Direct Lenders in the U.S. Middle Market*

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A shortage in credit supply by traditional lenders following the 2007–2008 Financial Crisis has contributed to a surge of direct lenders and, in particular, business development companies (BDCs). Using a novel hand-collected dataset, we provide the first systematic analysis of the BDC sector. In a difference-in-differences setting, we exploit three exogenous shocks to credit supply — new regulations for banks and the collapse of a major finance company — to establish that BDC capital acts as a substitute for traditional financing. We further document that access to BDC funding has stimulated local economic growth using an instrumental variable approach.

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1 Introduction

Firms' access to credit plays an essential role in generating economic growth. Credit allows firms to invest in capital, innovations, and labor, which, in turn, leads to higher productivity. In periods when credit becomes scarce, companies that are small and risky may have difficulty qualifying for conventional forms of financing. This issue has become particularly germane after the Financial Crisis of 2007–2008, which has triggered the tightening of regulation in the banking sector and impeded credit supply. These changes in credit environment have contributed to a surge in direct lenders and, in particular, business development companies (BDCs).

Despite their increasing global prominence, direct lenders have received limited attention in the academic literature. Lack of regulatory oversight and reliance on private capital for investments contribute to the opacity in this segment of financial intermediation. Focusing our analysis on business development companies allows us to largely overcome issues of the data scarcity due to their regulatory status. BDCs are a special type of a closed-end investment company which provides funding directly to businesses with annual revenues between $10 million and $1 billion — so called middle-market companies. Over the past two decades, the BDC sector has grown rapidly with asset growth close to 35% per annum almost reaching $100 billion in total assets as of 2017:Q4, making it an interesting sector to study in itself (see Figure 1).

This paper provides the first systematic analysis of BDCs and assesses their role within the space of private debt providers. We investigate what factors determine the entry of BDCs in local lending markets and what impact this new source of credit has on local economic outcomes. In a difference-in-differences setting, we show that BDCs enter markets with a shortage of financing by traditional lenders. To this end, we exploit three contractionary shocks to credit supply: the introduction of stress tests for bank holding companies, the 2009 collapse of major finance companies, and the new

accounting standards on the consolidation of off-balance items for banks. To uncover the causal effect of BDC financing on local economic growth, we further implement an instrumental variable approach where we rely on heterogeneity in counties' exposure to the above credit supply shocks. Taken together, our empirical findings suggest that BDCs fill in the lending gap in the middle market, thereby stimulating local employment and output.

For our analysis, we hand collect an extensive database of BDC investments from publicly available filings. Our database covers the period 2001:Q1 through 2017:Q4 and includes 69 BDCs, 9,487 portfolio companies, and 20,817 individual debt investments along with their characteristics such as debt type, deal size, industry, interest rate, and maturity date. We additionally establish the geographic areas in which BDCs concentrate their investment activity by hand-collecting the exact addresses of their borrowers from the capital registration statements. These location data allow us to uncover the factors driving the rise of BDCs and assess the importance of BDC financing for economic growth. To the best of our knowledge, it is the largest and most comprehensive investment-level database of its kind.

Business development companies were created in the 1980s with the goal to stimulate the flow of capital to small- and mid-sized private businesses. However, the growth of the BDC sector began to significantly increase only in the early 2000s. In line with the regulatory restrictions on their activity, we observe that a median BDC allocates more than 90% of its assets to investments in portfolio companies with broad presence across industries and geographical areas. At the same time, these portfolios are highly skewed towards few large borrowers and as such viewed as underdiversified. On the upside, this concentration allows BDCs to enhance the value of their credit by providing substantial managerial assistance to their borrowers.

Among the financing solutions offered to middle-market firms, BDCs predominantly invest through debt securities with a recent shift to senior debt deals. Equity constitutes

close to a quarter of BDCs' investments. One peculiarity of BDCs is that they can offer "one-stop" financing solutions simultaneously providing equity and debt capital to a portfolio company. Zooming in on the terms of debt securities shows that direct loans carry a premium of 400–500 basis points relative to bank commercial and industrial (C&I) loans.[1] A median loan originated by BDCs fluctuates around $10 million prior to the Financial Crisis dropping to $5 million thereafter and has a maturity of 4–6 years. In order to make their financing solutions attractive to middle-market companies, BDCs offer significant flexibility, loan tailoring, quicker deal execution, and looser covenants.

To sustain their investment activities, BDCs rely on capital markets to secure both equity and debt financing. Apart from that, they borrow from banks through revolving credit facilities and term loans. Even though their maximum leverage ratio prescribed by the regulation is 50%, BDCs tend to maintain an equity-to-assets ratio of 60%–70% amid the high riskiness of their portfolios.[2] Provided that the majority of BDCs are publicly traded institutions, their equity ownership provides retail and institutional investors with the access to illiquid investments in the middle-market companies. The 13-F disclosures indicate that among key institutional shareholders are private equity firms, mutual funds, and banking institutions. In a companion paper, we document that substantial drop in mutual fund ownership of BDCs following their exclusion from S&P and Russell Indices in 2014 (Davydiuk, Marchuk, and Rosen, 2020). A subsequent drop in their investment activity highlights the importance of access to capital markets for the business model of BDCs.

In summary, BDCs represent a hybrid institution between commercial banks, extending term loans and lines of credit to middle-market companies, and private equity funds, providing equity financing along with the managerial assistance. At the same time, BDCs have established themselves as a growing segment within the space of private debt funds, constituting a quarter of the total private debt investments.

[1] Note that we are not able to account for the risk profile of borrowers.

[2] Prior to March 2018 BDCs are allowed to have a debt-to-equity ratio of 1:1 and 2:1 since March 2018.

Unlike other direct lenders, most BDCs are publicly traded allowing them to fund their investments via public capital markets. Importantly, this sector exhibited unprecedented growth following the Financial Crisis with the aggregate total assets increasing from $24.44 billion in 2010:Q1 to $93.02 billion in 2017:Q4.

Given the importance of credit availability for economic growth, we next examine the real effects on middle-market firms from the expansion in direct lending by BDCs in the post-crisis period. Figure 2 demonstrates a substantial heterogeneity in the presence of BDCs' investments across the U.S., with the highest concentration in the coastal areas. Using this geographical variation, we analyze whether the access to financing from BDCs has a positive impact on future local economic outcomes. However, we face several identification challenges. First, we might observe a positive relationship between capital provision by BDCs and local economic growth, that is not necessarily due to the firms' credit access, but rather to the choice of BDC managers to target firms located in areas with high expected growth opportunities. Second, BDC capital could have been either superfluous or negligible and played no role in stimulating employment and output. Finally, the growth in macroeconomic outcomes could have been achieved even in the absence of these direct lenders, with BDC borrowers employing an alternative funding source.

To uncover the reasons behind the growth of new direct lender and assess real effects from firms' access to BDC financing, we exploit three exogenous negative shocks to the supply of capital to middle-market firms by traditional banks and finance companies.

First, we exploit one of the macroprudential policies instituted following the 2007–2008 Financial Crisis for bank holding companies — stress tests — aimed to ensure that financial institutions are well-capitalized to withstand future economic downturns.[3] We rely on the first implementation of these tests under the Supervisory Capital Assessment Program (SCAP) as our shock, provided that the overall setup and test outcomes were

[3]See Acharya, Engle, and Pierret (2014), Acharya, Berger, and Roman (2018) and Cortés, Demyanyk, Li, Loutskina, and Strahan (2019).

the least predictable. Under a threat of failing future stress tests, BHCs participating in the SCAP retained more capital and switched to investments with lower risk weights. Since middle-market firms are relatively risky borrowers and as such lending to them is more costly in terms of regulatory capital, portfolio adjustments by stress-tested banks constitute a negative credit supply shock in the middle market. We identify exposed counties as those with presence of stress-tested banks which were required to recapitalize amid the SCAP outcomes.

Second, we analyze one of the largest bankruptcies of finance companies during the Financial Crisis — the collapse of the CIT Group. Since debt markets feature borrower segmentation with finance companies serving riskier companies compared to banks (Carey, Post, and Sharpe, 1998), the CIT Group failure constitutes a contractionary shock to the credit supply in the middle market with a direct impact on potential BDCs' borrowers. Additionally, they might be affected indirectly via the capital reallocation channel. Financial intermediaries may shift their capital away from potential BDC borrowers to companies formerly funded by the CIT Group. We measure the county-level exposure to this credit supply shock by aggregating outstanding loans from the CIT Group prior to the shock.

Third, we study the changes in accounting standards on the consolidation of variable interest entities (VIEs) for bank holding companies according to the FAS 166/167 regulation.[4] Starting from 2011:Q1, this new accounting rule requires banks to consolidate off-balance sheet items onto their balance sheets with direct implications for the calculation of regulatory capital ratios. To offset the decline in the regulatory capital following the adoption of FAS 166/167, VIE-consolidating banks employed a "flight to quality" strategy, thereby reducing credit supply to middle-market firms. We similarly define exposed counties as those with presence of affected banks — banks which were forced to consolidate VIEs' assets onto their balance sheets.

[4]See Dou (2017), Dou, Ryan, and Xie (2018), and Tang (2019) for further details of the FAS 166/167 regulation.

In a difference-in-differences setting, we first document that BDCs enter local markets with a shortage of funding by finance companies and traditional banks. Specifically, we find that following the capital supply shock exposed counties have a 2%–4% higher presence of BDCs than counties in the control group. The effect is stronger following the SCAP and FAS 166/167 shocks than the collapse of the CIT Group. Importantly, in our analysis we assume that the shocks were not anticipated by BDCs. To corroborate our identification strategy, we demonstrate that there were no significant differences in the entry of BDCs between the treated and control groups of counties. This evidence supports our choice of instrumental variables.

To uncover the causal effects from the rise of BDCs, we further implement an instrumental variable approach exploiting exogenous variation in credit supply to middle-market firms following the contractionary shocks. We first document that counties with higher exposure to the shock indeed experience a larger increase in BDC investment activity — supporting the relevance condition of our instrumental variable. We next show that counties with access to BDC financing exhibit a higher employment and output growth in the future. In particular, the point estimates imply that a 1% increase in the BDC investment growth leads to a 0.04%–0.05% increase in employment and output growth when using the CIT bankruptcy as an instrument. At the same time, we find that a 1% increase in the BDC investment growth leads to a 0.22%–0.43% (0.06%–0.32%) increase in employment (output) growth when using the changes to bank regulation as an instrument. This finding is consistent with our conjecture that small and risky firms have been credit rationed in the debt markets and BDCs are filling in this post-crisis lending gap by providing financing to middle market companies.

Literature review. Our paper contributes to the emerging literature on the role of nonbank institutions in the financial sector. As the share of nonbank financial intermediation continues to increase both in the U.S. and worldwide (Financial Stability Board, 2019), policymakers have become concerned about potential risks originating in

this less regulated segment of the economy (International Monetary Fund, 2018). From the macro-financial stability perspective, it is crucial to distinguish between bank and nonbank credit due to strong non-synchronicities in their dynamics throughout the business cycle as it allows to sustain the availability of capital to borrowers (Herman, Igan, and Solé, 2017; Kemp, Stralen, Vardoulakis, and Wierts, 2018). The BDC sector, while a rapidly growing segment within the space of private debt, is yet relatively small compared to the entire financial sector in the U.S. to pose substantial systemic risks.

The tightening of regulation in the banking sector after the Financial Crisis has impeded the flow of credit to borrowers, thereby causing them to substitute away from traditional banks to less regulated financial institutions. In the U.S. mortgage market, Buchak, Matvos, Piskorski, and Seru (2018) document a significant shift toward mortgage originations by shadow bank lenders and, in particular, fintech lenders. The authors document that alternative lenders target market segments and geographical areas where traditional bank mortgage lending is hampered amid the regulatory scrutiny. By contrast, we focus on the role of nonbank institutions in the corporate debt markets. Irani, Iyer, Meisenzahl, and Peydro (2018) and Lee, Neuhann, and Saidi (2019) highlight the importance of nonbank intermediaries in the U.S. corporate syndicated loan market as ultimate holders of loans originated by banks. In this paper, we show that in the middle market segment nonbank lenders act both as originators and holders of loans. Similarly to Buchak et al. (2018), we present evidence supporting a view that direct lenders and, in particular, BDCs fill in the void in the credit supply to middle market companies, credit rationed by banks after the financial crisis due to the ensued stricter regulation.

Our paper is also related to studies analyzing the space of direct investment deals by financial institutions other than banks. Due to the opacity of this less regulated segment of the economy, a thorough analysis of direct lenders and their borrowers is quite challenging. The existing literature argues that credit markets feature lender

specialization and high extent of synergy across different types of institutions. For example, Carey, Post, and Sharpe (1998) compare deals' characteristics originated by banks and finance companies and conclude that finance companies choose to serve observably riskier borrowers. Similar inferences have been drawn from the analysis of private debt placements (Denis and Mihov, 2003) and capital structure of the U.S. public firms (Colla, Ippolito, and Li, 2013). They conclude that nonbank private credit is essential in financing enterprises deemed too risky by traditional lenders. In line with these studies, we find that BDCs specialize in providing credit predominantly to mid-sized private companies. Debt securities issued by these borrowers are typically not rated, but if they were they would have been rated as junk bonds.

Since BDC-sponsored financing of middle-market companies has grown prominently following the Financial Crisis, our paper contributes to the studies analyzing lending to small and medium businesses in the post-crisis financial markets.[5] The common consensus in the literature is that the tightening of regulation in the banking sector has led to a significant decrease in funding extended to small firms (Chen, Hanson, and Stein, 2017; Bord, Ivashina, and Taliaferro, 2018; Cortés, Demyanyk, Li, Loutskina, and Strahan, 2019). In our study, we show that mid-sized firms' access to alternative financing solutions has positive effects on local employment and output growth. While we focus on equity and debt funding provided by BDCs, Samila and Sorenson (2011) and Gonzalez-Uribe and Paravasini (2019) analyze equity investments by venture capital and private equity funds. In general, our findings support the argument that small lenders are more efficient in generating local economic growth (Hakenes, Hasan, Molyneux, and Xie, 2014).

Our analysis of the real effects stemming from the surge of BDC financing also complements the existing literature that assesses real effects of credit expansion in the context of the interstate and intrastate deregulation of the U.S. banking sector in the 1970-

[5]See Berger and Udell (1998) for an extensive review of small business financing.

80s. These studies document positive real effects in terms of output and income growth (Jayaratne and Strahan, 1996; Strahan, 2003; Beck, Levine, and Levkov, 2010), innovation (Amore, Schneider, and Žaldokas, 2013; Chava, Oettl, Subramanian, and Subramanian, 2013; Cornaggia, Mao, Tian, and Wolfe, 2015), and education (Sun and Yannelis, 2016). However, Huang (2008) finds only weak evidence of positive real effects when applying a regression discontinuity method at the county level. In line with these studies, we document that expansion of financial intermediation through entry of nonbank lenders stimulates local output and employment. The corresponding evidence on real effects from small business lending is less conclusive. Craig, Jackson, and Thomson (2007) find that the impact of Small Business Administration (SBA) guaranteed lending on growth is positive but economically small. Using firm-level data, Brown and Earle (2017) estimate that a $1 million increase in SBA lending leads to 3–3.5 additional jobs. In contrast, Greenstone, Mas, and Nguyen (2020) find that small business lending in general does not promote economic activity.

An important advantage of BDCs is that they improve decision making process of their borrowers by making equity investments and providing managerial assistance to their boards. In this regard, BDCs adopt the key features of both commercial banks and private equity funds. In the context of syndicated lending, Fang, Ivashina, and Lerner (2013) and Ivashina and Kovner (2011) argue that a fusion of banks' expertise and private equity capital generate positive effects on loan terms and subsequent performance of originated deals. Furthermore, Bernstein, Lerner, and Mezzanotti (2018) show that the managerial assistance provided by private equity funds to their portfolio companies is beneficial in alleviating negative impacts during market downturns.

This paper is closely related to the analysis of Chernenko, Erel, and Prilmeier (2018), who examine the terms of nonbank loans for a large set of *publicly traded* middle-market companies. Due to the eligibility requirements on portfolio companies, BDCs primarily specialize in financing *private* companies and, as a result, constitute only a small share

of lenders under consideration in Chernenko et al. (2018). The contribution of our paper therefore is to provide insights into nonbank lending in the less transparent segment of the middle market.

Since BDCs are a growing part of the larger private debt sector, our analysis complements the study by Munday, Hu, True, and Zhang (2018), who provide an overview of the performance of private credit funds in the U.S. Furthermore, our paper is closely connected to Loumioti (2019), who analyzes the institutional composition of direct lending space and links the rise of direct lending to the recent changes in the regulation of the banking industry. The focus of this paper, however, is the BDC sector and its role in the middle-market credit provision. To the best of our knowledge, the systematic analysis of business development companies and their lending activities is novel to the literature.

The remainder of the paper is as follows. Section 2 provides institutional background on BDCs, and Section 3 contains the data details. The systematic analysis of the BDC sector is provided in Section 4. In Sections 5 and 6, we analyze the drivers of the BDC entry and estimate real effects stemming from firms' access to the new source of financing, correspondingly.

2 Institutional Background

Business development companies (BDCs) were created through the *Small Business Investment Incentive Act of 1980* ("1980 Amendments") to address a perceived crisis in the capital markets. Market participants (and in particular private equity funds) believed that many restrictions in the *Investment Company Act of 1940* (the "1940 Act") hampered the flow of capital to small- and mid-sized private businesses. Congress responded to these concerns by enacting the 1980 Amendments with the explicit intent to facilitate the flow of capital to companies which were perceived as less capable of securing

conventional forms of financing. After their initial appeal in the 1980s, however, the popularity of BDCs was rather modest until 2003, when we see that the number of BDCs and their assets under management begin to significantly increase (see Figure 1).

A BDC is a special category of a closed-end investment company. Under the 1980 Act, BDCs benefit from relaxed requirements on external debt issuance and greater flexibility with respect to investor compensation than typical closed-end funds have. In return, BDCs are subject to a number of restrictions on their activity.[6] Specifically, BDCs are required to hold at least 70% of their investments in eligible assets, which primarily consist of cash, government securities, and investments in *eligible portfolio companies*. The latter in turn include all private U.S. companies and public U.S. companies with equity market capitalization of up to $250 million.[7] Aside from the eligible asset requirement, a unique feature of BDCs is that they are required to provide substantial managerial assistance to their portfolio companies. BDCs typically provide significant guidance and counsel concerning the management, operations, or business objectives and policies of their portfolio companies (Boehm, Krus, Pangas, and Morgan, 2004).

BDCs fund their investments in eligible portfolio companies by raising capital both in public and private markets. After the initial round of investment using private funding, most BDCs decide to become publicly traded and raise equity through an initial public offering (IPO). As to debt funding, BDCs do not rely on short-term funding such as deposits but rather borrow long term through senior secured debt, convertible bonds and other hybrid securities. In terms of the outstanding debt amounts, BDCs are less restricted than other closed-end funds but more than traditional banks. By regulation prior to 2018, BDCs were required to have a debt-to-equity ratio of 1:1 compared to other investment companies having a 1:2 ratio requirement. Meanwhile, banks must maintain a leverage ratio — a ratio of regulatory tier 1 equity capital to average total assets — of at least 4% and must be above 5% in order to be considered well-capitalized from a

[6]Pub. L. No 96–477, 94 stat. 2275

[7]See the Section 55(a) of the 1940 Act for a more detailed definition of eligible assets.

prompt corrective action standpoint. The BDC debt-to-equity ratio of 1:1 translates into a minimum leverage ratio of 50%. In March 2018, the restriction on BDC leverage was further relaxed to a minimum of a 2:1 debt-to-equity ratio or a 33% minimum leverage ratio.

For tax purposes, BDCs can elect to be treated as a regulated investment company (RIC).[8] By doing so, they can avoid double taxation by passing through their net income and capital gains to shareholders free of tax. The key prerequisite for qualifying as a RIC is distributing at least 90% of taxable income to debt- and equityholders. Further requirements include income and diversification tests for sources of income.[9] Since most of the BDC income is distributed as dividends and capital gains, shareholders end up holding high yielding stocks in addition to enjoying a sizable tax advantage.

One advantage of BDCs is that they provide retail investors with the access to illiquid investments in private companies. Historically, this risk exposure was only available to institutional investors and wealthy individuals through private funds. By being publicly traded, BDCs provide their investors with similar risk exposure and substantial liquidity at the same time. In this sense, business development companies are similar to publicly held private equity or venture capital funds. Moreover, investors benefit from regulatory disclosures by having access to the information on the BDCs portfolio strategy and end-use of funds. When electing to be treated as a BDC, a company must have a class of its equity securities registered under the *Securities Exchange Act of 1934*. Consequently,

[8]BDCs are not registered investment companies, but instead are closed-end investment companies that elect to be treated as a RIC under the 1940 Act by filing a notice with the SEC (Boehm et al., 2004).

[9]The "90% Income Test" is that a BDC must derive in each taxable year at least 90% of their gross income from dividends, interest, payments with respect to securities loans, gains from the sale of stock or other securities, or other income derived with respect to their business of investing in such stock or securities. The "Diversification Test" requires that a BDC diversify their holdings so that at the end of each quarter of the taxable year: (1) at least 50% of the value of their assets consists of cash, cash items, U.S. government securities, securities of other regulated investment companies, and other securities if such other securities of any one issuer do not represent more than 5% of their assets or more than 10% of the outstanding voting securities of the issuer; (2) no more than 25% of the value of their assets is invested in the securities (other than U.S. government securities or securities of other regulated investment companies) of any one issuer or of two or more issuers that are controlled (as determined under applicable Internal Revenue Code rules) by the BDC and are engaged in the same or similar or related trades or businesses.

BDCs file periodic and current reports (i.e., Forms 10-Q, 10-K and 8-K) as well as proxy statements with the SEC like those filed by public companies.

3 Data

Our analysis of the BDC sector relies on a variety data sources. The BDC universe is constructed from the list of companies that file a Form N-54A with the Securities and Exchange Commission (SEC).[10] Panel (a) of Figure 3 demonstrates that the number of companies making a BDC election has been steadily increasing since 2001 and has reached over 90 as of 2017:Q4.[11]

First, we gather the BDC-level data to understand the business model of the BDCs themselves. We analyze financial statements data from S&P SNL Financial, debt capital structure data from S&P Capital IQ, and ownership structure data from WRDS SEC Analytics Suite (13F Holdings Data). As shown in Figure 1, SNL Financial collects financial statements data both for publicly traded and privately held BDCs, with the growing presence of the private companies in the very recent years. Additionally, we retrieve data on private debt deals from Preqin Pro.

Second, we construct a comprehensive database of BDC investments by hand-collecting data from the SEC filings. As part of their regulatory status, publicly registered BDCs have to disclose their individual investments in the 10-Q and 10-K filings, within the so-called schedule of investments (SOI) tables (see Figure 3, Panel (a)).[12] Our database covers the period 2001:Q1 through 2017:Q4 and includes 69 BDCs providing funding to 9,487 portfolio companies.[13] To our knowledge, it is the largest and most

[10]Form N-54A is a notification of election to be subject to Sections 55-65 of the 1940 Act.

[11]Note that balance sheet information available through SNL Financial is reported only for 81 as of 2017:Q4 (see Figure 1).

[12]The publicly registered BDCs include not only publicly-traded BDCs but also privately held institutions.

[13]The total number of portfolio companies increases to 10,069 when we include collateralized loan

comprehensive investment-level database of its kind.[14] It includes key investment-level variables such as industry, instrument type, deal amount, rate, and maturity date.

Finally, to establish the geographic areas in which BDCs concentrate their investment activity we augment our investment-level data by collecting location data on the BDC-funded companies. Majority of BDCs file N-2 forms — a registration statement submitted to the SEC when issuing new debt and equity securities. Importantly, these forms record the exact addresses of portfolio companies, which allows us to hand-collect location data (city, state and zip code) for over 7,100 businesses. Additionally, we manually track company name changes and account for mergers and acquisitions. The main identifier for portfolio companies in the SOI tables and N-2 forms is the name and therefore we rely on an algorithm for reducing and matching string values to merge the location data to the BDC investments dataset. Appendix A provides further details on this merging method. In almost each quarter, we obtain the location data for over 80% of portfolio companies (see Appendix Figure A.2). The figures are 5%–10% higher if we measure the share of portfolio companies with location information in terms of their investment value. Since BDCs file N-2 forms when expanding their investment activity and seeking for new capital, there might be selection bias in the location measurement. To address this concern, we complement our location data with addresses that we obtain from Bloomberg company profiles. This step yields location information for additional 955 firms, thereby increasing the coverage to over 90% in terms of the investment value.

In addition to the BDC- and investment-level data, we rely on the Call Reports to measure asset holdings of consolidated VIEs for bank holding companies, on the Federal Deposit Insurance Corporation (FDIC) Summary of Deposits to identify banks' presence in local markets, and on Thomson Reuters DealScan syndicated loan data to construct

obligations, collateralized debt obligations, and investments to venture capital funds, mutual funds, and other funds which allow investors to access the financial markets.

[14]We are aware that S&P's LCD product includes a proprietary database with investment-level BDC data. This database begins much later than ours (2013:Q3) and, based on the provided information, appears to include less BDCs.

counties' exposure to the CIT Group collapse. Additionally, we use aggregate and local macroeconomic data. Specifically, we collect the data on employment, job creation, job loss, hiring and separation from the Bureau of Labor Statistics (BLS), gross output from the Bureau of Economic Analysis (BEA), and number of establishments from the Internal Revenue Service (IRS). The data on consumer price index (CPI) come from the BLS. The price level is normalized to 1 in December of 2017. All of the nominal quantities are deflated by the CPI to obtain real measures.

4 Systematic Analysis of BDC Sector

Figure 1 demonstrates that BDCs have expanded rapidly over the past two decades with asset growth close to 35% per annum to nearly $100 billion as of end-2017. Provided that credit availability enhances the productive capacity of firms, the entry of new lending institutions could stimulate economic growth. Despite BDCs growing prominence, there has been no systematic study of these direct lenders in the literature. We therefore carry out a thorough analysis of the BDC market using the existing data sources and our newly constructed database.

4.1 Role of BDCs in the Middle Market

Financing middle-market companies is intrinsic to the BDC business model. BDCs specialize in providing these companies with large capital infusions, helping them to scale and grow their businesses, often with the goal of taking a company public through an initial public offering, selling a company through a strategic acquisition, or negotiating a management buyout. According to the National Center for the Middle Market (NCMM), middle-market companies are defined as firms with annual revenues ranging between $10 million and $1 billion. For example, one of the largest BDCs —

the Main Street Capital Corp. — operates in the lower middle market and defines its investment targets as U.S. companies with revenues between $10 and $150 million and earnings between $3 and $20 million.

The middle market is a critical sector of the U.S. economy fueling job creation, yet relatively understudied in the academic literature. As of 2017, the NCMM estimates that the middle-market sector comprises nearly 200,000 companies and accounts for a third of private-sector employment and GDP. Survey evidence however suggests that one of the key impediments to the growth in this sector is lack of funding under advantageous terms (Makhija, 2011). Middle-market firms are relatively large and mature to qualify for small business or venture capital financing, but they are at the same time not large enough to directly tap public capital markets. As such, they predominantly rely on financing from banks, private equity (PE) funds, private debt (PD) funds, and more recently from business development companies. The BDC presence in the middle market has been steadily growing with the number of borrowing companies exceeding 4,300 as of 2017:Q4 and reaching close to 10,000 companies in total during our sample period (see Figure 3, Panel (b)).

While in general the BDC capital is allocated across numerous companies and industries, individual BDCs are still not well diversified. Figure 5 points that a large share of BDC investments is within few fast growing industries. As of 2010:Q4, 13% of BDC investments were targeted at companies in business services, 10% — in trading, 8% — in pharmaceutical, and 7% — in wholesale sectors. The Figure also highlights the recent shift towards more innovative and R&D intensive industries, such as technology and energy sectors. Not only BDCs were drawn to the energy sector but also PE firms, who conducted buyout deals, exploiting the downturn in oil and gas stocks in 2014 (PitchBook, 2019). At the same time, we observe the decline in the investment flow to pharmaceutical industry from 8% in 2010:Q4 to 2% in 2017:Q4.

Figure 2 shows that the presence of BDC investments is dispersed across the U.S.

counties with largest concentration in the U.S. coastal areas. Importantly, there is a substantial heterogeneity in the amount of credit supplied to companies in different regions. For example, as of 2017:Q4 such counties as New York (NY), Harris (TX), Cook (IL), Nassau (NY), and Los Angeles (CA) received over $1.8 billion each in financing from BDCs, while companies located in South Dakota and West Virginia have very limited use of this funding form. Most BDCs invest nationwide being present in at least 10 states. As of 2017:Q4, a typical BDC has 6% of its portfolio companies within the same county and 32% within the same Census region (see Appendix Table B.1). The median BDC-to-borrower distance constitutes over 500 miles (see Appendix Figure B.3). At the same time, here are a handful of small BDCs that invest locally. This widespread allocation of capital across the U.S. may result in a significant contribution to job creation, employment and GDP growth at the aggregate level.

4.2 BDC Portfolio Composition

A unique feature of BDCs is that they are required to provide substantial managerial assistance to their borrowers. Not surprisingly, we find that BDCs investment portfolios are highly skewed to a few large portfolio companies. Table 2 documents that as of 2010:Q4 the capital allocation to the top 10 companies in a BDC portfolio ranges between 29% and 97%, while the largest allocation to a single company reaches on average 17%. Portfolio concentration of BDC investments only moderately declines between 2010:Q4 and 2017:Q4, with the largest allocation to a single company dropping to 13%. Even though the high concentration of the portfolio increases the BDCs risk exposure, it allows them to provide a higher quality managerial assistance to their borrowers and gives them a more powerful role when negotiating distress situations. Anecdotal evidence further suggests that large-scale deals carry a prestige premium and can help BDCs to secure their position in the competitive market of private debt investments and scale up in the future. Though we observe a skewed portfolio composition when analyzing

capital allocations in terms of their fair values, BDCs originate investment deals across numerous borrowers. For example, a typical BDC holds 154 securities extended to 95 distinct portfolio companies as of 2017:Q4 (see Table 3). While the largest BDCs sponsor more than 200 deals, the smallest — finance less than 35 deals.

The BDC regulation requires that at least 70% of their investments must be in eligible assets, which primarily consist of cash-like securities and investments in qualifying portfolio companies. In line with this regulatory requirement, we find that BDCs tend to hold the ratio of portfolio capital, which is the sum of cash instruments and financial securities, to total assets above 97% on average as of 2017:Q4 (see Table 1). Moreover, Figure 4 demonstrates a substitution effect between risky financial securities and cash instruments with the former being counter-cyclical. BDCs tend to reduce their risk exposure and increase cash holdings during economic slowdowns. In the time series, the correlation coefficient between the cash-to-assets and securities-to-assets ratios is negative 84%. Table 1 further shows that in the cross section of BDCs there is a wide dispersion in cash holdings, with the 90th percentile of the cash-to-assets ratio exceeding 25% as of 2017:Q4.

We next describe the key investment instruments in the BDCs portfolio. Within the corporate structure of their borrowers, BDCs issue most commonly debt securities. As shown in Figure 6, the share of debt investments is relatively stable throughout 2004 and 2017, fluctuating between 60% and 80%. However, in the post-crisis period there has been a shift towards debt with higher seniority. Senior secured debt deals issued by BDCs can be viewed as an equivalent to loans originated by traditional banks. Figure 6 confirms that the growth in senior debt investments was predominantly at the expense of sponsoring junior and subordinated debt. This switch from junior to senior debt tranche can be partially attributed to the increased regulatory scrutiny of the banking sector following the Financial Crisis which allowed BDCs to gain a competitive advantage.

The less prevalent type of securities on the balance sheet of BDCs is equity, including

common stock, preferred shares, warrants, membership, and limited partnership interests. Figure 6 shows that equity securities constitute less than 25% of all issued financial securities in terms of their fair values. When considering the number of deals, equity investments on average represent 43% of all outstanding deals as of 2010:Q4 and 32% as of 2017:Q4 (see Table 3). One of the risk-management strategies implemented by BDCs is offering a debt security bundled with a warrant. In periods when a portfolio company defaults on its obligations, a BDC can exercise a warrant to receive a stake in the company and acquire the control rights, thereby offsetting its losses on debt securities. In our sample, around 13% of portfolio companies conform to this financing strategy.

One further peculiarity of BDCs is that they originate "one-stop" capital solutions simultaneously providing debt and equity funding to their borrowers. On one hand, portfolio companies benefit from the convenience of obtaining all capital from one provider and lower search costs. On the other hand, this product mitigates the conflict of interest and, thus, allows BDCs to achieve cost-effective resolution of the borrowers' financial distress. Because of these benefits, around 30% of portfolio companies rely simultaneously on equity and debt financing from BDCs. If we exclude the financing solutions in which debt securities are bundled with equity warrant, this figure drops to 22%.

Finally, BDCs lend to portfolio companies via structured products such as collateralized loan obligations (CLO) and collateralized debt obligations (CDO). However, investments through these structured products constitute only a small share of BDCs investment portfolio — less than 5%. Table 3 further shows that a typical BDC holds only 2%–3% of its portfolio capital in CLOs and CDOs in terms of the number of originated deals. These numbers are in line with the business objective of BDCs — to facilitate the flow of capital to middle-market companies.

4.3 Terms of BDC Debt Securities

Even though BDCs offer various financing solutions, their main investment instrument is debt securities. As reported in Table 3, debt deals constitute the dominant share of the investments originated by BDCs exceeding 62% on average as of 2017:Q4. By zooming in on the terms of BDC debt securities, we find that a median loan originates by BDCs fluctuates around $10 million prior to the Financial Crisis dropping to $5 million thereafter (see Figure 7, Panel (a)). Table 4 further shows that the size of a median loan at the origination date is close to the size of a median outstanding loan.[15] Moreover, a median BDC loan has a maturity of 4–6 years, which is similar to the maturity of loans issued to public middle-market companies in the syndicated loan market (see Figure 7, Panel (b)).[16]

Figure 8 shows that BDC borrowers typically face interest rates of 8%–11%. When benchmarked against the aggregate rate on bank C&I loans, the spread comprises about 5% on average.[17] This comparison is subject to a caveat that this spread does not take into account the difference in the risk profile of bank and BDC borrowers and as such does not necessarily imply that BDCs loans are relatively more expensive. These magnitudes are consistent with findings of Chernenko et al. (2018), who document that public middle firms face about 4%–5% higher interest rates when borrowing directly from nonbank financial intermediaries relative to traditional banks. Once controlling for firm and loan characteristics the spread reduces to 2%. Among possible reasons why middle-market firms choose to borrow from BDCs despite the higher cost are greater flexibility in loan tailoring, quicker deal closure, and looser covenants. Since BDCs do not face any

[15] Occasionally BDCs record loans amounts with negative values which represent unfunded loan commitments.

[16] We estimate the maturity of loans issued in the syndicated loan market to middle-market companies by imposing the following restriction on the overall sample: we consider borrowers with revenues between $10 million and $1 billion which receive a term loan of $100 million or less.

[17] We compute the weighted average interest rate on C&I loans as the ratio of the aggregate sum of interest and fee income on C&I loans in domestic offices (*riad4012*) divided by the aggregate sum of average C&I loans in domestic offices (*rcon3387*).

restrictions on their borrowers' loan-to-earnings ratios, they are able to provide larger loan amounts to firms with low earnings relative to banks.

BDCs offer several pricing alternatives for their debt securities, including a conventional spread over a base rate (e.g., LIBOR), a fixed cash rate, and a "payment-in-kind" (PIK) rate options. Table 4 demonstrates that debt deals with a fixed cash rate were relatively more common among BDCs in 2010, while in 2017 there has been a shift towards floating rate pricing.[18] Not surprisingly, we find that floating loan rates are on average lower than the fixed ones. For example, in 2010:Q4 the median variable loan rate offered by BDCs was almost 4% lower that the corresponding fixed rate. In 2017:Q4, this difference shrinks to 2%. Table 4 also indicates that very few deals featured loan rates with a PIK option. The PIK rate offers borrowers a possibility to postpone their debt interest payments up to the maturity date, allowing them to better align the maturity of their capital expenditures and funding. Though more flexible, the PIK loans are on average more expensive than loans with conventional floating and fixed interest rates. Among companies which obtain funding from BDCs through debt securities, about 16% receive a loan with a PIK option at least once.

4.4 BDCs as a Private Debt Provider

Business development companies in the U.S. established themselves as a rapidly growing segment in the market of private debt investments. However, it is difficult to assess their share in the market. The data on financing deals executed between private capital providers and portfolio companies are scarce due to the lack of regulatory oversight. To address this question, we rely on a new dataset of private debt deals provided by Preqin Pro, which allows us to study the deals arranged by direct lenders other than BDCs and identify types of capital providers.

[18] Note Table 4 documents the summary statistics across BDC portfolio debt investments and does not include any controls for riskiness of their borrowers.

We first analyze types of institutional investors active in the market in terms of number of executed deals, since more than a half of private debt deals are recorded without a deal amount. Panel (a) of Figure 9 indicates that about 50% of the observed private debt investments are ultimately sponsored by PE firms. The second largest group of market participants are banking institutions. However, this distribution significantly changes when we focus on the private debt deals with a non-missing deal amount. Panel (b) of Figure 9 highlights that banks are by far the largest capital providers in the private debt markets. This finding could be partially attributed to the limited disclosure of investments by PE and PD funds.

Even though the BDC sector may seem to be relatively small compared to the banking industry, we find that within the space of private debt investments it comprises a quarter of the total private debt volume as of 2017 (see Figure 10). We compare the aggregate value of BDC investments with the assets under management of direct lenders as explicitly identified by Preqin Pro and other private debt funds (including mezzanine, distressed debt, special situations and venture debt funds). Note, Preqin Pro tracks only a subsample of BDCs and does not account for their investments in the direct lending category. We therefore rely on our hand-collected dataset to estimate the aggregate fair value of BDC deals. To ensure consistency between the two data sources, we adjust the assets under management of direct lenders and other private debt funds by netting out the dry powder. Figure 10 further shows that the private debt sector has expanded drastically over our sample period growing on average by 15% per annum, and more than 50% of the private debt deals in the U.S. are originated by direct lenders.

4.5 BDC Capital Structure and Ownership

Unlike deposit-financed commercial banks, BDCs raise both debt and equity capital in public markets to fund their portfolio investments. First, they have access to cheap government sponsored debt financing such as SBA debentures. Second, BDCs can

borrow through public debt instruments. They specialize in issuing so-called baby-bonds (i.e., bonds with face values of $25) and exchange traded notes with yields ranging from 5% to 7% per annum. Apart from the public markets, BDCs borrow from banks through revolving credit facilities and term loans. Figure 11 demonstrates that in the last decade BDCs shift away from bank credit to bond financing. Importantly, BDCs do not face a high degree of the maturity mismatch between their assets and liabilities. Recall, a median loan originated by BDCs has a maturity of 4–6 years. At the same time, we find that the maturity of their liabilities fluctuates around 6–8 years for bonds and notes, 4–6 years for revolving credit, and 4 years for term loans (see Figure 12).

BDCs also raise capital in public equity markets, providing retail and institutional investors with the access to illiquid investments in middle-market companies. Figure 13 shows that a typical BDC maintains a book equity-to-assets ratio of 60%–70%, which is above the level prescribed by the regulation. Prior to March 2018, BDCs were required by law to have a debt-to-equity ratio of 1:1 or equivalently a capital ratio of 50%. Panel (b) of the Figure further demonstrates that netting out cash holdings from the total book assets increases the capital ratio of a median BDC by additional 5%–10%. We also observe that the market capital ratio, calculated using the market value of equity, closely follows its book counterpart except for the Financial Crisis period when the stock prices fell.

Because of its growth potential and high-yield returns, the BDC sector has attracted a number of institutional investors. Using the 13-F disclosures, we find that among key institutional shareholders are private equity firms, mutual funds, and financial intermediaries. The synergies between the private equity sector and direct lenders can be particularly high because of the PE funds' expertise in screening and monitoring private ventures. Sourcing deals from the PE sector can help BDCs to facilitate their lending process. The TPG Capital LP and New Mountain Capital are two examples of private equity firms with BDC ownership. To gain exposure to the middle market, the TPG Capital LP launched a privately held BDC, TPG Specialty Lending Inc, in 2011 and took

it public in 2014. New Mountain Capital has operated a public BDC, New Mountain Finance Corporation, since 2010. In general, we observe the significant presence of private equity firms in the private debt market beyond the ownership of BDCs (see Figure 9).

Figure 14 demonstrates that mutual funds have significant equity holdings in public BDCs, for example, through index investments. The mutual fund ownership of a typical BDC fluctuates between 5%–15% prior to 2014 and declines to 3%–5% following the BDCs' exclusion from S&P and Russell Indices. Davydiuk et al. (2020) document that this shock to the flow of equity capital leads to a drop in BDCs' investment activity with subsequent negative effects for the local employment growth. This evidence highlights the importance of access to capital markets for the BDC lending model.

Rather than financing middle-market firms directly, banking institutions may seek opportunities to enter this market segment indirectly through investments in BDC equity capital.[19] This strategy allows banks to avoid high capital charges, since debt securities issued to middle-market companies are usually not rated, but if they were they would have been rated as junk bonds. Basel II postulates that a capital charge for high-risk debt investments is 150%, while for BDCs equity investments this charge is only 100%. Admittedly, this regulatory loophole may increase bank risk exposures as equity positions in BDCs are levered claims on high-risk debt investments.

Table 6 indicates that it is a common strategy among banks to hold equity of multiple BDCs. For example, Credit Suisse Group AG holds shares of American Capital Senior Floating Ltd., Oaktree Strategic Income Corp., OHA Investment Corp., and Crossroads Capital Inc. In extreme cases, financial intermediaries launch their own BDCs. For instance, in April 2013 Goldman Sachs Group Inc. launched a new lending unit to invest in high-risk debt, later known as Goldman Sachs BDC Inc. Importantly, to avoid the Volcker rule regulations the equity share of a bank should remain below 20%. Otherwise,

[19]Amid the data limitations, we are not able to distinguish between the actual equity ownership by banks, that is, using their capital, or by banks' asset management arms.

a bank-founded BDC would be under the umbrella of a bank holding company and, as such, subject to its regulations. The Table reports that the medial Goldman Sachs Group Inc. ownership level of its BDC shares is 14.5%. In addition to the shares of its own BDC, Goldman Sachs Group Inc invests in other BDCs — Full Circle Capital Corp. and Golub Capital BDC Inc.

BDCs not only provide investors with the access to illiquid investments in private companies, but also offer high returns on their capital allocations. Table 5 reports that a typical BDC close to 9% annually in interest income per unit of assets. The right tail of the interest income distribution exceeds 12% as of 2010:Q4 and 10% as of 2017:Q4. Besides earning interest income on their investments, BDCs collect nontrivial noninterest income predominantly consisting of management fees for their capital allocation services.

In summary, BDCs represent a hybrid institution between private equity funds, providing equity financing along with the managerial assistance, and commercial banks, extending term loans and lines of credit to middle-market companies. BDC financing solutions are attractive to borrowers because of their significant flexibility and speed of execution.

5 Drivers behind the BDC Entry

Figure 2 demonstrates that the presence of BDC investments is dispersed across U.S. counties, with the largest concentration in the coastal areas. Importantly, there is a substantial heterogeneity across regions in the amount of credit supplied by BDCs. For example, as of 2017:Q4 counties such as New York (NY), Harris (TX), Cook (IL), and Los Angeles (CA) received over $1.8 billion each in financing from BDCs, while companies located in South Dakota, Montana, and West Virginia have very limited access to this funding form. We investigate what factors explain this geographic variation in the BDC

presence and drive the growth of the BDC sector.

5.1 Identification Strategy

The National Center for the Middle Market reports that around 55% of middle-market firms have insufficient access to capital markets. According to analyst industry reports, this issue has become particularly germane after the 2007–2008 Financial Crisis which triggered tighter regulatory requirements for banks and impeded credit supply, thereby creating the so-called middle-market funding gap. We conjecture that BDCs fill in this emerged gap in credit supply by offering funding solutions to borrowers who were credit rationed by traditional lenders.

In our analysis, we exploit three contractionary shocks to the credit supply: the introduction of stress tests for bank holding companies, the collapse of a major finance company, and the new accounting standards on the consolidation of off-balance items for banks. While the bankruptcy events represent an idiosyncratic shock to lenders specializing in middle-market financing, the other two regulations constitute a sector-wide shock to the traditional banking industry. We rely on a difference-in-differences analysis to examine whether the presence of BDCs is growing in counties subject to capital shocks.

Bank stress tests. Following the 2007–2008 Financial crisis, the Board of Governors of the Federal Reserve introduced tighter macroprudential policies to ensure that financial institutions are well-capitalized to withstand future potential economic downturns. Among the introduced measures are bank stress tests: the first test was conducted under the Supervisory Capital Assessment Program (SCAP) at the end of 2008 and was followed by the annual Comprehensive Capital Analysis and Reviews (CCARs) from 2011 onwards. As a result of the SCAP, 10 out of 19 bank holding companies were required to increase their regulatory capital (Acharya et al., 2014). Data on the SCAP

results were released on April 24, 2009, while the recapitalization should have been implemented in November 2009.

Among other quantities, banks subject to the SCAP are required to provide estimates of potential losses on their loan portfolios under two alternative macroeconomic scenarios and a set of indicative loss rate ranges. The outcome of the stress test consequently has a direct impact on BHCs' future loan origination. Since banks are constrained by risk-weighted capital ratios, insufficient capital levels will force them to reduce overall capital charges by shifting away from loans to riskier borrowers (see, e.g., Acharya et al., 2018; Gropp et al., 2018).

Through macroprudential policies, the regulators impose a high level of scrutiny on bank holding companies. Under a threat of failing future stress tests, BHCs will retain more capital and choose investments with lower regulatory risk-weights and hence lower loss rates under adverse scenarios. The aggregate effect of such bank-level (that is, microprudential) decisions appears in lower capital provision to private businesses. Traditionally, middle-market firms are not mature enough to tap the capital markets and, thus, rely on banks to secure external financing. A contraction in bank credit provision therefore leads to a funding gap for middle-market companies if their possibilities to substitute bank financing are limited. Within the small business lending segment, Cortés et al. (2019) show that CCARs led to a capital redistribution within the banking sector — away from the stress-tested BHCs to less-scrutinized smaller banks. Given a larger size of middle-market loans and BDCs' specialization, we argue that the recapitalization and loan portfolio adjustments of stress-tested banks constitutes a contractionary shock to middle-market lending and therefore contributes to the rise of alternative non-bank lenders.

In our analysis, we use the first implementation of the stress tests — the SCAP — as our shock, since the design and set of tested characteristics was not known to banks in advance. Even though the following CCARs included a larger group of tested

institutions, the overall setup and test outcomes were more predictable. We define a bank to be treated if it participates in the SCAP, reports non-zero estimated losses on the C&I lending, and was required to recapitalize following the release of the results.

To uncover the effects of this capital supply shock on the rise of BDC financing, we exploit variation in the geographical presence of treated banks across the U.S. and conduct our analysis at the county level. We rely on the FDIC data on Summary of Deposits to measure counties' access to financing from traditional banks. Specifically, a bank is considered to be present in a given county if it has at least one branch located in this county with a strictly positive amount of deposits. We propose two measures: (i) an indicator whether a county j have at least one treated bank, $D(SCAP\ Deposits_{j,2008} > 0)$, and (ii) the deposit market share of treated banks in a county j, measured as the total deposits of treated bank in a county j scaled by the total deposit of all banks in that county, $\frac{\sum_b SCAP\ Deposits_{b,j,2008}}{\sum_b Deposits_{b,j,2008}}$.

Our difference-in-differences approach captures the causal effect of the capital supply shock on the entry of BDCs provided that the following assumptions hold. First, the design of bank stress tests and their results were not anticipated. Second, absent the shock the change in the average outcomes for treated counties would not have been different than the change in the average outcomes for the untreated counties — parallel trend assumption, — which we formally test in Section 5.2. Finally, we require that there exist no unobservable factors that make the treated and control counties systematically different and cannot be controlled for.

The collapse of the CIT Group. Next, we propose to exploit a negative credit supply shock in spirit of Ivashina and Scharfstein (2010), and Chodorow-Reich (2014). Rather than using the failure of Lehman Brothers as a source of exogenous variation in the availability of credit to borrowers, we tailor our identification strategy to the middle market by focusing on finance companies. In our benchmark specification, we analyze one of the largest bankruptcies among finance companies during the Great Recession —

the failure of the CIT Group.

Because of its exposure to underperforming subprime mortgages and student loans and subsequent difficulties in securing short-term funding, the CIT Group had to file for bankruptcy protection on November 1, 2009. Even though it emerged from bankruptcy 38 days later, on December 10, 2009, the CIT Group lending activity started to contract way before in 2008. According to the 10-K filings, its loan origination volume in commercial businesses was $7.0 billion in 2009, down from $18.6 billion in 2008 and well below $35.4 billion during 2007. Particularly dramatic was the drop in consumer and small business lending: $1.3 million in 2009, down from $1.4 billion in 2008 and well below $6.6 billion during 2007[20]. Importantly, even after its restructuring into a bank holding company, the CIT Group never resumed its lending activity at the pre-crisis levels: its new lending volume totaled $3.2 billion in 2011, $6.0 billion in 2012, and $7.1 billion in 2013.

Since debt markets feature borrower segmentation with finance companies serving riskier companies compared to banks (Carey et al., 1998), the bankruptcy of a finance company will have a direct effect on BDC borrowers. Additionally, there could be an indirect effect through a capital reallocation channel: the funding that financial intermediaries could have provided to BDC borrowers is now reallocated to former CIT Group borrowers due to a limited credit supply. Overall, we expect counties with higher exposure to the CIT Group bankruptcy to experience a higher shortage of capital supply and a larger increase in BDC presence.

We argue that the CIT Group bankruptcy constitutes a contractionary shock to the capital supply in the middle market. It is highly unlikely that former CIT Group borrowers can easily switch to financing provided by other finance companies and continue their business operations uninterrupted. The reasons are twofold. First, this segment of the market features a high degree of asymmetric information between

[20]See Form 10-K for the fiscal year ended December 31, 2009 https://www.sec.gov/Archives/edgar/data/1171825/000089109210001036/e38085_10k.htm.

borrowers and lenders, making relationship lending crucial for securing stable financing on favorable terms. Second, we analyze the growth of BDC investments following the Financial Crisis of 2008-09. This period is characterized by a systemic decline in the credit supply, accompanied by an increase in capital search costs and greater challenges of switching between lenders. We therefore argue that the CIT group collapse has indeed resulted in the shortage of credit.

To capture the county-level exposure to the CIT Group failure, we propose two measures: (i) the natural logarithm of the average amount of outstanding loans to companies in county j from the CIT Group between 2001 and 2005, $Ln(\overline{CIT\ Lending}_{j,[2001,2005]})$, as reported in the syndicated loan data by Thomson Reuters DealScan; (ii) an indicator whether companies in county j have any outstanding loans from the CIT Group in the 2001–2005 period, $D(CIT\ Lending_{j,[2001,2005]} > 0)$. We exclude 2006 and 2007 years when measuring the pre-crisis exposure in order to minimize the effect of the credit boom. Additionally note that to measure the county-level exposure we consider all originated loans where the CIT Group is a member of the syndicate irrespective of its role.[21] Our difference-in-differences approach relies on the same set of assumptions as the SCAP shock.

FAS 166/167 regulation. In 2010, the Financial Accounting Standards Board (FASB) instituted new accounting standards on the consolidation of variable interest entities (VIEs) for bank holing companies — so-called FAS 166/167. Starting from 2011 Q1, banks have been required to consolidate securitized off-balance sheet assets onto their balance sheets. Since VIEs' holding assets and associated loan loss reserves became treated as on-balance sheet items, the adoption of FAS 166/167 had a direct effect on the calculation of regulatory capital ratios such as leverage and risk-weighted capital ratios.

In line with previous studies, we argue that this new regulation constitutes an exogenous negative shock to bank credit supply. While Dou (2017) and Dou et al. (2018)

[21] Moreover, we do not differentiate between new loans, amendments and refinancing agreements.

show that following the shock VIE-consolidating banks reduced their small business lending and mortgage approval rates, correspondingly, we cannot document a similar decline in bank lending to middle-market firms due to the lack of the data. It is however highly likely that FAS 166/167 had a negative effect on loans to middle-market firms as well. Since this type of loans is relatively risky and as such more costly in terms of risk-based capital, this conjecture will align with the finding of Tian and Zhang (2016) that affected banks employ a "flight to safety" strategy in terms of credit card lending. VIE-consolidating banks have reduced their lending to risky borrowers, including plausibly middle-market firms, to offset the decline in the regulatory capital following the implementation of FAS 166/167 (Dou et al., 2018).

Using data on asset holdings of consolidated VIEs from Call Reports, we identify 53 bank holding companies that were subject to the FAS 166/167 regulation. In total, these banks have consolidated $756.4 billion of assets on their balance sheets. There is a wide heterogeneity in the degree to which bank holding companies were exposed to this new regulation. While for a typical affected bank the VIEs' assets constituted 7.5% of total assets, the exposure of banks ranges between less than 1% to over 50%.

Similarly to the SCAP shock, we identify treated counties as those with presence of treated banks. Specifically, we construct the following two measures to capture the counties' exposure to the shock: (i) an indicator whether a county j have at least one treated bank, $D(Deposits_{j,2010} > 0)$, and (ii) the deposit market share of treated banks in a county j, measured as the total deposits of treated bank in a county j scaled by the total deposit of all banks in that county, $\frac{\sum_b FAS\ Deposits_{b,j,2010}}{\sum_b Deposits_{b,j,2010}}$. We also rely on the same set of conditions to estimate the causal effect of the FAS 166/167 regulation on the entry of BDCs.

5.2 Difference-in-Differences Analysis

The first step of our analysis is to establish that the growth of BDCs is concentrated in areas with the contraction in credit supply either by finance companies or traditional banks. In our preferred specification, we estimate:

$$D(BDC\ Investment_{j,t} > 0) = \beta Post_t \times Treated_j + \gamma X_{j,t-1} + \eta_j + \tau_t + \varepsilon_{j,t}, \qquad (1)$$

where the dependent variable is an indicator that equals one if a county j in quarter t has a non-zero investment amount by BDCs. $Post_t$ is a dummy variable that equals one post the capital supply shock starting from (i) 2009:Q3 for the SCAP shock, (ii) 2010:Q1 for the CIT shock, and (iii) 2011:Q1 for the FAS 166/167 shock. To capture the treatment effect, we restrict our sample period to two years before and three years after the shock. $Treated_j$ is an indicator that equals one if a county j is in the treated group as defined in Section 5.1. Our control group is limited to non-treated counties with BDC financing along with non-exposed counties adjacent to them. Focusing on adjacent counties allows us to better account for differences in economic conditions across the U.S. geographical regions.

One could be concerned that counties in treated and control groups are systematically different. Table 7 reports the counties' characteristics across the two groups prior to the shock. We find that regardless of the shock, treated counties on average have a higher share of middle-market companies (defined as firms with the number of employees between 50 and 500), a lower number of bank branches per 1000 establishments, and exhibit a lower level of bank competition (measured by the deposits Herfindahl-Hirschman Index (HHI)). The differences in employment and output growth between the treated and control group vary across the shock specifications. In order to alleviate concerns about these systematic differences among counties in treated and control groups, we control for the full set of observable characteristics presented in Table 7, that

is, employment growth, job creation and loss rates, output growth, share of middle-market companies, number of bank branches per 1000 establishments, and deposits HHI. Additionally, we include time and county fixed effects allowing us to account for unobservable time-invariant county-specific characteristics and common time trends.[22]

The coefficient of interest is β, which captures the average growth in BDC presence following the capital supply shock for the treated group of counties relative to the control group. The regression estimates are reported in Table 8. We find that following the capital supply shock exposed counties have a 2%–4% higher presence of BDCs than counties in the control group. The effect is stronger following the SCAP and FAS 166/167 shocks. We additionally document a positive and statistically significant effect when we account for the treatment intensity when measuring counties' exposure to the shocks. For example, for the FAS 166/167 shock a 1 percentage point increase in the market share of treated banks leads to a 9% higher presence of BDCs in treated relative to control counties following the adoption of new regulation.

To formally test that the entry of BDCs in the treated and control counties have evolved in parallel prior to the contractionary credit shock, we estimate the following regression:

$$D(BDC\ Investment_{j,t} > 0) = \sum_t \gamma_t \left(\lambda_t \times Treated_j\right) + \gamma X_{j,t-1} + \eta_j + \tau_t + \varepsilon_{j,t}, \qquad (2)$$

where λs are post-quarter dummies. For each quarter t in our sample period, we set λ_t to one starting from quarter t and zero otherwise. Importantly, we exclude dummies for the last quarter before the shock, which allows us to estimate the dynamics of the treatment relative to this reference period. Figure 15 plots the coefficient estimates of γ along with the 95% confidence intervals. For the SCAP and CIT capital supply shocks, we document "parallel trends" in the presence of BDCs prior to the shock: there were no

[22]Note, that the explanatory variables $Post_t$ and $Treated_j$ are absorbed by the time and county fixed effects, correspondingly.

significant differences in the presence of BDCs between the treated and control group. In line with our conjecture, we find a rise in BDC entry among the exposed counties relative to the treated group, with the effect becoming stronger over time. For the FAS 166/167 shock, we observe a large significant effect after the adoption of new standards on assets' consolidation, with mild pre-shock differences in the number of present BDCs.

Overall, our results confirm our hypothesis that BDCs tend to target the areas that experience shortages in capital supply suggesting that BDC capital can act as a substitute source of financing for loans originated by traditional banks and finance companies.

6 Real Effects From the Rise of BDC Financing

Figure 1 demonstrates a dramatic growth of the BDC sector following the Financial Crisis. The aggregate total assets have grown more than threefold from $24.4 billion in 2010:Q1 to $87.7 billion in 2015:Q4. In this section, we estimate the real effects due to the entrance of new direct lending institutions by exploiting the three shocks to the capital supply by traditional lenders and implementing an instrumental variable approach. Greenwood and Jovanovic (1990) show that expansion in financial intermediation improves the allocation of capital and, therefore, can stimulate economic growth. Hence, we expect that the access to additional sources of financing will have positive effects on employment and output growth.

6.1 Identification Strategy

A naive approach to measure the impact of BDC activity on local economic growth would be, for example, to estimate a cross-sectional ordinary least squares regression:

$$\overline{\Delta y}_j = \alpha + \beta \overline{\Delta BDC\ Investment}_j + \gamma X_j + \varepsilon_j, \tag{3}$$

where $\overline{\Delta y_j}$ is the average future growth rate of employment or output in county j following the entry of BDCs. $\overline{\Delta BDC\ Investment_j}$ is the average growth rate of total investments by BDCs in county j. If our hypothesis is correct, we would find a positive and statistically significant estimate of β coefficient.

Nonetheless, we face a number of identification challenges. First, a positive relationship between capital provision and local economic growth could have been driven by a strategic choice of BDCs' managers to invest in counties with relatively high expected growth potential. Second, even if BDC capital was randomly allocated across counties, it could have been superfluous and played no role in promoting economic growth. Alternatively, the aggregate amount of provided funding could have been negligible to generate any positive effects at the county level. Finally, the economic growth could have been achieved even without access to BDC financing as BDC-funded companies could have employed an alternative capital source.

To address these potential endogeneity concerns, we continue to rely on the three contractionary shocks to the credit supply. We use the continuous measures of county-level exposure as our instrumental variables for the BDC investment activity. To establish the causal effect of the BDC investment activity on future local economic growth, we rely on the following two identifying assumptions. First, the relevance condition requires that BDC investment growth is driven by the shortages in credit supply to middle-market firms. In Section 5.1, we outline the argument why we expect counties with higher exposure to the shocks to experience a larger increase in BDC investment activity. We further validate this condition by calculating Kleinbergen Papp F-statistics in the first-stage regressions of the IV approach.

Second, we require the exclusion condition to hold — the future local economic growth is not directly driven by the contraction of credit supply by finance companies or banking institutions. Note, if anything, the shortage of funding would have rather dampened employment and output growth in localities exposed to the shock since

middle-market companies were either forced to substitute in more expensive financing or reduce their investment intensity and employment.

To further strengthen the exclusion condition, we introduce a time lag between the periods when we measure the exposure to the CIT Group collapse and when we record the macroeconomic outcomes of interest. In particular, while we construct our instrumental variable using loan data over the 2001–2005 period, we assess local economic growth from 2014 to 2016. It is therefore highly unlikely that the future county-level outcomes are affected by the CIT Group decisions to target specific geographical areas leading to 2005. Since the stress-test and FAS 166/167 contractionary shocks were induced by new unexpected regulations at the sector level, we do not introduce the time lag when measuring the geographical presence of affected bank holding companies. Hence, we argue that our instrumental variables satisfy the exclusion condition — they do not affect the future economic growth via any other channel other than the entry of new lenders compensating for a shortage in the credit supply.

6.2 Instrumental Variable Analysis

For our analysis, we construct our sample of counties following the stacked regression approach of Gormley and Matsa (2011). We include counties with non-zero lending either by BDCs or by exposed financial institutions — banks subject to the SCAP, the CIT Group, or banks affected by FAS 166/167 regulation — together with counties adjacent to them. This methodology implies that every neighboring county acts as a "control" for the county with the exposure to the credit supply shock.

First stage. We further test whether the BDC investment intensity grows in counties subject to the capital shock by estimating the first-stage cross-sectional regression of the

IV approach:

$$\overline{\Delta BDC\ Investment}_{j,post\text{-}shock} = \alpha + \beta z_{j,pre\text{-}shock} + \gamma X_{j,pre\text{-}shock} + \varepsilon_j, \tag{4}$$

where $z_{j,pre\text{-}shock}$ is one of the IVs defined above. Remember that for the CIT shock we introduce a time lag when measuring the counties' exposure to the shock. $\overline{\Delta BDC\ Investment}_{j,post\text{-}shock}$ is the average growth rate of total investment by BDCs in county j over the four years following the shock. We first aggregate the fair value of investments across all borrowers located in county j to obtain total investment at the county-level. We then compute the quarter-to-quarter growth rates for each quarter and take the average over the post-shock period. To mitigate the effect of outliers, we follow the approach in Davis, Haltiwanger, and Schuh (1996) and compute the growth rate of x in the following way:

$$\Delta x_{j,t} = \frac{x_{j,t} - x_{j,t-1}}{0.5(|x_{j,t}| + |x_{j,t-1}|)}.$$

We additionally control for the average growth rate in the pre-shock employment and productivity levels for each county, $X_{j,pre\text{-}shock}$.

The results of the first-stage estimation specified in equation (4) are reported in Table 9, where the regressions shown in columns (1) and (2) rely on a continuous measure of the instrument and those reported in columns (3) and (4) rely on a zero-one measure. In our regressions, we include fixed effects at the level of adjacent county groups. We document that indeed there is a strong positive relationship between the exposure to the capital supply shock and BDC lending in the post-shock period. For example, when using $Ln(\overline{CIT\ Lending}_{j,[2001,2005]})$ as an instrumental variable, we find that a 10 percent increase in the amount of CIT lending in the pre-crisis period results in 0.3% increase in the average growth rate of BDC investments. We also show that counties with non-zero loans by the CIT group during the 2001-2005 period have on average a 2% higher growth rate of BDC investments than counties with no exposure to the finance company collapse. The results remain quantitatively and qualitatively similar if we use

the SCAP and FAS 166/167 shocks. Importantly, the estimated β coefficient across all specifications are strongly statistically significant, which together with the high values of Kleinbergen Papp F-statistics further validate that our instrumental variables are not weak.

Second stage. In the second-stage regression, we exploit the variation in the county-level exposure to the capital supply shock and estimate the effect of the access to BDC financing on the future real outcomes, such as employment and gross domestic product growth. In particular, we estimate the following cross-sectional regression:

$$\Delta y_{j,\textit{post-shock}+\tau} = \alpha^{IV} + \beta^{IV} \widehat{\Delta BDC\ Investment}_{j,\textit{post-shock}} + \gamma^{IV} X_{j,\textit{pre-shock}} + \varepsilon_j, \qquad (5)$$

where $\Delta y_{j,\textit{post-shock}+\tau}$ is the average growth rate in employment or output levels of county j over the period (i) 2013:Q3-2016:Q2 for SCAP shock, (ii) 2014:Q1-2016:Q4 for CIT shock, and (iii) 2015:Q1-2017:Q4 for FAS 166/167 shock. That is, we shift the measurement of employment and output growth by $\tau = 4$ years from when we measure the BDC investment growth. The post-shock growth rate in BDC investment activity is instrumented with the pre-shock county-level exposure to the credit supply shock. As before, we include county-level controls measured prior to the shock such as employment and output growth. The coefficient of interest is β^{IV}, which captures the causal effect of the firms' access to direct investments on the local economic growth.

The estimation results of equation (5) for employment growth rates are reported in Table 10, while the analogous results for GDP are presented in Table 11. Positive statistically significant values of β^{IV} across all specifications indicate that the surge in BDC financing has positive real effects on the growth of the middle-market sector. Note that we find lower magnitudes for coefficient estimates for the CIT shock than for the other two which may be attributed to a broader effect of the new regulations on the counties. While only 236 counties were exposed to the collapse of the CIT group, the SCAP and FAS 166/167 credit shocks affected 1,639 and 1,855 counties, respectively. In

particular, the point estimates imply that a 1% increase in the BDC investment growth leads to a 0.04%–0.05% increase in employment and output growth when using the CIT bankruptcy as an instrument. At the same time, we find that a 1% increase in the BDC investment growth leads to a 0.22%–0.43% (0.06%–0.32%) increase in employment (output) growth when using the changes to bank regulation as an instrument.

OLS estimates. In Table 12, we report a set of the corresponding OLS estimates for specification (5). Note, that we report three set of regressions — one for each shock — as the set of counties changes, as well as the measurement periods both for the BDC investment growth and outcome variables. When the BDC investment growth is not instrumented, the elasticity estimates are 0.005%–0.010% for employment and 0.006%–0.011% for output growth. By construction, the IV estimates represent a local average treatment effect and capture the changes in local economic growth due to the changes in BDC credit supply induced by the credit shock. The OLS estimates reflect the changes in local economic growth with respect to the total variation in BDC investments driven by various credit demand and supply factors. These unaccounted factors represent omitted variables in the OLS specification which lead to attenuation bias in the coefficient estimates.

Our estimates of real effects are both statistically and economically significant. The back of the envelope calculation indicates that \$0.77 billion increase in the BDC lending volume leads to \$0.83–\$1.52 billion increase in the total output across counties with BDC borrowers. Given that total securities holdings of BDCs as of 2015:Q4 equal 77 billion of December 2017 dollar, a 1% increase in BDC investments translates into \$0.77 billion of additional BDC financing. Total output in counties with BDC borrowers as of 2017 equals \$14 trillion. These figures suggest that a 1% increase in BDC investments generates from \$0.83(=0.00006$\times$\$13,806) to \$1.52(=0.00011$\times$\$13,806) billion of additional output in counties with BDC presence. Note that we assess the magnitude of real effects based on the OLS estimates from regression (5) representing the lower bound of the

overall effect.

The presented evidence leads us to conclude that BDCs are filling in the lending gap in the middle market which stems from the pull back of traditional lenders from this sector. At the same time, our estimates of the real effects spurred by the access to BDC financing may be understated. In our analysis, we only consider counties with active investments in middle-market firms by BDCs and as such do not take into account spillover effects to other segments of the economy and geographical areas. Moreover, since BDC financing is a relatively new phenomenon, we are not able to assess potential positive long-term effects of the firms' access to these direct lenders.

7 Conclusion

The recent Financial Crisis has triggered the tightening of regulation in the banking sector, thereby contributing to a surge in alternative lenders and, in particular, business development companies. Our paper is the first to provide a systematic analysis of these financial institutions. To this end, we construct an extensive database of BDC investments from publicly available filings. Using our database, we describe the BDCs' uses and sources of funds — portfolio composition, types of investments, geographical presence, loan pricing terms, ownership structure, and cost of funding.

Although our initial analysis focuses on BDCs, our study provides insight into an important yet understudied segment of the U.S. economy — the middle market. Using the 2009 stress-test program for bank holding companies, the 2009 collapse of the CIT Group, and FAS 166/167 accounting standards on consolidation of VIEs' assets for banks as a source of exogenous variation in the credit availability to borrowers, we document that BDCs enter local markets experiencing shortage of capital by traditional lenders, indicating that BDC financing acts as a substitute to more common sources of funding. Using the instrumental variable approach, we estimate the real effects on the

middle-market segment stemming from the entry of new direct lenders. We document that access to BDC financing has stimulated employment and output, emphasizing the importance of credit availability for economic growth.

Overall, these findings lead us to conclude that BDCs fill a niche that allows capital to reach middle-market companies — companies with high growth opportunities and lack of sustainable funding sources, — thereafter stimulating economic growth.

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Table 1: Balance Sheet Composition of BDCs

2010:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Total Assets, $ Billions	30	0.96	1.54	0.47	0.04	0.17	0.90	2.52
(Cash+Securities)/Total Assets, %	30	94.26	7.88	97.93	85.83	93.13	98.25	99.01
Cash/Total Assets, %	30	13.24	16.42	6.01	1.29	3.64	18.10	31.05
Securities/Total Assets, %	30	81.03	17.91	87.41	54.78	75.57	93.01	96.43
Other Assets/Total Assets, %	30	5.74	7.88	2.07	0.99	1.75	6.87	14.17
Book Equity/Total Assets, %	30	71.49	18.91	70.48	50.12	58.64	84.94	98.36
Book Equity/(Total Assets-Cash), %	30	94.98	79.10	82.52	53.35	62.42	100.27	117.88
Market Equity/Total Assets, %	28	66.54	22.45	67.96	41.45	56.18	79.92	90.59
Debt/Total Assets, %	30	24.51	18.46	27.59	0.00	9.99	37.13	45.54
Other Liabilities/Total Assets, %	30	4.00	5.60	2.07	1.11	1.39	5.07	7.48

2017:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Total Assets, $ Billions	81	1.15	1.76	0.51	0.05	0.23	1.55	2.44
(Cash+Securities)/Total Assets, %	81	97.14	3.30	98.02	95.27	97.12	98.70	99.04
Cash/Total Assets, %	81	8.99	11.33	4.97	0.58	1.78	9.57	25.13
Securities/Total Assets, %	81	88.15	12.01	92.86	72.51	85.94	95.85	97.55
Other Assets/Total Assets, %	81	2.86	3.30	1.98	0.96	1.30	2.88	4.73
Book Equity/Total Assets, %	81	63.04	15.24	57.21	50.68	53.65	68.72	92.49
Book Equity/(Total Assets-Cash), %	81	71.61	26.36	61.52	53.20	56.41	78.08	102.09
Market Equity/Total Assets, %	52	49.12	15.59	51.54	30.68	40.19	57.19	65.68
Debt/Total Assets, %	81	32.20	16.19	37.63	0.00	22.84	43.59	46.50
Other Liabilities/Total Assets, %	81	4.76	7.50	2.49	0.94	1.49	3.51	10.99

The Table reports the balance sheet summary statistics for publicly traded and privately held BDCs from SNL Financial. The figures represent the cross-sectional statistics across BDCs as of 2010:Q4 and 2017:Q4. The data on total assets are expressed in billions of December 2017 dollars.

Table 2: Portfolio Concentration

2010:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Portfolio Companies, Count	30	48.77	38.04	39.50	12.50	21.00	69.00	108.50
Allocation Top 1 Portfolio Companies, %	30	17.02	18.46	10.70	4.33	6.22	22.48	31.19
Allocation Top 3 Portfolio Companies, %	30	33.60	23.00	27.62	11.33	16.64	44.48	65.36
Allocation Top 5 Portfolio Companies, %	30	44.54	24.74	37.22	17.39	26.14	57.45	83.37
Allocation Top 10 Portfolio Companies, %	30	62.66	24.85	58.70	29.14	43.08	87.09	97.10

2017:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Portfolio Companies, Count	59	91.02	184.87	54.00	19.00	31.00	89.00	145.00
Allocation Top 1 Portfolio Companies, %	59	12.98	15.87	8.06	3.84	4.97	15.00	23.44
Allocation Top 3 Portfolio Companies, %	59	25.55	19.32	19.49	8.65	12.85	33.77	45.84
Allocation Top 5 Portfolio Companies, %	59	34.64	21.23	28.30	13.71	19.20	44.60	63.52
Allocation Top 10 Portfolio Companies, %	59	50.79	23.24	47.39	24.25	32.74	63.64	82.60

The Table reports summary statistics for portfolio concentration of BDC investments. Allocations to portfolio companies are recorded in terms of their fair values. The figures represent the cross-sectional statistics across BDCs as of 2010:Q4 and 2017:Q4. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded.

Table 3: Investment Portfolio of BDCs

2010:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Portfolio Companies, Count	31	51.68	43.42	42.00	13.00	17.00	70.00	100.00
Outstanding Deals, Count	31	96.84	93.09	61.00	16.00	39.00	133.00	155.00
Outstanding Debt Deals, %	31	49.27	27.00	54.67	6.25	31.82	66.67	76.67
Outstanding Equity Deals, %	31	42.83	25.25	37.81	16.39	24.37	52.54	71.74
Outstanding Structured Products, %	31	3.01	6.94	0.00	0.00	0.00	3.49	7.69
New Deals, Count	31	9.19	11.57	6.00	0.00	2.00	11.00	20.00
New Debt Deals, Count	31	9.19	11.57	6.00	0.00	2.00	11.00	20.00
New Equity Deals, Count	31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
New Structured Products, Count	31	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2017:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Portfolio Companies, Count	59	94.69	185.72	56.00	20.00	32.00	93.00	162.00
Outstanding Deals, Count	59	154.12	235.47	95.00	35.00	58.00	165.00	215.00
Outstanding Debt Deals, %	59	62.56	21.66	63.54	27.69	50.53	78.38	88.46
Outstanding Equity Deals, %	59	31.80	21.27	29.80	6.45	17.39	44.78	67.08
Outstanding Structured Products, %	59	2.38	8.02	0.00	0.00	0.00	0.12	5.88
New Deals, Count	59	16.29	23.42	11.00	1.00	5.00	20.00	28.00
New Debt Deals, Count	59	16.03	23.42	11.00	1.00	5.00	19.00	28.00
New Equity Deals, Count	59	0.00	0.00	0.00	0.00	0.00	0.00	0.00
New Structured Products, Count	59	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The Table reports summary statistics for portfolio of BDC investments. The figures represent the cross-sectional statistics across BDCs as of 2010:Q4 and 2017:Q4.

Table 4: Pricing Terms of BDC Debt Securities

2010:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Outstanding Loan Size, $ Millions	1591	11.46	16.91	5.62	0.57	2.02	12.96	29.57
New Loan Size, $ Millions	271	13.77	19.74	6.75	1.23	2.42	15.75	32.61
New Loan Maturity, Years	274	4.91	2.01	5.00	1.75	3.75	6.00	7.00
New Loan Rate, %	272	10.44	4.00	10.28	5.80	7.25	13.00	15.00
Rate: Cash Only, %	145	11.28	3.86	11.50	7.00	8.00	14.00	15.00
Rate: PIK Only, %	5	12.20	0.45	12.00	12.00	12.00	12.00	13.00
Rate: Cash and/or PIK, %	11	14.86	1.53	14.00	13.00	14.00	16.50	16.50
Rate: Base + Spread, %	111	8.83	3.76	7.30	5.50	6.25	11.00	13.00

2017:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Outstanding Loan Size, $ Millions	6438	9.02	19.96	2.56	0.01	0.12	10.10	22.57
New Loan Size, $ Millions	959	10.80	24.19	4.10	0.02	0.43	12.25	25.07
New Loan Maturity, Years	944	6.05	4.78	5.00	1.50	3.33	7.75	10.00
New Loan Rate, %	935	8.62	2.50	8.35	6.10	7.15	10.00	12.00
Rate: Cash Only, %	132	9.18	3.74	10.00	3.25	7.56	12.00	12.25
Rate: PIK Only, %	19	9.62	5.24	9.00	3.00	6.00	12.00	15.00
Rate: Cash and/or PIK, %	5	14.10	1.75	14.00	12.50	13.00	14.00	17.00
Rate: Base + Spread, %	773	8.46	2.04	8.10	6.19	7.15	9.60	11.06

The Table reports summary statistics for pricing terms of BDC debt securities. The figures represent the cross-sectional statistics across BDC debt deals as of 2010:Q4 and 2017:Q4. The data on loan size are expressed in millions of December 2017 dollars. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded.

Table 5: Profitability Summary Statistics of BDCs

2010:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Interest Income/Total Assets, %	28	8.55	4.13	9.39	1.67	6.75	11.24	12.27
Interest Expence/Total Assets, %	28	1.10	0.99	0.94	0.00	0.33	1.72	2.42
Net Interest Income/Total Assets, %	28	7.46	3.87	8.54	0.95	5.41	9.98	11.95
Noninterest Income/Securities, %	28	1.21	3.49	0.44	0.00	0.06	1.26	2.83
ROA, %	28	10.57	13.62	10.56	−6.42	2.93	15.15	27.14
ROE, %	28	12.36	21.62	13.73	−14.18	3.01	20.83	33.90
ROD, %	23	4.70	2.73	4.96	1.77	2.81	6.07	6.56

2017:Q4

	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
Interest Income/Total Assets, %	80	8.59	2.81	9.20	4.72	7.52	10.21	10.97
Interest Expence/Total Assets, %	79	1.59	0.92	1.75	0.01	1.17	2.22	2.77
Net Interest Income/Total Assets, %	80	7.02	2.55	7.32	3.83	5.83	8.40	9.15
Noninterest Income/Securities, %	81	0.57	1.27	0.27	−0.05	0.02	0.74	1.43
ROA, %	79	6.24	11.77	5.77	−1.75	3.04	7.93	10.69
ROE, %	80	6.65	14.06	7.25	−4.98	2.42	10.83	14.79
ROD, %	70	5.12	1.84	4.68	3.75	4.20	5.86	7.36

The Table reports the summary statistics for publicly traded and privately held BDCs from SNL Financial. The figures represent the cross-sectional statistics across BDCs as of 2010:Q4 and 2017:Q4.

Table 6: Bank Ownership of BDCs

BDC	Banking Institution	Equity Holding, % Median	Max
Alcentra Capital Corp.	Bank of New York Mellon Corp	2.41	14.64
	UBS Group AG	1.40	2.25
American Capital Senior Floating Ltd.	Credit Suisse AG	3.50	3.50
	UBS Group AG	1.81	2.49
Capital Southwest Corp.	Comerica Bank	1.08	1.46
Capitala Finance Corp.	Suntrust Banks Inc	2.00	2.01
	BBT Securities LLC	1.26	1.74
Crossroads Capital Inc.	Credit Suisse AG	1.69	3.38
FS KKR Capital Corp.	Bank of Montreal	1.17	1.53
Fidus Investment Corp.	UBS Group AG	1.45	2.47
	State Street Corp	1.10	1.76
Firsthand Technology Value Fund Inc.	State Street Corp	1.28	1.46
Full Circle Capital Corp.	Goldman Sachs Group Inc	5.85	11.62
Gladstone Investment Corp.	Bank of Montreal	1.11	1.12
Goldman Sachs BDC Inc.	Goldman Sachs Group Inc	14.52	16.48
Golub Capital BDC Inc.	UBS Group AG	1.30	2.48
	Goldman Sachs Group Inc	1.05	1.98
Great Elm Capital Corp.	UBS Group AG	1.10	1.42
Horizon Technology Finance Corp.	UBS Group AG	1.47	2.78
	State Street Corp	1.07	1.08
MCG Capital Corp.	State Street Corp	2.36	3.10
MVC Capital Inc.	State Street Corp	1.65	1.67
	UBS Group AG	1.07	2.00
Main Street Capital Corp.	Macquarie Group Ltd	1.95	2.30
	State Street Corp	1.59	1.64
Monroe Capital Corp.	UBS Group AG	1.78	2.45
OFS Capital Corp.	UBS Group AG	1.30	4.21
OHA Investment Corp.	Credit Suisse AG	1.85	6.12
Oaktree Strategic Income Corp.	Credit Suisse AG	2.87	3.10
	Barclays PLC	1.57	3.86
	UBS Group AG	1.45	2.73
	Deutsche Bank AG	1.10	2.61
Oxford Square Capital Corp.	UBS Group AG	1.24	2.42
PennantPark Floating Rate Capital Ltd.	State Street Corp	1.03	1.16
Rand Capital Corp.	Associated Banccorp	4.75	4.75
	HSBC Holdings PLC	1.13	1.15
Sixth Street Specialty Lending Inc.	UBS Group AG	1.56	2.40
Solar Capital Ltd.	State Street Corp	1.91	2.06
	UBS Group AG	1.54	2.70
Solar Senior Capital Ltd.	State Street Corp	1.04	1.37
Stellus Capital Investment Corp.	State Street Corp	1.05	1.18
SuRo Capital Corp.	State Street Corp	1.35	1.41
TCG BDC Inc.	UBS Group AG	1.11	2.19
TriplePoint Venture Growth BDC Corp.	Bank of Montreal	1.19	1.23

The Table documents the relative maximum and median shares of BDC equity held by banks among all BDC shareholders filing the 13F-form with the SEC. We focus on bank shareholders with maximum share above 5% and median share above 1%. The shares are computed using the 13F Holdings data from WRDS SEC Analytics. The data sample covers the period 2001:Q1 to 2017:Q4.

Table 7: Descriptive Statistics: Treated vs Control Counties

Panel (a): SCAP Shock

	Treated			Control			
	N	Mean	St.Dev.	N	Mean	St.Dev.	Difference
Total Employment Growth, %	1325	−3.77	5.47	862	−2.68	7.67	−1.083***
Job Creation/Total Employment, %	1325	3.77	1.67	862	4.03	2.10	−0.260***
Job Loss/Total Employment, %	1325	5.86	2.31	862	6.03	3.11	−0.175
Output Growth, %	1306	−0.34	6.04	854	0.25	10.13	−0.590*
Middle-Market Firms, %	1336	4.36	1.47	864	3.33	1.57	1.033***
# of Bank Branches per 1000 Establishments	1336	16.29	6.17	854	24.14	12.26	−7.845***
Deposits HHI	1337	1.97	3.59	854	0.99	1.09	0.977***

Panel (b): CIT Shock

	Treated			Control			
	N	Mean	St.Dev.	N	Mean	St.Dev.	Difference
Total Employment Growth, %	226	−5.95	3.30	1961	−5.91	5.89	−0.042
Job Creation/Total Employment, %	226	3.75	1.20	1961	3.94	1.96	−0.188
Job Loss/Total Employment, %	226	4.33	1.18	1961	5.36	2.89	−1.033***
Output Growth, %	227	−3.61	3.95	1933	−1.71	9.50	−1.903***
Middle-Market Firms, %	231	5.22	1.22	1969	3.65	1.47	1.576***
# of Bank Branches per 1000 Establishments	231	13.44	3.87	1960	20.69	10.44	−7.254***
Deposits HHI	231	4.81	6.62	1961	1.13	1.27	3.683***

Panel (c): FAS 166/167 Shock

	Treated			Control			
	N	Mean	St.Dev.	N	Mean	St.Dev.	Difference
Total Employment Growth, %	1480	1.24	4.15	707	0.73	7.59	0.501**
Job Creation/Total Employment, %	1491	4.05	1.86	709	4.15	2.18	−0.093
Job Loss/Total Employment, %	1491	4.87	2.33	709	5.40	3.54	−0.531***
Output Growth, %	1456	2.55	6.06	704	2.09	10.38	0.460
Middle-Market Firms, %	1491	4.08	1.38	709	3.06	1.53	1.018***
# of Bank Branches per 1000 Establishments	1491	17.03	6.53	700	25.96	12.78	−8.928***
Deposits HHI	1493	1.68	2.82	707	1.00	1.13	0.676***

The Table reports the descriptive statistics for counties in the treated and control groups. The set of treated counties is defined in Section 5.1. The control group includes non-treated counties with BDC financing during the pre-shock period along with non-treated counties adjacent to them. The county-level outcomes are as of (i) 2008:Q4 for the SCAP shock, (ii) 2009:Q4 for the CIT shock, and (iii) 2010:Q4 for the FAS 166/167 shock. Middle-market firms are defined as firms with the number of employees between 50 and 500. ***, **, and * indicate significance at the 1%, 5%, and 10% level.

Table 8: BDC Presense Following Credit Supply Shock

Panel (a): SCAP Shock

	(1)	(2)	(3)	(4)
Post × D($SCAP\ Deposits > 0$)$_{2008}$	0.02***	0.02***		
	(0.00)	(0.00)		
Post × $SCAP\ Deposits/Deposits_{2008}$			0.04***	0.03***
			(0.01)	(0.01)
Controls	No	Yes	No	Yes
County FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
R^2	0.81	0.81	0.81	0.81
N	44460	42844	44460	42844

Panel (b): CIT Shock

	(1)	(2)	(3)	(4)
Post × D($CITLending > 0$)$_{[2001,2005]}$	0.04***	0.04***		
	(0.01)	(0.01)		
Post × $Ln(\overline{CIT\ Lending})_{[2001,2005]}$			0.01***	0.01***
			(0.00)	(0.00)
Controls	No	Yes	No	Yes
County FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
R^2	0.80	0.80	0.80	0.80
N	44460	42872	44460	42872

Panel (c): FAS 166/167 Shock

	(1)	(2)	(3)	(4)
Post × D($FAS\ Deposits > 0$)$_{2010}$	0.04***	0.04***		
	(0.00)	(0.00)		
Post × $FAS\ Deposits/Deposits_{2010}$			0.09***	0.09***
			(0.01)	(0.01)
Controls	No	Yes	No	Yes
County FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
R^2	0.78	0.78	0.78	0.78
N	44460	42924	44460	42924

The Table reports the estimated coefficients from the difference-in-differences regression:

$$D(BDC\ Investment_{j,t} > 0) = \beta Post_t \times Treated_j + \gamma X_{j,t-1} + \eta_j + \tau_t + \varepsilon_{j,t}.$$

The dependent variable in each regression is an indicator that equals one if a county j in quarter t has a non-zero investment amount by BDCs. $Post_t$ is a dummy variable that equals one post the capital supply shock starting from (i) 2009:Q3 for the SCAP shock, (ii) 2010:Q1 for the CIT shock, and (iii) 2011:Q1 for the FAS 166/167 shock. The set of treated counties is defined in Section 5.1. The control group includes non-treated counties with BDC financing during the pre-shock period along with non-treated counties adjacent to them. ***, **, and * indicate significance at the 1%, 5%, and 10% level.

Table 9: BDC Loan Growth and Credit Supply Shock

Panel (a): SCAP Shock

	(1)	(2)	(3)	(4)
$SCAP\ Deposits/Deposits_{2008}$	0.089***	0.088***		
	(0.015)	(0.015)		
$D(SCAP\ Deposits > 0)_{2008}$			0.020***	0.018***
			(0.003)	(0.003)
Controls	No	Yes	No	Yes
F-stat.	35.76	34.97	47.09	36.46
R^2	0.004	0.004	0.002	0.002
# counties	11641	11558	11641	11558

Panel (b): CIT Shock

	(1)	(2)	(3)	(4)
$Ln(\overline{CIT\ Lending})_{[2001,2005]}$	0.034***	0.033***		
	(0.002)	(0.002)		
$D(CIT\ Lending > 0)_{[2001,2005]}$			0.173***	0.171***
			(0.012)	(0.012)
Controls	No	Yes	No	Yes
F-stat.	314.63	296.00	222.21	209.22
R^2	0.083	0.079	0.074	0.071
# counties	3655	3596	3655	3596

Panel (c): FAS 166/167 Shock

	(1)	(2)	(3)	(4)
$FAS\ Deposits/Deposits_{2010}$	0.152***	0.154***		
	(0.011)	(0.011)		
$D(FAS\ Deposits > 0)_{2010}$			0.036***	0.034***
			(0.003)	(0.003)
Controls	No	Yes	No	Yes
F-stat.	190.81	195.37	206.53	185.15
R^2	0.019	0.020	0.007	0.006
# counties	12951	12874	12951	12874

The Table reports the estimated coefficients from the first stage of the IV regressions:

$$\overline{\Delta BDC\ Investment}_{j,post\text{-}shock} = \alpha + \beta z_{j,pre\text{-}shock} + \gamma X_{j,pre\text{-}shock} + \varepsilon_j.$$

The dependent variable in each regression is the average growth rate of investment volume extended by all BDCs in county j during four years following the shock. The instrumental variable, $z_{j,pre\text{-}shock}$, measures the county-level exposure prior to the corresponding shock and described in Section 5.1. We construct our sample of counties following the stacked regression approach of Gormley and Matsa (2011). We include counties if they record non-zero lending either by BDCs or by exposed financial institutions: banks subject to the SCAP in Panel (a), the CIT Group in Panel (b), and banks affected by FAS 166/167 regulation in Panel (c), together with counties adjacent to them. We report robust standard errors clustered at the county-group level in parentheses. *F-stat.* denotes the robust Kleinbergen-Papp statistic of the weak instruments test. ***, **, and * indicate significance at the 1%, 5%, and 10% level.

Table 10: Employment Growth and BDC Financing

Panel (a): SCAP Shock

	$SCAP\ Deposits/Deposits_{2008}$		$\mathrm{D}(SCAP\ Deposits>0)_{2008}$	
	(1)	(2)	(3)	(4)
$\widehat{\Delta BDC\ Investment}$	0.255***	0.244***	0.400***	0.433***
	(0.048)	(0.046)	(0.073)	(0.086)
Controls	No	Yes	No	Yes
# counties	11603	11348	11603	11348

Panel (b): CIT Shock

	$Ln(\overline{CIT\ Lending})_{[2001,2005]}$		$\mathrm{D}(CIT\ Lending>0)_{[2001,2005]}$	
	(1)	(2)	(3)	(4)
$\widehat{\Delta BDC\ Investment}$	0.040***	0.042***	0.044***	0.045***
	(0.005)	(0.006)	(0.006)	(0.007)
Controls	No	Yes	No	Yes
# counties	3548	3437	3548	3437

Panel (c): FAS 166/167 Shock

	$FAS\ Deposits/Deposits_{2010}$		$\mathrm{D}(FAS\ Deposits>0)_{2010}$	
	(1)	(2)	(3)	(4)
$\widehat{\Delta BDC\ Investment}$	0.230***	0.221***	0.367***	0.376***
	(0.021)	(0.020)	(0.035)	(0.036)
Controls	No	Yes	No	Yes
# counties	13020	12738	13020	12738

The Table reports the estimated coefficients from the second stage of the IV regressions:

$$\Delta Employment_{j,post\text{-}shock+\tau} = \alpha^{IV} + \beta^{IV}\widehat{\Delta BDC\ Investment}_{j,post\text{-}shock} + \gamma^{IV}X_{j,pre\text{-}shock} + \epsilon_j.$$

The dependent variable in each regression is the average growth rate of employment in county j during (i) 2013:Q3-2016:Q2 for SCAP shock, (ii) 2014:Q1-2016:Q4 for CIT shock, and (iii) 2015:Q1-2017:Q4 for FAS 166/167 shock. The instrumental variable, $z_{j,pre\text{-}shock}$, measures the county-level exposure prior to the corresponding shock and described in Section 5.1. We construct our sample of counties following the stacked regression approach of Gormley and Matsa (2011). We include counties if they record non-zero lending either by BDCs or by exposed financial institutions: banks subject to the SCAP in Panel (a), the CIT Group in Panel (b), and banks affected by FAS 166/167 regulation in Panel (c), together with counties adjacent to them. We report robust standard errors clustered at the county-group level in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level. level.

Table 11: Output Growth and BDC Financing

Panel (a): SCAP Shock

	$SCAP\ Deposits/Deposits_{2008}$		$D(SCAP\ Deposits>0)_{2008}$	
	(1)	(2)	(3)	(4)
$\widehat{\Delta BDC\ Investment}$	0.064	0.061	0.156*	0.173*
	(0.055)	(0.056)	(0.091)	(0.105)
Controls	No	Yes	No	Yes
# counties	11430	11348	11430	11348

Panel (b): CIT Shock

	$Ln(\overline{CIT\ Lending})_{[2001,2005]}$		$D(CIT\ Lending>0)_{[2001,2005]}$	
	(1)	(2)	(3)	(4)
$\widehat{\Delta BDC\ Investment}$	0.044***	0.043***	0.045***	0.043***
	(0.007)	(0.008)	(0.008)	(0.009)
Controls	No	Yes	No	Yes
# counties	3496	3437	3496	3437

Panel (c): FAS 166/167 Shock

	$FAS\ Deposits/Deposits_{2010}$		$D(FAS\ Deposits>0)_{2010}$	
	(1)	(2)	(3)	(4)
$\widehat{\Delta BDC\ Investment}$	0.229***	0.227***	0.305***	0.322***
	(0.024)	(0.024)	(0.040)	(0.043)
Controls	No	Yes	No	Yes
# counties	12815	12738	12815	12738

The Table reports the estimated coefficients from the second stage of the IV regressions:

$$\Delta GDP_{j,post\text{-}shock+\tau} = \alpha^{IV} + \beta^{IV}\widehat{\Delta BDC\ Investment}_{j,post\text{-}shock} + \gamma^{IV}X_{j,pre\text{-}shock} + \epsilon_j.$$

The dependent variable in each regression is the average growth rate of output in county j during (i) 2013:Q3-2016:Q2 for SCAP shock, (ii) 2014:Q1-2016:Q4 for CIT shock, and (iii) 2015:Q1-2017:Q4 for FAS 166/167 shock. The instrumental variable, $z_{j,pre\text{-}shock}$, measures the county-level exposure prior to the corresponding shock and described in Section 5.1. We construct our sample of counties following the stacked regression approach of Gormley and Matsa (2011). We include counties if they record non-zero lending either by BDCs or by exposed financial institutions: banks subject to the SCAP in Panel (a), the CIT Group in Panel (b), and banks affected by FAS 166/167 regulation in Panel (c), together with counties adjacent to them. We report robust standard errors clustered at the county-group level in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level. level.

Table 12: Local Economic Growth and BDC Financing

OLS Estimates

	ΔEmployment $_{post\text{-}shock+\tau}$			ΔGDP $_{post\text{-}shock+\tau}$		
	SCAP	CIT	FAS	SCAP	CIT	FAS
ΔBDC Investment $_{post\text{-}shock}$	0.007***	0.005***	0.010***	0.011***	0.006***	0.009***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
ΔGDP $_{pre\text{-}shock}$	−0.014	0.140***	0.010	−0.057***	0.220***	0.006
	(0.014)	(0.036)	(0.007)	(0.015)	(0.054)	(0.011)
ΔEmployment $_{pre\text{-}shock}$	−0.033***	−0.033	−0.048**	0.029*	−0.042	−0.003
	(0.011)	(0.063)	(0.020)	(0.016)	(0.058)	(0.022)
R^2	0.006	0.023	0.009	0.007	0.026	0.002
# counties	13349	3437	12738	13349	3437	12738

The Table reports the estimated coefficients from the OLS regressions:

$$\Delta y_{j,post\text{-}shock+\tau} = \alpha^{OLS} + \beta^{OLS} \Delta BDC\ Investment_{j,post\text{-}shock} + \gamma^{OLS} X_{j,pre\text{-}shock} + \epsilon_j.$$

The dependent variables are the average growth rates of employment and output in county j during (i) 2013:Q3-2016:Q2 for SCAP shock, (ii) 2014:Q1-2016:Q4 for CIT shock, and (iii) 2015:Q1-2017:Q4 for FAS 166/167 shock. We construct our sample of counties following the stacked regression approach of Gormley and Matsa (2011). We include counties if they record non-zero lending either by BDCs or by exposed financial institutions: banks subject to the SCAP in columns labeled *SCAP*, the CIT Group in columns labeled *CIT*, and banks affected by FAS 166/167 regulation in columns labeled *FAS*, together with counties adjacent to them. We report robust standard errors clustered at the county-group level in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level. level.

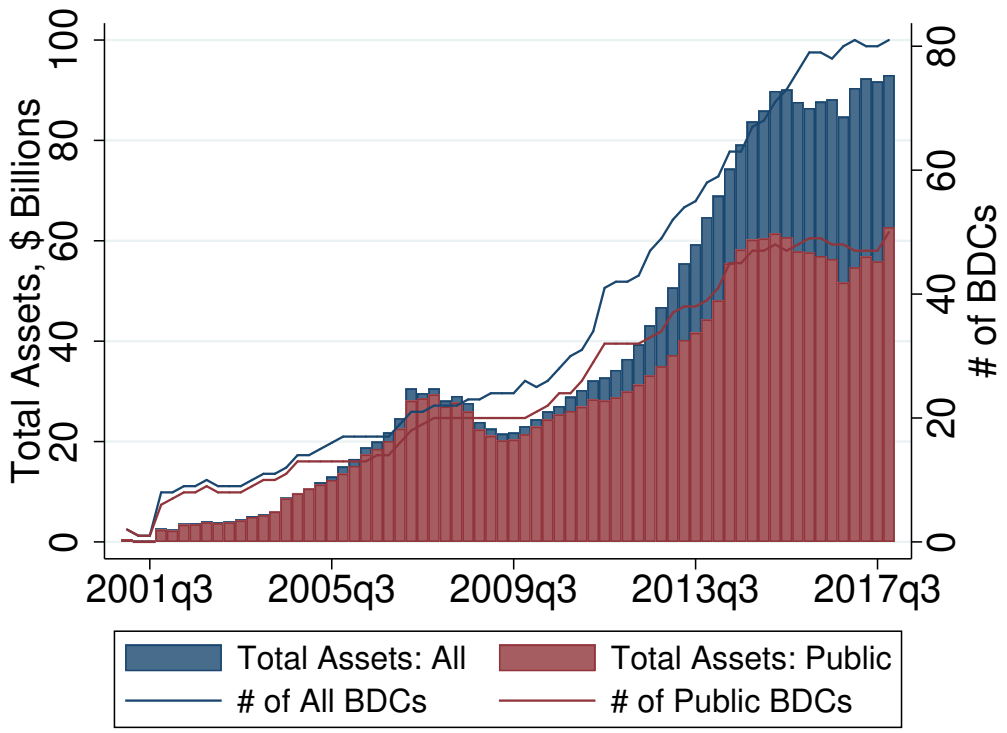


Fig. 1: Size of the BDC Sector

This figure depicts the aggregate total assets of publicly traded and privately held BDCs along with their count as reported by SNL Financial. BDCs with missing total assets are excluded from the count. The data on total assets are real quarterly observations from 2001:Q1 to 2017:Q4, expressed in billions of December 2017 dollars.

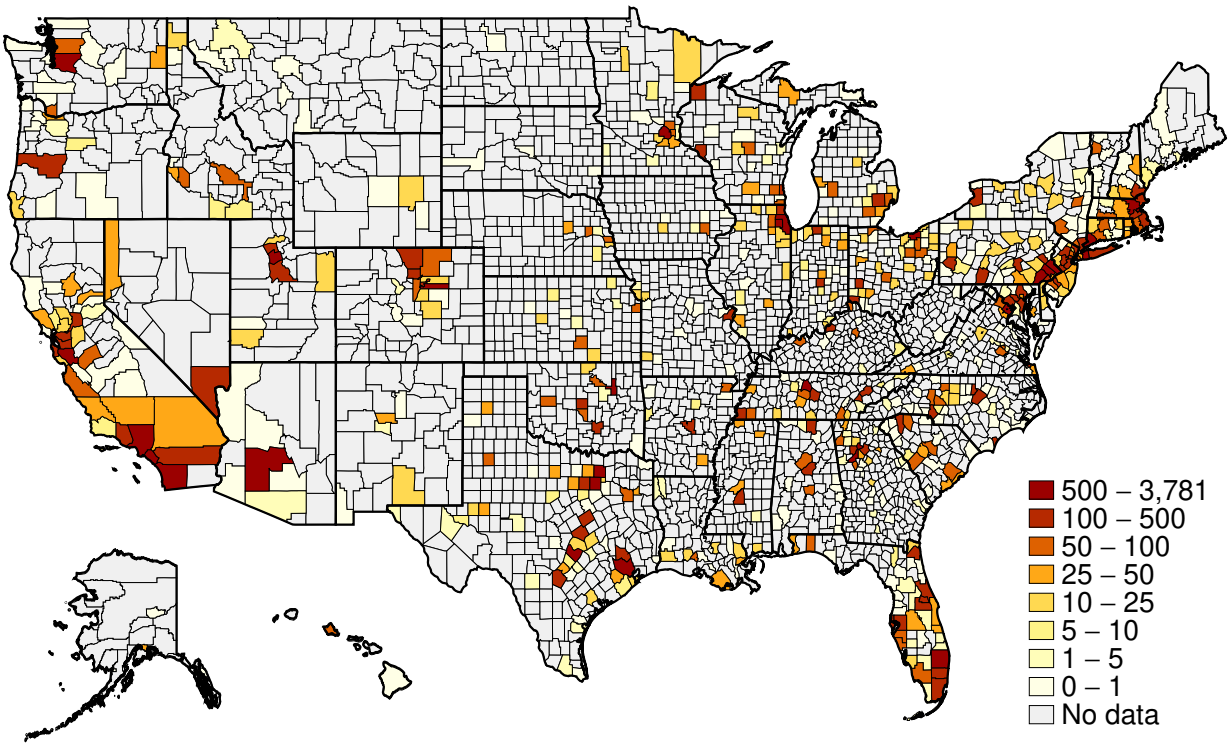
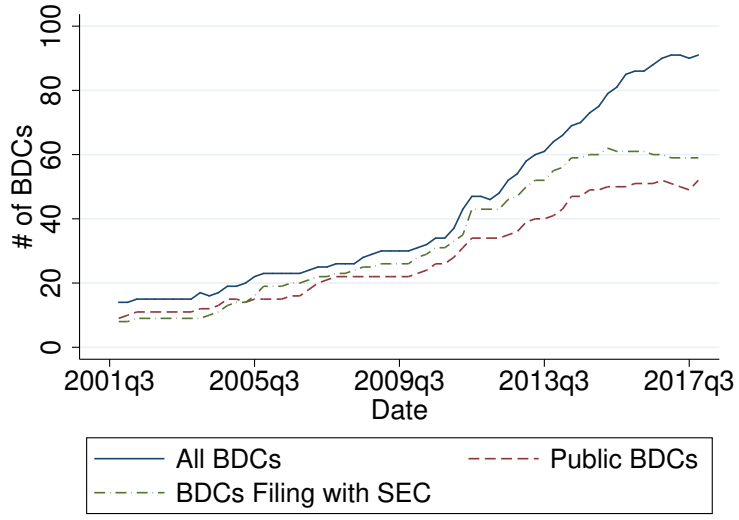
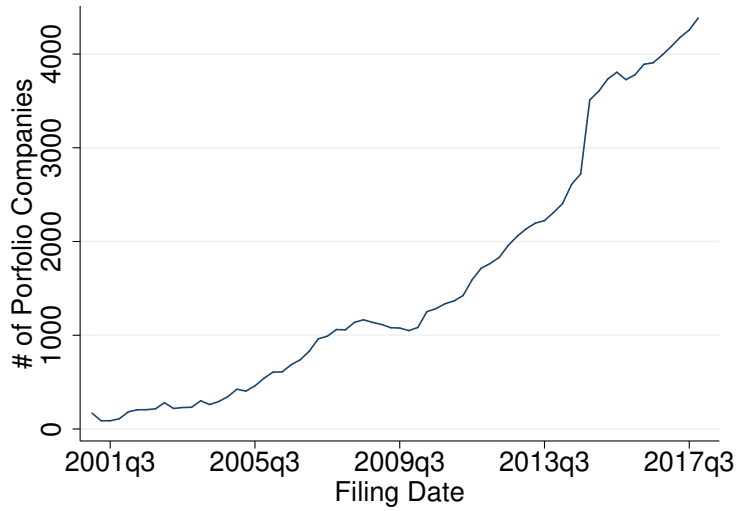


Fig. 2: Location of BDC Borrowers

The Figure shows the snapshot of the geographical presence of BDCs' portfolio companies as of 2017:Q4. The darker areas correspond to counties with larger capital allocations and the lighter areas – with smaller capital allocations. Capital allocations are recorded at their fair values. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded.



Panel (a): Number of BDCs



Panel (b): Number of Portfolio Companies

Fig. 3: Number of BDCs and Portfolio Companies

Panel (a) of this figure depicts the number of all active BDCs, publicly traded BDCs, and BDCs disclosing their investments in quarterly filings with the SEC at a given time. The entry date for a BDC is the date of filing a Form N-54A or N-6F if the previous is missing. The exit date is the date of filing a Form N-54C. The initial public offering date is imputed as a first date with trading information. In Panel (b) we depict the number of unique portfolio companies which have borrowed from BDCs at a given time. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded from the count. The data are quarterly observations from 2001:Q1 to 2017:Q4.

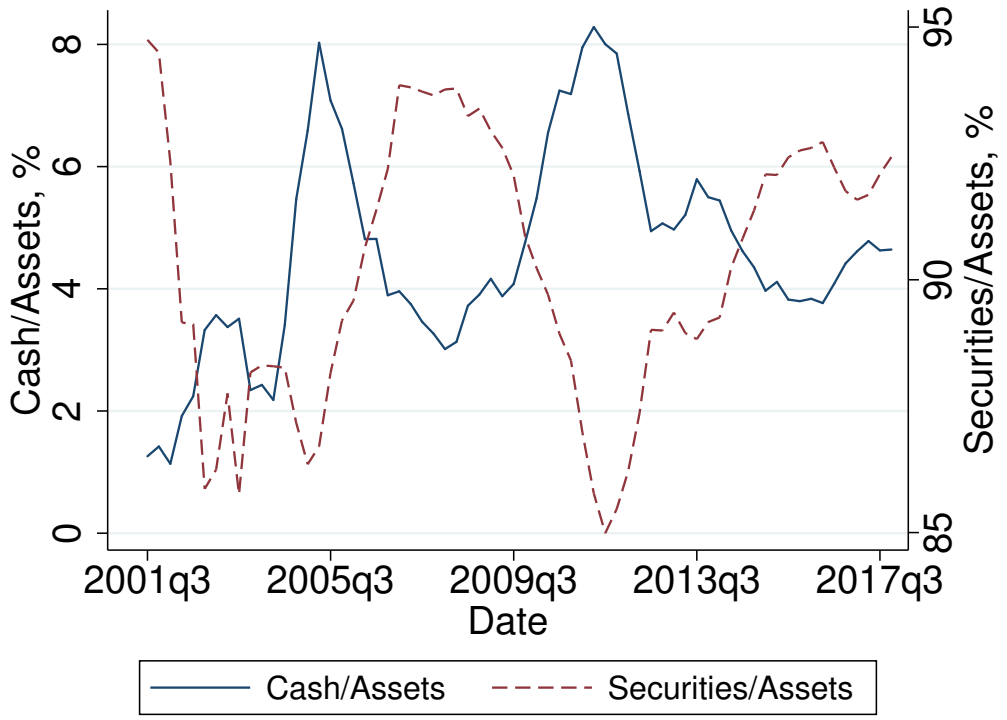


Fig. 4: Asset Composition of BDCs

The Figure depicts the cross-sectional median of the ratio of cash-like asset to total assets (left axis) and the ratio of financial securities to total assets (right axis) across BDCs over time. The medians are smoothed using the four-quarter moving average. The data are quarterly observations from 2001:Q1 to 2017:Q4, expressed in percentages.

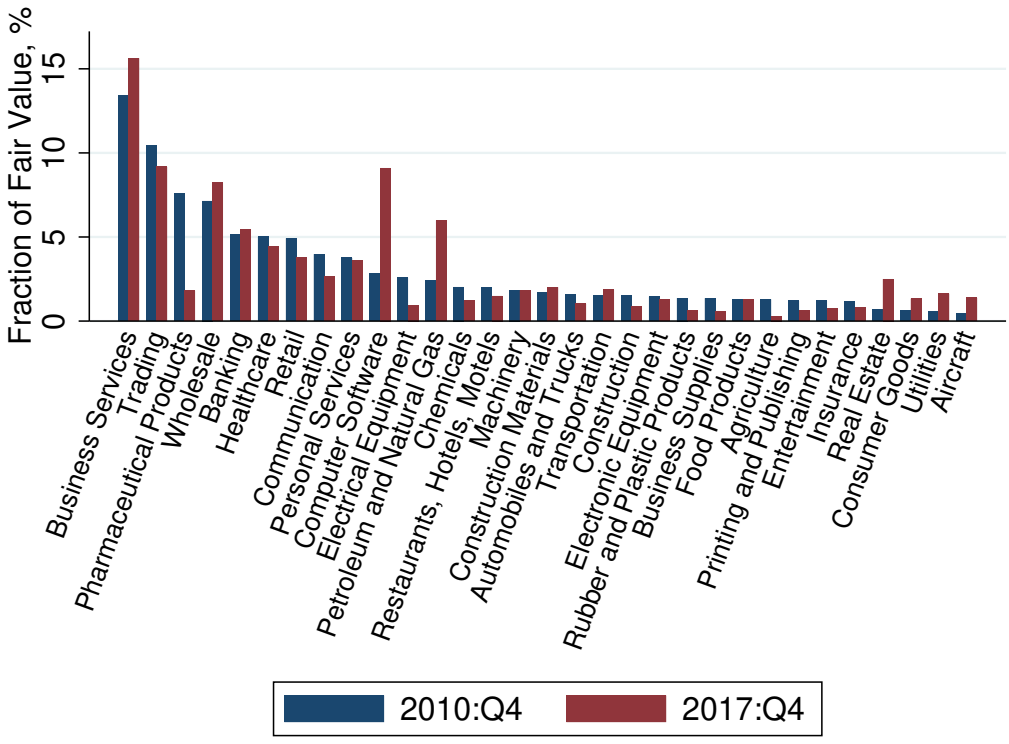


Fig. 5: BDCs Investments across Industries

The Figure reports the share of BDCs investments across Fama-French 49 industries in terms of their fair values as of 2010:Q4 and 2017:Q4. Only industries with the share above 1% either in 2010:Q4 or 2017:Q4 are depicted in the Figure. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded

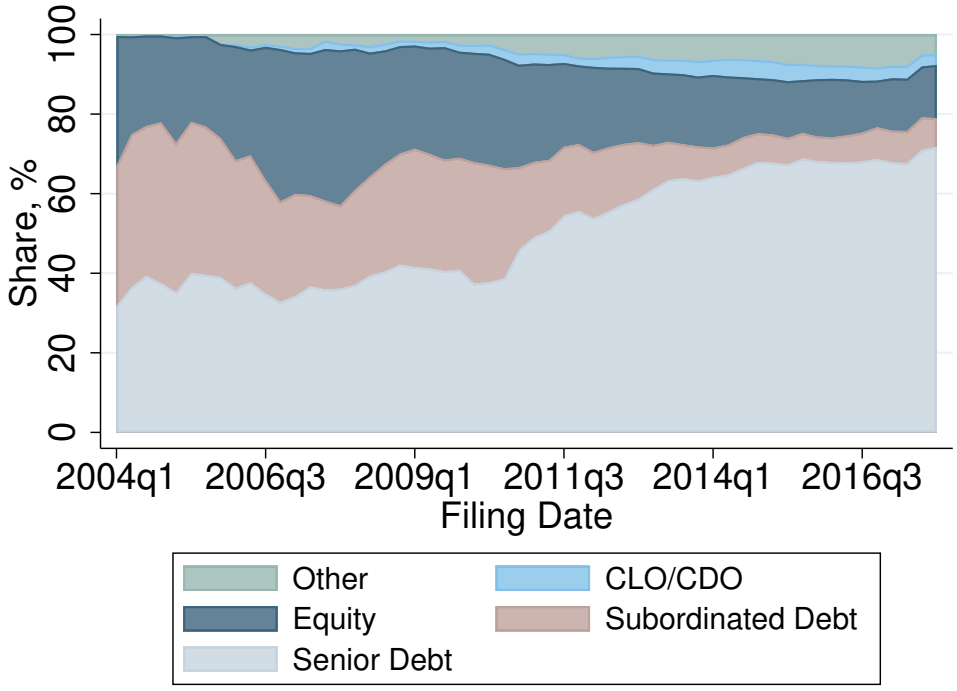
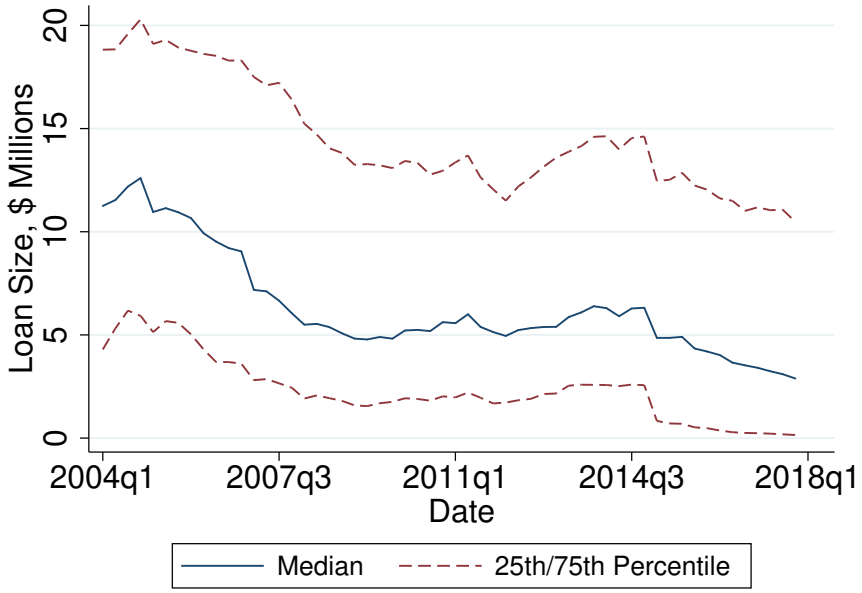
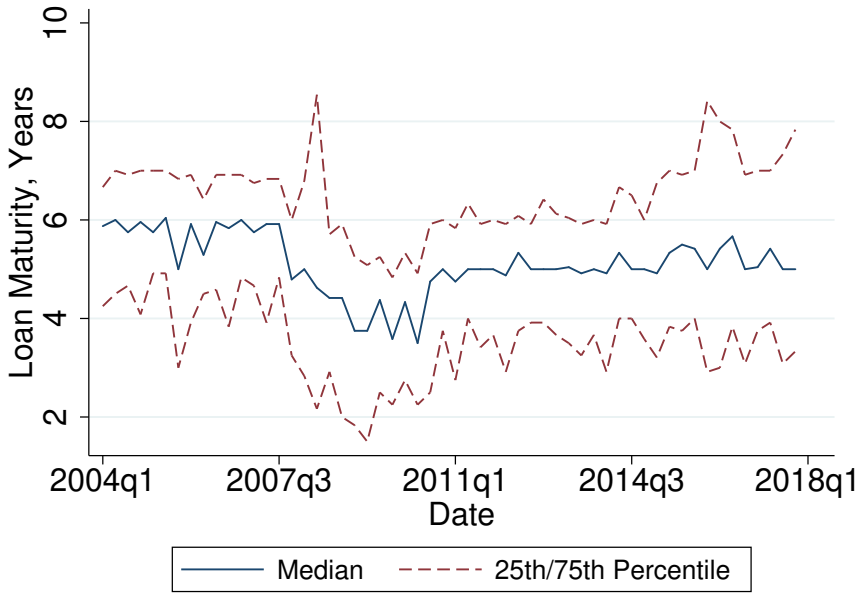


Fig. 6: BDC Investment Instruments

The Figure depicts the shares of different investment instruments employed by BDCs. The investment instruments include senior debt, subordinated debt, equity, structured products, and other investments. The shares are calculated based on the fair values of investments. The data are quarterly observations from 2004:Q1 to 2017:Q4.



Panel (a): Size of BDC Loans



Panel (b): Maturity of BDC Loans

Fig. 7: Size and Maturity of BDC Loans

The Figure depicts the cross-sectional median, 25^{th} and 75^{th} percentiles of (i) the loan size across outstanding BDC debt deals Panel (a), the loan maturities and the loan rates across newly originated BDC debt deals in Panel (b). The loan size is recorded at the fair value. The data are quarterly observations from 2004:Q1 to 2017:Q4, expressed in millions of December 2017 dollars. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded.

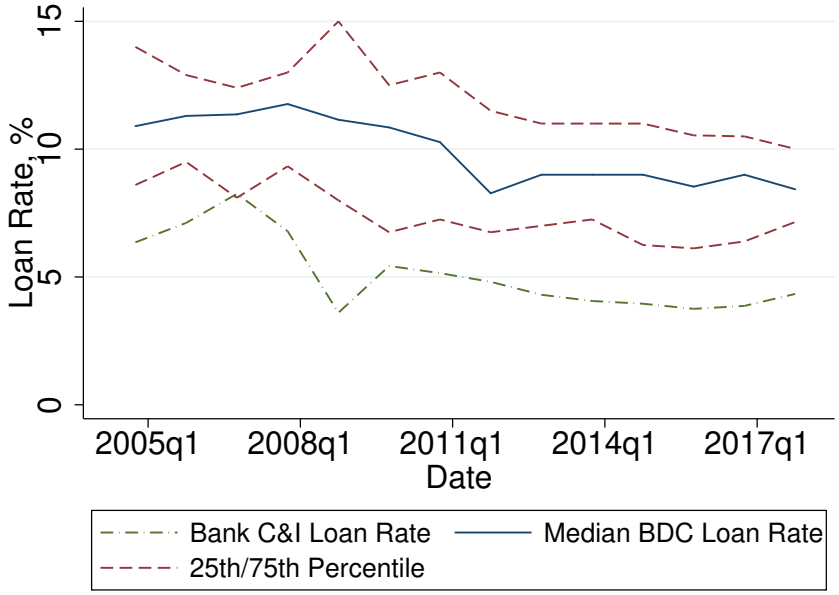
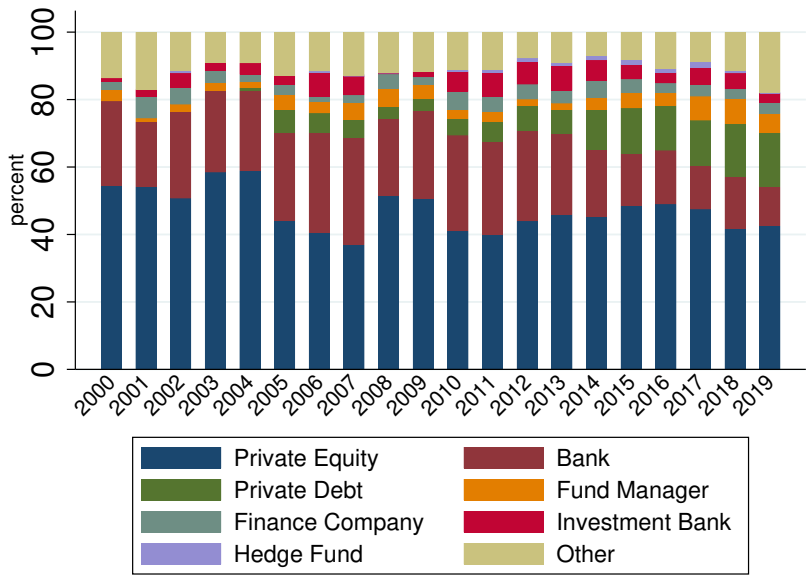
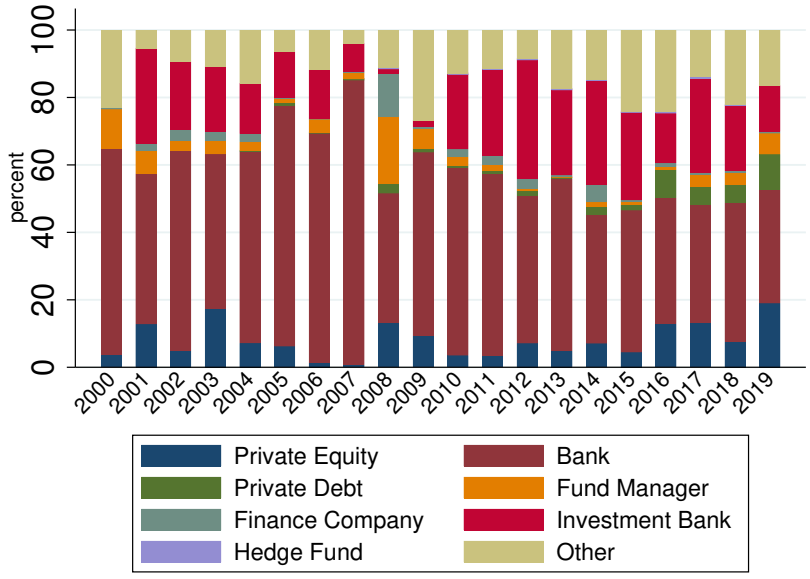


Fig. 8: Loan Rate of New BDC Loans

The Figure depicts the cross-sectional median, 25^{th} and 75^{th} percentiles of the loan rates across newly originated BDC debt deals over time. Allocations in collateralized loan obligations, collateralized debt obligations, venture capital funds, mutual funds and other funds are excluded. The Figure also shows the weighted average interest rate on the bank commercial and industrial loans from the Call Reports. The data are annual observations from 2004 to 2017, expressed in percentages.



Panel (a): Deal Counts



Panel (b): Deal Amounts

Fig. 9: Private Debt Market

The Figure depicts the shares of institutional investors in the market for private debt investments in terms of their deals counts in Panel (a) and in terms of deals amount in Panel (b). In the second panel only investments with non-missing deal amounts are included. The data are annual observations for the period 2000 to 2019 from Preqin Pro.

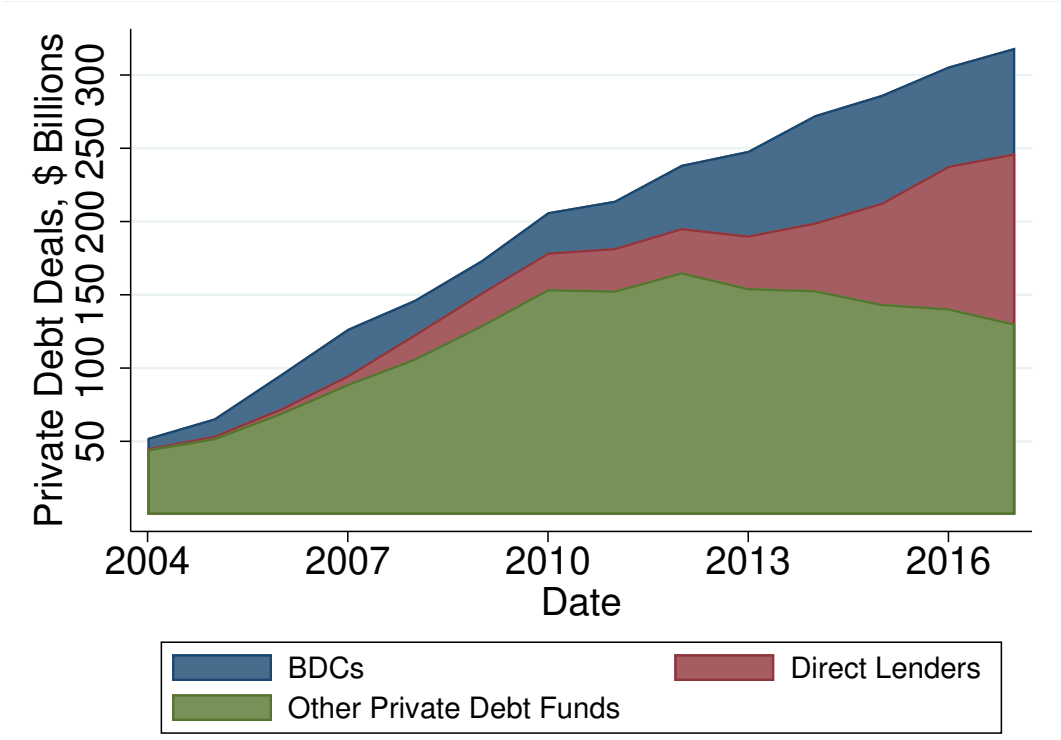


Fig. 10: Size of Private Debt Market

The Figure depicts the aggregate amount of investment deals originated by BDCs, direct lenders and other private debt funds. Other debt funds include mezzanine, distressed debt, special situations and venture debt funds. The numbers for BDCs represent the fair value of investments from our hand-collected dataset. The numbers for direct lenders and other private debt funds represent the assets under management net of the dry powder from Preqin Pro. The data are real annual observations for the period 2004 to 2017, expressed in billions of December 2017 dollars.

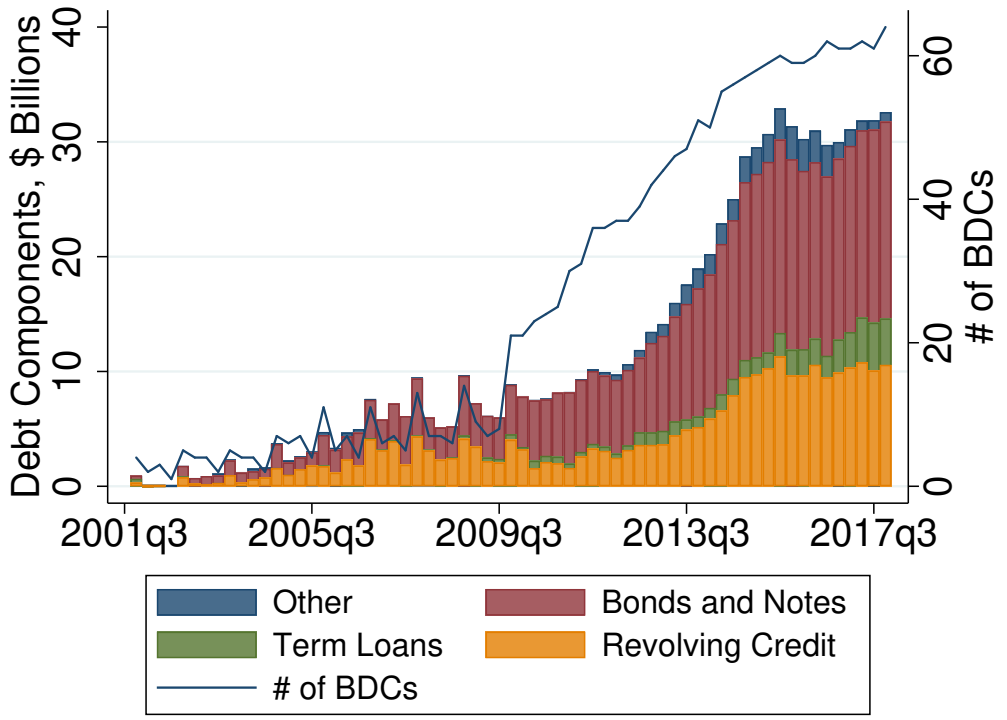


Fig. 11: Debt Composition of BDCs

The Figure depicts the composition of the BDC outstanding debt. The debt instruments include revolving credit, term loans, bonds and notes. The data on debt components are real quarterly observations from 2001:Q1 to 2017:Q4, expressed in billions of December 2017 dollars. For a subset of BDCs, prior to 2010 the data on outstanding debt are reported only annually .

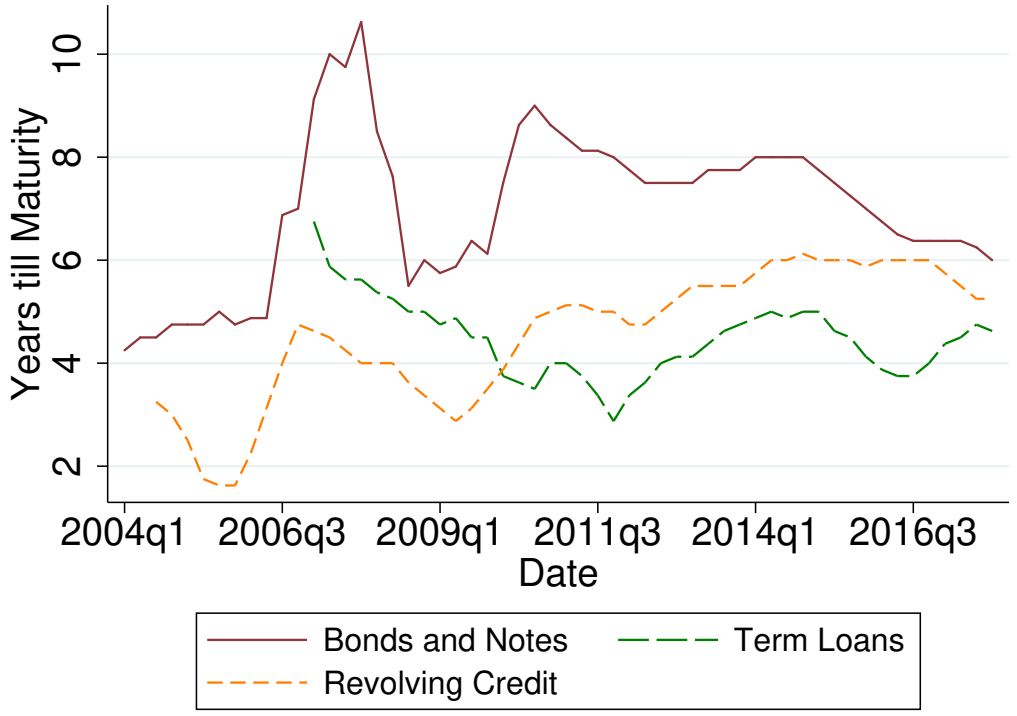
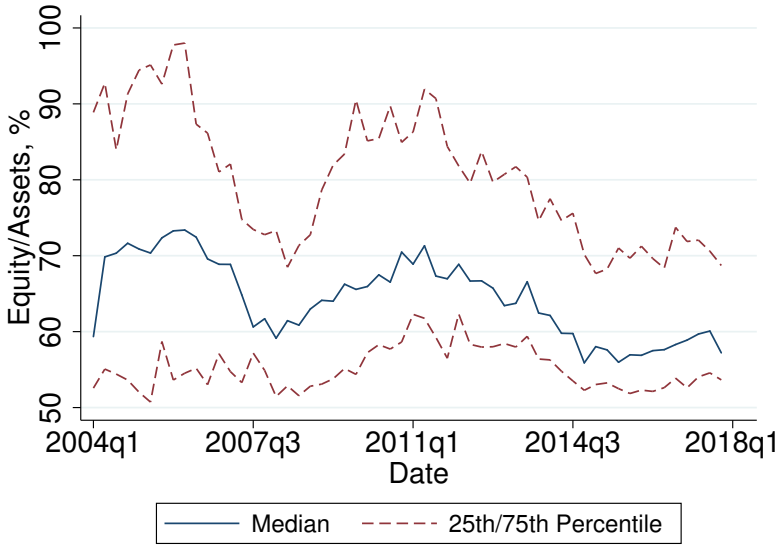
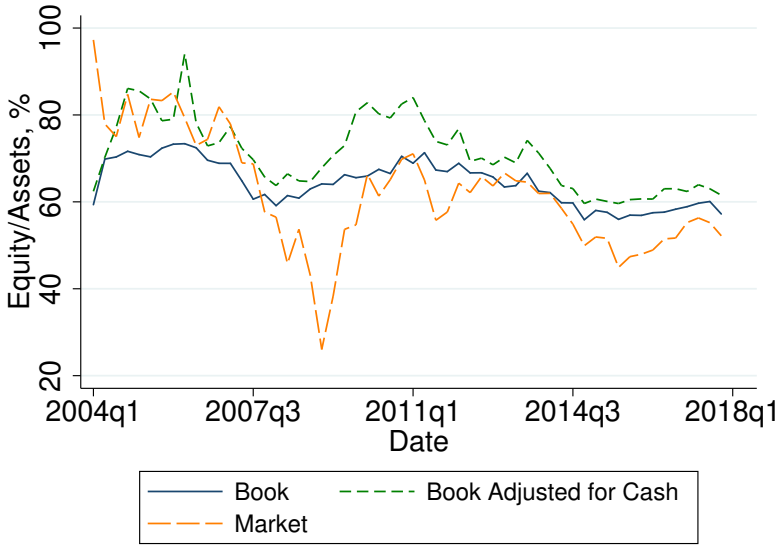


Fig. 12: Debt Maturity of BDCs

The Figure depicts the cross-sectional median of the maturity of the BDCs outstanding debt securities over time. The debt instruments include revolving credit, term loans, bonds and notes. The data on debt maturity are smoothed using the four-quarter moving averages and are expressed in years. The sample covers the period from 2001:Q1 to 2017:Q4. For a subset of BDCs, prior to 2010 the data on outstanding debt securities are reported only annually .



Panel (a): Book Capital Ratio



Panel (a): Book vs Market Capital Ratios

Fig. 13: Capital Structure of BDCs

Panel (a) of the Figure depicts the cross-sectional median, 25^{th} and 75^{th} percentiles of a book equity-to-assets ratio across BDCs over time. Panel (b) of the Figure depicts the cross-sectional median of (i) a book equity-to-assets ratio, (ii) a book equity-to-assets ratio adjusted for cash holdings, and (iii) a market equity-to-assets ratio across BDCs over time. The data are quarterly observations from 2004:Q1 to 2017:Q4, expressed in percentages.

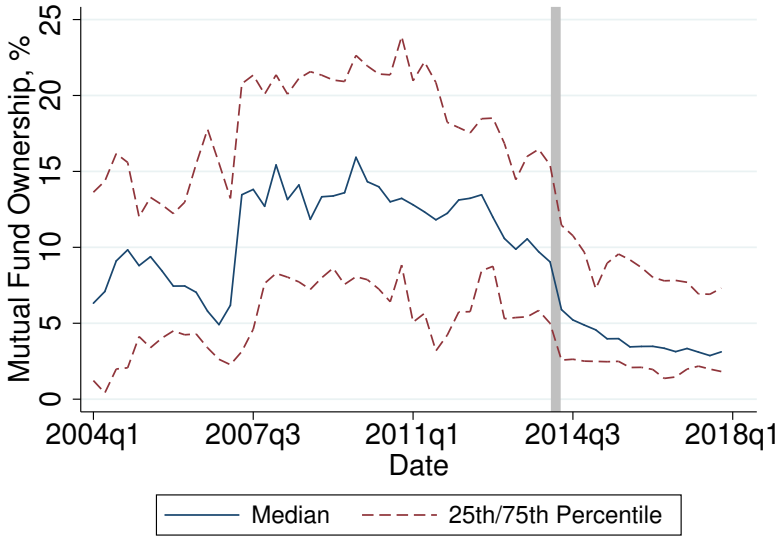
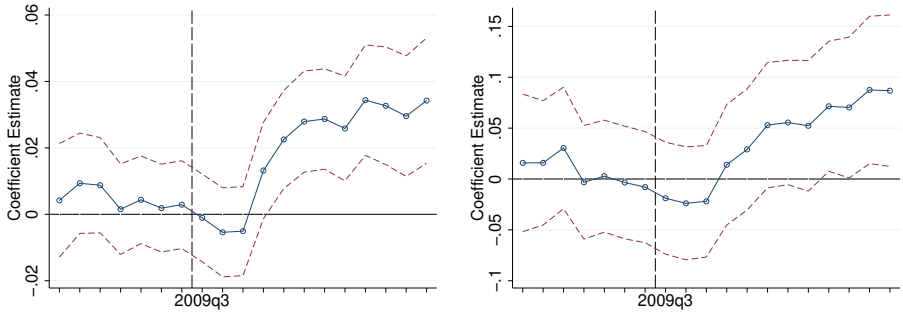
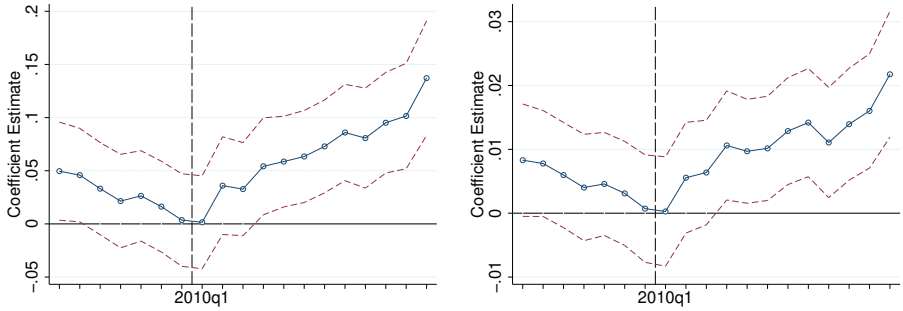


Fig. 14: Mutual Fund Ownership

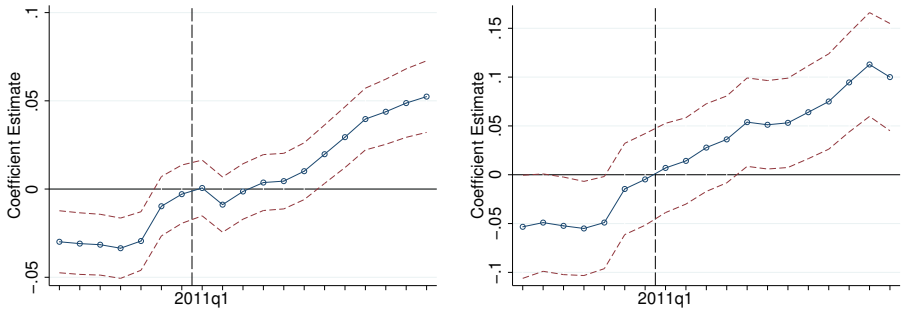
The Figure depicts the cross-sectional median, 25^{th} and 75^{th} percentiles of the mutual fund ownership across BDCs over time. The data are quarterly observations from 2004:Q1 to 2017:Q4, expressed in percentages.



Panel (a): SCAP Shock



Panel (b): CIT Shock



Panel (c): FAS 166/167 Shock

Fig. 15: Parallel Trends: Treated versus Control BDCs

The Figure depicts the coefficient estimates of γs along with the 95% confidence intervals from the following panel regression: $D(BDC\ Investment_{j,t} > 0) = \sum_t \gamma_t \left(\lambda_t \times Treated_j\right) + \gamma X_{j,t-1} + \eta_j + \tau_t + \varepsilon_{j,t}$, where the dependent variable is an indicator that equals one if a county j in quarter t has a non-zero investment amount by BDCs. λs are post-quarter dummies: for each quarter t in the sample period, λ_t is set to one starting from quarter t and zero otherwise. Dummies for the last quarter before the shock are excluded. The left column of figures corresponds to a specification where we define treated counties using an indicator variable, while the right column — using a continuous measure of counties' exposure to the shock.

Appendix

A Coverage of Portfolio Company Locations

In this Appendix, we describe our method for merging portfolio company location data with our quarterly investment-level data. The investment-level data are from the schedule of investments (SOI) tables from the 10-Q and 10-K filings of BDCs that are available on the Securities and Exchange Commission (SEC) website. For each BDC in our sample, we collect location information from its N-2 filings. N-2 forms are a registration statement filed by companies when issuing new debt and equity securities. As shown in Figure A.1, the majority of BDCs file an N-2 form every 6–14 quarters, but there are a few BDCs that never filed an N-2 form during our sample period. From each N-2 filing, we extract company names along with the corresponding addresses including city, state, and ZIP code.[23] If a company has an address outside of the United States, we flag it as a foreign company. Given the size of BDC borrowers, we assume that a reported address represents a company's principal place of business.[24]

In order to merge the N-2 filing location data onto the SOI data, we proceed as follows. First, we use a string matching algorithm to link the set of company names in each N-2 filing to the SOI table from the same BDC and filing quarter. Given that we can obtain high but less than 100% matching scores due to minor differences in the string values, we manually review all of the assumed matches.[25] Since N-2 filings should contain the addresses of all active borrowers reported in the SOI tables, this step yields a match rate

[23] In some cases, a BDC only reports city and state or only state. For these observations, we manually gather and verify ZIP code information from other sources including other N-2 filings.

[24] In rare instances, we observe and verify that the reported location is the address of a private equity firm. For these cases, we substitute this location with the company's address as reported by another BDC if it can be verified as a correct one through, for example, the company's official website.

[25] In some instances, a company is reported in a N-2 filing but not reported in an SOI table until a later quarter. A common reason for this discrepancy is that the investment was an unfunded commitment at the time of the N-2 filing. We allow for this type of match after manually verifying that there is no available match within that same quarter.

of 99.8%. Specifically, we are able to match 20,104 out of the 20,148 total observations in the N-2 data for which there is a corresponding SOI table to match against.

We also keep track of possible address changes over time. Specifically, once we have assigned addresses to portfolio companies in quarters with a N-2 filing, we consider any given location to be effective until a future quarter in which the BDC reports a different location or the end of our sample, whichever comes first. If a BDC reports a different location for a portfolio company in a future N-2 filing, this location becomes effective from the date of the corresponding N-2 filing. For each company, we consider the first reported location to be valid from the the first date the company appears in the SOI tables.

In the second step, we spread location information across BDCs if a company borrows from multiple BDCs. In this context, a company's name is a unique string identifier that we have created after manually reviewing and standardizing every name reported in the SOI tables. This step allows us to assign location information to companies which borrow from BDCs that have never submitted an N-2 filing or borrow in the quarter when a BDC did not submit an N-2 filing.[26] Recall that N-2 forms are not filed in every quarter (Figure A.1). Through these two steps, we collect location information for 73.4% of portfolio companies in our sample.

We further supplement our location data using Bloomberg, which maintains its own database of private company profiles. This data is retrieved using a Python script that (1) conducts Google searches for company names plus the words "bloomberg profile," and then (2) records information from the first search result if the URL corresponds to a Bloomberg company profile. To ensure the search quality and minimize the number of false matches, we exclude observations for which the company name from Bloomberg

[26]For companies with multiple locations (e.g., branches) borrowing from several BDCs we proceed as follows. First, we locate BDC investments based on the addresses they report in their N-2 fillings. If for one of the BDCs the location information is not available, we assign the location of another BDC with the largest investment in that company.

does not closely match the name in the SOI data. This step delivers location information for an additional 9.9% of portfolio companies in our sample.

Figure A.2 summarizes the coverage of portfolio company locations in our dataset over time. We report the match rates both in terms of the investment count and fair values throughout the sample period in each filing quarter. Note that the coverage rates reported over time exceed 73.4% since companies with location information tend to receive funding for longer periods of time and in larger amounts.

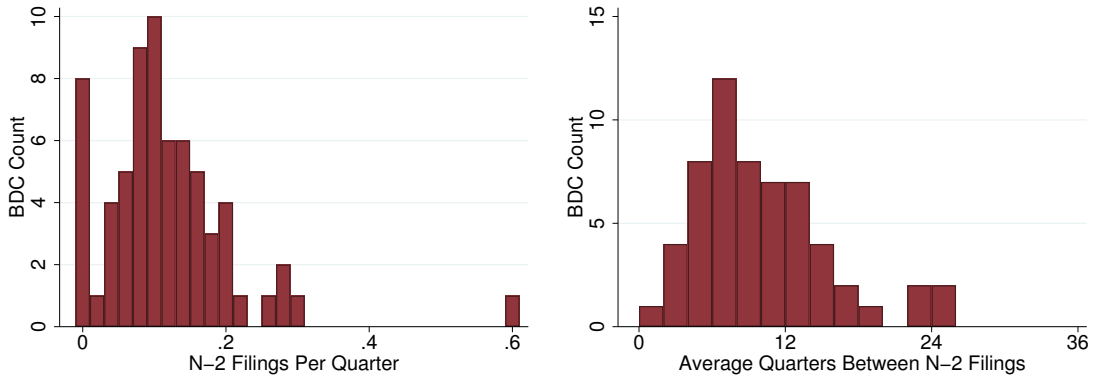
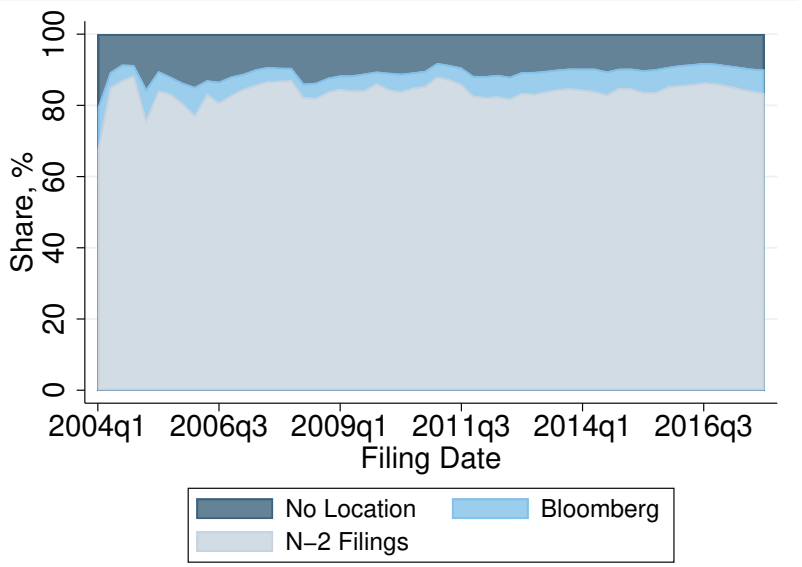
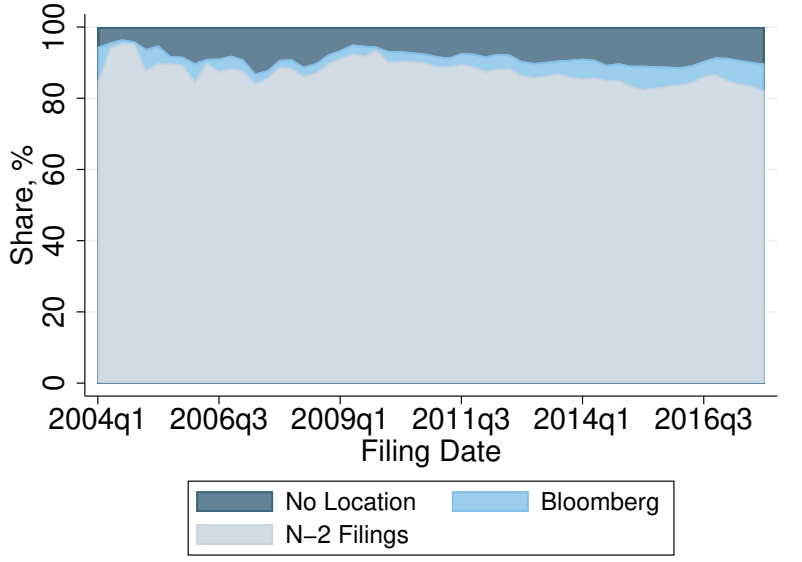


Fig. A.1: N-2 Filing Frequency by BDC

The Figure plots the distribution of the N-2 filing frequency across BDCs. N-2 filings per quarter is the total number of N-2 filings divided by the number of SOI filings over the period from 2004:Q1 to 2017:Q4. Average quarters between N-2 filings is the inverse of N-2 filings per quarter. Each observation represents a BDC.



Panel (a): Number of Portfolio Companies



Panel (b): Fair Value of Investments

Fig. A.2: Coverage of Portfolio Company Locations Over Time

The Figure depicts the shares of portfolio companies with location information. The shares are calculated based on the number of portfolio companies in Panel (a) and based on fair values of investments in Panel (b). In computing these figures, we exclude collateralized loan obligations, collateralized debt obligations, and investments to venture capital funds, mutual funds, and other funds which allow investors to access the financial markets. The data are quarterly observations from 2004:Q1 to 2017:Q4.

B Locations of BDCs and Their Borrowers

In this Appendix, we analyze the geographical presence of BDCs and their portfolio companies. Figure B.1 demonstrates that majority of BDCs are headquartered in New York, Texas, and California. Not surprisingly, we also observe substantial presence of BDC borrowers in these states. At the same time, BDC investments are spread out nationwide (see Panel (b) of Figure B.1). Figure B.2 shows that almost all BDCs have active investments in at least 10 states as of 2017:Q4.

Table B.1 reports summary statistics for the distances between BDCs and their borrowers. To assess the degree to which BDCs lend nationally, we compute percentages of portfolio companies located within the same geographical area as a BDC from which they borrow. The location of the BDC is determined based on the ZIP code of its headquarters as reported in SEC filings. The locations of portfolio companies are from N-2 filings and Bloomberg company profiles (see Appendix A for more details). We consider multiple geographical units within the U.S. — county, Metropolitan Statistical Area (MSA), state, division, and region. The corresponding Federal Information Processing Standard county code is assigned based on crosswalk tables from the U.S. Department of Housing and Urban Development.[27] The MSA and state code is assigned based on the "CBSA to FIPS County Crosswalk" table from the National Bureau of Economic Research.[28] The division and region codes are assigned according to the U.S. Census Bureau definitions.[29] We document that 6% of portfolio companies are on average located within the same county as their lender. For the largest geographical unit, region, this figure is 32%. These results lead us to conclude that BDCs lend nationwide.

Additionally, we assess how big the distances between portfolio companies and their lenders are. Using the "ZIP Code Distance Database" from the National Bureau of

[27] https://www.huduser.gov/portal/datasets/usps_crosswalk.html.
[28] https://data.nber.org/data/cbsa-fips-county-crosswalk.html.
[29] https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf.

Economic Research, we assign the longitude and latitude coordinates for each ZIP code in our sample.[30] We rely on the "geodist" package for Stata to calculate the the distance in miles between two sets of coordinates. This package computes geographical distances by measuring the length of the shortest path between two points along the surface of a mathematical model of the earth. Figure B.3 reports the distribution of distances to portfolio companies for each BDC as of 2017:Q4. We observe a wide range in distance values spanning a few thousand miles. For most BDCs, the median portfolio company is located about 500–1000 miles away from its lender. At the same time, there are a handful of small BDCs investing locally.

Table B.1: Location Similarity of BDCs and Their Borrowers

Panel (a) 2010:Q4

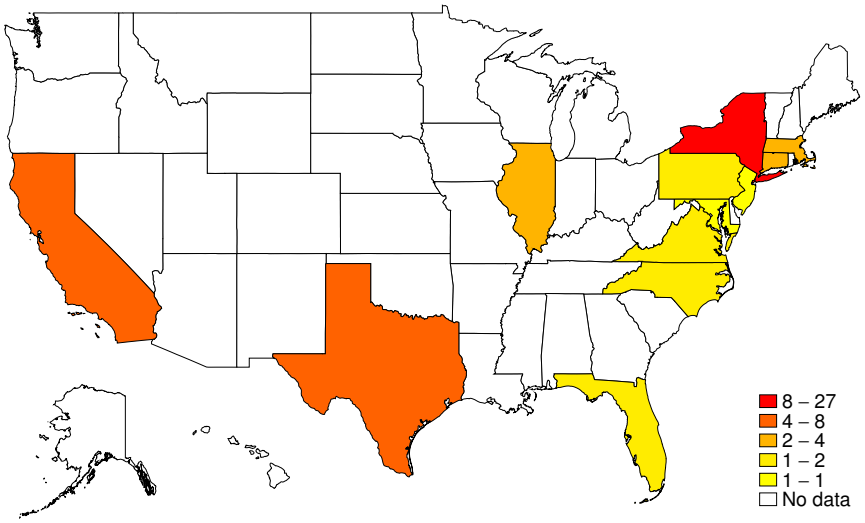
	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
County	30	6.34	7.74	3.29	0.00	0.00	11.86	15.05
CBSA	30	8.00	8.20	6.19	0.00	0.00	14.29	16.93
State	30	13.84	13.17	12.02	0.00	2.50	16.18	32.16
Divison	30	20.64	13.92	21.06	0.00	10.53	30.77	37.50
Region	30	31.61	20.18	29.28	11.29	21.28	39.44	56.28

Panel (b) 2017:Q4

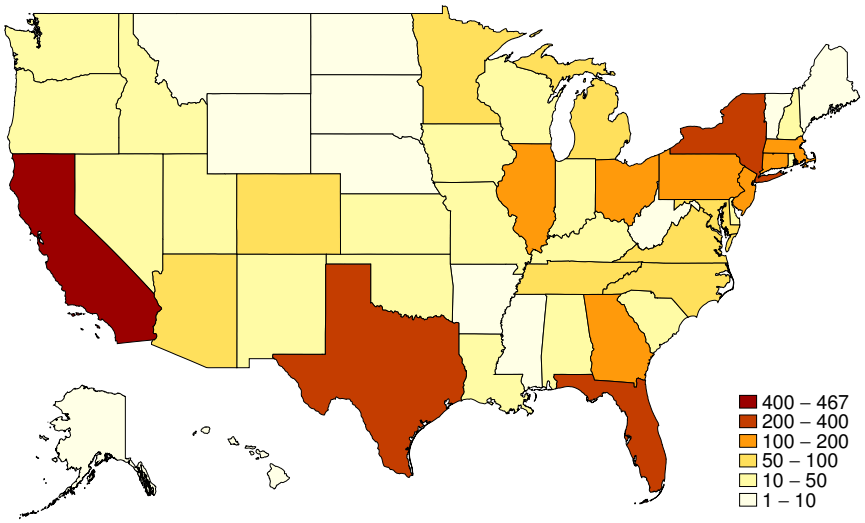
	Count	Mean	St.Dev.	Median	10%	25%	75%	90%
County	57	6.01	8.41	4.24	0.00	1.20	8.00	11.76
CBSA	57	8.06	9.10	5.26	0.00	3.03	10.00	20.00
State	57	14.52	19.37	7.27	2.22	4.88	12.50	35.79
Divison	57	21.80	17.75	18.18	6.45	12.50	23.08	41.67
Region	57	32.00	19.50	27.08	15.56	19.72	36.36	52.50

The Table reports the percentage of portfolio companies located within the same geographical area (e.g. county) as a BDC from which they borrow. The figures represent the cross-sectional statistics across BDCs as of 2010:Q4 and 2017:Q4.

[30] `https://data.nber.org/data/zip-code-distance-database.html`.



(a) BDCs



(b) BDC Borrowers

Fig. B.1: Locations of BDCs and BDC Borrowers

The Figure depicts the count of BDCs in Panel (a) and BDC borrowers in Panel (b) in each state as of 2017:Q4. BDCs' location refers to the location of their headquarters.

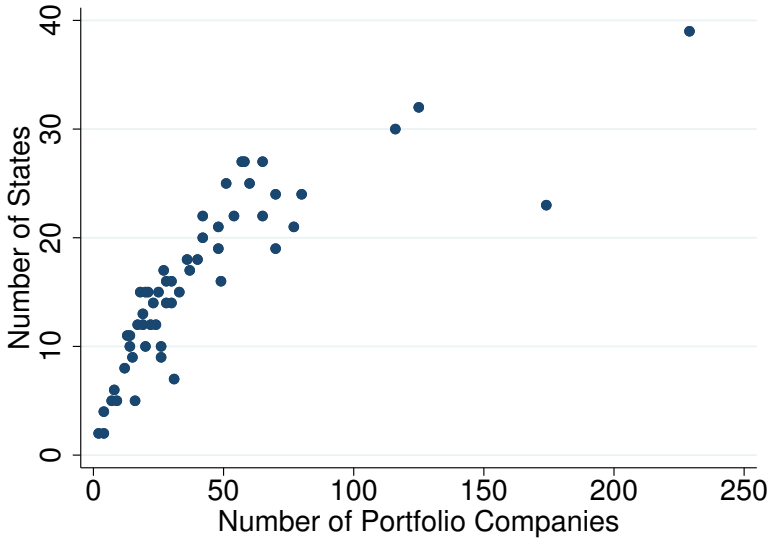


Fig. B.2: Presence of Portfolio Companies Across States

The Figure scatters the number of companies borrowing from a BDC against the number of distinct states in which those companies are located as of 2017:Q4. Each dot represents a BDC. We exclude Newtek Business Services (NEWT), which lends to around 1,500 portfolio companies in all 50 states.

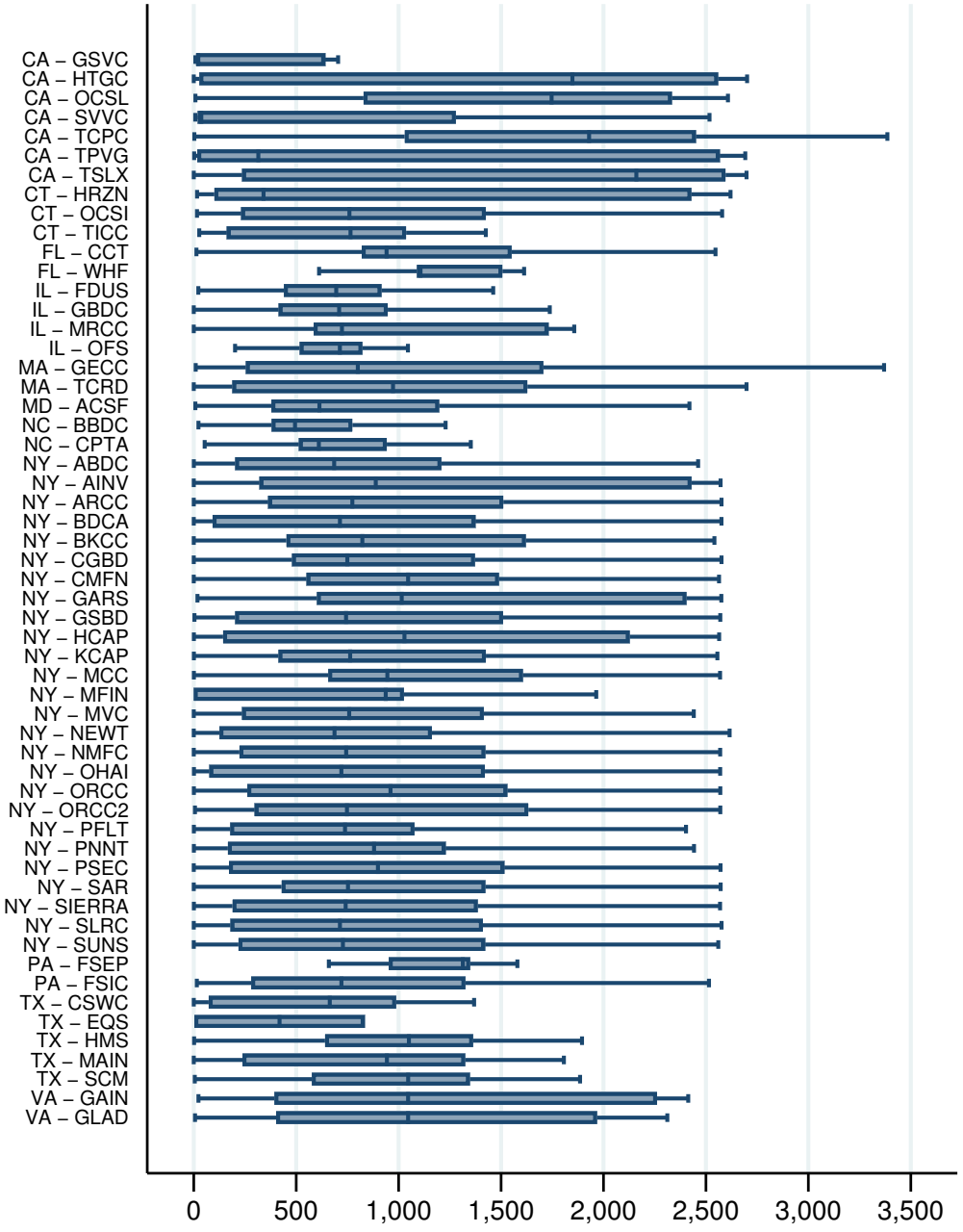


Fig. B.3: Distribution of BDC-to-Borrower Distance

The Figure depicts the distribution of the BDC-to-borrower distances as of 2017:Q4. The y-axis labels include both the state abbreviation in which the BDC is headquartered and the BDC ticker. The box edges are the 25th to 75th percentile values, and the solid line within the box is the median. The whiskers of the box extend to the extreme values excluding outside values. An outside value is defined as being smaller (larger) than the lower (upper) quartile minus (plus) 1.5 times the interquartile range.