ANNUAL REVIEWS

Annual Review of Financial Economics

Public Policies for Private Finance

Ralph De Haas[1,2,3] and Juanita González-Uribe[2,4]

[1]European Bank for Reconstruction and Development, London, United Kingdom

[2]Centre for Economic Policy Research, Paris, France

[3]KU Leuven, Leuven, Belgium

[4]London School of Economics, London, United Kingdom; email: j.gonzalez-uribe@lse.ac.uk

Annu. Rev. Financ. Econ. 2025. 17:243–66

First published as a Review in Advance on August 6, 2025

The *Annual Review of Financial Economics* is online at financial.annualreviews.org

https://doi.org/10.1146/annurev-financial-082123-105552

JEL codes: D04, G20, G28, H25, H81, L26

OPEN ACCESS CC BY

Keywords

entrepreneurship, small business finance, public policy, financial constraints

Abstract

We review the literature on the effectiveness of public policies to facilitate firms' access to finance. The rationale for such policies is to address market failures that cause financial constraints. Using a simple taxonomy, we discuss the current evidence on common interventions to tackle these constraints: public lending through state and development banks, public lending through private banks, subsidized credit, credit guarantee schemes, export credit agencies, publicly backed venture capital, and tax incentives for equity investors. Based on the quantity and quality of the available evidence, we summarize the policies that have proven most effective in helping firms access external financing. In addition, we highlight areas where future research is needed to address current knowledge gaps and to provide more definitive policy guidance.

1. INTRODUCTION

Amid a slowdown in financial globalization and a tightening of monetary conditions, governments are increasingly turning to policies to improve access to financing for private firms. Their aim is to target market failures that prevent firms with promising projects from securing the debt, equity, or hybrid capital necessary to fund their operations and growth. Although many countries now employ a patchwork of such policies, as **Figure 1** illustrates for the United Kingdom, it is not yet clear how effective they are in alleviating financial constraints and whether there are unintended spillover effects. This article summarizes the academic evidence on these issues, using the following taxonomy:

1. Public lending through state and development banks
2. Public lending through private banks
3. Subsidized credit
4. Credit guarantee schemes
5. Export credit agencies (ECAs)
6. Publicly backed venture capital (VC)
7. Tax incentives for equity investors

Three main themes emerge from our review. First, there is growing evidence that well-designed public policies can help alleviate financial constraints and promote firm growth, especially for smaller businesses, but that the effects are context-dependent. Second, policy makers need to consider potential downsides, such as fiscal costs, distortion of incentives, and the risk of crowding out private finance. Third, the literature highlights the importance of tailored policies that target specific market failures and firm types, as one-size-fits-all approaches are less effective. We advocate for further research on the long-term equilibrium impacts of public policies for private

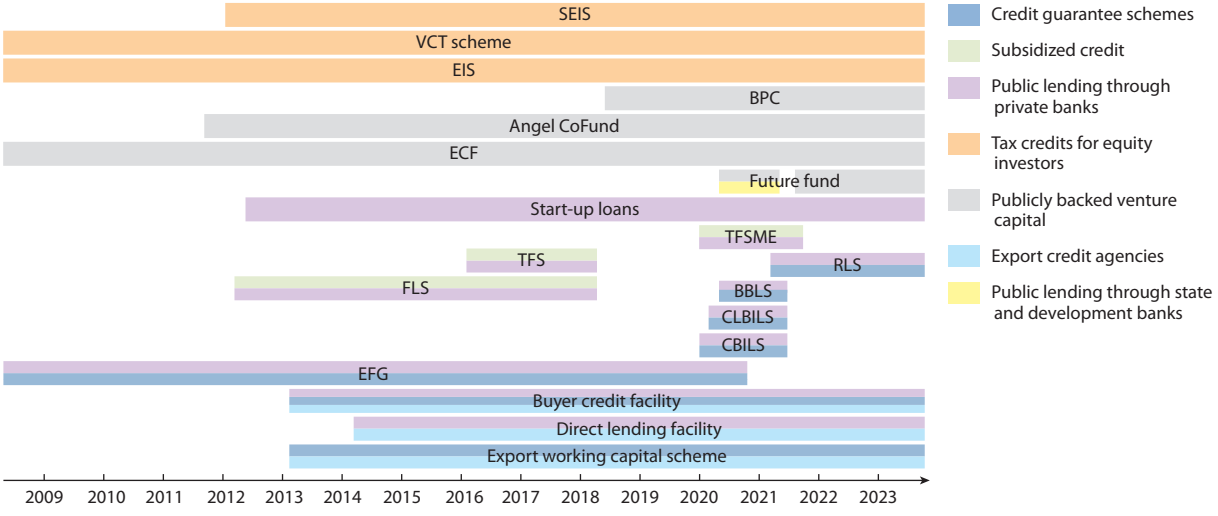

Figure 1

Public policies for private finance as implemented in the United Kingdom starting in 2009. Abbreviations: BBLS, Bounce Back Loan Scheme; BPC, British Patient Capital—core funds and coinvestment program; CBILS, Coronavirus Business Interruption Loan Scheme; CLBILS, Coronavirus Large Business Interruption Loan Scheme; ECF, Enterprise Capital Fund; EFG, Enterprise Finance Guarantee; EIS, Enterprise Investment Scheme; FLS, Funding for Lending Scheme; RLS, Recovery Loan Scheme; SEIS, Seed Enterprise Investment Scheme; TFS, Term Funding Scheme; TFSME, Term Funding Scheme with additional incentives for small- and medium-sized enterprises; VCT, Venture Capital Trust.

finance and their interaction with other interventions, such as through the estimation of structural models. We also recommend generating more rigorous evidence, ideally using randomized controlled trials (RCTs) and quasi-experimental approaches, to inform optimal policy formulation, as the effectiveness of these policies often depends on the details of their design and implementation.

We assess only a subset of the programs available to governments to address financial market failures. Many other interventions exist, some of which interact with financial policies by creating the right (or wrong!) framework conditions. Examples include establishing credit registries (Pagano & Jappelli 1993), strengthening creditor rights (La Porta et al. 1998), introducing collateral laws (Calomiris et al. 2017), and allowing foreign bank entry (Claessens & Laeven 2004). Moreover, beyond the fiscal policy tools that we consider, governments and central banks can also directly influence firms' access to finance through a variety of monetary and prudential policy instruments. A discussion of these types of policy is beyond the scope of this article.

Before discussing the effectiveness of public policies for private finance, we need to answer two basic questions: Why would governments implement such policies? And how can one measure their impacts?

2. PUBLIC POLICIES FOR PRIVATE FINANCE AND SOCIAL WELFARE

That public policies for private finance enhance social welfare is not self-evident. Their justification requires both the presence of a market failure and the ability of government intervention to resolve more distortions than it creates.

Market failures occur when market equilibria do not lead to Pareto-efficient outcomes. A longstanding literature demonstrates how market failures such as information asymmetries, imperfect competition, and externalities can prevent socially desirable projects from obtaining necessary funding (Mas-Colell, Whinston & Green 1995). There are two types of such projects. First, there are projects with both positive private and social values that cannot attract sufficient financing from private investors, leaving their owners financially constrained (Stiglitz & Weiss 1981, Myers & Majluf 1984, Tirole 2010). For example, promising entrepreneurs may lack the collateral or track record required to secure credit from private banks. Second, some projects have a negative private value but a positive social value, making them worthy of investment from a social perspective. An example would be innovative but loss-making firms that generate substantial knowledge spillovers to other companies.

Public policies aimed at addressing these market failures may introduce their own distortions. For example, they may displace more productive investment, influence prices in ways that reduce benefits for intended recipients, encourage socially inefficient risk-taking, or misallocate capital due to political capture (Gale 1991, Arping, Lóránth & Morrison 2010, Lelarge, Sraer & Thesmar 2010, Eslava & Freixas 2021).

Assessing the effectiveness of financial policy in improving social welfare is an empirical challenge for two reasons. First, the most direct tests involve estimating complex and unobservable economic factors, not least financial constraints. Second, identifying credible counterfactuals to isolate causal effects is difficult, as macroeconomic conditions and firm trajectories can shift together with the policies of interest, making it difficult to separate their effects. The next two subsections explore these measurement and inference issues.

2.1. Measurement Challenges

Most studies evaluating public policies for private finance acknowledge the challenge of measuring their overall impact on social welfare. They instead aim for a more attainable goal: determining if these policies help reduce inefficient capital allocation due to market failures, with a special emphasis on financial constraints. However, even this more targeted analysis faces hurdles. A conceptual

difficulty stems from differences in the definition of financial constraints between studies. In addition, financial constraints are not directly observable, adding additional empirical complexity to their assessment.

The financial economics literature distinguishes two primary definitions of financial constraints, as highlighted by Farre-Mensa & Ljungqvist (2015). The first describes situations where firms cannot obtain enough capital for their projects with positive private values despite being willing to pay the demanded price or more; Stiglitz & Weiss (1981) refer to this as credit rationing. The second definition, based on Fazzari, Hubbard & Petersen (1988), refers to cases where the cost of external capital is significantly higher than the opportunity cost of internal capital. This cost wedge prevents firms from investing in otherwise viable projects, with larger wedges indicating higher financial constraints.

Based on these definitions, earlier studies often determined whether public policies mitigated financial constraints by examining the usage of these policies among eligible beneficiaries and the amounts of capital they accessed. However, these metrics alone do not conclusively show whether policies reduced financial constraints. For example, unconstrained firms might also opt to utilize financing from public policies if it is less expensive than alternative sources of capital. Other approaches rely on comparing how firms, categorized by their ex ante financial constraint levels, use public policies. This categorization often uses proxies based on observable characteristics like firm size, age, or leverage—employing indices like those introduced by Kaplan & Zingales (1997), Whited & Wu (2006), and Hadlock & Pierce (2010). However, there is an ongoing academic debate on whether these methods accurately determine how financially constrained firms are (Farre-Mensa & Ljungqvist 2015).

Recent studies use rich data to assess various firm outcomes over time, enabling more robust financial constraint evaluations, particularly when policies do not affect capital costs. For example, Banerjee & Duflo (2014) analyze a directed lending program in India. They document increased borrowing, profits, and sales among eligible firms, without changes in interest costs or shifts in other capital sources, suggesting that these businesses were financially constrained before the policy. If not constrained, they would likely have used the extra funds to replace more expensive capital.

A limitation of this method arises when public policies subsidize firms' cost of capital. In such cases, this method may not robustly evaluate financial constraints. For example, the fact that policy beneficiaries use subsidized capital for investment, instead of replacing unsubsidized capital, does not necessarily mean that the policy reduces constraints. In such cases, firms might use the subsidized capital to fund projects that seem viable only at the subsidized interest rate but would not be pursued otherwise due to their negative net present value under the higher, unsubsidized cost of capital.

Investing in projects with negative private values can still improve social welfare if these projects produce tangible external benefits. However, most empirical analyses do not even attempt to account for such externalities. A small but growing area of research aims to address this gap. Current work primarily explores the externalities linked to innovation, a research avenue that faces considerable challenges, as discussed by Bryan & Williams (2021).

2.2. Inference Challenges

The second challenge in assessing the welfare effects of public policies for private finance is to create meaningful counterfactuals. The question here is one of causation: How much of what we observe is actually due to the policy rather than other factors? Looking at the trajectories of recipients is not enough to understand the impact of the policy. Three key concerns are that macroeconomic factors affect the trajectories of companies regardless of the usage of the scheme;

self-selection into the scheme by firms with particular expected trajectories (one can think of both positive and negative selection stories); and policy makers targeting firms that would have had particular trajectories even absent the policy.

To trace the impact of a policy, one needs information on a control group of firms that absent the policy would have followed very similar trajectories as the beneficiaries. Several econometric methods have been used to construct such counterfactuals, with varying degrees of success. Matching on observables is a common approach where researchers assemble a sample by matching beneficiaries with nonbeneficiary firms on observables. A key example is the work by Brown & Earle (2017) evaluating the loan programs of the Small Business Administration (SBA) in the United States. Another, typically more rigorous, approach is to exploit nonlinearities in access to public policies, such as eligibility thresholds (e.g., Custodio, Bonfim & Raposo 2023). Lastly, in specific cases, RCTs can be used to measure the impact of a new policy, depending on whether researchers can integrate an experimental component into the rollout of a new (pilot) program. This is the approach taken in various papers evaluating microcredit programs, discussed in Section 3.2.2. In other cases, researchers may exploit that the introduction of a new policy was quasi-random. Throughout this article, our focus is mostly on papers using such more rigorous methodologies.

An emerging alternative approach to evaluate public policies for private finance involves structural estimation and calibration. By explicitly modeling the economic mechanisms through which policies affect firm behavior and market outcomes, structural models allow for counterfactual analysis and the quantification of both direct and indirect policy effects. This approach is particularly valuable when exploring general equilibrium effects and optimal policy design. Although applications of structural models to analyze public policies for private finance remain relatively limited, they offer a promising complementary toolkit for understanding policy impacts, especially when experimental or quasi-experimental variation is unavailable. In what follows, we discuss some examples of this structural approach to complement our review of reduced-form evidence.

3. PUBLIC POLICIES FOR PRIVATE FINANCE: WHAT WORKS?

This section synthesizes the empirical evidence on how public policy shapes private finance. We organize the discussion using a taxonomy of seven distinct policy types, each targeting different mechanisms to steer access to finance.

3.1. Public Lending Through State and Development Banks

A seemingly straightforward way for governments to expand firms' access to finance is to take direct ownership of commercial banks or to create a development bank. State-owned commercial banks operate, in principle, like regular banks and generate profits through deposit-taking and lending activities. Development banks have a more specific mandate to promote economic development and social progress.

3.1.1. State-owned commercial banks. While most state-owned commercial banks are located in developing countries and emerging markets, they can also be found in high-income countries. Examples include the regional Landesbanken in Germany, the Banque Postale in France, and the Bank of North Dakota in the United States. An early literature shows that, at the macro level, greater state ownership of commercial banks is associated with shallower financial systems and slower economic growth (Shleifer & Vishny 1994, La Porta, Lopez-de Silanes & Shleifer 2002, Sapienza 2004, Cole 2009b). An important factor contributing to this negative relationship is the susceptibility of state banks to political influence, leading to distortions in the allocation of credit due to vested interests. Microevidence on political interference in the credit

allocation of state banks, especially around elections, is now available for many settings (Dinç 2005, Khwaja & Mian 2005, Cole 2009c, Carvalho 2014, Bircan & Saka 2021, Koetter & Popov 2021).

One can raise two objections against this bleak depiction of state banks. First, due to the inference challenges discussed in Section 2.2, some cross-country studies are not well identified. Second, while microeconometric studies typically do better on this account, they have almost exclusively focused on the distortions caused by state banks. These studies often overlook, by design, any positive direct impacts on borrowers, such as eased financial constraints and indirect spillovers to other firms, as discussed in Section 2.1.

Some recent studies have begun to address this imbalance. One is the aforementioned study by Banerjee & Duflo (2014) on lending to medium-sized enterprises by an Indian state bank. The authors find that beneficiary firms expanded sales and profits faster, in line with previously having been financially constrained. Returns to capital were substantial. For the case of Spain, Jiménez et al. (2018) analyze the impact of a credit facility by a state bank during the global financial crisis. The supply of public credit led to large positive real effects on financially constrained firms and helped crowd in new private-bank credit.[1] There were also positive spillovers, as targeted firms paid suppliers faster and were more likely to repay private banks. Importantly, while the private returns of this credit facility were negative, its social returns are estimated to be positive.

Lastly, Ru (2018) exploits exogenous variation in lending by the China Development Bank (CDB), using predetermined cycles in turnover of municipal politicians. The author finds that cities borrow more from the CDB in the first year of a secretary's term, with borrowing gradually decreasing over time. This induces exogenous variation in the CDB's credit supply that allows the causal effects on firms to be estimated (while at the same time adding to the evidence on politically motivated state bank lending). The author finds that state loans to upstream state-owned enterprises crowd out private firms in the same industry but crowd in downstream private firms, especially more efficient ones. In addition, state bank infrastructure loans have positive spillovers on private firms. The message is therefore nuanced, also compared to the earlier literature. The impact of state bank lending on the private sector can vary by target industry and can shift as the composition of loan portfolios changes.

A related strand of the literature uses the geographical expansion of state bank branch networks for identification. Burgess & Pande (2005) evaluate a large state-led branch expansion in India, exploiting the program's spatial variation in rural areas. They find that the entry of state bank branches in rural, previously unbanked locations reduced local poverty.[2] More recently, Fonseca & Matray (2024) study the expansion of state bank branches in urban areas throughout Brazil. They find positive impacts on firm creation and expansion and, through higher labor demand, local average wages. The state-led expansion of bank branches did not crowd out private lending.

To comprehensively evaluate state banks' role in economic development, it is important to look beyond aggregate measures in order to disentangle heterogeneous effects across firms and industries and examine how these effects change over time. Future research could focus on the strategic lending behavior of state banks, particularly during crises and in relation to privately owned peers, and how the role of state banks interacts with other policy interventions, such as various types of industrial policy. Another promising area for future research is to investigate how the corporate governance of state banks affects the allocative efficiency of their lending.

[1]The authors define financially constrained firms as those whose main banks substantially reduced credit supply during the crisis or those with a significant fraction of short-term debt.

[2]Relatedly, Cole (2009a) analyzes agricultural lending by Indian state banks. The author finds that state banks are less profitable than private ones, but their lending is associated with higher agricultural production and less rural poverty.

Hau & Thum (2009), for example, study the biographical background of German banks' supervisory board members. They show that state banks have less experienced representatives compared to private banks, with this board incompetence correlating with greater losses during the global financial crisis. Likewise, Cuñat & Garicano (2010) show how, during Spain's financial crisis, savings and loan institutions (*Cajas*) led by chairmen who were political appointees, lacked postgraduate education, or had no banking experience showed worse loan performance. Interestingly, formal governance structures and board composition had little impact on performance, suggesting that personal leadership qualifications were more critical than institutional arrangements to weather the crisis.

3.1.2. Development banks. Development banks are state lenders with a mandate to promote economic development and social progress in a specific geography, either multiple countries (e.g., the Asian Development Bank), one country (e.g., the British Business Bank in the United Kingdom), or a subnational region (e.g., India's Andhra Pradesh State Financial Corporation). These banks engage in both direct lending to large companies and intermediated lending to smaller firms through credit lines to private lenders. Eslava & Freixas (2021) show theoretically how development banks can mitigate market failures by internalizing the full social value of projects as well as the aggregate benefits of screening.

Empirical evidence on the functioning and impact of development banks is scarce due to data limitations and heterogeneity across institutions. Paravisini (2008) examines an Inter-American Development Bank program in Argentina that provided funding to commercial banks, which in turn lent the funds to small- and medium-sized enterprises (SMEs)—a structure known as "on lending," where public capital is channeled through financial intermediaries to reach final borrowers. The study finds a persistent increase in lending by recipient banks, suggesting these banks and at least some of their borrowers faced financial constraints prior to the program. Eslava, Maffioli & Meléndez (2014) show that loans from the Colombian development bank Bancóldex increase firms' employment, investment, output, and credit access, especially for smaller firms. The results suggest that Bancóldex loans complement and expand access to private credit rather than just substitute for private loans. This indicates how public lending through development banks can help alleviate credit constraints, with long-term lending being particularly effective. Moreover, public lending does not need to be explicitly subsidized to have positive effects on firm performance, as long as it expands access to credit for firms that are otherwise rationed by private lenders.

Other recent papers use microdata to evaluate the impact of intermediated lending programs by development banks. Bazzi et al. (2023) study an SME credit line by Brazil's BNDES. The authors leverage the fact that Brazilian (private and state) banks could access this credit line at different points in time and that individual municipalities had different prior exposure to treated banks (based on the preexisting branch footprint). The resulting spatial variation in credit supply shocks led to more business creation and exit, with new firms having higher short-term growth and survival prospects, especially in municipalities with initially shallower credit markets. In more developed local credit markets, the additional credit supply mainly induced entry by marginal firms. De Negri et al. (2013) also focus on Brazil's BNDES but analyze its lending during the global financial crisis. They find that BNDES increased its lending during the crisis, especially to large firms and in regions where private banks retrenched the most. This countercyclical lending helped mitigate the effects of the credit crunch on firm-level employment and investment.

Future research on development banks could benefit from expanding beyond Latin America to other geographies; exploring optimal lending program design in terms of key modalities such as tenor, interest rates, and collateral requirements; and assessing additionality by examining whether development banks crowd out or crowd in private lending.

3.2. Public Lending Through Private Lenders

A second way for governments to expand firms' access to finance is by channeling public capital through financial intermediaries. These intermediaries can include commercial banks as well as more specialized organizations, such as microfinance institutions (MFIs) that focus on lending to small and underserved businesses.

3.2.1. Public lending through commercial banks. Development banks are increasingly allocating public funding to target sectors, such as SMEs or female-owned enterprises, through commercial banks. In this approach, a public institution provides credit to commercial banks, which then lend these earmarked funds to the targeted firm segment, often at longer tenors than available in the market (Arping, Lóránth & Morrison 2010, Gutierrez et al. 2011). Commercial banks are typically required to combine the public funding with their own private capital, a practice known as blended finance or cofinancing (Broccolini et al. 2021, Flammer, Giroux & Heal 2024). This approach aims to increase the total amount of funding mobilized for a target group. Blended finance facilities usually include three components: credit lines with a use-of-proceeds clause to ensure funds are directed to the intended beneficiaries; credit guarantees to mitigate the perceived risk of lending to the target group; and technical assistance to overcome banks' initial reluctance to lend to the targeted group. Evidence on the impact of these public programs intermediated via commercial banks is limited and rarely extends to estimates of the impact on final beneficiaries (for examples from Latin America, see Section 3.1.2). This reflects measurement and inference challenges (Section 2) as well as insufficient granular data.

Aydın, Bircan & De Haas (2024) provide empirical evidence on the impact of a blended finance program for female entrepreneurs in Türkiye. Using credit registry data, firm-level tax records, and matched employer-employee data, they find a 22% increase in credit to women-owned firms, with banks lending more to existing clients, poaching clients from other banks, and attracting first-time borrowers. Firms receiving more credit experienced increases in investment, employment, sales, profits, and supplier relationships. While this study indicates that blended finance can ease credit constraints and have real impacts for underserved entrepreneurs, the authors note that their findings reflect the combined effect of liquidity support, risk-sharing, and loan officer training. Disentangling the relative importance of these main elements of blended finance programs is a promising direction for future research. Additionally, such research could examine potential negative spillovers on other borrowers when programs target specific groups.

3.2.2. Public lending through microfinance institutions. In many poor countries, governments play an active role in the microfinance sector, either owning or subsidizing MFIs. Globally, the median MFI receives 5 cents of subsidy per dollar lent, highlighting the extent of government involvement (Cull, Demirgüc-Kunt & Morduch 2018).

Unlike most public policies to stimulate private finance, microcredit has been subject to rigorous empirical evaluation through RCTs.[3] This evidence indicates that while access to microcredit typically leads to more borrowing, business creation, and investment, it does not translate into significant increases in profits, income, or consumption, at least not over the 1- to 3-year horizons studied. These sobering results can be attributed to two factors. First, the take-up of microcredit is often lower than expected. Second, even among those who take up microcredit, the increases in profits are generally limited and concentrated among specific subpopulations, such as existing entrepreneurs (Banerjee et al. 2019, Meager 2019).

[3] See Angelucci, Karlan & Zinman (2015), Attanasio et al. (2015), Augsburg et al. (2015), Banerjee et al. (2015), Banerjee, Karlan & Zinman (2015), Crépon et al. (2015), and Tarozzi, Desai & Johnson (2015).

Recent experimental work has begun to explore whether adapting the standard microcredit contract can make it a more attractive and therefore more effective tool to increase entrepreneurship and improve living standards. The evidence so far suggests that design changes such as introducing grace periods (Field et al. 2013) or varying the liability structure (Attansio, Augsburg & De Haas 2019) can indeed influence take-up and how people use microcredit (including the choice of investments). Barboni & Agarwal (2023) and Battaglia, Gulesci & Madestam (2024) study microcredit contracts that allow borrowers to delay repayment during the loan cycle. Such ex post repayment flexibility appears to increase borrowing and risk-taking while improving business outcomes.

Other research has focused on making microcredit "less micro" by allowing larger loan sizes. Bari et al. (2024) conduct an RCT in which they offer microcredit clients in Pakistan the opportunity to finance a business asset worth four times their usual borrowing limit, using a hire-purchase contract. Treated clients started to run larger and more profitable businesses, leading to increased consumption. Similarly, Bryan, Karlan & Osman (2024) use an RCT to examine the impact of loans four times the typical size to small businesses in Egypt. While these larger loans had only small positive impacts on average, there was substantial heterogeneity in impacts. Top performers—those with the highest predicted treatment effects based on psychometric testing—saw large increases in profits, productivity, wage bills, and household expenditures. In contrast, poor performers experienced significant decreases in profits, employees, and wage bills.

Future research could explore how promising microentrepreneurs can seamlessly transition from MFIs, which typically operate with capped loan sizes, to commercial banks, enabling them to grow into small- or medium-sized firms.[4]

3.3. Subsidized Credit

Governments frequently provide credit subsidies to lower the borrowing costs for firms to below-market interest rates.[5] While subsidized credit may help mitigate financial constraints and underinvestment, it also carries risks. One concern is that it may distort the efficient allocation of resources by channeling funds to firms that may not be the most productive or efficient. Additionally, subsidized credit can crowd out lending by private lenders, and this may reduce overall credit.

The evidence on the effectiveness of interest rate subsidies is rather thin. Bach (2014) examines the impact of a French targeted credit program, CODEVI, on small businesses. The program allowed banks to intermediate tax-free household savings to firms in specific sectors with annual sales below a threshold. The study exploits a natural experiment in which eligibility criteria were suddenly expanded. Using firm-level data and a difference-in-differences design, the author finds that the program increased debt financing of eligible firms by 8 percentage points without substituting subsidized for unsubsidized finance. Returns on subsidized debt were significantly above market cost, suggesting recipient firms were credit constrained. The study showed no increase in default risk for eligible firms.

Horvath & Lang (2021) study the impact of Hungary's Funding for Growth Scheme, a subsidized loan program introduced in 2013 to reduce SMEs' financing costs. Eligible firms accessed credit at a 2.5% interest rate, 4 percentage points below the average corporate lending rate. Using

[4]S. Agarwal et al. (2023) show how a microcredit program in Rwanda allowed unbanked microborrowers to build credit histories and eventually transition to commercial banks. This paper also illustrates how program success may depend on complementary institutional features, such as well-functioning information sharing through a credit bureau.

[5]We focus here on subsidies that lower the cost of debt financing for firms and do not discuss grant programs that directly subsidize firm investment.

administrative microdata and a difference-in-differences design, the authors find that firms receiving subsidized loans substantially increased their investment and employment within the first year compared to a control group. The study also shows long-term improvements in efficiency, with treated firms ranking five percentiles above control firms 3 years after receiving loans. As expected, firms with more severe credit constraints responded more strongly to the subsidized loans.[6]

Lastly, Zia (2008) investigates the effects of Pakistan's Export Finance Scheme on firm-level exports and financial constraints within the textile sector. Exploiting an exogenous policy change that excluded cotton yarn exports from the subsidy program, the study reveals that the removal of subsidies significantly reduced exports for financially constrained, privately owned firms. In contrast, publicly listed and large firms, often part of corporate networks, remained unaffected, suggesting they were not financially constrained and did not rely on subsidized credit for exports. The study finds that nearly half of the subsidized loans were misallocated to financially unconstrained, publicly listed firms, resulting in an estimated output loss of at least 0.75% of GDP for privately owned firms.

This limited evidence suggests that well-targeted subsidized lending can alleviate credit constraints, particularly for smaller firms. Firms receiving subsidized loans can experience substantial short-run growth, with high marginal returns to capital surpassing market interest rates, indicating prior credit constraints. However, the impact is likely driven by expanded credit access rather than the subsidies themselves. Future research should investigate potential negative spillovers of interest subsidies on other firms, such as local competitors, and estimate the fiscal costs of subsidy misallocation for a broader set of environments.

3.4. Credit Guarantees

Credit guarantees have gained renewed attention over the past two decades, particularly during the COVID-19 pandemic, as a public policy to improve SME credit access. These schemes offer lenders third-party credit risk protection by absorbing losses on small-business loans in exchange for a fee. Empirical evidence on the effectiveness of credit guarantees has been steadily accumulating. Due to data limitations, early studies evaluated the impact on beneficiary firms' credit use rather than real effects like investment or employment (Beck, Klapper & Mendoza 2010, Asdrubali & Signore 2015). However, recent work leverages large administrative data and quasi-experimental methods to provide more robust and comprehensive insights into how credit guarantees affect firm performance.

A popular identification strategy combines matching, whereby program participants are matched with nonparticipants on the basis of observable characteristics, with a difference-in-differences framework. Asdrubali & Signore (2015) use such a strategy to study the economic impact of the European Union SME Guarantee Facility, specifically in Central, Eastern, and Southeastern European (CESEE) countries. The authors show that employment and turnover of beneficiary firms increased by almost 20% relative to control cohorts. Likewise, Akcigit et al. (2024) study the Turkish credit guarantee fund. They also find positive effects, with employment and sales of treated firms increasing by 17% and 70% relative to a matched control group, respectively. The authors also document a reduction in default probability for beneficiary firms.

Matching cannot control for unobserved heterogeneity across firms, as it assumes that borrowers and matched nonborrowers do not significantly differ in unobservable characteristics related to borrowing decisions. This assumption may be unrealistic, potentially leading to selection bias (González-Uribe & Wang 2022). To address this issue, recent papers exploit variation in program

[6]The authors estimate each firm's credit constraints based on their ex ante characteristics.

participation induced by eligibility cutoffs or restrictions, often related to firm size. The intuition is that firms just below and above the cutoff are expected to be similar along many dimensions, mitigating the impact of unobserved heterogeneity.

An example of this approach is the study by González-Uribe & Wang (2022), who evaluate the British Enterprise Finance Guarantee (EFG) program launched during the global financial crisis. The EFG provided lenders with a government-backed guarantee of 75% of each loan's value up to 1.2 million pounds for firms in targeted industries with annual revenues below 25 million pounds. Using a difference-in-differences approach, they match eligible and noneligible firms based on pre-trends—that is, how the firms' outcomes were evolving before the intervention—to ensure the groups were following similar trajectories. They then compare the two groups over a narrow window around the eligibility threshold to estimate the policy's effect more credibly. The results show that the program positively affected various outcomes, including employment, wages, productivity, and relative growth in revenues and profit. Although eligibility increased firm indebtedness, it did not impact repayment, survival, interest charges, leasing, or other nondebt financing relative to noneligible firms.

A similar identification approach uses regression discontinuity designs (RDDs). Bonfim, Custódio & Raposo (2023) employ this approach to study the introduction of the SME-Leader program in Portugal in 2008. The program targeted low-risk small firms, offering a loan guarantee, an interest rate cap, and a public credit rating. Using an RDD around the eligibility thresholds, the authors find a positive impact on eligible firms' investment, employment, revenue growth, and exports relative to noneligible firms over the 2008–2013 period. However, the positive effects are less pronounced in the postcrisis period. It is important to note that the study evaluates the effectiveness of a policy bundle (credit guarantee, interest cap, and public rating) and does not isolate the impact of the guarantee alone.

An important question is whether any impacts of credit guarantee programs fizzle out or are instead stable over time. Bertoni, Colombo & Quas (2023) therefore use a range of quasi-experimental designs to explore the long-term (10-year) effects of loan guarantees on French SMEs. They find that firms receiving guaranteed loans experienced higher growth in sales, employment, and assets and had higher survival rates compared to a control group of nonbeneficiaries. This growth was more pronounced in firms typically facing greater financial constraints, like younger or smaller companies. Effects were durable and did not lead to a slowdown in total factor productivity growth for treated firms relative to nonbeneficiaries.

For the United States, several papers analyze the impact of the country's flagship SBA program of partially government-guaranteed loans. Overall, the evidence indicates that SBA guarantees have alleviated small firms' credit constraints and created jobs. Brown & Earle (2017) estimate the SBA's effect on employment growth using administrative data on loans and lenders linked to all US employers. They exploit geographic variation in the presence of lenders active in SBA lending programs for identification, constructing instrumental variables based on the local presence of branches belonging to banks heavily participating in programs like the Preferred Lender Program (PLP) in counties other than the borrower's county. The authors find that each million dollars of SBA loans results in a 3–3.5 job increase in the first 3 years after loan receipt.

Bachas, Kim & Yannelis (2021) examine the effects of SBA guarantees on credit supply by exploiting a discontinuity induced by program rules. Using a bunching estimator, they find that a 1 percentage point increase in guarantee generosity leads to a $19,000 increase in per-loan lending volume, confirming that the volume of small business lending is highly responsive to loan guarantees. This aligns with prior literature showing that guarantee schemes can boost overall debt financing without substitution between subsidized and unsubsidized finance and with minimal impact on marginal default probabilities.

Granja, Leuz & Rajan (2022) nuance this message by showing that during the 2004–2007 boom years, just before the global financial crisis, SBA loans from physically distant lenders had significantly higher charge-off rates compared to loans from nearby lenders, suggesting they were riskier. Notably, banks did not charge higher interest rates on these riskier distant loans. This implies that in the precrisis period, banks loosened credit standards and made riskier SBA loans to distant firms that were more challenging to assess and monitor.

Core & De Marco (2023) explore the role of banks' IT infrastructure in lending decisions, using data from the Italian public guarantee scheme during COVID-19. They find that banks with better IT provide more, cheaper, and faster guaranteed loans, particularly to first-time borrowers in areas where they do not operate branches. This suggests that while physical distance remains a barrier, as shown by Granja, Leuz & Rajan (2022), banks with superior IT can partially overcome this constraint and extend credit to distant firms. Nevertheless, even tech-savvy banks tend to lend more locally, indicating that guaranteed lending remains predominantly local irrespective of banks' lending technology.

In contrast to the evidence from France, Portugal, Türkiye, the United Kingdom, and the United States discussed so far, several other studies have found that credit guarantees can significantly increase the probability of default for targeted firms. de Blasio et al. (2018) use a fuzzy RDD to estimate the impact of the Italian program Fondo di Garanzia on credit access.[7] While they find a positive impact on overall bank borrowing, they also show that the probability of default increases substantially for treated firms. Similarly, Mullins & Toro (2018) study Chile's FOGAPE program of credit guarantees for small firms and, using a similar strategy, find that firms default more on guaranteed loans, suggesting that the scheme induced moral hazard. Lelarge, Sraer & Thesmar (2010) study a French SME loan guarantee program and confirm that targeted firms borrow more and enjoy higher growth rates than similar untreated firms. However, they also find that loan guarantees cause firms to become more likely to file for bankruptcy.[8] The overall efficiency of the program therefore depends on the trade-off between increased growth and increased risk. Other papers, such as those by Uesugi, Sakai & Yamashiro (2010) for Japan and D'Ignazio & Menon (2020) for Italy, also find an increase in loan default associated with credit guarantee programs.

Barrot et al. (2024) is one of the first studies to investigate the worker-level impacts of credit guarantees. To do so, they examine a French guarantee program for SMEs during the global financial crisis. Using a border discontinuity design and administrative data, they find persistent positive effects on workers' employment and earnings. However, the program reduced worker mobility, especially for highly skilled workers, leading to labor misallocation and reduced aggregate productivity. This highlights another trade-off: Credit guarantees may preserve jobs in beneficiary firms during downturns but can harm long-term economic efficiency by impeding optimal resource allocation between firms.

More recently, studies have quantified the role of credit guarantees during the COVID-19 pandemic. In the United States, the focus has been on the Paycheck Protection Program (PPP), which offered SBA-guaranteed loans to eligible firms. Using administrative payroll data, Autor et al. (2022) find that the PPP increased employment in eligible firms by 2–5% at its peak. Bartik et al. (2020) examine the first tranche of PPP loans, revealing that banks favored their most valuable

[7] Fuzzy RDDs have a local average treatment effect (LATE) interpretation, estimating the causal effect for the subpopulation of complier firms around the eligibility threshold. As firms move away from the threshold, the randomization assumption becomes less plausible.

[8] While Lelarge, Sraer & Thesmar (2010) consider bankruptcy filings, Bertoni, Colombo & Quas (2023) focus on actual firm dissolutions. This may explain the contrasting findings on firm survival.

customers. Their study also shows that banks' targeting was more effective than random allocation, with long-term employment effects per $100,000 in lending 5–10% higher than random allocation among applicants would have achieved.[9]

Using data from the euro area credit register, Altavilla et al. (2025) document significant credit substitution effects during the COVID-19 pandemic. They show that banks issuing guaranteed loans reduced their supply of nonguaranteed credit relative to other banks lending to the same firms. Their analysis spans multiple countries and reveals important heterogeneity between firm types, particularly with respect to size, default risk, exposure to pandemic-related shocks, and prior bank-firm lending relationships. For Spain specifically, Jiménez et al. (2022) also find that public credit guarantees favored firms with existing bank relationships.[10] They confirm the credit substitution pattern at the firm-bank level, with firms receiving guaranteed credit experiencing a decrease in their nonguaranteed loan share. These findings from COVID-19 times contrast with those from earlier studies, mentioned above, which found little evidence for credit substitution effects.

Although, across the board, the evidence suggests that credit guarantee schemes can be a relatively cost-effective policy during economic crises, these schemes can have significant fiscal costs that may not be immediately visible (Hee Hong & Lucas 2023). In particular, in the case of credit support during the COVID-19 pandemic, the fact that there are many loans still outstanding makes it difficult to assess long-term total losses. To better gauge these longer-term impacts of COVID-19 guarantee programs, several authors have turned to structural models. Gourinchas et al. (2021, 2024) combine structural modeling with the use of rich data on European SMEs to evaluate the cost and effectiveness of public loan guarantees for small firms during the COVID-19 pandemic. Their results ease concerns about a delinquency "time bomb" due to large-scale pandemic support programs for SMEs.[11] Relatedly, Burga et al. (2024) study Peru's COVID-19 loan guarantee program to examine how its effectiveness varies with the type of financial intermediary. The authors exploit cross-sectional variation in lenders' participation in guarantee auctions, where banks bid on interest rates, to identify the program's impact. Their findings suggest that MFIs played a crucial role in reaching smaller firms. Using a structural model, the authors estimate that MFI participation reduced aggregate defaults by about 30% compared to a counterfactual in which only traditional banks distribute guarantees. These results highlight how institutional design, particularly the selection of participating lenders, can shape program impact. They also demonstrate the value of combining reduced-form estimation with structural methods to evaluate public policies for private finance.

We suggest three priority areas for further research. First, the heterogeneity in the effects of guarantees across different types of firms and industries remains understudied. It is important to understand which sectors benefit the most from these programs to avoid disproportionate fiscal costs and zombie lending (Bonfim, Custódio & Raposo 2023). Second, more evidence is needed on the interaction between credit guarantees and other government interventions, such as direct lending programs or job retention schemes, to understand general equilibrium effects and optimal policy packages (Autor et al. 2022). A key example of such work is by Huneeus et al. (2024), who find important complementarities between credit guarantee and employment protection programs during crises. Their analysis shows that employment support helps contain aggregate risk

[9]Additional research on PPP impacts can be found in the works by Chetty et al. (2020), Hubbard & Strain (2020), and Granja et al. (2022).

[10]Li & Strahan (2021) provide similar evidence for the PPP in the United States.

[11]For Italy, Bonaccorsi di Patti et al. (2024) find that borrowers with guaranteed loans were significantly less likely to experience repayment problems compared to those without guarantees, controlling for ex ante risk.

by reducing firms' credit needs and enabling better bank screening of borrowers. Without the employment program, they estimate that the expected losses from the guarantee program would have been one-third larger, indicating how different policy tools may reinforce each other. Structural modeling can be particularly useful in this strand of the literature.[12] Third, optimal guarantee design requires further research, including whether guarantees can be phased out after banks learn about the creditworthiness of previously underserved market segments and determining the optimal guarantee size and reduction timeline to prevent weakening of banks' screening and underwriting standards.

3.5. Export Credit Agencies

ECAs are (quasi-)public institutions established by governments to promote international trade. They provide government-backed loans, guarantees, and insurance to domestic exporters and their foreign buyers, particularly in cases where private sector financing may be unavailable or inadequate. The primary goal of ECAs is to mitigate commercial and political risks and facilitate access to financing for export transactions.

Recent empirical evidence suggests that ECAs might play a significant role in supporting exports and firm growth. Matray et al. (2024) use the temporary shutdown of the Export-Import Bank of the United States (EXIM) between 2015 and 2019 to study the effects of ECA financing.[13] Using a difference-in-differences approach, they compare firms that previously relied on EXIM support to those that did not, before and after the shutdown. EXIM-reliant firms experienced an 18% drop in global sales driven by reduced exports during the shutdown period, with the effects being particularly pronounced for financially constrained firms and those with higher ex ante export opportunities and returns to capital. Unable to fully substitute the loss of EXIM financing, these firms consequently reduced employment and investment.

Exploiting the same shock, Benmelech & Monteiro (2023) focus on the airline industry and Boeing aircraft. In a difference-in-differences setting, they show that the cessation of loan guarantees resulted in a relative increase in the cost of Boeing aircraft, which significantly affected airlines in countries with underdeveloped financial systems. In contrast, airlines with high liquidity or access to developed financial markets managed to substitute EXIM funds with private financing. Together, these findings suggest that targeted export credit support can be an effective policy, even in countries with well-developed financial markets.

N. Agarwal et al. (2023) also explore how government-backed export credit guarantees can alleviate information frictions and mitigate risks. Using a quasi-natural experiment induced by the marketing campaigns of the Swedish ECA and employing an RDD, the authors show that export credit guarantees enable firms to enter foreign markets and grow their exports, especially outside the European Union and OECD. Smaller, liquidity-constrained firms benefit more. However, while guarantees boost exports, they have limited effects on employment and value added.

Future studies could explore what specific institutional factors influence the success or failure of export guarantees and whether tailored approaches can be developed to make ECAs more effective and cost-efficient in weaker institutional environments, such as in many low-income countries.

[12] For example, Crouzet & Tourre (2021) develop a structural model to study the short- and long-term equilibrium effects of direct purchases of corporate debt by the Federal Reserve during the COVID-19 pandemic. They show that, while such credit support may boost firm growth in the short term, the resulting overhang of legacy debt can depress corporate investment in the long term, slowing down the economic recovery. Whether these negative long-term effects outweigh the short-term benefits depends on the extent to which financial markets are dislocated during the initial downturn.

[13] EXIM's charter was allowed to lapse in July 2015 and its board lost quorum, causing its supply of trade financing to collapse sharply relative to previous years, until it was fully reauthorized in May 2019.

3.6. Publicly Backed Venture Capital

Governments often support entrepreneurial firms by investing in the VC industry. VC funds are independently managed pools of capital that focus on equity or equity-linked investments in privately held high-growth companies. Research shows that VC investors help address the funding challenges these firms face by reducing information asymmetries through careful selection and monitoring while internalizing the positive externalities of innovation (González-Uribe 2020, Lerner & Nanda 2020).

Government VC support programs vary widely. The most direct method involves setting up government-owned VC funds where the government acts as the general partner (GP).[14] Government GPs are more prevalent in the developing world and in other developed nations compared to the United States (Leleux & Surlemont 2003). For example, the Business Development Bank of Canada directly invests in young firms, and in the European Union, many VC funds are set up and managed by companies entirely owned by government bodies (Cumming, Grilli & Murtinu 2017). In China, the government is a minority owner of a significant share of GPs: About 38% of GPs have some government ownership (Colonnelli, Li & Liu 2023).

Governments can also act as a limited partner (LP), providing cornerstone commitments or boosting the size of privately managed VC funds. Here, the government is meant to be a passive investor, providing funds without interfering in investment decisions. Examples include the Enterprise Capital Fund and the British Patient Capital programs of the British Business Bank. These support programs can be substantial relative to the size of the VC market. For example, in China, government LPs are significantly larger investors than private LPs (Colonnelli, Li & Liu 2023).

Some government programs offer favorable terms to private GPs, such as tax breaks. In Canada, the labor-sponsored VC program provides a generous federal tax credit, with additional provincial tax credits (Brander, Egan & Hellmann 2010). Other programs operate as matching funds, coinvesting alongside independently managed and capitalized VC firms, such as the Future Fund program in the United Kingdom. Bai et al. (2021) investigate how governments and private investors interact in public entrepreneurial finance programs. Using data on 755 programs in 66 countries, they find that coinvestments are more likely when investment projects are harder to evaluate, when more private capital is available, and when governments operate more effectively.

The evidence on the effectiveness of publicly sponsored VC is mixed. Success stories include the British investment firm 3i, created by the Bank of England and leading British banks in the 1940s; Taiwan's VC investment incentive in the 1980s; the Israeli Yozma program in the 1990s; and most recently, Bpifrance in France during the 2010s (Lerner 2013, Klingler-Vidra 2018, Moretti 2024). However, many programs face controversy, especially because of the relatively low returns government-sponsored funds often generate.

Several studies suggest that government-sponsored GPs perform poorly compared to their private counterparts. These studies analyze the performance of companies backed by government-sponsored GPs versus those backed by private investors, using various methodologies to isolate the effects of government sponsorship, with varying degrees of success. For example, Cumming, Grilli & Murtinu (2017), in their study of several European countries, find that companies supported by government GPs have a lower likelihood of positive exits compared to those backed by private GPs. The authors match their sample of VC-backed companies with comparable

[14]A general partner (GP) actively manages a VC fund and makes investment decisions while bearing unlimited liability, whereas a limited partner (LP) is a passive investor who provides capital but has limited liability and no involvement in day-to-day operations.

non-VC-backed firms to account for observable differences between companies funded by the two types of investors. Similarly, Brander, Egan & Hellmann (2010), using Canadian data, show that companies funded by government-sponsored VCs (whether fully government owned or privately owned but subsidized) are less likely to achieve successful exits, especially initial public offerings (IPOs) on major exchanges, and tend to have lower exit values than those backed by private VCs. The authors use variations in provincial political leadership as an exogenous factor affecting the presence of government-sponsored VCs, finding that these VCs are more common when left-leaning parties are in power. Furthermore, Brander, Du & Hellman (2014) confirm this pattern of underperformance in a broader sample of 25 countries, using the market size of government-sponsored VC funds as an instrument to measure the impact of local government-sponsored VC funding on firm performance.

The underperformance of government-sponsored GPs may be due to government officials lacking the necessary skills for selection and value creation as well as limited access to top-tier GPs. In the VC industry, returns are often skewed and consistently influenced by differences in GP expertise and access to high-quality deal flow (Kaplan & Schoar 2005, Sorensen 2007). Even specialized investors struggle to identify successful companies (González-Uribe et al. 2023). In support of this view, Colonnelli, Li & Liu (2023) find that top-performing Chinese GPs tend to avoid LPs with government ties, especially central government agencies, due to concerns about interference in investment decisions. This avoidance limits the government's access to high-quality deal flow. The finding is based on a novel nondeceptive field experiment measuring preferences for government involvement in China's VC market. In the same study, the authors also show that government LPs disproportionately invest in government-owned GPs, leading to decisions driven by political, rather than profit-maximizing, incentives—similar to the dynamics observed in the literature on state banks (as discussed in Section 3.1).

An alternative explanation for the documented pattern of underperformance is that traditional analyses may focus too narrowly on private returns, overlooking the broader objectives of public VC, such as supporting innovative firms that struggle to secure funding due to the positive externalities they generate. Few studies have effectively measured these broader goals. For example, Brander, Egan & Hellmann (2010) find little evidence of positive social returns in the Canadian market, noting that Canadian government–sponsored GPs are no more likely to invest in high-tech industries and that the companies they fund generate fewer patents and show no significant employment growth, even after accounting for industry selection. In contrast, recent studies on the Chinese market suggest that government-sponsored GPs can promote innovation despite lower financial returns. Ge, Xue & Zhang (2024) show that Chinese government–backed GPs are more likely to invest in targeted industries, make larger and earlier investments, and hold on to investments longer in government-endorsed sectors, thus fostering corporate innovation. Similarly, Zhang, Fan & Liu (2024) develop a two-sided matching structural model to study the impact of government VC on funded companies. They find that government-backed investors in China are more effective than private GPs in improving company innovation.

A final possible reason for the evidence of underperformance of government-sponsored VCs could be the use of inappropriate benchmarks. If the private sector does not provide enough VC, and the public program steps in to expand the pool, then government-sponsored firms represent the "next best" set of enterprises. These may not be as strong as those selected by the private sector in the absence of government support. Thus, comparing the performance of companies backed by privately owned VCs to those backed by government-sponsored VCs may set an unrealistically high standard, naturally leading to a perception of underperformance for the latter. A more appropriate comparison would be to measure participants' performance against a scenario where no government program exists. However, identifying this counterfactual is challenging.

Moreover, it is difficult to assess whether publicly supported VC adds to the pool of supported enterprises or merely crowds out private investment. So far, the evidence has been mostly indirect and mixed. Brander, Du & Hellman (2014) seek evidence of complementarity between government-sponsored and privately sponsored VC, which would suggest additionality rather than crowding out. They find that when both types of VC are present in a company, total investment is higher, and exit outcomes are better than with either type alone. This positive effect on exit performance is primarily due to a scale effect: Once the amount of investment is controlled for, mixed funding no longer has a statistically significant effect on exit performance. Other studies, including those by Brander, Egan & Hellmann (2010) and Leleux & Surlemont (2003), find evidence of crowding out.

Future research on publicly backed VC should focus on improving counterfactuals through quasi-experiments, measuring effects beyond participating firms, and examining program design regarding incentives for private investors. Exploring the distinction between programs where the government acts as a GP or an LP (while potentially influencing capital allocation) is also essential. Finally, research could explore how publicly supported VC interacts with complementary programs to prepare firms to receive VC investment (Cusolito, Dautovic & McKenzie 2021, González-Uribe & Reyes 2021).

3.7. Tax Incentives for Equity Investors

Governments also aim to promote VC by subsidizing individual investors, often called "business angels," who invest in young businesses that attract VC. These programs offer various forms of tax rebates to increase equity-linked financial support for start-ups. Over time, these programs have expanded internationally. In 2017, the European Commission reported that 19 of the 36 countries studied offered some level of tax credits to angel investors or VC investors (European Commission 2017).

Most studies analyzing the effects of tax incentives for equity investors use aggregate data from a single country (Cumming & MacIntosh 2006) or from different states within the United States due to the difficulties in comparing various contexts (Denes et al. 2023). Recent studies have started to use data from individual firms and examine the impact of tax credit eligibility changes before and after unexpected policy shifts. These studies often employ techniques like difference-in-differences or RDD to compare firms on both sides of a size threshold before and after the policy change (González-Uribe & Paravisini 2019, Edwards & Todtenhaupt 2020). An example is Berger & Gottschalk (2021), who study a major angel investor subsidy program in Germany. Using a difference-in-differences approach on a representative sample of entrepreneurial companies, they find that eligible companies were 36–67% more likely to receive angel investment and the amount of financing increased by 70–82%. This suggests that well-designed subsidy programs can stimulate angel investment activity without compromising the quality of investor support.

More generally, the collective findings from these studies suggest that subsidizing equity investors does indeed boost investment in companies. González-Uribe & Paravisini (2019) estimate that a 50% reduction in the cost of outside equity leads to a 17% increase in the likelihood of issuing outside equity. However, other studies raise concerns about additionality, reach of intended beneficiaries, efficiency, and rent-sharing between investors and firms. One concern is whether tax credits for equity investors genuinely increase overall funding to companies or merely replace private investment that would have occurred anyway. While González-Uribe & Paravisini (2019) find evidence of crowding in, where subsidized equity attracts more nonequity funding, Denes et al. (2023) demonstrate that after the introduction of tax credits across US states, non-angel early stage investment decreases and total early stage investment remains unchanged, suggesting

potential crowding out. Differences in policy design help explain these discrepancies: The UK setting explored by the former study has strict rules preventing insider usage of equity investor tax credits; instead, the latter study notes extensive usage of the scheme by firm insiders, who are more likely to label investments that would have happened anyway as "angel" to qualify for the subsidy.

Government VC programs may lead to funding companies that are not intended targets. This can occur if programs attract new investors with different investment goals and levels of experience. In the United States, tax credits have been shown to change the composition of investors, favoring in-state and inexperienced investors, with limited impact on professional angels, firm entry, and job creation (Denes et al. 2023). Tax credits may also have a limited influence on professional investors' decisions if they only offer minimal benefits for their preferred investments. For example, fixed percentage credits without capital gains provisions might not attract investors evaluating projects with positively skewed return distributions.

A final concern is how subsidy benefits are shared between investors and firms. Increased funding suggests firms receive some benefits through reduced cost of capital. However, without equity price data, it is challenging to evaluate the benefit to firms. Tax credits might primarily benefit investors through higher after-tax returns, without significantly lowering firms' cost of equity. Most studies cannot assess this aspect due to data limitations. An exception is the study by Edwards & Todtenhaupt (2020), who examine the 2010 Small Business Jobs Act, which introduced a complete exemption from federal capital gains tax on the sale of qualified shares for private firms. In the subsample of firms with available valuations, the authors find that issuing firms capture only about two-thirds of the benefit, with the remainder going to investors. This contrasts with the work by Guenther & Willenborg (1999) on IPOs and the introduction of a 50% exemption on the sale of Qualified Small Business Stock shares, which found that issuing firms capture nearly all of the benefit through higher offer prices. This disparity could be due to greater market frictions in the setting of private firms.

In summary, there is a trade-off between the flexibility of tax credit programs, which allow investors to make their own choices, and their effectiveness in targeting the intended beneficiaries. This observation aligns with insights from public economics, indicating that informational and transaction costs associated with accessing government programs can discourage the very individuals these programs aim to help (Bhargava & Manoli 2015, Deshpande & Li 2019). Future research could explore program designs that balance flexibility with targeted effectiveness while minimizing barriers to access.

4. CONCLUSIONS

This review has examined the empirical evidence on seven types of public policies to improve firms' access to financing. The effectiveness of these policies varies considerably, as does the quality and quantity of evidence available for each type. Here, we summarize the key findings and identify areas where further research is most needed:

Public lending through state and development banks. State banks may positively impact firm growth and employment, especially during downturns, but are very susceptible to political influence, leading to inefficient credit allocation. Development banks have shown promise in expanding credit access and supporting growth for smaller enterprises, particularly in Latin America, by addressing market failures and acting countercyclically. However, their effectiveness depends on program design, targeting, and institutional context.

Public lending through private banks. Emerging evidence indicates that blended finance programs, which channel public funding through private commercial banks, can ease credit

constraints and have real impacts on underserved entrepreneurs. However, rigorous evaluations of these programs remain scarce. For microcredit, extensive experimental evidence shows limited impacts on profits, income, or consumption in the short term, although recent innovations in contract design and improved client targeting show some promise.

Subsidized credit. Limited evidence indicates that well-targeted subsidized lending can alleviate the credit constraints of smaller firms. However, more research is needed to understand potential negative spillovers on nonrecipient firms and to evaluate long-term effects, including in terms of the fiscal costs of subsidy misallocation.

Credit guarantee schemes. While substantial evidence indicates that credit guarantees can effectively increase SME credit access, the empirical findings remain mixed on two key issues. First, some studies find an increase in defaults among guarantee recipients, while others show better loan performance. Second, research is divided on whether guarantees truly expand credit or merely substitute for existing loans. Recent research has also begun to explore worker-level impacts and potential labor misallocation effects.

Export credit agencies. ECAs can play an important role in supporting exports and firm growth, particularly for financially constrained firms. However, the evidence remains thin and is focused on a few specific contexts.

Publicly backed venture capital. The evidence on government-sponsored VC is mixed. Although some programs have been successful, government-owned GPs often perform poorly compared to private GPs. Recent studies, particularly from China, suggest that government-sponsored VC may support innovation despite poorer financial performance.

Tax incentives for equity investors. The evidence indicates that tax incentives for equity investors can boost investment in companies, but concerns remain regarding additionality, reach of intended beneficiaries, efficiency, and rent-sharing between investors and firms.

Of all these interventions, public lending through private lenders, subsidized credit, and ECAs are relatively understudied and would benefit from more rigorous evaluations. The evidence on credit guarantees and on microcredit is more extensive and rigorous, typically pointing to positive effects in the case of the former and limited impacts in the case of the latter.

Five common themes emerge across these policy types: (*a*) The impact of policies often varies across firm types, industries, and economic conditions. (*b*) Many studies focus on short-term impacts, leaving questions about the long-term effects of these policies. (*c*) While some studies have begun to explore spillovers to nonrecipient firms and workers, this remains an understudied area. (*d*) As governments often implement multiple financial policies simultaneously, understanding how these policies interact is crucial. (*e*) Across all policy types, questions remain about optimal design features, such as the appropriate level and duration of subsidies, guarantee coverage, or tax incentives.

Taking these themes into account, we recommend five priorities for future research on public policies for private finance: (*a*) Wherever possible, conduct more rigorous evaluations, including RCTs and quasi-experimental studies, for understudied policy types such as public lending through private lenders and ECAs. (*b*) Expand the geographical scope of research, particularly for development banks and publicly backed VC, to understand how policy effectiveness varies across institutional contexts. (*c*) Investigate the long-term effects of these policies, including potential changes in firm behavior, market structure, and aggregate productivity. (*d*) Develop better methodologies for quantifying spillovers, both positive and negative, on nonrecipient firms,

workers, and clients. (*e*) Related to the previous points, another promising direction for future research is the greater use of structural models that allow for counterfactual analysis. This approach can not only help identify optimal policy design features but also quantify both direct effects and indirect spillovers in ways that complement reduced-form empirical approaches.

Addressing these research priorities would help policy makers gain a deeper understanding of the effectiveness and potential pitfalls of public policies for private finance, possibly leading to policy decisions that are more informed and more effective in the future.

DISCLOSURE STATEMENT

The views expressed in this article are the authors' and not necessarily those of the European Bank for Reconstruction and Development (EBRD). J.G.-U. is a director of Positive Impact MPG and serves on the advisory boards of the Startup Coalition and the British Private Equity and Venture Capital Association. The authors are not aware of any other affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

We thank Pablo García Guzmán and Elizaveta Smorodenkova for excellent research assistance and an anonymous referee, Emanuele Colonnelli, Robert J. Cull, Thomas Hellmann, and David McKenzie for useful comments.

LITERATURE CITED

Agarwal N, Chan JM, Lodefalk M, Tang A, Tano S, Wang Z. 2023. Mitigating information frictions in trade: evidence from export credit guarantees. *J. Int. Econ.* 145:103831

Agarwal S, Kigabo T, Minoiu C, Presbitero AF, Silva AF. 2023. Serving the underserved: microcredit as a pathway to commercial banks. *Rev. Econ. Stat.* 105(4):780–97

Akcigit U, Seven U, Yarba I, Yilmaz F. 2024. Firm-level impact of public credit guarantees. *Eur. Econ. Rev.* 170:104861

Altavilla C, Ellul A, Pagano M, Polo A, Vlassopoulos T. 2025. Loan guarantees, bank lending and credit risk reallocation. *J. Financ. Econ.* 172:104137

Angelucci M, Karlan D, Zinman J. 2015. Microcredit impacts: evidence from a randomized microcredit program placement experiment by Compartamos Banco. *Am. Econ. J. Appl. Econ.* 7(1):151–82

Arping S, Lóránth G, Morrison AD. 2010. Public initiatives to support entrepreneurs: credit guarantees versus co-funding. *J. Financ. Stab.* 6(1):26–35

Asdrubali P, Signore S. 2015. The economic impact of EU guarantees on credit to SMEs. Discuss. Pap. 002, Directorate General for Economic and Financial Affairs, European Commission

Attanasio O, Augsburg B, De Haas R. 2019. Microcredit contracts, risk diversification and loan take-up. *J. Eur. Econ. Assoc.* 17(6):1797–842

Attanasio O, Augsburg B, De Haas R, Fitzsimons E, Harmgart H. 2015. The impacts of microfinance: evidence from joint-liability lending in Mongolia. *Am. Econ. J. Appl. Econ.* 7(1):90–122

Augsburg B, De Haas R, Harmgart H, Meghir C. 2015. The impacts of microcredit: evidence from Bosnia and Herzegovina. *Am. Econ. J. Appl. Econ.* 7(1):183–203

Autor D, Cho D, Crane LD, Goldar M, Lutz B, et al. 2022. An evaluation of the Paycheck Protection Program using administrative payroll microdata. *J. Public Econ.* 211:104664

Aydn H, Bircan C, De Haas R. 2024. Blended finance and female entrepreneurship. Discuss. Pap. 18763, Centre for Economic Policy Research, London

Bach L. 2014. Are small businesses worthy of financial aid? Evidence from a French targeted credit program. *Rev. Finance* 18(3):877–919

Bachas N, Kim OS, Yannelis C. 2021. Loan guarantees and credit supply. *J. Financ. Econ.* 139(3):872–94

Bai J, Bernstein S, Dev A, Lerner J. 2021. The dance between government and private investors: public entrepreneurial finance around the globe. NBER Work. Pap. 28744
Banerjee A, Breza E, Duflo E, Kinnan C. 2019. Can microfinance unlock a poverty trap for some entrepreneurs? NBER Work. Pap. 26346
Banerjee A, Duflo E. 2014. Do firms want to borrow more? Testing credit constraints using a directed lending program. *Rev. Econ. Stud.* 81(2):572–607
Banerjee A, Duflo E, Glennerster R, Kinnan C. 2015. The miracle of microfinance? Evidence from a randomized evaluation. *Am. Econ. J. Appl. Econ.* 7(1):22–53
Banerjee A, Karlan D, Zinman J. 2015. Six randomized evaluations of microcredit: introduction and further steps. *Am. Econ. J. Appl. Econ.* 7(1):1–21
Barboni G, Agarwal P. 2023. How do flexible microfinance contracts improve repayment rates and business outcomes? Experimental evidence from India. SSRN Work. Pap. 4358795
Bari F, Malik K, Meki M, Quinn S. 2024. Asset-based microfinance for microenterprises: evidence from Pakistan. *Am. Econ. Rev.* 114(2):534–74
Barrot JN, Martin T, Sauvagnat J, Vallée B. 2024. The labor market effects of loan guarantee programs. *Rev. Financ. Stud.* 37(8):2315–54
Bartik AW, Cullen ZB, Glaeser EL, Luca M, Stanton CT, Sunderam A. 2020. When should public programs be privately administered? Theory and evidence from the Paycheck Protection Program. NBER Work. Pap. 27623
Battaglia M, Gulesci S, Madestam A. 2024. Repayment flexibility and risk taking: experimental evidence from credit contracts. *Rev. Econ. Stud.* 91(5):2635–75
Bazzi S, Muendler MA, Oliveira RF, Rauch JE. 2023. Credit supply shocks and firm dynamics: evidence from Brazil. NBER Work. Pap. 31721
Beck T, Klapper LF, Mendoza JC. 2010. The typology of partial credit guarantee funds around the world. *J. Financ. Stab.* 6(1):10–25
Benmelech E, Monteiro J. 2023. Who benefits from the Export-Import Bank aid? NBER Work. Pap. 31562
Berger M, Gottschalk S. 2021. Financing and advising early stage startups: the effect of angel investor subsidies. Discuss. Pap. 21-069, Leibniz Centre for European Economic Research (ZEW)
Bertoni F, Colombo MG, Quas A. 2023. The long-term effects of loan guarantees on SME performance. *J. Corp. Finance* 80:102408
Bhargava S, Manoli D. 2015. Psychological frictions and the incomplete take-up of social benefits: evidence from an IRS field experiment. *Am. Econ. Rev.* 105(11):3489–529
Bircan C, Saka O. 2021. Lending cycles and real outcomes: costs of political misalignment. *Econ. J.* 131(639):2763–96
Bonaccorsi di Patti E, Felici R, Moretti D, Rinaldi F. 2024. The allocation of public guaranteed loans to firms during Covid-19: credit risk and relationship lending. Work. Pap. 1462, Bank of Italy
Bonfim D, Custódio C, Raposo C. 2023. Supporting small firms through recessions and recoveries. *J. Financ. Econ.* 147(3):658–88
Brander JA, Du Q, Hellmann T. 2014. The effects of government-sponsored venture capital: international evidence. *Rev. Finance* 19(2):571–618
Brander JA, Egan E, Hellmann TF. 2010. Government sponsored versus private venture capital: Canadian evidence. In *International Differences in Entrepreneurship*, ed. J Lerner, A Schoar. National Bureau of Economic Research
Broccolini C, Lotti G, Maffioli A, Presbitero AF, Stucchi R. 2021. Mobilization effects of multilateral development banks. *World Bank Econ. Rev.* 35(2):521–43
Brown JD, Earle JS. 2017. Finance and growth at the firm level: evidence from SBA loans. *J. Finance* 72(3):1039–80
Bryan G, Karlan D, Osman A. 2024. Big loans to small businesses: predicting winners and losers in an entrepreneurial lending experiment. *Am. Econ. Rev.* 114(9):2825–60
Bryan KA, Williams HL. 2021. Innovation: market failures and public policies. NBER Work. Pap. 29173
Burga C, Cuba W, Díaz E, Sanchez E. 2024. Financial stimulus and microfinance institutions in emerging markets. Work. Pap. 2023-001, Central Reserve Bank of Peru

Burgess R, Pande R. 2005. Do rural banks matter? Evidence from the Indian social banking experiment. *Am. Econ. Rev.* 95(3):780–95
Calomiris CW, Larrain M, Liberti J, Sturgess J. 2017. How collateral laws shape lending and sectoral activity. *J. Financ. Econ.* 123(1):163–88
Carvalho D. 2014. The real effects of government-owned banks: evidence from an emerging market. *J. Finance* 69(2):577–609
Chetty R, Friedman JN, Stepner M, Opportunity Insights Team. 2020. The economic impacts of COVID-19: Evidence from a new public database built using private sector data. NBER Work. Pap. 27431
Claessens S, Laeven L. 2004. What drives bank competition? Some international evidence. *J. Money Credit Bank.* 36(2):563–83
Cole S. 2009a. Bank ownership and lending behavior: Evidence from India. *J. Financ. Int.* 18(2):138–62
Cole S. 2009b. Financial development, bank ownership, and growth: Or, does quantity imply quality? *Rev. Econ. Stat.* 91(1):33–51
Cole S. 2009c. Fixing market failures or fixing elections? Agricultural credit in India. *Am. Econ. J. Appl. Econ.* 1(1):219–50
Colonnelli E, Li B, Liu E. 2023. Investing with the government: a field experiment in China. *J. Political Econ.* 132(1):726237
Core F, De Marco F. 2023. Information technology and credit: evidence from public guarantees. *Manag. Sci.* 70(9):6202–19
Crépon B, Devoto F, Duflo E, Parienté W. 2015. Estimating the impact of microcredit on those who take it up: evidence from a randomized experiment in Morocco. *Am. Econ. J. Appl. Econ.* 7(1):123–50
Crouzet N, Tourre F. 2021. Can the cure kill the patient? Corporate credit interventions and debt overhang. SSRN Work. Pap. 3954581
Cull R, Demirgüc-Kunt A, Morduch J. 2018. The microfinance business model: enduring subsidy and modest profit. *World Bank Econ. Rev.* 32(2):221–44
Cumming D, Grilli L, Murtinu S. 2017. Governmental and independent venture capital investments in Europe: a firm-level performance analysis. *J. Corp. Finance* 42(C):439–59
Cumming DJ, MacIntosh JG. 2006. Crowding out private equity: Canadian evidence. *J. Bus. Ventur.* 21(5):569–609
Cuñat V, Garicano L. 2010. Did good *Cajas* extend bad loans? Governance, human capital and loan portfolios. Work. Pap. 2010-08, Fundación de Estudios de Economía Aplicada
Cusolito AP, Dautovic E, McKenzie D. 2021. Can government intervention make firms more investment ready? A randomized experiment in the Western Balkans. *Rev. Econ. Stat.* 103(3):428–42
Custodio C, Bonfim D, Raposo CC. 2023. Supporting small firms through recessions and recoveries. *J. Financ. Econ.* 147:658–88
de Blasio G, De Mitri S, D'Ignazio A, Finaldi Russo P, Stoppani L. 2018. Public guarantees to SME borrowing. An RDD evaluation. *J. Bank. Finance* 96:73–86
De Negri JA, Maffioli A, Rodriguez CM, Vazquez G. 2013. Lending policies of the Brazilian Development Bank during the global financial crisis. *J. Dev. Econ.* 104:19–30
Denes M, Howell ST, Mezzanotti F, Wang X, Xu T. 2023. Investor tax credits and entrepreneurship: evidence from U.S. states. *J. Finance* 78(5):2621–71
Deshpande M, Li Y. 2019. Who is screened out? Application costs and the targeting of disability programs. *Am. Econ. J. Econ. Policy* 11(4):213–48
D'Ignazio A, Menon C. 2020. Causal effect of credit guarantees for small- and medium-sized enterprises: evidence from Italy. *Scand. J. Econ.* 122(1):191–218
Dinç IS. 2005. Politicians and banks: political influences on government-owned banks in emerging markets. *J. Financ. Econ.* 77(2):453–79
Edwards A, Todtenhaupt M. 2020. Capital gains taxation and funding for start-ups. *J. Financ. Econ.* 138(2):549–71
Eslava M, Freixas X. 2021. Public development banks and credit market imperfections. *J. Money Credit Bank.* 53(5):1121–49
Eslava M, Maffioli A, Meléndez M. 2014. Credit constraints and business performance: evidence from public lending in Colombia. Res. Pap. 2014–37, Department of Economics, Universidad de los Andes

European Commission. 2017. *Effectiveness of tax incentives for venture capital and business angels to foster the investment of SMEs and start-ups*. Rep., European Commission and Directorate-General for Taxation and Customs Union. **https://doi.org/10.2778/005699**

Farre-Mensa J, Ljungqvist A. 2015. Do measures of financial constraints measure financial constraints? *Rev. Financ. Stud.* 29(2):271–308

Fazzari S, Hubbard RG, Petersen B. 1988. Financing constraints and corporate investment. *Brookings Pap. Econ. Act.* 19(1):141–206

Field E, Pande R, Papp J, Rigol N. 2013. Does the classic microfinance model discourage entrepreneurship among the poor? Experimental evidence from India. *Am. Econ. Rev.* 103(6):2196–226

Flammer C, Giroux T, Heal GM. 2024. Blended finance. Work. Pap. 973/2024, European Corporate Governance Institute

Fonseca J, Matray A. 2024. Financial inclusion, economic development, and inequality: evidence from Brazil. *J. Financ. Econ.* 156:103854

Gale W. 1991. Economic effects of federal credit programs. *Am. Econ. Rev.* 81(1):133–52

Ge G, Xue J, Zhang Q. 2024. Industrial policy and governmental venture capital: evidence from China. *J. Corp. Finance* 84:102532

González-Uribe J. 2020. Exchanges of innovation resources inside venture capital portfolios. *J. Financ. Econ.* 135(1):144–68

González-Uribe J, Klingler-Vidra R, Wang S, Yin X. 2023. The broader effects of venture capital on innovation: reducing entrepreneurial capability constraints through due diligence. SSRN Work. Pap. 4516863

González-Uribe J, Paravisini D. 2019. How sensitive is young firm investment to the cost of outside equity? Evidence from a UK tax relief. Work. Pap., London School of Economics

González-Uribe J, Reyes S. 2021. Identifying and boosting "gazelles": Evidence from business accelerators. *J. Financ. Econ.* 139(1):260–87

González-Uribe J, Wang S. 2022. The real effects of small-firm credit guarantees during recessions. SSRN Work. Pap. 3382280

Gourinchas PO, Kalemli-Özcan Ş, Penciakova V, Sander N. 2021. COVID-19 and small- and medium-sized enterprises: A 2021 "time bomb"? *AEA Pap. Proc.* 111:282–86

Gourinchas PO, Kalemli-Özcan Ş, Penciakova V, Sander N. 2024. SME failures under large liquidity shocks: An application to the Covid-19 crisis. *J. Eur. Econ. Assoc.* 23(2):431–80

Granja J, Leuz C, Rajan RG. 2022. Going the extra mile: distant lending and credit cycles. *J. Finance* 77(2):1259–324

Granja J, Makridis C, Yannelis C, Zwick E. 2022. Did the Paycheck Protection Program hit the target? *J. Financ. Econ.* 145(3):725–61

Guenther DA, Willenborg M. 1999. Capital gains tax rates and the cost of capital for small business: evidence from the IPO market. *J. Financ. Econ.* 53:385–408

Gutierrez E, Rudolph HP, Homa T, Beneit EB. 2011. Development banks: role and mechanisms to increase their efficiency. Policy Res. Work. Pap. 5729, World Bank

Hadlock CJ, Pierce JR. 2010. New evidence on measuring financial constraints: moving beyond the KZ index. *Rev. Financ. Stud.* 23(5):1909–40

Hau H, Thum M. 2009. Subprime crisis and board (in-) competence: private versus public banks in Germany. *Econ. Policy* 24(60):701–52

Hee Hong G, Lucas D. 2023. Evaluating the costs of government credit support programs during COVID-19: international evidence. Work. Pap. 2023/016, International Monetary Fund

Horvath A, Lang P. 2021. Do loan subsidies boost the real activity of small firms? *J. Bank. Finance* 122:105988

Hubbard RG, Strain MR. 2020. Has the Paycheck Protection Program succeeded? NBER Work. Pap. 28032

Huneeus F, Kaboski JP, Larrain M, Schmukler S, Vera M. 2024. Crisis credit, employment protection, indebtedness, and risk. Work. Pap. 11652, CESifo

Jiménez G, Laeven L, Martinez Miera D, Peydró JL. 2022. Public guarantees, relationship lending and bank credit: evidence from the COVID-19 crisis. CEPR Discuss. Pap. 17110

Jiménez G, Peydró JL, Repullo R, Saurina Salas J. 2018. Burning money? Government lending in a credit crunch. CEPR Discuss. Pap. 13267

Kaplan SN, Schoar A. 2005. Private equity performance: returns, persistence, and capital flows. *J. Finance* 60(4):1791–823
Kaplan SN, Zingales L. 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints? *Q. J. Econ.* 112(1):169–215
Khwaja AI, Mian A. 2005. Do lenders favor politically connected firms? Rent provision in an emerging financial market. *Q. J. Econ.* 120(4):1371–411
Klingler-Vidra R. 2018. *The Venture Capital State: The Silicon Valley Model in East Asia*. Cornell University Press
Koetter M, Popov A. 2021. Political cycles in bank lending to the government. *Rev. Financ. Stud.* 34(6):3138–80
La Porta R, Lopez-de Silanes F, Shleifer A. 2002. Government ownership of banks. *J. Finance* 57(1):265–301
La Porta R, Lopez-de Silanes F, Shleifer A, Vishny RW. 1998. Law and finance. *J. Political Econ.* 106(6):1113–55
Lelarge C, Sraer D, Thesmar D. 2010. Entrepreneurship and credit constraints: evidence from a French loan guarantee program. In *International Differences in Entrepreneurship*. University of Chicago Press
Leleux B, Surlemont B. 2003. Public versus private venture capital: Seeding or crowding out? A pan-European analysis. *J. Bus. Ventur.* 18(1):81–104
Lerner J. 2013. The boulevard of broken dreams: innovation policy and entrepreneurship. *Innov. Policy Econ.* 13:61–82
Lerner J, Nanda R. 2020. Venture capital's role in financing innovation: What we know and how much we still need to learn. *J. Econ. Perspect.* 34(3):237–61
Li L, Strahan PE. 2021. Who supplies PPP loans (and does it matter)? Banks, relationships, and the COVID crisis. *J. Financ. Quant. Anal.* 56(7):2411–38
Mas-Colell A, Whinston M, Green J. 1995. *Microeconomic Theory*. Oxford University Press
Matray A, Müller K, Xu C, Kabir P. 2024. EXIM's exit: the real effects of trade financing by export credit agencies. NBER Work. Pap. 32019
Meager R. 2019. Understanding the average impact of microcredit expansions: a Bayesian hierarchical analysis of seven randomized experiments. *Am. Econ. J. Appl. Econ.* 11(1):57–91
Moretti L. 2024. *Creating innovation markets: government venture capital in Europe*. PhD Thesis, University of Oxford
Mullins W, Toro P. 2018. Credit guarantees and new bank relationships. Work. Pap. 820, Central Bank of Chile
Myers SC, Majluf NS. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *J. Financ. Econ.* 13(2):187–221
Pagano M, Jappelli T. 1993. Information sharing in credit markets. *J. Finance* 48(5):1693–718
Paravisini D. 2008. Local bank financial constraints and firm access to external finance. *J. Finance* 63(5):2161–93
Ru H. 2018. Government credit, a double-edged sword: Evidence from the China Development Bank. *J. Finance* 73(1):275–316
Sapienza P. 2004. The effects of government ownership on bank lending. *J. Financ. Econ.* 72(2):357–84
Shleifer A, Vishny RW. 1994. Politicians and firms. *Q. J. Econ.* 109(4):995–1025
Sorensen M. 2007. How smart is smart money? A two-sided matching model of venture capital. *J. Finance* 62(6):2725–62
Stiglitz JE, Weiss A. 1981. Credit rationing in markets with imperfect information. *Am. Econ. Rev.* 71(3):393–410
Tarozzi A, Desai J, Johnson K. 2015. The impacts of microcredit: evidence from Ethiopia. *Am. Econ. J. Appl. Econ.* 7(1):54–89
Tirole J. 2010. *The Theory of Corporate Finance*. Princeton University Press
Uesugi I, Sakai K, Yamashiro GM. 2010. The effectiveness of public credit guarantees in the Japanese loan market. *J. Jpn. Int. Econ.* 24(4):457–80
Whited TM, Wu G. 2006. Financial constraints risk. *Rev. Financ. Stud.* 19(2):531–59
Zhang J, Fan Y, Liu Y. 2024. The effects of government venture capital: new evidence from China based on a two-sided matching structural model. *J. Corp. Finance* 84:102521
Zia BH. 2008. Export incentives, financial constraints, and the (mis)allocation of credit: micro-level evidence from subsidized export loans. *J. Financ. Econ.* 87(2):498–527