applications. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $Ln(AmountLoanLEQ1M_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $Ln(Deposit_{pretreatment})$ is log of total deposits in the year before a state adopts intrastate crowdfunding. $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No Business Applications)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	1.238** (0.574)	1.398** (0.558)	1.142** (0.439)	0.971 (0.592)	1.170** (0.549)	0.921** (0.420)
$Ln(AmountLoanLEQ1M_{pretreatment}) * D_{s,t}$	-0.056** (0.026)	-0.064** (0.026)	-0.052** (0.020)			
$Ln(Deposit_{pretreatment}) * D_{s,t}$				-0.038 (0.023)	-0.046** (0.022)	-0.036** (0.017)
$Ln(Pop_{s,t})$		0.998*** (0.346)	1.474*** (0.518)		0.986*** (0.300)	1.558*** (0.505)
$Ln(GDP_{s,t})$			-0.382 (0.346)			-0.456 (0.364)
Constant	10.217*** (0.012)	-4.857 (5.235)	-7.456 (5.557)	10.217*** (0.012)	-4.676 (4.535)	-7.834 (4.987)
Observations	561	561	561	561	561	561
R-squared	0.839	0.852	0.859	0.830	0.843	0.854
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 3: The Effect of Regulation CF on the Total Number of Business Applications

This table reports the differences-in-differences estimates for the effect of Regulation CF on the number of business applications conditional on the pre-treatment measures of local financial market development. The dependent variable is log number of business applications. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one for all states from 2016 onward. $\ln(\text{AmountLoanLEQ1M}_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $\ln(\text{Deposit}_{pretreatment})$ is log of total deposits in 2015 (the year before the passage of Regulation CF). $\ln(\text{Pop}_{s,t})$ is log of population and $\ln(\text{GDP}_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No Business Applications)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	1.228*** (0.415)	1.224*** (0.419)	1.081*** (0.296)	1.140*** (0.403)	1.198*** (0.392)	1.068*** (0.278)
$\ln(\text{AmountLoanLEQ1M}_{pretreatment}) * D_{s,t}$	-0.040** (0.019)	-0.042** (0.019)	-0.030** (0.012)			
$\ln(\text{Deposit}_{pretreatment}) * D_{s,t}$				-0.030* (0.016)	-0.035** (0.015)	-0.025*** (0.009)
$\ln(\text{Pop}_{s,t})$		0.877** (0.329)	1.381*** (0.489)		0.963*** (0.290)	1.473*** (0.502)
$\ln(\text{GDP}_{s,t})$			-0.392 (0.356)			-0.414 (0.365)
Constant	10.217*** (0.012)	-3.033 (4.970)	-5.929 (4.978)	10.217*** (0.012)	-4.328 (4.386)	-7.057 (4.792)
Observations	561	561	561	561	561	561
R-squared	0.835	0.845	0.852	0.831	0.844	0.852
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 4: The Effect of Intrastate Crowdfunding on the Number of Business Applications by Non-corporations

This table reports the differences-in-differences estimates for the effect of intrastate crowdfunding on the number of business applications by non-corporations conditional on the pre-treatment measures of local financial market development. The dependent variable is log number of business applications by non-corporations. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $Ln(AmountLoanLEQ1M_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $Ln(Deposit_{pretreatment})$ is log of total deposits in the year before a state adopts intrastate crowdfunding. $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No. Business Applications By Non-Corporations)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	1.135*	1.327**	1.043**	0.884	1.124*	0.857*
	(0.631)	(0.616)	(0.491)	(0.645)	(0.598)	(0.464)
$Ln(AmountLoanLEQ1M_{pretreatment}) * D_{s,t}$	-0.052*	-0.061**	-0.048**			
	(0.029)	(0.028)	(0.022)			
$Ln(Deposit_{pretreatment}) * D_{s,t}$				-0.034	-0.044*	-0.033*
				(0.026)	(0.024)	(0.018)
$Ln(Pop_{s,t})$		1.196***	1.724***		1.187***	1.801***
		(0.369)	(0.547)		(0.317)	(0.530)
$Ln(GDP_{s,t})$			-0.424			-0.489
			(0.360)			(0.377)
Constant	9.995***	-8.079	-10.959*	9.995***	-7.940	-11.328**
	(0.013)	(5.570)	(5.937)	(0.014)	(4.783)	(5.320)
Observations	561	561	561	561	561	561
R-squared	0.864	0.878	0.884	0.859	0.872	0.881
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 5: The Effect of Regulation CF on the Number of Business Applications by Non-corporations

This table reports the differences-in-differences estimates for the effect of Regulation CF on the number of business applications by non-corporations conditional on the pre-treatment measures of local financial market development. The dependent variable is log number of business applications by non-corporations. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one for all states from 2016 onward. $Ln(AmountLoanLEQ1M_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $Ln(Deposit_{pretreatment})$ is log of total deposits in 2015 (the year before the passage of Regulation CF). $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No. Business Applications By Non-Corporations)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	1.384*** (0.434)	1.380*** (0.436)	1.232*** (0.314)	1.262*** (0.421)	1.333*** (0.407)	1.197*** (0.290)
$Ln(AmountLoanLEQ1M_{pretreatment}) * D_{s,t}$	-0.042** (0.020)	-0.045** (0.019)	-0.033** (0.013)			
$Ln(Deposit_{pretreatment}) * D_{s,t}$				-0.031* (0.016)	-0.037** (0.015)	-0.027*** (0.010)
$Ln(Pop_{s,t})$		1.093*** (0.349)	1.611*** (0.523)		1.182*** (0.312)	1.714*** (0.527)
$Ln(GDP_{s,t})$			-0.403 (0.366)			-0.432 (0.376)
Constant	9.995*** (0.013)	-6.527 (5.272)	-9.500* (5.413)	9.995*** (0.013)	-7.864 (4.716)	-10.710** (5.169)
Observations	561	561	561	561	561	561
R-squared	0.865	0.877	0.882	0.862	0.875	0.882
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 6: The Effect of Intrastate Crowdfunding on the Number of Business Applications with Planned Wages and the Number of High Propensity Business Applications

This table reports the differences-in-differences estimates for the effect of intrastate crowdfunding on the number of business applications with planned wages and on the number of high propensity business applications conditional on the pre-treatment measures of local financial market development. The dependent variable in columns (1) to (3) is log number of business applications with planned wages, and the dependent variable in columns (4) to (6) is log number of high propensity business applications. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $\ln(\text{AmountLoanLEQ1M}_{\text{pretreatment}})$ is log amount of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. $\ln(\text{Pop}_{s,t})$ is log of population and $\ln(\text{GDP}_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No. Business Applications With Planned Wages)			Ln(No. High Propensity Business Applications)		
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	0.499 (0.332)	0.692* (0.357)	0.789** (0.357)	0.652 (0.435)	0.787* (0.407)	0.741** (0.350)
$\ln(\text{AmountLoanLEQ1M}_{\text{pretreatment}}) * D_{s,t}$	-0.022 (0.015)	-0.031* (0.016)	-0.036** (0.016)	-0.029 (0.020)	-0.035* (0.019)	-0.033** (0.016)
$\ln(\text{Pop}_{s,t})$		1.204*** (0.310)	1.025** (0.477)		0.840*** (0.290)	0.924* (0.473)
$\ln(\text{GDP}_{s,t})$			0.144 (0.232)			-0.068 (0.290)
Constant	8.787*** (0.010)	-9.409** (4.678)	-8.431 (5.314)	9.454*** (0.010)	-3.231 (4.376)	-3.692 (4.880)
Observations	561	561	561	561	561	561
R-squared	0.490	0.574	0.578	0.338	0.389	0.391
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 7: The Effect of Intrastate Crowdfunding on the Local Bias in Entrepreneurship

This table reports estimates of the effect of intrastate crowdfunding on local bias in entrepreneurship (LBE) conditional on pre-treatment measures of local financial market development using a triple differences-in-differences regression model. The dependent variable is the dummy $Local_{i,t}$ equaling one if, in year t , the head of household i works in the state that he was born in. $En_{i,t}$ is a dummy equaling one if the head of household is self-employed (including both incorporated and unincorporated businesses). $D_{s,t}$ is a dummy equaling one if state s has intrastate crowdfunding regulations in year t . $Ln(AmountLoanLEQ1M_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $Ln(AmountLoanLess1MRev_{pretreatment})$ is log amount of loans to businesses with revenue less than or equal to \$1 million. I use samples of American Community Survey from 2009 to 2019. Each observation denotes a head of household. All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, *, and * denote significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	$1(Local_{i,t} == 1)$					
$En_{i,t}$	-0.0025 (0.0108)	0.0030 (0.0107)	0.0004 (0.0112)	-0.0025 (0.0108)	0.0030 (0.0107)	0.0004 (0.0112)
$D_{s,t}$	0.0005 (0.0039)	0.0011 (0.0035)	0.0018 (0.0036)	0.0004 (0.0039)	0.0011 (0.0035)	0.0018 (0.0036)
$En_{i,t} * D_{s,t}$	-0.0069** (0.0030)	-0.0074** (0.0029)	-0.0082*** (0.0028)	-0.0070** (0.0030)	-0.0075** (0.0029)	-0.0082*** (0.0027)
$Ln(AmountLoanLess1MRev_{pretreatment}) * En_{i,t}$	0.0009 (0.0006)	0.0006 (0.0006)	0.0009 (0.0006)	0.0009 (0.0006)	0.0006 (0.0006)	0.0009 (0.0006)
$Ln(AmountLoanLess1MRev_{pretreatment}) * D_{s,t}$	-0.0002 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)
$Ln(AmountLoanLess1MRev_{pretreatment}) * En_{i,t} * D_{s,t}$	0.0000 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
$Ln(AmountLoanLEQ1M_{pretreatment}) * En_{i,t}$				0.0009 (0.0006)	0.0006 (0.0006)	0.0009 (0.0006)
$Ln(AmountLoanLEQ1M_{pretreatment}) * D_{s,t}$				-0.0002 (0.0002)	-0.0001 (0.0001)	-0.0001 (0.0001)
$Ln(AmountLoanLEQ1M_{pretreatment}) * En_{i,t} * D_{s,t}$				0.0000 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Observations	6,220,063	5,895,340	5,302,097	6,220,063	5,895,340	5,302,097
R-squared	0.1198	0.1227	0.1310	0.1198	0.1227	0.1310
Education Level Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Race Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Race in the sample	All	White-African American/Black	White	All	White-African American/Black	White
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Yes-State Level	Yes-State Level	Yes-State Level	Yes-State Level	Yes-State Level	Yes-State Level

Table 8: Intrastate Crowdfunding and Business Formation within One Year after Business Application

This table reports the differences-in-differences estimates for the effect of intrastate crowdfunding on business formation within one year after business application conditional on the pre-treatment measures of local financial market development. The dependent variable is log number of business applications in year t that lead to employer businesses within one year after business applications are filed. The observations are at the state-year level, and the sample period is 2009 to 2018. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $Ln(AmountLoanLEQ1M_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $Ln(NumLoanLEQ1M_{pretreatment})$ is log number of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No Business Formation After 1 year)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	0.157 (0.323)	0.384 (0.232)	0.527** (0.230)	0.021 (0.154)	0.179 (0.114)	0.239** (0.110)
$Ln(AmountLoanLEQ1M_{pretreatment}) * D_{s,t}$	-0.006 (0.015)	-0.017 (0.011)	-0.023** (0.010)			
$Ln(NumLoanLEQ1M_{pretreatment}) * D_{s,t}$				0.000 (0.014)	-0.014 (0.010)	-0.020** (0.010)
$Ln(GDP_{s,t})$			0.231 (0.154)			0.216 (0.156)
$Ln(Pop_{s,t})$		1.673*** (0.374)	1.392*** (0.504)		1.688*** (0.382)	1.430*** (0.509)
Constant	8.045*** (0.009)	-17.238*** (5.652)	-15.757** (6.426)	8.045*** (0.009)	-17.461*** (5.777)	-16.166** (6.503)
Observations	510	510	510	510	510	510
R-squared	0.085	0.282	0.298	0.083	0.280	0.294
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: Intrastate Crowdfunding and Business Formation within Two Years after Business Application

This table reports the differences-in-differences estimates of the effect of intrastate crowdfunding on business formation within two years after business application conditional on the pre-treatment measures of local financial market development. The dependent variable is log number of business applications in year t that lead to employer businesses within two years after business applications are filed. The observations are at the state-year level, and the sample period is 2009 to 2017. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $Ln(AmountLoanLEQ1M_{pretreatment})$ is log amount of loans with origination amounts less than or equal to \$1 million and $Ln(Deposit_{pretreatment})$ is log amount of deposits in the year before a state adopts intrastate crowdfunding. $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(No Business Formation After 2 years)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	2.335*	2.534**	2.258**	2.003	2.300*	2.032**
	(1.165)	(1.242)	(1.068)	(1.282)	(1.276)	(0.968)
$Ln(AmountLoanLEQ1M_{pretreatment}) * D_{s,t}$	-0.106*	-0.115**	-0.102**			
	(0.054)	(0.057)	(0.048)			
$Ln(Deposit_{pretreatment}) * D_{s,t}$				-0.078	-0.090*	-0.079**
				(0.051)	(0.051)	(0.038)
$Ln(GDP_{s,t})$			-0.497			-0.590
			(1.339)			(1.322)
$Ln(Pop_{s,t})$		1.885***	2.485		1.940***	2.651
		(0.600)	(1.754)		(0.499)	(1.732)
Constant	7.919***	-20.557**	-23.649*	7.919***	-21.389***	-25.034**
	(0.028)	(9.066)	(12.553)	(0.028)	(7.535)	(11.700)
Observations	459	459	459	459	459	459
R-squared	0.100	0.111	0.115	0.094	0.105	0.111
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

Table 10: Intrastate Crowdfunding and Real Economic Outcomes

This table reports the differences-in-differences estimates of the effect of intrastate crowdfunding on the employment by non-farm proprietors and on the number of non-employer establishments conditional on a pre-treatment measure of local financial market development. The dependent variable in columns (1) to (3) is log employment by non-farm proprietors and the dependent variable in columns (4) to (6) is log number of non-employer establishments. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $Ln(Deposit_{pretreatment})$ is log amount of deposits in the year before a state adopts intrastate crowdfunding. $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(Non-Farm Proprietor's Employment)			Ln(No. of Establishments)		
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	-0.718*** (0.258)	-0.454** (0.185)	-0.450** (0.177)	-0.620*** (0.228)	-0.351** (0.137)	-0.378*** (0.131)
$Ln(Deposit_{pretreatment}) * D_{s,t}$	0.029*** (0.010)	0.018** (0.007)	0.018** (0.007)	0.025*** (0.009)	0.014** (0.005)	0.015*** (0.005)
$Ln(Pop_{s,t})$		1.153*** (0.166)	1.144*** (0.199)		1.330*** (0.152)	1.392*** (0.166)
$Ln(GDP_{s,t})$			0.007 (0.067)			-0.050 (0.044)
Constant	12.960*** (0.007)	-4.460* (2.512)	-4.407 (2.642)	12.439*** (0.006)	-7.657*** (2.294)	-8.000*** (2.301)
Observations	612	612	612	561	561	561
R-squared	0.769	0.866	0.866	0.788	0.906	0.907
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 11: Intrastate Crowdfunding and Business Dynamics (All Firms)

This table reports the differences-in-differences estimates of the effect of intrastate crowdfunding on job creation by all firms conditional on the pre-treatment measures of local financial market development. The dependent variable is log job creation (excluding self-employment) by all firm. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $Ln(NLoanLEQ1M_{pretreatment})$ is log number of loans with origination amounts less than or equal to \$1 million and $Ln(Deposit_{pretreatment})$ is log amount of deposits in the year before a state adopts intrastate crowdfunding. $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(Job Creation)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	-0.382*** (0.139)	-0.285** (0.139)	-0.080 (0.127)	-0.879*** (0.311)	-0.695** (0.293)	-0.335 (0.275)
$Ln(NLoanLEQ1M_{pretreatment}) * D_{s,t}$	0.036*** (0.012)	0.027** (0.013)	0.009 (0.011)			
$Ln(Deposit_{pretreatment}) * D_{s,t}$				0.035*** (0.012)	0.028** (0.012)	0.014 (0.011)
$Ln(Pop_{s,t})$		0.906*** (0.260)	0.088 (0.330)		0.911*** (0.275)	0.085 (0.328)
$Ln(GDP_{s,t})$			0.671*** (0.106)			0.659*** (0.117)
Constant	11.982*** (0.011)	-1.711 (3.936)	2.575 (4.130)	11.982*** (0.011)	-1.784 (4.152)	2.777 (4.035)
Observations	561	561	561	561	561	561
R-squared	0.527	0.561	0.632	0.529	0.565	0.635
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

Table 12: Intrastate Crowdfunding and Business Dynamics (Young Employer Firms)

This table reports the differences-in-differences estimates of the effect of intrastate crowdfunding on job creation and destruction by young employer businesses conditional on a pre-treatment measure of local financial market development. The dependent variable in columns (1) to (3) is log job creation (excluding self-employment) by firms that are still active one to five years after becoming an employer business. The dependent variable in columns (4) to (6) is log job destruction (excluding self-employment) by firms that are still active one to five years after becoming an employer business. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one if state s has intrastate crowdfunding in year t . $\ln(NLoanLEQ1M_{pretreatment})$ is log number of loans with origination amounts less than or equal to \$1 million and $\ln(Deposit_{pretreatment})$ is log amount of deposits in the year before a state adopts intrastate crowdfunding. $\ln(Pop_{s,t})$ is log of population and $\ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(Job Creation by Firms with Age 1-5 Years)			Ln(Job Destruction by Firms with Age 1-5 Years)		
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	-1.440*** (0.409)	-1.138*** (0.372)	-0.738 (0.462)	-1.663*** (0.478)	-1.418*** (0.462)	-1.359*** (0.490)
$\ln(Deposit_{pretreatment}) * D_{s,t}$	0.057*** (0.016)	0.045*** (0.015)	0.030 (0.018)	0.064*** (0.019)	0.054*** (0.018)	0.052*** (0.019)
$\ln(Pop_{s,t})$		1.495*** (0.275)	0.576 (0.421)		1.214** (0.487)	1.080** (0.534)
$\ln(GDP_{s,t})$			0.733*** (0.168)			0.106 (0.179)
Constant	9.999*** (0.014)	-12.592*** (4.146)	-7.517 (4.905)	10.535*** (0.015)	-7.804 (7.370)	-7.067 (7.437)
Observations	561	561	561	561	561	561
R-squared	0.154	0.217	0.274	0.717	0.730	0.731
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

Table 13: Regulation CF and Business Dynamics (All Firms)

This table reports the differences-in-differences estimates of the effect of Regulation CF on establishment entry and exit by all firms conditional on the pre-treatment measures of local financial market development. The dependent variable in columns (1) to (3) is log of establishment entry by all firm, and the dependent variable in columns (4) to (9) is log of establishment exits by all firm. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one from 2016 onward for all states. $Ln(NLoanLess1MRev_{pretreatment})$ is log number of loans to businesses with revenue less than or equal to \$1 million and $Ln(NLoanLEQ1M_{pretreatment})$ is log number of loans with origination amounts less than or equal to \$1 million in 2015 (the year before the passage of Regulation CF). $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(Establishment Entry by All Firms)			Ln(Establishment Exit by All Firms)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$D_{s,t}$	-0.148* (0.075)	-0.160** (0.070)	-0.157** (0.077)	-0.230** (0.115)	-0.237** (0.105)	-0.237** (0.105)	-0.229* (0.120)	-0.238** (0.110)	-0.239** (0.112)
$Ln(NLoanLess1MRev_{pretreatment}) * D_{s,t}$	0.016** (0.007)	0.010 (0.007)	0.002 (0.005)	-0.005 (0.011)	-0.008 (0.011)	-0.007 (0.015)			
$Ln(NLoanLEQ1M_{pretreatment}) * D_{s,t}$							-0.004 (0.010)	-0.007 (0.011)	-0.006 (0.014)
$Ln(Pop_{s,t})$		1.114*** (0.177)	0.744*** (0.260)		0.615 (0.405)	0.638* (0.371)		0.608 (0.401)	0.635* (0.371)
$Ln(Pop_{s,t})$			0.300** (0.140)			-0.019 (0.248)			-0.022 (0.249)
Constant	8.924*** (0.008)	-7.902*** (2.673)	-5.921** (2.871)	9.152*** (0.012)	-0.133 (6.123)	-0.259 (5.539)	9.152*** (0.012)	-0.034 (6.067)	-0.183 (5.480)
Observations	561	561	561	561	561	561	561	561	561
R-squared	0.320	0.462	0.497	0.739	0.750	0.750	0.739	0.750	0.750
Number of States/Territories	51	51	51	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 14: Regulation CF and Business Dynamics (Small Businesses)

This table reports the differences-in-differences estimates of the effect of Regulation CF on establishment exit by small businesses conditional on the pre-treatment measures of local financial market development. The dependent variable is the log of establishment exits by firms with fewer than 20 employees. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one from 2016 onward for all states. $Ln(NLoanLEQ1M_{pretreatment})$ is log number of loans with origination amounts less than or equal to \$1 million and $Ln(NLoanLess1MRev_{pretreatment})$ is log number of loans to businesses with revenue less than or equal to \$1 million in 2015 (the year before the passage of Regulation CF). $Ln(Pop_{s,t})$ is log of population and $Ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Ln(Establishment Exits by Firms with fewer than 20 Employees)					
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	-0.223*	-0.234**	-0.234*	-0.225*	-0.233**	-0.233**
	(0.132)	(0.116)	(0.119)	(0.125)	(0.110)	(0.111)
$Ln(NLoanLEQ1M_{pretreatment}) * D_{s,t}$	-0.003	-0.006	-0.006			
	(0.012)	(0.011)	(0.015)			
$Ln(NLoanLess1MRev_{pretreatment}) * D_{s,t}$				-0.003	-0.007	-0.007
				(0.012)	(0.011)	(0.015)
$Ln(Pop_{s,t})$		0.747*	0.749*		0.753*	0.752*
		(0.440)	(0.419)		(0.444)	(0.420)
$Ln(GDP_{s,t})$			-0.002			0.001
			(0.255)			(0.255)
Constant	8.961***	-2.326	-2.337	8.961***	-2.414	-2.409
	(0.013)	(6.656)	(6.126)	(0.013)	(6.716)	(6.188)
Observations	561	561	561	561	561	561
R-squared	0.742	0.757	0.757	0.742	0.757	0.757
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

Table 15: Regulation CF and Business Dynamics (Young Employer Firms)

This table reports the differences-in-differences estimates of the effect of Regulation CF on establishment entry and exit of young employer businesses conditional on a pre-treatment measure of local financial market development. The dependent variable in columns (1) to (3) is the log of establishment entry by firms that are still active one to five years after becoming employer businesses. The dependent variable in columns (4) to (6) is the log of establishment exit by firms that are still active one to five years after becoming employer businesses. The observations are at the state-year level, and the sample period is 2009 to 2019. $D_{s,t}$ is an indicator equaling one from 2016 onward for all states. $\ln(NLoanLEQ1M_{pretreatment})$ is log number of loans with origination amounts less than or equal to \$1 million in 2015 (the year before the passage of Regulation CF). $\ln(Pop_{s,t})$ is log of population and $\ln(GDP_{s,t})$ is log of GDP in state s and year t . All specifications include state and year fixed effects. Standard errors are clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

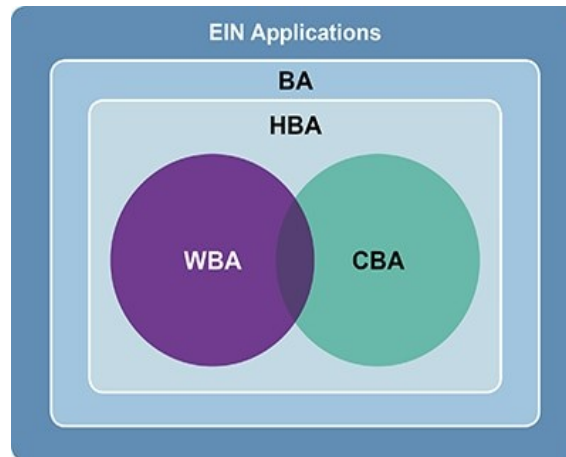
	Ln(Establishment Entry by Firms with Age 1 to 5 years)			Ln(Establishment Exit by Firms with Age 1 to 5 years)		
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{s,t}$	-0.310** (0.144)	-0.326*** (0.122)	-0.321** (0.125)	-0.464*** (0.167)	-0.484*** (0.131)	-0.476*** (0.141)
$\ln(NLoanLEQ1M_{pretreatment}) * D_{s,t}$	0.017 (0.012)	0.012 (0.012)	0.008 (0.012)	0.005 (0.014)	-0.001 (0.013)	-0.007 (0.018)
$\ln(Pop_{s,t})$		1.086** (0.430)	0.912* (0.489)		1.284** (0.613)	1.026* (0.554)
$\ln(GDP_{s,t})$			0.140 (0.192)			0.207 (0.301)
Constant	6.347*** (0.014)	-10.064 (6.497)	-9.111 (6.636)	8.323*** (0.018)	-11.081 (9.267)	-9.673 (8.446)
Observations	561	561	561	561	561	561
R-squared	0.688	0.705	0.706	0.792	0.811	0.813
Number of States/Territories	51	51	51	51	51	51
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (State Level)	Yes	Yes	Yes	Yes	Yes	Yes

9 Figures

9.1 Business Applications Series

Figure 1: The Relationship Between Different Business Applications Series

This figure shows a Venn diagram of the relationship between the four business applications series (BA, HBA, WBA, CBA) and EIN applications. EIN applications are applications for Employer Identification Number (EIN) through filing IRS Form SS-4. The main Business Applications (BA) series describes a subset of all EIN applications. EIN applications excluded from the main Business Applications (BA) series include applications for tax liens, estates, trusts, or certain financial filings, applications outside of 50 states and DC, applications with certain NAICS codes in sector 11 (agriculture, forestry, fishing and hunting) or 92 (public administration), and applications in industries such as private households, civic and social organizations. High-Propensity Business (HBA) Applications are Business Applications (BA) that are more probable to turn into employer businesses with payroll. These applications include Business Applications (BA) by corporations, Business Applications (BA) that indicate they are hiring employees, Business Applications that indicate a planned date to pay wages or a first wages-paid date on the IRS Form SS-4, Business Applications (BA) in certain industries. Business Applications with Planned Wages (WBA) are High-Propensity Business Applications (HBA) that indicate a planned date to pay wages or a first wages-paid date. Business Applications from Corporations (CBA) are filed by corporations or personal service corporations.



Source: <https://www.census.gov/econ/bfs/methodology.html>

9.2 Standard Tests of Parallel Trend Assumption

9.2.1 Intrastate Crowdfunding and the Number of Business Applications

Figure 2: Dynamic Effects of Intrastate Crowdfunding

This figure shows the dynamic effects of introducing intrastate crowdfunding on the log number of business applications using the following dynamic differences-in-differences regression model with continuous treatment:

$$\ln(Y_{st}) = \sum_{l,l \neq -1} \mu_l * \ln(Measure_{s,l=-1}) * \mathbb{1}\{t - E_s = l\} + \beta * D_{st} + \tau_t + \pi_s + \epsilon_{st}$$

Y_{st} is the number of business applications in state s in year t . E_s is the year in which state s adopts intrastate crowdfunding. l shows the distance between year t and the first treatment year for state s . $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that gets value equal to one when the distance between year t and the first treatment year for state s is equal to l . I drop the dummy variable for the period before the treatment year $\mathbb{1}\{t - E_s = -1\}$ to avoid co-linearity. Here, $\ln(Measure_{s,l=-1})$ denotes log amount of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. $D_{s,t}$ is a dummy equaling 1 if state s has intrastate crowdfunding regulations in year t . No control variable is included in this dynamic regression. τ_t and π_s are year and state fixed effects. The sample period is 2009 to 2019. The rhombuses denote the point estimates of μ_l and the bars indicate 95% confidence intervals.

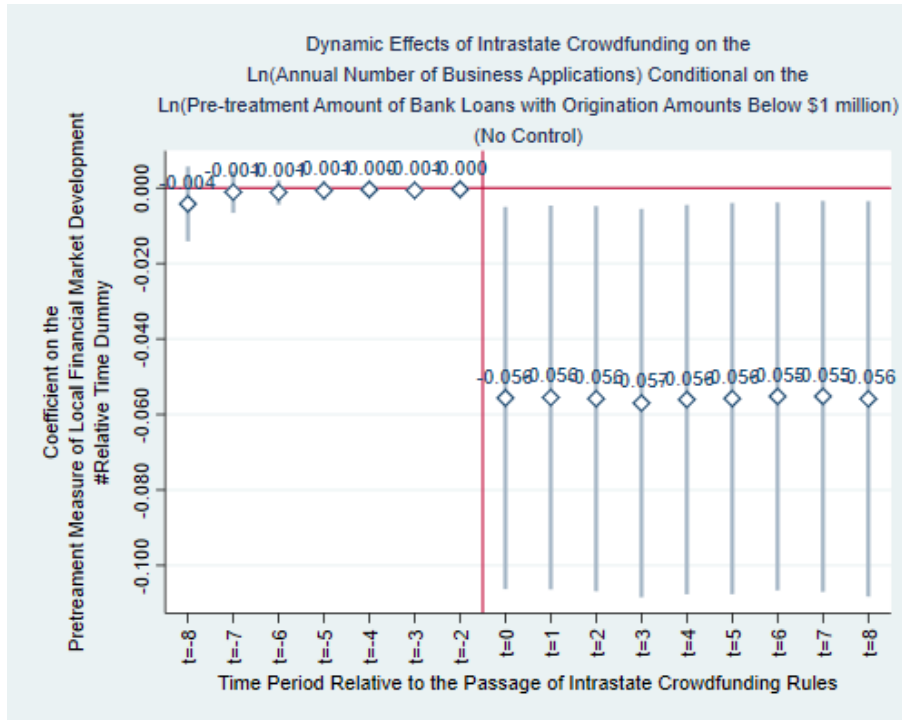


Figure 3: Dynamic Effect of Intrastate Crowdfunding

This figure shows the dynamic effect of introducing intrastate crowdfunding on the log number of business applications using the following dynamic differences-in-differences regression model with continuous treatment:

$$\ln(Y_{st}) = \sum_{l,l \neq -1} \mu_l * \ln(Measure_{s,l=-1}) * \mathbb{1}\{t - E_s = l\} + \beta * D_{st} + \ln(Pop_{s,t}) + \tau_t + \pi_s + \epsilon_{st}$$

Y_{st} is the number of business applications in state s in year t . E_s is the year in which state s adopts intrastate crowdfunding. l shows the distance between year t and the first treatment year for state s . $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that gets value equal to one when the distance between year t and the first treatment year for state s is equal to l . I drop the dummy variable for the period before the treatment year $\mathbb{1}\{t - E_s = -1\}$ to avoid co-linearity. Here, $\ln(Measure_{s,l=-1})$ denotes log amount of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. $D_{s,t}$ is a dummy equaling 1 if state s has intrastate crowdfunding regulations in year t . Log of population ($\ln(Pop_{s,t})$) is included in this dynamic regression. τ_t and π_s are year and state fixed effects. The sample period is 2009 to 2019. The rhombuses denote the point estimates of μ_l and the bars indicate 95% confidence intervals.

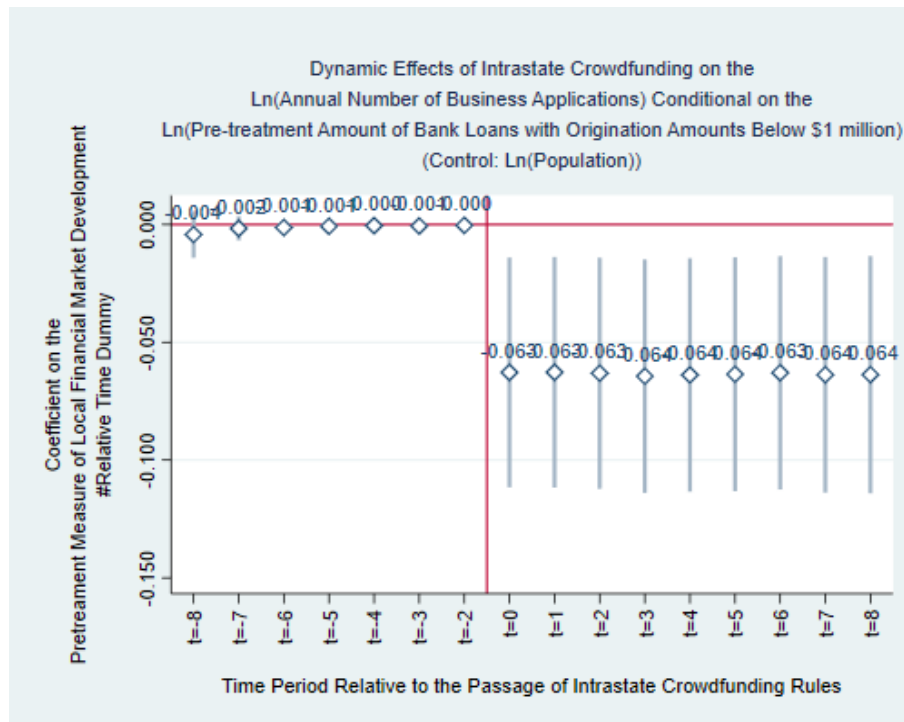
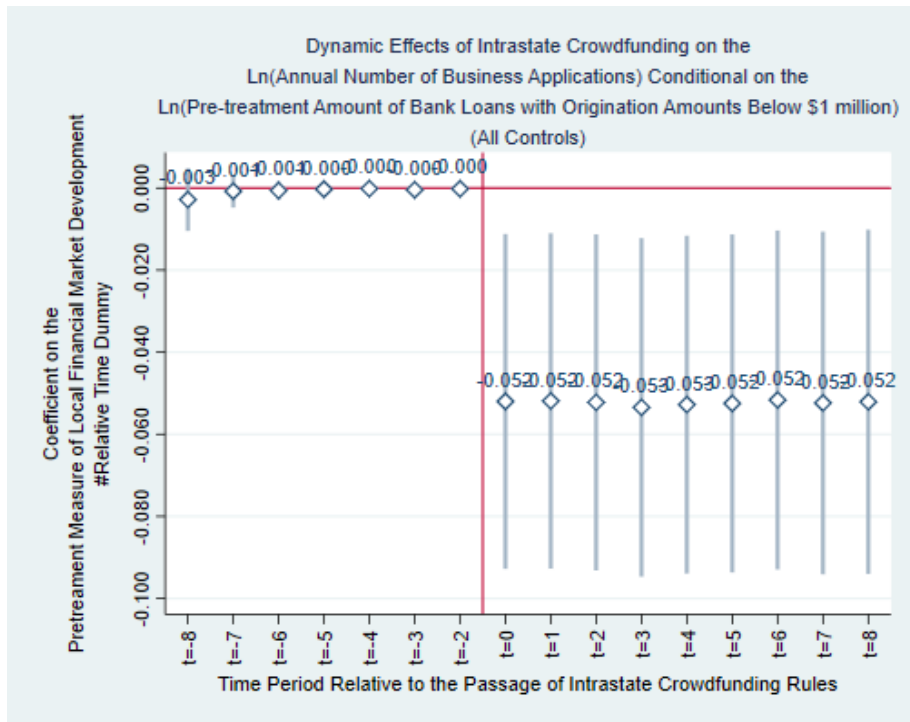


Figure 4: Dynamic Effect of Intrastate Crowdfunding

This figure shows the dynamic effect of introducing intrastate crowdfunding on the log number of business applications using the following dynamic differences-in-differences regression model with continuous treatment:

$$\ln(Y_{st}) = \sum_{l,l \neq -1} \mu_l * \ln(\text{Measure}_{s,l=-1}) * \mathbb{1}\{t - E_s = l\} + \beta * D_{st} + \ln(\text{Pop}_{s,t}) + \ln(\text{GDP}_{s,t}) + \tau_t + \pi_s + \epsilon_{st}$$

Y_{st} is the number of business applications in state s in year t . E_s is the year in which state s adopts intrastate crowdfunding. l shows the distance between year t and the first treatment year for state s . $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that gets value equal to one when the distance between year t and the first treatment year for state s is equal to l . I drop the dummy variable for the period before the treatment year $\mathbb{1}\{t - E_s = -1\}$ to avoid co-linearity. Here, $\ln(\text{Measure}_{s,l=-1})$ denotes log amount of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. $D_{s,t}$ is a dummy equaling 1 if state s has intrastate crowdfunding regulations in year t . Log of population ($\ln(\text{Pop}_{s,t})$) and log of GDP ($\ln(\text{GDP}_{s,t})$) are included in this dynamic regression. π_t and π_s are year and state fixed effects. The sample period is 2009 to 2019. The rhombuses denote the point estimates of μ_l and the bars indicate 95% confidence intervals.



9.2.2 Regulation CF and the Number of Business Applications

Figure 5: Dynamic Effect of Regulation CF

This figure shows the dynamic effect of introducing Regulation CF on the log number of business applications using the following dynamic differences-in-differences regression model with continuous treatment:

$$\text{Ln}(Y_{st}) = \sum_{l,l \neq -1} \mu_l * \text{Ln}(\text{Measure}_{s,l=-1}) * \mathbb{1}\{t - E_s = l\} + \beta * D_{st} + \tau_t + \pi_s + \epsilon_{st}$$

Y_{st} is the number of business applications in state s in year t . E_s is year 2016, the year in which Regulation CF became effective. l shows the distance between year t and year 2016. $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that gets value equal to one when the distance between year t and year 2016 is equal to l . I drop the dummy variable for 2015 ($\mathbb{1}\{t - E_s = -1\}$) to avoid co-linearity. Here, $\text{Ln}(\text{Measure}_{s,l=-1})$ denotes log amount of loans with origination amounts less than or equal to \$1 million in 2015, the year before the passage of Regulation CF. $D_{s,t}$ is a dummy equaling 1 for all states s from 2016 onward. No control variable is included in this dynamic regression. π_t and π_s are year and state fixed effects. The sample period is 2009 to 2019. The rhombuses denote the point estimates of μ_l and the bars indicate 95% confidence intervals.

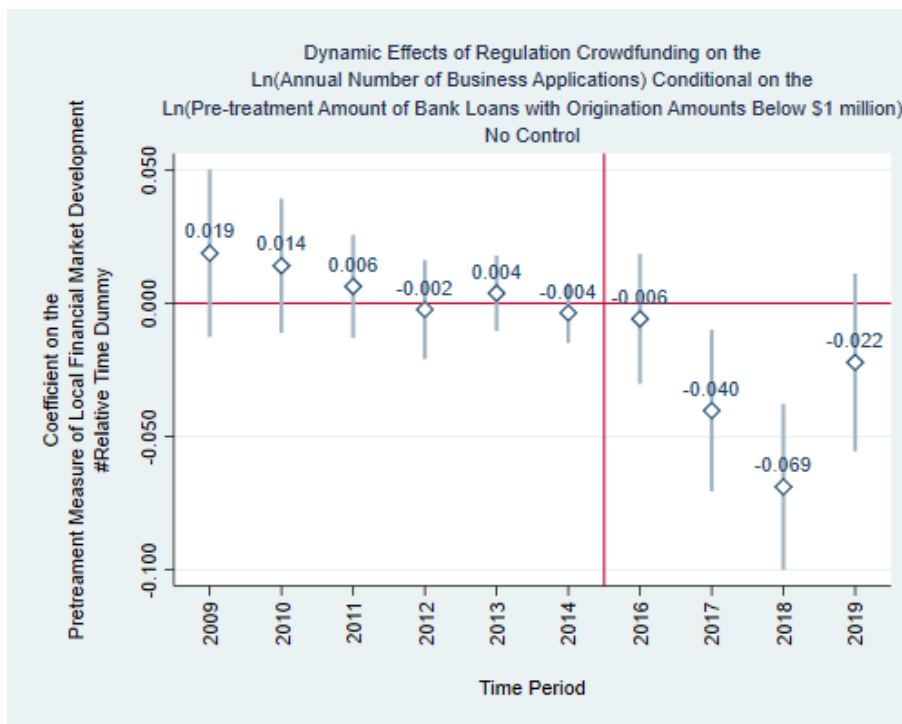


Figure 6: Dynamic Effect of Regulation CF

This figure shows the dynamic effect of introducing Regulation CF on the log number of business applications using the following dynamic differences-in-differences regression model with continuous treatment:

$$\ln(Y_{st}) = \sum_{l, l \neq -1} \mu_l * \ln(\text{Measure}_{s, l=-1}) * \mathbb{1}\{t - E_s = l\} + \beta * D_{st} + \ln(\text{Pop}_{s,t}) + \tau_t + \pi_s + \epsilon_{st}$$

Y_{st} is the number of business applications in state s in year t . E_s is year 2016, the year in which Regulation CF became effective. l shows the distance between year t and year 2016. $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that gets value equal to one when the distance between year t and year 2016 is equal to l . I drop the dummy variable for 2015 ($\mathbb{1}\{t - E_s = -1\}$) to avoid co-linearity. Here, $\ln(\text{Measure}_{s, l=-1})$ denotes log amount of loans with origination amounts less than or equal to \$1 million in 2015, the year before the passage of Regulation CF. $D_{s,t}$ is a dummy equaling 1 for all states from 2016 onward. Log of population ($\ln(\text{Pop}_{s,t})$) is included in this dynamic regression. τ_t and π_s are year and state fixed effects. The sample period is 2009 to 2019. The rhombuses denote the point estimates of μ_l and the bars indicate 95% confidence intervals.

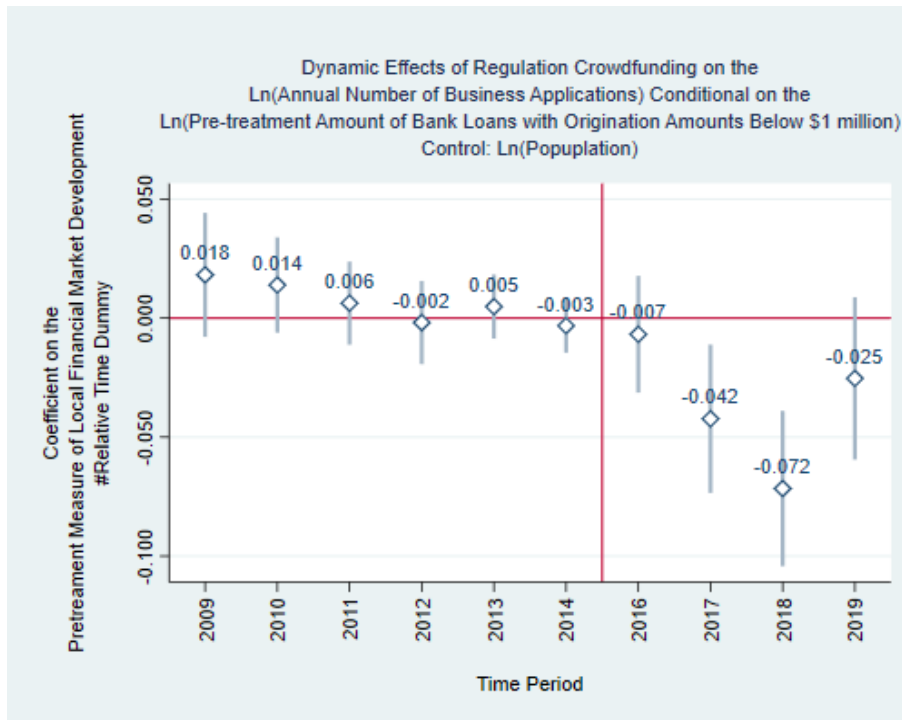
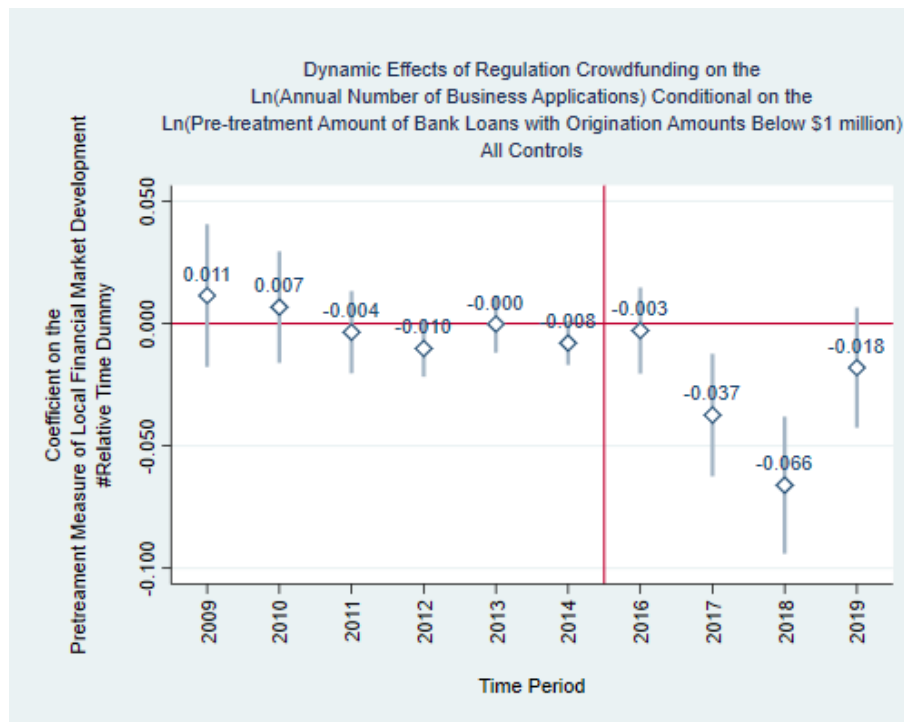


Figure 7: Dynamic Effect of Regulation CF

This figure shows the dynamic effect of introducing Regulation CF on the log number of business applications using the following dynamic differences-in-differences regression model with continuous treatment:

$$\ln(Y_{st}) = \sum_{l, l \neq -1} \mu_l * \ln(\text{Measure}_{s, l=-1}) * \mathbb{1}\{t - E_s = l\} + \beta * D_{st} + \ln(\text{Pop}_{s,t}) + \ln(\text{GDP}_{s,t}) + \tau_t + \pi_s + \epsilon_{st}$$

Y_{st} is the number of business applications in state s in year t . E_s is year 2016, the year in which Regulation CF became effective. l shows the distance between year t and year 2016. $\mathbb{1}\{t - E_s = l\}$ is a dummy variable that gets value equal to one when the distance between year t and year 2016 is equal to l . I drop the dummy variable for 2015 ($\mathbb{1}\{t - E_s = -1\}$) to avoid co-linearity. Here, $\ln(\text{Measure}_{s, l=-1})$ denotes log amount of loans with origination amounts less than or equal to \$1 million in 2015, the year before the passage of Regulation CF. $D_{s,t}$ is a dummy equaling 1 for all states from 2016 onward. Log of population ($\ln(\text{Pop}_{s,t})$) and log of GDP ($\ln(\text{GDP}_{s,t})$) are included in this dynamic regression. π_t and π_s are year and state fixed effects. The sample period is 2009 to 2019. The rhombuses denote the point estimates of μ_l and the bars indicate 95% confidence intervals.



9.3 Tests of Parallel Trend Assumption Using the Method Proposed by Sun and Abraham (2021)

Figure 8: Dynamic Effect of Intrastate Crowdfunding on States with Above-median Local Financial Market Development

This figure shows the dynamic effect of introducing intrastate crowdfunding on the log number of business applications using the dynamic differences-in-differences regression model in equation (5). The rhombuses denote the point estimates of dynamic coefficients (μ_t) for states with above-median pre-treatment measures of local financial market development, and the bars indicate 95% confidence intervals. These coefficients are estimated using the interaction weighted (IW) estimator proposed by Sun and Abraham (2021). The year before adoption of intrastate crowdfunding in each state is dropped. Here, the pre-treatment measure of local financial market development is log amount of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. State and time fixed effects are used, and the sample period is 2009 to 2019.

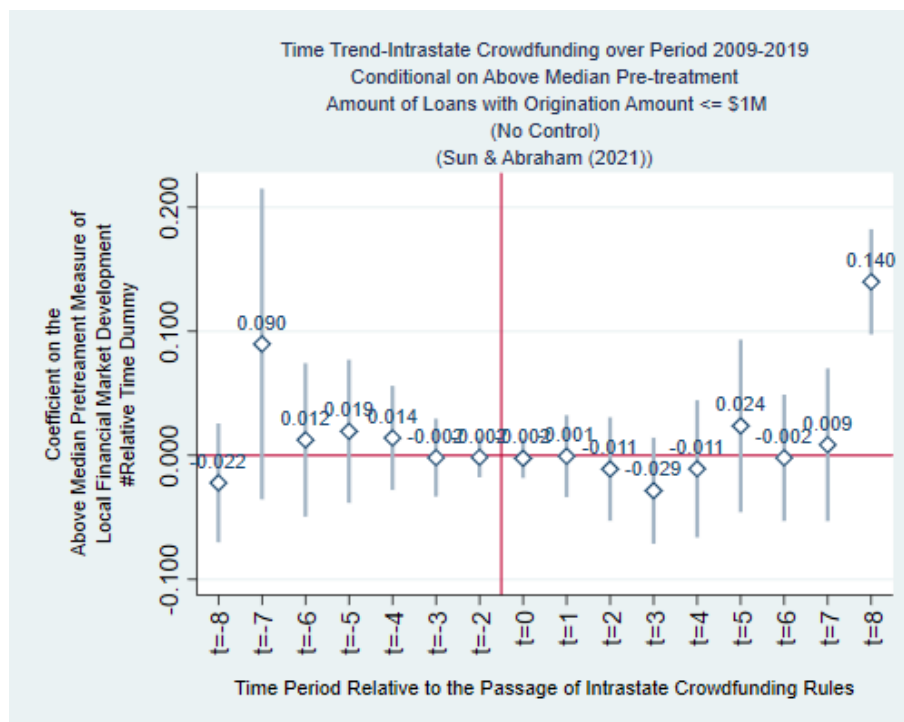


Figure 9: Dynamic Effect of Intrastate Crowdfunding on States with Below-median Local Financial Market Development

This figure shows the dynamic effect of introducing intrastate crowdfunding on the log number of business applications using the dynamic differences-in-differences regression model in equation (5). The rhombuses denote the point estimates of dynamic coefficients (λ_t) for states with below-median pre-treatment measures of local financial market development, and the bars indicate 95% confidence intervals. These coefficients are estimated using the interaction weighted (IW) estimator proposed by Sun and Abraham (2021). The year before adoption of intrastate crowdfunding in each state is dropped. Here, the pre-treatment measure of local financial market development is log amount of loans with origination amounts less than or equal to \$1 million in the year before a state adopts intrastate crowdfunding. State and time fixed effects are used, and the sample period is 2009 to 2019.

