

**EC-OECD Seminar Series on Designing better
economic development policies for regions and cities**



The theory and practice of financial instruments for small and medium-sized enterprises

28 June 2017

Ross Brown

Centre for Responsible Banking & Finance, School of Management, University of St Andrews

Neil Lee

Department of Geography, London School of Economics, Visiting Fellow Centre for Responsible Banking & Finance, University of St Andrews



■ Background information

This paper was prepared as a background document to the OECD-European Commission Seminar on ‘*When to use financial instruments*’ held on 28 June 2017 at the OECD Headquarters in Paris, France. It sets a basis for reflection and discussion.

■ About the Project

This seminar is part of a five-part seminar series in the context of an EC-OECD project “Designing better economic development policies for regions and cities”. Other sessions in the series addressed the use of: contracts for flexibility/adaptability, performance indicators, financial instruments, and insights from behavioural science. The outcome of the seminars supports the work of the Regional Development Policy Committee and its mandate to promote the design and implementation of policies that are adapted to the relevant territorial scales or geographies, and that focus on the main factors that sustain the competitive advantages of regions and cities. The seminars also support the Directorate-General for Regional and Urban Policy (DG REGIO) of the European Commission in the preparation of the impact assessment for the post-2020 legislative proposals and to support broader discussion with stakeholders on the future direction of the delivery mechanisms of regional policy.



Follow us on Twitter: [OECD SMEs, Regions, Cities \(@OECD_local\)](#)

Acknowledgements

The authors wish to thank the European Commission and the OECD for kindly funding this piece of research. In particular, they wish to thank Abel Schumann from the OECD for his very helpful input and feedback into the work. The feedback from the European Commission is also warmly acknowledged. The authors also wish to thank the participants at the OECD seminar on Financial Instruments that took place in Paris on 28 June 2017 for their helpful comments. Preliminary discussions with Fiona Wislade were also informative. Finally, the authors also wish to thank Isidora Zapata and Dorothee Allain-Dupre for their kind assistance with the final production of the report. The usual disclaimer applies.

Table of contents

Introduction	5
Context and definitions	7
Financial instruments	7
Theoretical discussion	8
Market failures and the rationale for government intervention	8
Market failures and credit markets	9
Funding gaps for specific firm types	11
Complementary institutions	14
Conclusion	15
The effectiveness of financial instruments: Empirical evidence	15
Credit guarantee schemes	15
Government venture capital	18
Publicly assisted loan schemes	21
Assessing the effectiveness of financial instruments	22
Grants versus financial instruments	22
The rationale for intervention in small and medium-sized enterprise credit markets	25
The effectiveness of financial instruments	25
Under what conditions do financial instruments work/don't work?	28
Conclusions.....	31
Notes	32
References	33
Box	
Box 1. The Australian Innovation Investment Fund	27

Introduction

The use of financial instruments – including public loans, public equity or venture capital, or credit guarantees – is becoming increasingly widespread in regional and local economic development (European Commission, 2015). Since the global financial crisis, there has been a resurgence of interest in these tools for several principal reasons. First, the crisis – and the “credit crunch” which formed part of it – led to a protracted problem with access to finance in many countries. According to the European Central Bank, in 2009 around 17% of firms in the euro area argued that access to finance was their most pressing concern. This figure has abated significantly; in 2016 it was closer to 9% (ECB, 2017). Second, while the cyclical issues in the availability of finance have waned, there is now increasing recognition that endemic problems remain for certain types of firms or types of investment (Lee, Sameen and Cowling, 2015; Brown and Lee, 2017). Third, some observers have also argued that the decline in relationship lending¹ coupled with the upsurge of automated lending technologies and increasingly centralised organisational structures has further exacerbated this situation (Canales and Nanda, 2008). Finally, stretched budgets have encouraged policy makers to seek new ways to leverage finance for public projects.

At the same time, the crisis also led to an upsurge of interest in activist approaches to economic development, in particular industrial policy, within advanced economies.² Scholars claim that there has been a “rejuvenation” of industrial policy in the wake of the global financial crisis to the extent that the question is not “whether any government should engage in industrial policy but how to do it right” (Stiglitz, 2013: 9). There has been a significant shift in the manner in which governments attempt to shape their national economies (European Commission, 2010; Rodrik, 2004; Stiglitz, Lin and Monga, 2013; Warwick, 2013). Policy makers are adopting new mechanisms, targeting approaches and conditionality agreements substantively different from those found in previous policy frameworks.

A good example of this strategic shift towards more carefully targeted industrial policies has been the growing interest from policy makers in the use of financial instruments as a way of stimulating economic development. Instruments such as public sector loans, guarantees and equity finance schemes are increasingly viewed as a central mechanism for improving the effectiveness of policy interventions, particularly those aimed to enhancing the performance of small and medium-sized enterprises (SMEs) (Wishlade et al., 2016). Indeed, according to Nadler and Nadler (2017), replacing traditional grant-based funding with financial instruments is now a central part of the ongoing reform of EU Cohesion Policy.

Financial instruments have been heavily promoted by the European Commission primarily because they have lower “sunk costs”, are seen as more cost-effective and market-oriented (i.e. often money has to be paid back) and in some cases they can leverage additional private funds (e.g. through equity investment schemes) (Bondonio and Greenbaum, 2014). Clearly there is an intuitive appeal for these mechanisms compared to the high levels of deadweight associated with grant expenditure (Begg, 2016). This has led some to claim they have the potential to “do more with less” (Dąbrowski, 2015). According to authors of a major evaluation of the use of these instruments within Cohesion Policy, financial instruments “are (potentially) an alternative, more sustainable policy delivery mode” (Wishlade et al., 2016: 14).

By the end of the 2013 programme period, the European Regional Development Fund (ERDF) had paid over EUR 9 billion into financial instruments, of which around 90% went to support for business development targeted at SMEs (European Commission, 2015). Given that innovation is the second-most prevalent issue targeted by such instruments (Wishlade and Michie, 2017), we can assume that much of this support also goes to SMEs. To a lesser extent, financial instruments have also been utilised within EU Structural Funds as a means of promoting supporting energy and infrastructure development (European Commission, 2015). However, the nature of these financial instruments in these domains is fundamentally different from those targeted towards SMEs and will not be examined explicitly within this paper.

This paper considers the theory behind the use of financial instruments, with a view to helping policy makers determine the validity and desirability of this policy focus especially within EU regional policy. While the shift in emphasis from grant-based forms of transactional support to a greater focus on financial instruments targeting SMEs has been widespread both within EU Cohesion Policy and elsewhere, to date little academic evidence has systematically examined the economic rationale for this new policy focus. Therefore, the primary focus of this paper will be to examine how financial instruments can potentially alleviate some of the problematic issues confronted by entrepreneurs and SMEs when attempting to grow their businesses. The paper scrutinises the theoretical and empirical rationale for these types of business support instruments. The potential role of financial instruments in other areas of Cohesion Policy such as transport and urban development will be touched upon, but the overriding focus of the paper will be on business funding issues.

In addition to this paper, a second paper has been commissioned to examine the practical implementation of financial instruments (Wishlade and Michie, 2017). Therefore, this paper will focus on the academic literature examining these instruments specifically in relation to the intended primary beneficiaries: SMEs. This focus is indicative of the wider thrust of EU Cohesion Policy, which brings “SMEs centre-stage in EU development policy thinking” (McCann and Ortega-Argilés, 2016: 537). Indeed, fostering entrepreneurship and innovation is now central to the policy priorities within EU regional policy as evidenced by the strong emphasis on so-called “smart specialization” (Morgan, 2017).³

More specifically, this paper will address the following questions:

- What are the theoretical arguments for the use of financial instruments?
- What are the general conditions to allow for an effective use of financial instruments?
- How does the effectiveness of different financial instruments differ depending on their purpose and the related market imperfections?
- Are there financial instruments that are particularly effective for achieving a particular objective?
- How does the effectiveness of financial instruments vary depending on market conditions and typical funding mechanisms used by public organisations and businesses in the different national and regional contexts that can be found within the EU?
- Are there general characteristics of businesses and public organisations that make it unlikely that financial instruments are effective in supporting them?

- Do market conditions exist under which the use of financial instruments for achieving the above-mentioned objectives is likely to be ineffective?

The paper is structured as follows. The next section provides context on the use of financial instruments and defines the key terms to be used in the rest of the paper. The paper then outlines the theoretical justifications behind the use of financial instruments and their use. The fourth section considers the evidence on the success of financial instruments in different contexts. We then assess the relative effectiveness of different financial instruments and raise various issues for policy makers wishing to implement these funding mechanisms. The final section ends with some brief conclusions.

Context and definitions

Financial instruments

Before commencing an assessment of the theoretical rationale for financial instruments it is important to specify exactly what is actually meant by a financial instrument. To date the term has been open to a degree of interpretative flexibility as is often the case with industrial policies more generally (Pack and Saggi, 2006). Indeed, rather than a strictly technical definition for a particular policy mechanism, the term financial instrument has become a rather vague “umbrella term” for a range of different financial programmes primarily aimed to help alleviate a disparate range of funding difficulties within SMEs. This probably reflects the fact that financial instruments are often driven by the pragmatic consideration to diversify the range of policy instruments within Cohesion Policy programmes rather than any in-depth consideration of the design of financial instruments (Wishlade et al., 2016).

In light of any definitive unpacking of the term, we shall offer the following definition:

Financial instruments are public policy instruments such as subsidised loans, credit guarantees and equity finance schemes designed to overcome market failures experienced by small and medium-sized enterprises to promote productive investments in a way that would not result through market interactions alone.

In recent years there has been a growing use of financial instruments within EU Cohesion Policy. Various types of financial instruments have been identified by researchers, but the most common forms used within EU Cohesion Policy (European Commission, 2015)⁴ to aid the growth of the SME sector include:

1. **Loans:** loans are the traditional and most common form of funding mechanisms used by SMEs. When asked what sources of finance they have used, or might use in the future, 52% of SMEs respond bank loans, well above other sources of finance, with the sole exception of overdrafts (54% of firms) (ECB, 2016). Examples of different loan instruments include the “Small Loan Fund” funded by the Finance Wales programmes in the United Kingdom, which funded 487 SMEs between 2001 and 2014 (Jones-Evans, 2015).
2. **Credit guarantees:** partial credit guarantees seek to expand funding to SMEs by underwriting the risks associated with the loan. These are essentially risk transfer and risk diversification mechanisms which guarantee repayment of part of the loan upon a default event. An example of this type of instrument is the “First Loss Portfolio Guarantee” in Bulgaria; since 2011, 4 000 SMEs have benefited from it (European Commission, 2015).

3. **Equity finance:** this occurs when firms exchange share capital in return for liquidity. This can include venture or risk capital and early-stage (seed and start-up funding). Equity finance is much less common and is typically associated with risky high-tech ventures. In the main, this type of finance is commonly associated with very innovative and/or high-tech firms that are often unable to obtain funding from banks. The return depends on the growth and profitability of the business and is earned when the investor sells its share to another investor or through an exit, such as an initial public offering or trade sale. An example of this is the JEREMIE Languedoc-Roussillon which invests in young companies with high potential, predominantly in the ICT and health sectors. To date, 21 companies have benefited from equity investments and 2 have raised further finance through a stock exchange listing (European Commission, 2015).

Underpinning the distinction between these financial instruments and other forms of public financial provision (i.e. grants) is that capital is repayable when using these financial instruments. However, it is important to note that the structure of each of the three instruments is fundamentally different. Therefore, while these financial mechanisms all fall under the overarching heading of financial instrument, the underlying principles and dynamics of these vehicles are quite heterogeneous.

First, in some cases these instruments are repayable, such as the case of subsidised loan instruments. Under these circumstances SMEs obtain loans from a bank or public sector intermediary which they may not have been able to obtain from a purely private sector bank. In some cases, the costs of borrowing are subsidised by the managing authority. Second, in the case of equity finance, the public sector receives shares in the firm in return for the capital sum provided to the SME. These tend to be higher risk companies, such as young innovative start-ups, which often require risk capital from business angels or venture capital to fund their expansion activities (Colombo and Grilli, 2007). Often these programmes co-invest in tandem with other private sector funders such as business angels and venture capital. Third, there is a variety of specialisation among partial credit guarantee funds. Most are restricted to smaller firms and often to SMEs located in specific regions (Beck et al., 2008). The risk management and risk assessment also differ across different schemes. Fourth, there are different institutional arrangements in place for managing these initiatives across different EU member states. In countries that receive Cohesion funding, a national body known as a managing authority oversees the use of these available resources. This either takes place through a fund of funds or another financial intermediary that manages the eligible projects which are financed.

Theoretical discussion

We now turn our attention to the theoretical principles which underpin the use of financial instruments. This is important for a number of reasons. First, it helps us to ascertain the rationality for governments to intervene within various types of markets inhabited by SMEs. Second, we can examine the specific nature of SMEs in terms of their ability to raise finance, which makes government intervention appropriate for assisting these firms.

Market failures and the rationale for government intervention

Since the days of the pioneering economist Adam Smith, it is a widespread belief that under an economic system with free markets, effective resource allocation will occur. This is called the Pareto optimal situation, where any change in the distribution of

resources would have to be detrimental to at least one economic actor. In a perfectly competitive market, unfettered competition would protect consumers from the political influence of lobbies, and forces producers to deliver products and services at cost. Alas, competition is rarely perfect, markets fail and market power – a firm’s ability to raise prices substantially above cost or to offer low quality – must be kept in check (Tirole, 2015). Indeed, it is now well recognised that there are many aspects of market failure in developed economies where this situation does not arise (Stiglitz, 1989).

Indeed, the core principle underlying the rationale for government intervention in a vast array of areas of public policy rests the notion of “market failure” (Stiglitz, 1989). Market failures arise when the competitive outcome of markets does not result in an efficient allocation of resources. As is known from the basic theory of welfare economics, under such market failures a competitive market system does not yield socially efficient outcomes (Pack and Saggi, 2006). In other words, market failures result in a suboptimal allocation of resources and prevent Pareto optimality.

The existence of market failures is the key rationale behind intervention in financial markets, and the use of financial instruments generally. Besley (1994) sets out the classic theoretical logic behind the allocation of capital. In a perfectly functioning credit market, there will be a market for loans with the interest rate determined through processes of supply and demand. As those who will make best use of the loans will be able to pay the highest rates, the market will allocate finance to the best investments. This market would be Pareto efficient as it would not be possible to improve the allocation without making someone worse off. Yet, in practice, there are a set of related market failures which prevent this situation from occurring. We shall now highlight some of the most important ones.

Market failures and credit markets

We shall now turn to the central issue of this paper, which involves the market failures associated with credit markets. During the last 40 years there has been a considerable amount debate and of theorising around the problems certain firms encounter when trying to obtain finance or “credit rationing”, especially small and innovative firms (see Cressy [2002]). A lot of theoretical literature stems from the seminal work undertaken by Stiglitz and Weiss (1981), who posit that credit rationing can result from adverse selection and moral hazard. Indeed, many of the *a priori* theoretical calls for policy interventions such as credit guarantees are predicated on these kinds of theoretical foundations (Riding, 2007).

Asymmetric information and adverse selection

The dominant theoretical explanations come from this basic idea that asymmetric information produces a market failure. First, there are multiple **informational failures** with strong implications for entrepreneurship policies (Karlsson and Andersson, 2009). An important issue characterising a number of different markets is the concept of “information asymmetries” (Akerlof, 1970). Owing to these types of informational problems, economic actors may not be able to obtain or cannot get the full information regarding the product involved. Often the seller knows much more about the product than the potential buyer – the so-called “lemons problem” posited by Akerlof where customers are deterred from buying used cars (1970). Informational issues are particularly salient within the market for credit for smaller firms due to their high levels of informational opacity (Cassar, 2004). Consequently, banks avoid lending to SMEs if these cannot offer collateral forcing them to seek alternatives (Berger and Udell, 1998). As we shall see

below when examining the experiences SMEs encounter when seeking finance for innovation, these informational problems are particularly salient for innovative firms. Indeed, among the “commodities” for which markets are most imperfect are those associated with knowledge and information (Stiglitz, 1989).

A market failure exists because it is hard for the lender to distinguish the risk level of a firm, entrepreneur or innovation without paying a significant cost. Lenders deal with this in two ways. In markets for debt, where lenders are primarily interested in ensuring a repayment stream, they will require either a significant financial track record or some form of collateral. In doing so, they exclude certain types of firms which can provide neither – young firms, or those seeking to attempt new, innovative business models. Providing finance to these firms would have been optimal for the economy overall, but the screening cost prevents it being provided. In this way, asymmetric information can provide an economic rationale for interventions in debt markets for certain firms.

Asymmetric information also provides a problem in a second market: equity finance. In this case, the provider of finance may be more concerned with the overall value of the company, rather than simply cash flow. But there are high fixed costs to the due diligence required to make a deal in the equity markets. While those working in the firm may be aware of its balance sheet information, market size and so on, specialist valuation is required for outsiders to do so. This means that providers of equity finance may focus on a smaller number of larger equity deals, often in simpler markets. Thus, asymmetric information leads to expensive valuations, and the underprovision of equity finance to smaller companies. This “equity gap” provides a theoretical justification for intervention in the equity market.

Asymmetric information is not simply about the supply side, it may cause problems on the demand side as well. Firms may simply not be aware of the potential suppliers of finance, or may undervalue the potential benefits that accessing finance might have for their business. In many cases, firms might be unprepared to “sell” their products to the correct provider. This does not always mean firms miss out on finance, but it may lead to unsuitable finance: for example, expensive, short-term finance such as credit cards, when cheaper finance might be better suited to their needs.

Monitoring costs

An additional issue relates to the cost of monitoring the behaviour of firms (Besley, 1994). A bank provides a large amount of finance to a project but the entrepreneur has to take a decision about how hard to work on the project. If the size of the loan is large relative to the expected returns from the project, this may provide a disincentive to the entrepreneur to work hard on that project. In the absence of expensive monitoring, the larger the size of the loan the lower the probability of repayment. This may lead to a suboptimal provision of finance, with fewer large loans being provided and a greater number of smaller ones.

Thin or incomplete markets

Most economic theory assumes a relatively complete market, with a large number of buyers and sellers for any particular good. Yet this assumption is clearly not true in practice (Stiglitz, 1993). In this case, markets may not function properly. This is particularly the case in relatively specialised, yet localised, markets such as might appear in venture capital funds (Nightingale et al., 2009). This might provide a rationale for government intervention to stimulate the market.

Government failure

Just as there are strong theoretical ideas justifying government action, there are strong theoretical arguments for problems with government policy. Some authors use the term “government failures” to describe these. Bravo-Biosca (2013) outlines some of these:

- **Lack of effective implementation.** There is no guarantee that government will be better able to address these market failures than the private sector. For example, the fixed costs of due diligence are the same for the government as for the market. In many cases government intervention will substitute a private sector problem with a public sector one.
- **Asymmetric information.** Government schemes do not lack the problems of asymmetric information faced by the private sector, and adverse selection and moral hazard will remain a problem. Government can help focus finance on particular types of firms, but the basic problems often remain.
- **Misaligned incentives.** Most government schemes are delivered by private sector intermediaries. These may not face incentives which are the same as other firms, for example, where they have targets to meet in terms of the number of participants. A second potential set of misaligned incentives relate to public loan guarantees, which change the incentives for banks to “screen” investments and may potentially lead to problems in the provision of debt.
- **Politics and capture.** Policy makers have priorities which may not be economically optimal, such as focusing financial instruments in declining industries with strong lobbying potential, rather than the growth sectors of the future.
- **Crowding out.** By subsidising some investment, government action may crowd out the private sector and prevent investments which would, in the absence of government action, be economically efficient.

Funding gaps for specific firm types

Since these pioneering theoretical developments, a number of scholars have examined the particular nature of SMEs to examine how their innate characteristics may influence their ability to obtain credit (and the cost thereof). This has also led to theoretical development concerning the capital structure of small firms which we will outline below: namely the growth cycle theory and the pecking order hypothesis. Essentially, a number of critical factors are theorised to hinder the ability of SMEs to obtain credit from their preferred funding source. Small firms are different from big firms and these features have significant ramifications for their ability to obtain finance. Plus, there are important differences between SMEs and this heterogeneity affects the ability to raise finance.

Prior literature suggests that SMEs find it both difficult and expensive to raise capital from banks and other investors (Berger and Udell, 1998). Agency problems and informational asymmetries lead to credit rationing in SMEs (Jaffee and Russell, 1976; Stiglitz and Weiss, 1981). Informational opacity is a key feature of start-ups and SMEs (Berger and Udell, 1998; Cassar, 2004). Small firms do not have audited financial statements or publicly visible contracts with staff and suppliers (Carpenter and Peterson, 2002). As such, small firms are less able to convey creditworthiness and growth to potential investors (Berger and Udell, 1998). Furthermore, most SMEs lack sufficient collateral to offset inherent informational asymmetries (Avery et al., 1998). As a consequence, SMEs are unable to access traditional forms of finance such as bank loans

(Cosh et al., 2009) and instead may seek alternatives (Robb and Robinson, 2014). It has been shown that these difficulties heightened quite markedly during the recent financial crisis (Cowling et al., 2012; Lee, Sameen and Cowling, 2015).

Berger and Udell (1998) introduce the “financial growth cycle” theory to explain small business financing decisions. They contend that the needs and options for financing change as firms grow and evolve. Under the financial growth cycle, the founders of new firms seek insider finance from family and friends before and at inception. Insider finance is often required at the very early stage of a firm’s development when entrepreneurs are “still developing the product or business concept and when the firm’s assets are mostly intangibles” (Berger and Udell, 1998: 22). As firms grow, they gain access to intermediated debt finance from banks and finance companies, or equity finance from business angels and venture capitalists. This theoretical model helps explain why small firms encounter credit constraints and the interconnectedness between different sources of finance.

So what does existing theory tell us about funding preferences within firms? SMEs can finance growth in a variety of different ways but the fundamental decision for many is whether or not to relinquish ownership of part of their business to external investors and to minimise intrusion into the firm (Hamilton and Fox, 1998). Under the “pecking order thesis” of fundraising (Myers and Majluf, 1984), many entrepreneurs are opposed to relinquishing control of their business to external investors and, wherever possible, resist equity dilution (Carter and Van Auken, 2005). Therefore, firms have a pecking order of preferences in terms of finance which begins with the use of internal funds generated by retained earnings; then recourse to debt finance from banks; and then, as the least preferable option, equity finance which dilutes the ownership of a business. In line with this hypothesis, high-growth firms prefer to finance their resources from internal sources of finance or through debt funding (Vanacker and Manigart, 2010). Equity funding is sought only as a last resort. Some researchers have discovered that some SMEs only seek out venture capital owing to the rent-seeking behaviour by their main bank (Berger and Schaeck, 2011). This contrasts to financing for new start-ups, especially new technology-based firms, which often seek venture capital funding owing to the high levels of risk associated with these ventures (Baum and Silverman, 2004; Lerner, 2010).

However, this model fails to adequately explain the manner in which SMEs obtain and utilise insider finance during the early stages of development. This is important because many entrepreneurs may not have sufficient levels of insider finance to help launch and grow their business. Internal sources of finance are sometimes limited and can constrain firm growth (Binks and Ennew, 1996; Carpenter and Peterson, 2002; Beck and Dermirguc-Kunt, 2006). Eventually firms are likely to use external sources of finance as a complement to existing internal sources to fund growth (Rostamkalaei and Freel, 2016). The model also downplays the alternative financing strategies used to fund expansion. Due to the innate heterogeneity across borrowers, financing by SMEs is not standardised (Udell, 2015). For example, low-growth SMEs may be able to rely on internally generated resources to fund expansion (Baker and Nelson, 2005), while growth-oriented firms may resort to innovative forms of “bootstrapping” to overcome financing constraints (Winborg and Landstrom, 2001; Brush et al., 2006; Ebben and Johnson, 2006).⁵

A key aspect of borrower heterogeneity affecting the ability to obtain finance is the level of innovativeness within small firms. Analysis of small firms regularly shows that innovative SMEs encounter the greatest difficulties obtaining finance, especially since the financial crisis, when credit rationing is tight (Freel, 2007; Lee, Sameen and Cowling,

2015). By and large, it is widely perceived that research and development (R&D) activities are difficult to finance in a freely competitive market.⁶ According to Hall (2002), there are various *a priori* reasons for this: 1) knowledge cannot be kept secret and is therefore hard to appropriate; 2) often more than 50% of R&D costs is salary-based costs which effectively are non-recoverable “sunk costs”; 3) concerns the lack of certainty associated with the output from the R&D. Innovation is “essentially a speculative process” (Freel, 2007: 23), which involves “a bet on the future, and most attempts fail” (Mazzucato, 2013: 851). Therefore, Hall (2002) claims that the marketplace for financing R&D looks like the “lemons model” posited by Akerlof because investors have difficulty identifying good projects from bad ones (Leland and Pyle, 1977).

However policies by modern governments increasingly recognise the wider societal benefits that accrue from R&D, which means that funding is often targeted towards innovative SMEs. Indeed, the positive impact of R&D on growth and productivity is predicated on a broad range of theoretical and empirical contributions (see Hall [2002]). In essence, arguments proceed that industrial R&D exhibit a classic “public goods” problem in that it is both non-rivalrous and not excludable (Becker, 2015). Therefore, government finance for industrial R&D is an important tool of industrial policy, however, the evidence on the effectiveness of these policies is mixed at best (Hyytinen and Toivanen, 2005). While previously R&D subsidies were perceived to crowd-out internal R&D by firms, more recent evidence suggest that the reverse may often be the case (Becker, 2015). Recent evidence examining the impact of R&D assistance has found three important findings for policy makers. First, R&D subsidies affect the ability of SMEs to access further external funding (Meuleman and De Maeseneire, 2012). Through a process of positive signaling about the legitimacy and validity of the R&D, SMEs benefit from the official stamp of approval by obtaining R&D subsidies. Second, the additionality from these subsidies is highest for the smallest firms, such as new start-ups. Third, tax credits are widely seen as the most effective form of public policy instrument for facilitating R&D as they support the innovation that is actually expended by the firm (Becker, 2015; Brown and Mason, 2014). However, one of the problems facing SMEs with R&D funding such as tax credits is that they may not have the ability to undertake and incur the upfront costs of the R&D. This penalises SMEs and consequently, most R&D funding has traditionally gone to larger firms (Becker, 2015).

It is not just innovative SMEs who are penalised when trying to obtain finance. Another crucial aspect of borrower heterogeneity concerns geographic location. It is now increasingly recognised by economic geographers that where a firm is located fundamentally shapes its ability to obtain finance (Martin and Sunley, 2015). Owing to organisational and technological changes which have reduced the relational proximity between SMEs and banks, small firms located in peripheral areas encounter a “liability of distance” (Lee and Brown, 2016: 23). While this is germane to all SMEs (Degryse et al., 2015; Zhao and Jones-Evans, 2016), it appears that innovative SMEs located in peripheral areas are particularly disadvantaged (Lee and Brown, 2016).⁷ Others note large national banks have a “home bias” which constrains local branches from lending to “soft-information intensive borrowers, such as small innovative enterprises” (Presbitero et al., 2014: 57). Evidence suggests that many of these aforementioned issues relate to a structural problem associated with so-called “thin markets” where investors and entrepreneurs find it difficult connect with each other outside core geographic areas (Nightingale et al., 2009). Other scholars have noted how the weak levels of local competition within some local areas leads to banks “cherry picking” customers restricting credit to other SMEs (Canales and Nanda, 2012). Recent research suggests that thin markets spill over into other forms

of SME lending markets in peripheral regions which may lead to the use of inappropriate types of finance such as credit cards (Brown et al. forthcoming).

It is important to note that theory does not suggest that all firms that seek credit should be able to access it. Some proponents suggest that any evidence that firms are unable to get finance is a market failure. However, this is not true. Theory around market failures does not suggest that all firms should get capital, merely that there may be situations where firms which would, in a perfectly working market, obtain finance do not.

Market failures in entrepreneurship

In addition to the important role played by these informational asymmetries, entrepreneurship scholars note the importance of five market failures and externalities which may impede and deter entrepreneurs (Acs et al., 2016). The first involves network externalities, which arise from the value individuals obtain from being located in close geographic proximity to other entrepreneurial actors. In other words, access to “key resources is place dependent” (Acs et al., 2016: 38). The recent growing literature on entrepreneurial ecosystems has strongly outlined the importance of various localised actors and assets which combine to create strong positive externalities (both pecuniary and non-pecuniary) for entrepreneurs who are located in strong ecosystems (Brown and Mason, 2017). The second and related factor is knowledge externalities. Knowledge created by a firm or university can be used by entrepreneurs to start and grow their entrepreneurial ventures. However, this process is often highly spatially mediated. Therefore, cities and regions with a lack of, or weak, institutions facilitating the spillover of knowledge will generate a lower value of knowledge spillovers. While policy can address these types of negative externalities (Acs et al., 2016), some peripheral regions seem quite unable to break from the path-dependent nature of these institutional weaknesses (Tödting and Tripl, 2005; Brown, 2016). A third is failure externalities, which are benefits to economies which arise from failed ventures. The famous example of the US semiconductor firm, Fairchild, is often used to demonstrate the benefits from failure. While the firm ultimately failed, it spawned a host of other companies – so-called “Fairchildren” – which provided a dynamic seedbed of innovation firms which boosted Silicon Valley (Klepper, 2010). The flip side of these types of issues are so-called “demonstration externalities”. These market failures lie in the information that is transmitted: entrepreneurship is rewarding, key competences are required and entrepreneurs are compatible in specific places (Acs et al., 2016). Feldman (2014) illustrates how positive demonstration effects, often through the role of so-called “regional champions”, play a powerful catalytic role in shaping the success of some regional economies.

What this brief examination of theory demonstrates is that important market failures, especially in relation to informational asymmetries and various externalities, hinder entrepreneurs from either: 1) establishing a firm; or 2) being able to obtain the necessary resources to enable the firm to grow its ventures. What this work also reveals is a strong spatial dimension to the issue of market failures. The manner in which markets work well (and don't work) is deeply mediated by spatial factors and shaped by the nature of local entrepreneurial environments.

Complementary institutions

One argument is that provision of financial instrument is only likely to work in the context of other complementary institutions (Besley, 1994). While this argument was originally made in the context of the developing world, where formal institutions such as

property rights and legal enforcement didn't seem to matter, evidence suggests that these institutions may matter in Europe as well. Theory suggests that financial instruments may work less well without certain institutions. These might include the government failures which are outlined above.

Conclusion

The preceding review of theory in relation to financial instruments has highlighted the important role of various “market failures”. It is important to highlight that not all SMEs are the same. Owing to the issue of “borrower heterogeneity”, these problems seem particularly acute for the smallest firms (especially new start-ups) who have the greatest levels of informational opacity (Cassar, 2004). Innovative firms are also penalised by lenders due to the factors outlined above. In addition, geographical issues strongly determine the availability of different types of finance for SMEs.

On balance, there are strong *a priori* theoretical reasons which potentially support the need for governments to intervene in the marketplace for SME funding. It is important to note that not all observers are in agreement with those who draw these policy conclusions despite the existence of credit rationing (Parker, 2002). Indeed, some authors believe that credit rationing is entirely justifiable given that it excludes “low quality” borrowers at the lower end of the wealth/income spectrum (de Meza and Webb, 2000). That said, some believe that funding will continue to be provided to small firms owing to their prominence within government policy and their strong association with job creation (Cressy, 2002).

The effectiveness of financial instruments: Empirical evidence

Over the last 20 years there has been a lot of experimentation within public policy aimed at alleviating the funding constraints within SMEs (Fraser, Bhaumik and Wright, 2015; Bellavitis et al., 2017; OECD, 2017). Within advanced industrialised economies there are a plethora of different types of support schemes aimed at increasing and subsidising the costs of credit to SMEs. Thus we find a growing proliferation of loan and equity schemes, venture capital trusts, soft loan schemes, micro-credit schemes, R&D grant mechanisms, government equity investment vehicles with a focus on small, young, often high-tech firms that are universally perceived to be the main casualty of such funding constraints (Cressy, 2002).

The exact structure and targeting of these policy approaches is extremely varied. This section reviews the academic literature which has examined these types of assistance programmes to ascertain their effectiveness. Given the focus of the paper, we shall concentrate on the following three types of assistance schemes: credit guarantee schemes (CGS), assistance accessing loans or loan subsidies, and governmental venture capital (GVC). There has been substantial body of evidence which has examined CGS. While subsidised loans are common approaches within various advanced economies, the volume of academic research on this topic has been quite limited. Conversely, while equity GVC schemes are relatively nascent in many countries, there has also been a growing body of work examining the effectiveness of these programmes.

Credit guarantee schemes

Let us first turn to the issue of CGS, which have received quite a considerable amount of empirical examination within the academic literature. CGS aimed at alleviating the credit rationing experienced by SMEs have been undertaken in multiple forms in a variety

of different countries, both developed and developing, for a considerable period of time (Levitsky, 1997). Quite some time ago, Green (2003) noted how almost 100 countries operate some form of CGS. As well as being ubiquitous, these schemes are also extremely well-funded in many cases. For example, in the United States alone, it has been noted that CGS alone support USD 62.5 billion in loans to SMEs (Cowan, Drexler and Yañez, 2015).

It is important to note that the nature of these schemes varies considerably across different countries. According to a recent report for the European Parliament (2015), loan guarantee schemes are too limited and concentrated in certain EU member states to enable a full assessment of these instruments. For this reason, this paper looks at assessments of GCS in various OECD economies. Despite their undoubted popularity among policy makers, there is still an intense debate amongst scholars around the efficacy of these policy instruments and their effects on economic incentives (Cowan et al., 2014).

Loan guarantee schemes are predicated on the notion that small firms cannot gain access to (proportionally) as much credit, or credit on equally favourable terms, as large firms of equal risk (Cowling and Siepel, 2013). This type of intervention seeks to provide loan security to smaller firms that would otherwise be unable to obtain debt finance through conventional means (Riding, 2007). According to most observers, the historical record of CGS was “less than a resounding success” (Levitsky, 1997: 4). Critics of these schemes highlighted the problems associated with these schemes, such as low levels of additionality (i.e. loans awarded under the scheme would have been obtained without the support), high administration costs, the fact banks strongly disliked them and the problems associated with “moral hazard” (Levitsky, 1997). The strongest allegation which is aimed at CGS is that it weakens the will of firms to repay the loans when they know that the guarantee will reimburse the lending institution. For this reason, some detractors were strongly critical of these schemes as tools within economic development (Vogel and Adams, 1997). This has been particularly the case in developing economies where the evidence on their effectiveness has generally been much more negative.⁸

Despite some of these earlier concerns, more recent empirical evidence has begun to paint CGS in a better light. Bradshaw (2002) examined the California State Loan Guarantee Program, which guaranteed small business bank loans to carefully selected firms that could not otherwise obtain credit. The study tracked the actual change in employment at 1 166 firms that received 1 515 loan guarantees from 1990 to 1996 during the depths of the California recession. The study found that employment increased in firms receiving loan guarantees by 40% among all firms and 27% among non-agricultural firms. The scheme also increased state tax revenues by USD 25.5 million, well in excess of the USD 13 million the state spent on the programme. Firms receiving loan guarantees had a default rate of only 2%.

Riding and Haines (2001) examined the Small Business Financing Loan programme in Canada. Their findings included: 1) loan guarantees granted under the terms of the Small Business Financing Loan provide an extremely efficient means of job creation, with very low estimated costs per job; 2) default rates are higher for newer firms, increase with the amount of funds borrowed and vary widely by sector (borrowers in the retail and accommodation, and food and beverage sectors were significantly more likely to default than borrowers in other sectors); and 3) the widening eligibility to larger firms and to larger loans may not be well advised and is inconsistent with the goals of the programme. Riding and Haines claimed that reducing the loan ceiling would arguably discourage fraudulent applications while servicing those SMEs most in need of early-stage capital. In

a follow-up study Riding (2007) re-examined 10 000 applicants to the Small Business Financing Loan. His findings corroborate this earlier positive picture, finding that there was a 75% level of additionality achieved by the programme which resulted in 22 000 new jobs (full-time equivalent). Interestingly, Riding found that start-ups and growth-oriented companies particularly benefited from the scheme. Indeed, half of the recipients had started their companies using the loans through the scheme.

Loan guarantee schemes have also been examined in Italy where this has been a prominent policy tool implemented by various governments. Examining the Italian state-funded guarantee scheme for SMEs, Zecchini and Ventura (2009) found the scheme to operate effectively. Using panel data of loan recipients and those not awarded under the scheme, the authors found a causal relationship between the public guarantee and higher debt leverage of guaranteed firms as well as lower cost of debt compared to non-awardees. The cost reduction is estimated at 16-20% while the additional supply of credit is estimated at 12.4%. Part of the successful performance of this particular programme is attributed to the high level of selectivity and targeting of the programme, which has apparently helped reduce the default rates of the scheme (Zecchini and Ventura, 2009). Another Italian study of the Central Guarantee Fund for SMEs used panel data of 1 500 SMEs between 1999 and 2004 (Boschi, Girardi and Ventura, 2014). The authors provide evidence that neglecting heterogeneity tends to provide biased estimates of the average credit additionality effects exerted by credit guarantees. Their calculations indicate that a lower threshold for the effectiveness of coverage ratios is about 25%. In other words, a firm offered a guarantee below the minimum threshold (estimated to be equal to 25%) can be better off avoiding the costs related to the guarantee. They also found a low level of additionality of the scheme and claim that a focus on larger guarantee intensities would increase the fund's overall additionality (Boschi, Girardi and Ventura, 2014).

The United Kingdom's Small Firm Loan Guarantee (SFLGS) scheme has also been subject of close empirical scrutiny by Cowling (2010); Cowling and Siepel (2013); and Ughetto, Scellato and Cowling (2017). Under the SLGS, the government covers 75% of the loan value and borrowing businesses pay a premium which is 2% over the commercial bank rate. Cowling (2010) used a unique dataset comprised of small firms facing a very real, and binding, credit constraint, to question whether a corrective scheme such as the SFLGS has, in practice, alleviated such constraints by promoting access to debt finance for small credit-constrained firms. The results broadly support the view that the SFLGS has fulfilled its primary objective. During a more recent examination, Cowling and Siepel (2013) examined the SFLGS for loans taken out between 2000 and 2005 across a population of 31 425 SFLGS-based firms. Their central estimates suggest that for every GBP 1 spent on the SFLGS the additional sales directly attributable to the SFLGS would be around GBP 3.13 (for a total of GBP 112 million). They also found a strong boost to the sample of firms in terms of employment. The directly attributable increase in net employment is around 2 292 at a cost of GBP 7 750 per job.

While the findings on the SLGS quite positive performance within the UK's SFLGS, based on their findings Cowling and Siepel (2013) raise a number of issues which policy makers ought to consider when structuring these types of SME support instruments. First, given that the default rate of firms is highest among firms using the finance for working capital and/or cashflow, despite the fact that higher spreads apply for those firms (Ughetto, Scellato and Cowling, 2017), policy makers may wish to limit funding for these purposes. This is especially important because firms that default will then face further discrimination when seeking future credit from other banks (Cowan, Drexler and Yañez, 2015). Second, the flip side of this is that firms that invest in tangible

productive assets have a much lower default rate. Equally, such firms would have levels of collateral to secure against for future loans. Third, given the strong job creation levels within the smallest firms, policy makers may wish to target the CGS towards the smallest firms and start-ups. Larger SMEs, on the other hand, tend to perform better in terms of growth and exports than smaller firms. Clearly, how these schemes are structured has important consequences for the types of outcomes that they generate.

Government venture capital

In recent years there has been a huge upsurge in government-backed venture capital (GVC) programmes. Much of this policy emphasis is heavily premised on the assumption that governments can help “pick winners” to help generate future dynamic high-tech firms associated with Silicon Valley. Fostering entrepreneurship is one of the most frequently cited objectives of GVC (Colombo, Cumming and Vismara, 2016). Observers have highlighted the fact the outlier status of many of these firms, such as Apple, Uber and Google, has fostered a disproportionate emphasis within public policy (Gartner et al., 2017).⁹

For the last 20 years, the limited size of the European venture capital (VC) market in Europe compared to the United States initiated a flurry of policy initiatives to try and grow Europe’s VC market. Work by the European Parliament (2012: 11) claimed that the European VC market was “much younger and smaller than that of the US”. This work found that the US VC funds in 2010 were EUR 10.1 billion compared to a figure of EUR 3.5 billion in the EU. The report further notes that the fragmentation of the EU market across different nations has diminished returns and prevented the emergence of large institutional investors (European Parliament, 2012).

National governments and the European Union have both been keen to help bridge this disparity through a raft of government-funded policy measures.¹⁰ A GVC is defined as “funds that are managed by a company that is entirely possessed by government bodies” (Grilli and Murtinu, 2014: 1 524). National examples of these funds in the EU include Biotech Fonds Vlaanderen founded by the Flemish government; the Finnish Innovation Fund managed by SITRA; the Scottish co-investment scheme managed by the state-owned Scottish Investment Bank. These schemes predominantly target high-tech new start-ups rather than the overall population of SMEs. Such has been the level of policy activism that the seed VC market in the EU is almost completely dominated by GVC (European Parliament, 2012). However, many national and regional schemes such as the ones above resemble the problem of “thin markets” (Nightingale et al., 2009). This problem arises when there is a lack of strong demand with good investment opportunities coupled with a lack of supply of active private VC and business angels. In thin markets the government attempts to bridge this “gap” through GVC.

Before examining some of the empirical evidence in relation to the performance of GVC it is important to highlight some of the unique characteristics of VC. Lots of empirical evidence has shown that venture capital can have a strong impact on the growth within VC-based firms (Davila, Foster and Gupta, 2003; Bertoni et al., 2011). Authors claim there are various key factors underlying the connection between VC and rapid growth (Grilli and Murtinu, 2014). First, VC can properly scout for and screen firms to ensure they select those with strong growth potential (Baum and Silverman, 2004). Second, VCs can “add value” to firms through an interactive relational form of upskilling the managerial competencies within the firms (Hellman and Puri, 2002), which leads some to label VCs as “smart money” to depict this process (Sørensen, 2007). Third, being backed

by VCs is thought to act as a positive signal of the firm's legitimacy and growth potential (Hsu, 2007). Signalling acts as a positive process of cumulative causation which reaps benefits for VC-backed firms in terms of network development with customers, suppliers and further institutional investors (Ozmel, Reuer and Gulati, 2013; Plummer, Allison and Connelly, 2016).

These are important traits of private sector VCs because the rationale for public intervention in the shape of GVC is premised on the assumption that the public sector can replicate the private sector counterpart. However, there seems to be some evidence that this may be problematic for a number of reasons. First, most private VCs have a fairly rudimentary set of objectives, which is to grow businesses quickly in order to provide an "exit" either in the shape of an initial public offering or via a trade sale. Consequently, private VCs are very directive and influential in promoting this kind of exit culture within firms. By contrast, GVCs may wish to offer firms a source of longer term "patient capital", which may offer less-stringent pressure to achieve rapid growth. Second, as noted above, several empirical studies have highlighted that private sector VCs offer VC-backed firms a range of value-added activities such as coaching and managerial development (Baum and Silverman, 2004). However, several scholars have highlighted how government officials or "bureaucrats" are highly unlikely to have these kinds of entrepreneurial skill sets to pass on to their clients (Lerner, 2002; 2009). Third, another key benefit conferred on privately VC-backed firms is the strong monitoring and use of contractual clauses, which create very strong incentives for entrepreneurs to pursue growth (Kaplan and Strömberg, 2003). Relatedly, due to the issue of moral hazard firms, firms that are funded by GVCs may be much less motivated to deliver returns for more passive investors.¹¹ Given these distinctive characteristics, there would appear to be quite strong *a priori* theoretical arguments for hypothesising that GVCs would be outperformed by private VCs.

In recent years – due in part to the development of better datasets such as the EU-funded VICO database – there has been a number of empirical studies which have examined the relative merits of GVCs relative to private venture capital (PVC). In the first such study of its kind, a recent paper examined the impact of GVC compared to PVCs within the European Union using the VICO dataset (Grilli and Murtinu, 2014). This comprehensive piece of research examined a large representative sample of pan-European high-tech entrepreneurial firms between 1993 and 2010. Their results show the main statistically significant and economically relevant positive effect is exerted by PVCs on sales growth within firms. Conversely, the impact of GVC alone appears to be negligible. In other words, the authors found that GVC investors are not found to exert any sizeable effect, in terms of statistical significance, irrespective of the growth measure employed (i.e. sales or employment growth). They conclude that GVC does not impact on the sales and employment growth of European high-tech firms. An interesting aspect of their findings was that GVC was only found to play a beneficial role in terms of firm growth when they are "non-leading partners in a VC syndicate" with other PVCs (Grilli and Murtinu, 2014: 1 537). Reflecting upon their findings, Grilli and Murtinu (2014: 1 537) claim that their analysis "sheds a negative light on the government's ability to support high-tech entrepreneurial firms by operating directly in the VC market". They further assert that the main factor underlying this weak performance is a lack of value-added skills with GVC programmes.

These findings highlighting the ineffectiveness of a hands-on approach within venture capital markets are very similar to other empirical studies examining the relative performance of GVCs *vis-a-via* PVCs (Lerner, 2009). In another study, their relative performance was compared using the Thomson One dataset of 20 466 enterprises based

in 25 OECD countries, half of which were US-based enterprises (Brander et al., 2015). This study compared the relative performance of these schemes in terms of the overall level of funding the firms received and their success at achieving successful exits (i.e. initial public offerings or trade sales). They found that firms which had a mix of GVCs and PVCs achieved the highest levels of overall funding. Firms that receive purely GVCs receive the lowest levels of overall funding. The authors conclude that many enterprises that receive pure GVC funding “would not otherwise receive VC funding at all” (Brander et al., 2015: 613). This problem of “adverse selection” by GVCs is frequently noted across a range of government-backed schemes (Lerner, 2009).

Importantly, Brander et al. (2015) also compared the issue of exits between differentially funded firms. Once again, the firms which received mixed GVCs and PVCs achieved the greatest incidence of successful exits. In other words, hybrid funded firms are more successful than purely GVC-funded or PVC-funded ones. It appears that the better exits are due largely to obtaining more investment as is consistent with a model that finds these firms are capital-constrained. Another additional finding from this study is also noteworthy. While the negative relationship between pure GVC funding and exits is particularly strong in the United States, there was some evidence of a positive relationship in Europe. However, the superior performance of GVC/PVC hybrid investments shows that potentially GVCs that “contribute to mixed funding are just as concerned with the “bottom line” as PVCs” (Brander et al., 2015: 614). Another study conducted using the European VICO dataset similarly found that PVC-backed firms had superior exit performance to GVC-backed firms (Cumming et al., 2017). However, unlike Brander et al. (2015), this study found no statistical relationship that hybrid syndicates of GVC and PVC had a higher likelihood of positive exits than PVC alone (Cumming et al., 2015). Vanacker, Heughebaert and Manigart (2014) discovered a similar finding during their work examining VCs in Europe.

Other more focused empirical evidence has also examined the differences in the operation and performance of GVCs relative to PVCs. Some of these studies are very pertinent to the European context, which has a much more prominent sources of GVC. One particular study discovered that GVC fund managers have a more positive attitude towards academic entrepreneurs (Knockaert et al, 2010). Luukkonen, Deschryvere and Bertoni (2013) report that PVCs provide more support in the development of business ideas, professionalisation and exit opportunities. Another issue various studies have sought to address concerns the issue of “crowding in” versus “crowding out”. On this matter, the evidence seems mixed (Colombo, Cumming and Vismara, 2016). Positive examples which are cited are the Small Business Investment Company in the United States and the Yozma fund in Israel. Examples of funds which have effectively crowded out the PVC are also evident within the literature such as the Labour-Sponsored Venture Capital Corporations in Canada, which was eventually phased out due to problems associated with crowding out (Cumming and MacIntosh, 2006).

It is clear from the findings outlined above that the effectiveness of GVC schemes is far from clear cut. The treatment effects of GVC on the portfolio of firms is a complex issue. The heterogeneity of different GVC schemes makes clear-cut policy prescription difficult. Some scholars argue that overall the empirical evidence base is very mixed: good examples, such as the Australian IIF, are in contrast with a lack of success of GVC programmes in other countries (Colombo, Cumming and Vismara, 2016). While scholars call for future research in this area, policy makers need to pay close attention to the formulation of these complex financial instruments if they are to be effectively designed and deployed.

Publicly assisted loan schemes

In contrast to the large and rapidly growing literature on CGS and GVCs, the literature evaluating the effectiveness of publicly assisted loan schemes (PALs) is significantly smaller. This seems all the more anomalous given that a recent review of support initiatives across the EU to help SMEs access credit found that schemes promoting the public subsidisation of bank loans to be a very prevalent tool in this regard (Infelise, 2014). Once again, there is a clear divergence in the use of PALs across the EU. In some countries, such as the United Kingdom, policy makers have tended to view these firms unfavorably. However, in other EU countries such as France, Germany, Italy and Spain these types of schemes are much more commonplace. Sometimes these types of loan subsidy schemes are channeled through state-owned banks, such as the Nuovo Plafond PMI Investimenti in Italy. Starting in January 2012, the programme is committed to channeling banks loans at favourable conditions through a network of private credit institutions (Infelise, 2014). Additional examples in France and Germany respectively include the *Prêt participatif d'amorçage* and the ERP Start-Up Loan. Interestingly, what seems apparent is that some of the schemes, such as the ERP Start-Up loan, are a “hybrid” between loan subsidies (i.e. fixed interest rates) and a CGS.¹²

Another notable feature of PALs is that most are strongly targeted towards start-ups (Infelise, 2014). Given their lack of track record coupled with a lack of collateral, start-ups are often the most informationally opaque SMEs which face the sternest difficulties obtaining external finance (Cassar, 2004). Indeed, the provision of “soft loans” has been a very common policy instrument adopted by policy makers to alleviate the funding gap encountered by new start-ups. In the United Kingdom there is the Start-Up Loan, in Germany there is the ERP Start-Up Loan, in France there is the *Prêt pour l'innovation* and in Spain the ENISA Entrepreneur. What seems apparent from a cursory examination of these schemes is their varied focus, with most having different eligibility criteria based on sectors, age of company and size of loan (Infelise, 2014). Plus, some of these loans are only eligible to firms already receiving funding through other programmes (e.g. France's *Prêt participatif d'amorçage*). Wishlade et al. (2016) in their review of financial instruments across the EU also note this considerable heterogeneity in the composition of loans funded under the EU's Cohesion Policy.

What does the academic evidence base on the provision of state-backed subsidised loans tell us? Once again, the evidence base on PALs seems quite mixed. Most of the empirical evidence has been conducted at a very local micro-level, focusing on particular programmes which are often quite distinctive and in many cases focused on particular cohorts of entrepreneurs. Targeting is often focused on very young people, unemployed people, disadvantaged groups such as ethnic minorities and R&D support. One such study examined the German start-up programme Deutsche Ausgleichsbank (DtA) (Almus, 2004). This study examined the performance of the entrepreneurs funded under the scheme and also examined a control group of non-assisted firms to test for the treatment effects of the programme. Almus (2004) examined the success measure, which was the average annual employment growth rate over a six-year period and the resulting causal effect is the difference of this measure between the group of subsidised firms and the selected control group firms that did not receive any DtA start-up loans. The empirical analysis shows that the DtA start-up loans significantly improved the average employment growth rate.

Another study also examining a start-up programme in Germany examined the effectiveness of two programmes designed to help unemployed people become entrepreneurs (Caliendo and Künn, 2011). Caliendo and Künn (2011) found that that over 80% of

participants are integrated in the labour market and have a relatively high income five years after start-up. Additionally, participants are much more satisfied with their current occupational situation compared to previous jobs. Based on propensity score matching methods, they estimated the long-term effects of the programmes against non-participation and took great care in assessing the sensitivity of their results with respect to deviations from the identifying assumption. The results turn out to be robust and show that both programmes are effective with respect to income and employment outcomes in the long run, i.e. five years after start-up. Moreover, they consider effect heterogeneity with respect to several dimensions and show that start-up subsidies for the unemployed tend to be the most effective for disadvantaged groups in the labour market.

Interestingly, a recent study examined the relative performance of soft loans relative to direct subsidies for the purpose of generating further R&D within Spanish firms (Huergo and Moreno, 2014). While this study is not purely focused on SMEs, over a third of the firms employed 10-50 employees. Drawing on a large sample of firms, the authors found that the loan subsidies played the strongest role in helping increase the R&D intensity of the firms. Similarly, this assistance also increased the innovativeness of the firms in terms of patents. In another similar comparative study, Bondonio and Greenbaum (2014) examined the relative effectiveness of soft loans and capital grants deployed under the ERDF in an Italian region. This empirical analysis found the employment creation of both support measures to be broadly similar. However, owing to the much greater cost-effectiveness of soft loans relative to capital grants “the impact estimates indicate that soft loans possess higher employment effectiveness than capital grants” (Bondonio and Greenbaum, 2014: 99).

Overall, there appears to be some evidence which highlights the positive role played by PALs for certain types of entrepreneurs. However, given the fact most of the schemes tend to be highly targeted to particular types of entrepreneurs care must be taken when extrapolating these results across the wider SME population.

Assessing the effectiveness of financial instruments

The remainder of this paper will attempt to examine the overall effectiveness of financial instruments and some of the main issues surrounding their practical implementation. This assessment is not based on the prior experience of the effectiveness of financial instruments within previous structural funds programmes.¹³ Instead, we aim to synthesise the main practical lessons from the proceeding review of the academic literature on this topic. This element will also draw upon additional empirical studies of various financial instruments utilised in various national and regional contexts which were not covered in the earlier discussion. Before proceeding, however, it must be highlighted that an ongoing concern raised within the academic literature is a lack of sound evaluation evidence to inform policy makers (Honohan, 2010; Colombo, Cumming and Vismara, 2016). Indeed, many authors have commented on the fact that many of the interventions implemented in this public policy domain seem to be driven as much by political imperatives as they are based on sound and rigorous empirical evidence. Therefore, we shall be cautious to highlight the level of evidence there is when making concrete assertions in relation to any of these financial instruments.

Grants versus financial instruments

This paper does not strive to provide a comprehensive assessment of different support instruments, but we think the discussion of the effectiveness of financial instruments should be framed within the overall context of various alternative industrial policy

instruments. Therefore, before we begin our appraisal of different instruments, it is worth considering the issue of their relative effectiveness compared to other key forms of business support, such as grants and tax credits, etc. Probably the form of public assistance which has garnered the greatest degree of criticism in recent years has been the issue of public sector “grants”. Indeed, a key aspect of the change to many industrial policy frameworks has been the replacement of grant-based subsidies with alternative methods of support (see Warwick [2013]; Mason and Brown, 2014).

Traditionally, within most advanced economies, the public sector has deployed a wide array of grant instruments. These are transactional forms of support designed to promote certain aspects within companies aimed at improving business performance. The types of thematic areas grants have been designed to assist SMEs include thematic support such as, *inter alia*, capital investment, R&D, management development, innovation or internationalisation and so on. Given that grants are essentially non-recoverable “one-off” subsidies or payments to firms (Wren, 2005), there is no requirement that the firm repays or returns any of the financial costs to the public sector.

The small but mounting literature on the effectiveness of grants seems to hint towards some key problems with certain types of grant-based instruments. Grants as a policy instrument are often highly controversial for a number of reasons (Wren, 2005). First, public grants raise important issues connected to the issue of so-called “moral hazard” questions. As the expenditure is essentially incurred by a third party there are clear “agency” problems. As the principal, the public sector has little control over the expenditure of the funding and how effectively it is deployed within the firm. In other words, a grant means that a firm has little “skin in the game”, meaning that it may be less inclined to maximise the return from the expenditure than if the activities undertaken entailed the use of internal firm resources. Second, given that firms receive grants to undertake certain activities within firms there is great difficulty of proving the level of additionality. Difficulties proving the so-called counterfactual are endemic when undertaking evaluations of various grants and consequently ascertaining the genuine level of additionality is extremely difficult. However, the lack of additionality is one of the key arguments against grants. Economists typically dislike grants as a policy tool for this reason and many view it can lead to evidence of a “grant mentality” within SMEs. This is certainly an allegation which has been aimed at various regional economies, such as Northern Ireland, which has experienced high levels of grant-related instruments in previous years (Brown, Mawson, and Lee, 2017). This can dampen the levels of self-resiliency among entrepreneurs and produce adverse selection by awarding grants to the wrong “types” of firms.

In some areas grants have been shown to be quite effective aid instruments, especially within regional policy (Wren, 2005). Regional aid instruments designed to foster capital expenditure within companies have been highlighted as one area where grants seem to perform quite well on a number of criteria, such as cost per job and levels of genuine additionality. Evaluation evidence in this area has been quite substantial and often positive (Harris and Robinson, 2005; Wren, 2005; Devereux, Griffith and Simpson, 2007; Hart et al., 2008). However, often capital-related grants are based on genuinely additional expansions to firms to enable the purchase of capital equipment and/or premises so policy makers can assess the tangible difference the grant can make to the expansion of the firm.

In stark contrast, probably the area where grants have been most heavily criticized, is in the area of R&D and innovation support which has become a huge focus within most advanced economies (Lerner, 2009; Mazzucato, 2013; Brown and Mason, 2016). Grant support in this area is often justified on the wider societal benefits that arise from

so-called knowledge spillovers. However, in the main the academic evidence around the benefits of R&D grants has shown their performance to be quite poor (Hyytinen and Toivanen, 2005; Becker, 2015). Tax credits, on the other hand, are widely seen as the most effective form of public policy instrument for facilitating R&D, as they support the innovation that is actually expended by the firm (Becker, 2015; Brown and Mason, 2016). However, one of the problems facing SMEs with R&D funding such as tax credits is that they may not have the ability to undertake and incur the upfront costs of the R&D. This penalises SMEs and consequently, most funding has traditionally gone to larger firms that can afford upfront costs associated with R&D (Becker, 2015).

In recent years, there has also been quite substantial criticism for grants based on the unintended consequences they may instil within firm behaviour. In a recent paper Brown and Mawson (2016) examine the nature of support aimed towards “high-growth start-ups” – i.e. so-called “gazelles” – which has become a sizeable policy focus in most economies in recent years (see Brown et al. 2017). Often these firms receive multiple forms of state-backed support from various public agencies from a variety of support instruments such as incubator programmes, R&D support and GVC schemes. When taken collectively, these levels of support can become quite sizeable, which can heavily reduce the requirement for firms to generate their own revenue streams. The authors argue that these firms can become too cosseted, to the point that the public sector may be “killing them with kindness” (Brown and Mawson, 2016).

Crucially, Brown and Mawson (2016) highlight that offering firms intensive levels of support alters the innovative and funding behaviour of participating firms. In other words, the incentive mechanisms within the firms are overly skewed towards a reliance on public sector sources of revenue to the exclusion of private sources of revenue. Rather than producing more resilient and strongly performing growth-oriented start-ups, these comprehensive, often grant-based instruments, end up having a seriously deleterious impact on the long-term prospects of the firms. This seems particularly the case with some programmes like the High-Growth Spin-Out programme in Scotland or Germany’s HighTech Grunderfonds, which offer high levels of multi-programme support to a small number of participants (Brown and Mawson, 2016). Similar findings have been reported from firms heavily supported by state-funded business incubators (Tamasy, 2007).

In sum, grants are increasingly deemed unsuited for certain more developed regions and for certain types of activities, especially on the grounds of their inferior cost-effectiveness compared to financial instruments (Bondonio and Greenbaum, 2014). On the other hand, grants may have greater salience for less well-developed regions with a poorly endowed SME sector and poorly developed financial institutions. In these locations financial instruments may have less traction. Grants are also increasingly viewed as appropriate in certain thematic areas. One such area is capital grants under regional policy, which continue to be a core focus of EU regional policy. The move away from grant-based assistance has been most apparent within innovation policy (Martin, 2016). Tax credits in this area have become much more prevalent for the reasons noted above but often these favour larger and medium-sized firms. Indeed, often the firms that are less able to fund innovation are smaller companies that have difficulties raising finance within credit markets, an issue that will be discussed below.

The rationale for intervention in small and medium-sized enterprise credit markets

A very common concern raised in the small business literature is the issue of credit rationing caused by the imperfections in the capital markets for small business finance (Cressy and Olofsson, 1997; Beck and Demirguc-Kunt, 2006). As discussed earlier, often these issues are particularly problematic for the most informationally opaque firms such as start-ups (Cassar, 2004), innovative firms (Carpenter and Petersen, 2002) and small firms located in geographically remote locations (Lee and Brown, 2017).¹⁴ However, it is important to note that some observers take issue with the veracity of the evidence of so-called widespread “funding gaps” facing SMEs (Cressy, 2002; Parker, 2002). While the empirical base does show signs of discriminatory behaviour towards certain types of riskier SMEs, some believe that this is purely markets operating correctly.

Leaving aside these concerns, most policy makers in advanced developed economies generally subscribe to varying degrees to the core thesis of “credit rationing” within SMEs. The main theoretical rationale which ties various strands of the literature together concerns the role information plays in the small firm-bank relationship (Stiglitz and Weiss, 1981). In other words, judging borrower quality *ex ante* is virtually undetectable by the lending bank (Cowling, 2010). Another critical determinant causing friction between borrowers and lenders is collateral. Cowling (2010) notes how the issue of collateral may affect different types of borrowers variably. On one hand, bad borrowers who know they’re intrinsically risky will not offer collateral as they have a high probability of losing it. Good borrowers, on the other hand, knowing they have a high possibility of succeeding, will offer it knowing that it will confer enhanced borrowing costs in the shape of lower interest rates.

Cowling (2010) further notes that a proportion of genuinely good low-risk borrowers may be unfairly credit rationed when the amount of collateral required exceeds their wealth endowment. Instances where this may arise are entrepreneurs who have a limited track record or financial wealth. Younger entrepreneurs are unlikely to be serial entrepreneurs whom have cashed out prior businesses or to have wealth tied to housing equity, etc. Plus, the level of collateral needed will be dependent on the scale of the risk within the enterprise. Therefore, more inherently innovative SMEs – irrespective of the degree of risk involved in the venture – will incur the highest level of risk (i.e. level of collateral). In these instances, there is some *prima facie* evidence of credit rationing which opens the door for state intervention (Cowling, 2010).

The effectiveness of financial instruments

If there is a genuinely *a priori* case for state intervention to rectify market imperfections for SME finance it begs the crucial question of what shape should this intervention take? While the foregoing review of the available academic evidence was not completely exhaustive, it does provide us with a level of evidence to make some informed judgements about the effectiveness of different types of financial instruments. The following discussion will review the nature of the different types of financial instruments and offer some practical recommendations on the applicability of these instruments as tools for enhancing the availability of finance to SMEs in light of some of the aforementioned theoretical issues highlighted earlier.

We shall take each type of instrument examined in turn. First, following our discussion of the evidence around **government sponsored credit guarantees** we discovered that there is a considerable and ongoing debate around the efficacy of these

instruments and their impact on economic incentives within firm behaviour (Arping, Lóránth and Morrison, 2010; Cowling, 2010; Honohan, 2010; Cowan et al., 2014). These instruments are very commonplace and take several forms. While historically they have been deployed rather indiscriminately and ineffectively, *ceretis paribus*, the academic evidence seems to be suggestive of a growing broad agreement across the scholarly community of the relative merits of GCS, especially compared to other forms of financial assistance such as directed lending schemes such as PALs (see Honohan [2010]). Advocates argue that partial CGS reduce collateral requirements, increase access to finance in low-asset SMEs that have credit constraints despite have strong potential upside in terms of investment opportunities (Cowling and Seipel, 2013; Cowan et al., 2014). In other words, they seem to alleviate the market imperfections within the small business credit market.

That said, nearly all observers note that the devil is in the detail with CGS and that government involvement in credit markets “must introduce fewer distortions that it resolves” (Arping, Lóránth and Morrison, 2010: 26). Given the upsurge in the literature on these aid instruments, some critically important aspects concerning the appropriate design of these policies has been raised by several of the leading researchers in this field. Honohan (2010) offers five main practical suggestions when designing these instruments. First, they should have clearly designed and precise welfare improvement goals. Second, there should be a reliable and clear approach to accounting so that costs are manifestly (and immediately) explicit. Third, there should be built-in data collection that enables prompt evaluation of outcomes. Fourth, attention should be paid to scheme design that maximises the chance of goal achievement. Fifth, transparency in operation and reporting. While broadly helpful, these are quite generic in scope and apply to virtually all realms of public policy.

Perhaps of greater help for policy-making purposes, other scholars have highlighted important recommendations in light of their research findings in relation to CGS. Cowling and Siepel (2013) and Arping, Lóránth and Morrison (2010) raise a number of issues which policy makers ought to consider when structuring these types of SME support instruments. First, given that the default rate of firms is highest among firms using the finance for working capital and/or cashflow, policy makers may wish to limit funding for these purposes. Secondly, authors found the strongest job creation levels to be within the smallest firms (Cowling and Siepel, 2013). Therefore, policy makers may wish to target CGS towards the smallest firms and start-ups. Larger SMEs, on the other hand, tend to perform better in terms of growth and exports than smaller firms. Finally, research has shown that a guarantee which is excessively generous (above 75% of the loan amount) decreases the additionality of the scheme as firms replace public for private collateral (Arping, Lóránth and Morrison, 2010). This might explain the positive results for partial rather than full guarantee schemes such as the United Kingdom’s Enterprise Finance Guarantee (Cowling and Siepel, 2013). Similarly, other authors have found that public funds can minimise their risk exposure by offering a partial guarantee above a certain threshold, thus generating an extra endowment (Boschi, Girardi and Ventura, 2014).

Second, the analysis of the role and effectiveness of public **sector venture capital backed or GVC** revealed this to be an increasingly important tool deployed by governments both directly and indirectly via economic development agencies. It also highlighted the complex nature of these instruments and the interconnections to other parts of the SME funding escalator (North, Baldock and Ullah, 2013). Although the volume of evidence is much smaller, the findings on GVCs are much more consistent across a number of different empirical studies. Overall, the vast majority of the empirical

research points towards a fairly clear-cut conclusion: GVC funds are much less successful at producing growth within assisted firms than PVC funds (Grilli and Murtinu, 2014; Brander et al., 2015; Cumming et al., 2017). These treatment effects appear to hold for various measures of firm performance, be it sales growth, employment growth or the success of “exits”. These findings seem to be consistent with the nature of PVCs and their superior levels of value-added skills identified within the earlier sections. According to some observers, these findings strongly caution against implementing a “go it alone” strategy of European GVC funds (Cumming et al., 2017).

Another key finding from this literature also seems to unite the literature. While GVC typically underperforms PVC, when taken together in a mixed or hybrid fund such as co-investment schemes very common in the United Kingdom such as the Scottish co-investment scheme operated by the Scottish Investment Bank (Mason and Harrison, 2015), the performance of the government-assisted firms improves markedly across a range of different variables. In other words, when public VC backs the firms selected by the private sector, the performance of the funded companies improves markedly (Brander et al., 2015). In terms of best practice, in this respect a number of authors have hailed the Australian Innovation Investment Fund as a suitable role model for this kind of hybrid model (Box 1).

Box 1. The Australian Innovation Investment Fund

Between its formation in 1998 and 2011, the Australian Innovation Investment Fund had invested some AUD 291 million in over 95 high-tech ventures. The evaluation evidence of this programme certainly points to a high degree of success in a number of respects (Australian Government, 2011). For example, the fund operates in a very high-risk segment of the venture capital market which is largely uninhabited by the private venture capital market in Australia, preventing any process of crowding out. Whether this type of large-scale revolving fund is replicable in the context of EU regions is a moot point.

According to some, these messages already appear to be taken on board within the sphere of EU policy initiatives, such as the EU framework programme Horizon 2020 (Cumming et al., 2017). Positively, assessments of current Cohesion Policy found that many of the regional initiatives within the programmes tended to be co-investment schemes between the public and private sector (Wishlade et al., 2016). These schemes tend to be very small in size and skewed towards relatively early-stage seed investments. Such funds are unable to make follow-on sizeable investments which will lead to a full-scale exit (Munari and Toschi, 2015), limiting the ability of these restricted funds to reap the upside from such a “harvest” event. Indeed, some GVC schemes seem to pump prime early-stage companies for large-scale PVCs to capitalise on in terms of large-scale follow-on investments.

A final word of caution in relation to these programmes is needed. While these schemes are becoming increasingly prevalent across different EU regions (Wishlade et al., 2016), these types of VC capital injections are only suitable for a tiny minority of SMEs. Research has consistently shown that less than 5% of SMEs utilise this form of funding (Brown et al., 2017).¹⁵ Owing to the underdeveloped nature of many regions that receive funding from EU Cohesion funds, many of these regions feature the characteristics of “thin markets” (Nightingale et al., 2009). In other words, firms in these regions may seek recourse to unsuitable forms of SME finance, such as GVC, if there is a dearth of more suitable forms of debt-based finance from banks. Policy makers need to be conscious of

these types of unintended impacts from such financial instruments. Therefore, public sector VC models supplying equity capital will not by themselves close regional equity gaps given the nature of most economically and technologically lagging regions (Munari and Toschi, 2015).

Finally, we now turn our attention to the final form of financial instrument examined in this paper. Despite the fact that across the board **publicly assisted loan schemes** have become much less commonplace in recent years, these are apparently quite widespread in parts of Europe, with many funded through the Structural Funds (Wishlade, 2016).

A number of observations can be made about these types of financial instruments. First, as a rule, economists dislike subsidised loan schemes owing to the potential distortions this can have on private sector credit markets (Honohan, 2010). Second, the evidence from some of these instruments suggests that some of these programmes have not been able to offer SMEs discounted rates of interest on various loan products (e.g. under the Finance Wales initiative), leading some researchers to call into question the relevance of loan schemes (Jones-Evans, 2015). Third, our review of some of the empirical evidence also suggests that these types of financial products may have their greatest relevance when targeted towards specific types of disadvantaged groups who have the greatest difficulties obtaining credit – such as the long-term unemployed, ethnic minorities and social enterprise sector. Fourth, the relevance of this kind of directed lending model will greatly depend on the host country context and whether the country has state-owned banks.

Hypothetically, subsidised loans could appeal to certain types of SMEs which are extremely reluctant to engage within the mainstream banking sector. One such category of company are so-called “discouraged borrowers”, who are defined as creditworthy (good) borrowers who do not apply because they feel they will be rejected (Kon and Storey, 2003). These borrowers are often very successful businesses but are highly reluctant to engage with banks owing to the perception that they may lose control of their business due to demanding bank covenants and/or personal guarantee for overdraft and/or loan facilities (see Brown and Lee 2014; 2017). While it is hard to estimate the actual size of this cohort, it appears from survey evidence that discouraged borrowers can make up a sizeable proportion of the SME community. Indeed, a recent study of UK SMEs found that there were twice as many SMEs deemed to be “discouraged borrowers” as there were those who had their loan applications actually rejected (Freel et al., 2012). A recent study of discouraged borrowers in nine EU countries found that discouraged borrowers tend to be prominent in younger smaller companies, especially in countries with concentrated banking sectors (Mac an Bhaird, Vidal and Lucey, 2016).

The authors wish to issue a strong caveat in relation to the issue of PALs. Within this area of financial instrument, there is much less evaluation evidence to draw upon when making a holistic assessment of PALs. In this regard, there seems to be a case for commissioning research evaluating the performance of PALs with EU Cohesion Policy and their role in reducing funding constraints for SMEs.

Under what conditions do financial instruments work/don't work?

We shall now examine some of the key conditions and factors which shape the relevance and potential impact of various financial instruments. From the review of theory combined with the assessment of empirical evidence, it is very much apparent that “context matters”. When considering the conditions which will influence the structure, conduct and performance of financial instruments, policy makers need to bear in mind the

following three main issues: institutional and regulatory context, timing, and targeting (normal SMEs versus high-growth firms).

The first important point to make is the crucial importance of the domestic **institutional and regulatory context** within different EU economies. The manner in which the banks operate is obviously a crucial distinction in this regard. The overall structure of banks, together with the levels of banking competition, state ownership of banks and bank regulation are vastly different across various EU member states. Research shows that the levels of banking concentration also vary markedly across the EU, which will obviously shape the ability of SMEs to access finance in certain countries more than others. Consequently, problems accessing finance for SMEs is highly variable across the both the euro area and the EU more widely. Evidence from the European Central Bank's SAFE survey frequently shows national discrepancies in the perceptions of access to finance among SMEs. This variation also applies to the levels of "discouraged borrowers" across these countries (Mac an Bhaird, Vidal and Lucey, 2016). Clearly, these factors need to be taken into consideration when designing predominantly regionally based schemes to be funded through the Structural Funds.

Additionally, the nature of the funding landscape for entrepreneurial finance for SMEs is also highly varied across the EU. In countries such as France, Germany and the United Kingdom, there are well-developed sources of entrepreneurial finance from both institutional and private investors. Within these countries there are also a range of various tax incentives to encourage investors to invest in early-stage companies which stimulates the supply side of the VC and business angel market. For example, Gregson, Mann and Harrison (2013) note how the business angel market is five times the size of the VC industry in the United Kingdom. Consequently, firms are aware of the opportunities presented using risk finance as a source of funding.

Plus, in some countries such as the United Kingdom there is an active and well-developed market for initial public offerings both for small-scale listings (AIM) and for larger initial public offerings (LSE) (Colombo, Cumming and Vismara, 2016). This ensures that these countries have the types of capital markets that can facilitate entrepreneurial exits. These distinctions have important implications for the suitability and indeed relevance of GVCs, but are often overlooked by regional policy makers keen to undertake localised policy instruments. In other words, the institutional context within which policy making is formulated are very important in the context of interventions in the SME credit market.

The second point concerns the issue of **targeting**. In the main, governments adopt a relatively wide-ranging approach when designing financial instruments in terms of sectoral coverage, stage of company development, company growth orientation and export orientation, etc. Observers have noted that in many of these regionally funded projects, financial instruments have very different eligibility criteria (start-ups versus SMEs, R&D-based firms, etc.) and sectoral orientation (Wishlade et al., 2016). While there may be very solid theoretical and pragmatic reasons for this kind of targeting, this may not always be the case. This is a crucially important issue, however, as the funding requirements of SMEs are not homogenous. Policy makers therefore have to pay considerable attention to the precise issues within the intended target market for different financial instruments. There is also likely to be a trade-off between the economies of scale achievable and the specificity of different programmes within various types of financial instrument schemes. In other words, narrowly focused schemes targeting specific types of SMEs (either high-tech or in different sectors) may incur higher set-up and operational costs, which reduces their overall cost-effectiveness.

During the discussion about the nature of SME credit markets we raised the issue of “borrower heterogeneity”. This is a critical issue that should to be reflected in the design of policy instruments. Targeting specific types of firms within programmes will probably be required. For example, given the nature of R&D-intensive firms, there is clearly a greater likelihood that forms of publicly assisted VC would be more appropriate to these types of firms than conventional SMEs. For example, it was noted that policy approaches such as credit guarantees might be much more appropriate for heavily resource-constrained new early-stage businesses than well-established SMEs that have collateral. It was also noted how access to funding in SMEs is geographically dependent on the location of the SME. In short, SMEs in peripheral regions may need access to finance much more than the overall population of SMEs. Therefore, spatial targeting of policy instruments, such as PALs, may be extremely valid on geographical rather than purely market failure grounds.

Another consideration related to targeting is the impact this has on the private sector. The evidence on various types of financial instruments such as GVC schemes is the fact that they can effectively “crowd out” the private sector in some instances (Cumming and MacIntosh, 2006; Colombo et al., 2016), a problem particularly affecting lagging regions (Munari and Toschi, 2015). The use of hybrid schemes whereby the public sector co-invests with the private sector seems to be one relatively successful approach to help “crowd in” the private sector. However, co-investment with the private sector may not be feasible within some economically disadvantageous economies where the private sector investment community is absent or nascent. In these circumstances there may be a temptation to let the GVC schemes take centre stage to fill the void left by a lack of PVC. This would appear to be a somewhat misguided approach and could be detrimental in the longer term.

In economically lagging regions, it might make better sense to help SMEs seek conventional forms of debt finance through financial instruments such as GCS programmes. This form of finance is generally more suited to the majority of SMEs. In order to develop more high-tech SMEs rather than replicate the private sector, perhaps policy makers could consider augmenting external private sector investors. Programmes have been developed by some countries to help nurture their local entrepreneurial ecosystems by accessing external VC. One such example is the Yozma programme operated by the Israeli government, which helps attract foreign VC to local entrepreneurial firms and is credited with the rapid growth of the country’s growing high-tech economy (Brown and Mason, 2017). However, to date, this type of externally focused policy approach has largely been absent within the European Union and may merit further consideration by policy makers.

It is important to add a final word of caution. Policy makers ought to avoid some of the common mistakes within entrepreneurship policy more generally regarding policy targeting. A typically erroneous trait within many financial instrument programmes is the conflation made between high-growth firms and high-tech firms. The majority of high-growth firms are firms in mundane business sectors and service sectors. However, many high-growth programmes tend to typically focus on high-tech sectors (Brown and Mason, 2016). In other words, if the goal of a region is to generate more high-growth firms, then targeting high-tech firms is not the correct policy objective. Policy makers have to clearly define their intended outcomes if they are to design appropriate eligibility criteria.

A final issue concerns the issue of **timing**. A key instance in this regard concerns the nature of market conditions: in other words “timing matters”. At times of extreme

economic recession, such as the recent global financial crisis, the problems facing SMEs when attempting to obtain credit clearly markedly worsened (Lee, Sameen and Cowling, 2015). These kind of temporal factors have clear implications for the direction of public policy. During this time, concerted efforts were made to quickly increase the supply of liquidity to the SME population in many countries. In many countries, directly increasing the supply of funding through loan instruments such as PALs may be a very appropriate course of action. Similarly, levels of discouragement within SMEs is also strongly pro-cyclical (Mac an Bhaird, Vidal and Lucey, 2016). However, during normal circumstances, bank liquidity increases and lending conditions to SMEs can improve. Therefore, schemes could tighten their eligibility criteria during periods of economic growth; for example by restricting the types of usage of the associated loans to prevent SMEs using loans for working capital, etc. Conversely, there could be a case for increasing the levels of partial credit guarantees for SMEs during economic downturns and perhaps consequently accepting a higher level default rate. In other words, the nature of market imperfections is cyclical, meaning that a temporal approach towards policy making is required. The issue of timing also affects the issue of CGS.

Conclusions

Owing to the significance in terms for the overall growth and success of economies, the financing of SMEs has been the subject of great interest both to policy makers and researchers (Beck, Demirgüç-Kunt and Pería, 2011). Having undertaken a systematic review of the economic theory concerning the rationale for intervention in credit markets for small firms, a number of key conclusions can be drawn from the proceeding analysis. This paper has shown that the nature of the critical market failures within small firm credit markets are extremely complex, systemic and enduring. While some take issue with the nature of the problem, most academic researchers concede that the nature of borrow-lender relationships means that capital constraints can and do arise for SMEs. Furthermore, these problems are particularly acute for certain types of SMEs, especially those that are new, very small, innovative and geographically remote.

It is also important to note that while these constraints undoubtedly exist, especially in certain lagging regions, there are important demand-side factors which also shape the nature of the SME funding marketplace within these economies. A lack of good investable business propositions is also one of the key features of these so-called “thin markets” (Nightingale et al., 2009). Therefore, while policy makers are correct to examine shortfalls in the supply of finance for SMEs, proper acknowledgement also needs to be given to the fact that a lack of good “investment-ready” businesses is an equally important problem in many less-advantaged regional economies. Indeed, some authors believe that credit rationing is entirely justifiable in these occurrences (de Meza and Webb, 2000). Some authors suggest in these instances increasing the levels of investment-readiness is an important mechanism for increasing connections with external financial providers and SMEs, thereby helping to alleviate funding constraints (Silver, Berggren and Veghohn, 2010).

While a large number of observers concur with this diagnosis, much less unanimity coalesces around the appropriate method of tackling these intractable problems. Indeed, poorly designed financial assistance to SMEs is often and arguably even more distortive than no assistance whatsoever. Policies that are market-augmenting, conditional on performance and provide some form of payback to the public sector are worthy of consideration as appropriate tools of industrial and regional policy. Notwithstanding these important caveats, this appraisal essentially boils down to a key and important question:

should policy makers encourage the use of financial instruments as tools of economic development policy? Having systematically reviewed some, but not all, of the empirical evidence concerning different instruments for rectifying these problems reveals a fairly mixed set of findings. All of the instruments appear, *prima facie*, to play some form of role in addressing some of the key market imperfections outlined. Compared with previous approaches such as wide-ranging grant-based forms of assistance, many financial instruments look to be much more effective forms of public assistance.

However, the key and overriding conclusion from this exploratory analysis is that the devil is very much in the detail. The usefulness of each of the financial instruments examined seems heavily contingent upon how the instruments are designed and embedded within their local context. Policies designed to intervene in SME credit markets need to be carefully customised to take on board the institutional context, nature of the economic conditions and the appropriate methods of company targeting. To further our understanding of effective policy formulation, examining the design and execution of these forms of policy assistance within EU regional policy must take a holistic approach, encompassing the nature of the local entrepreneurial ecosystems coupled with a nuanced view of the institutional environments within which these regional policies are mediated. Given the increasing prevalence of financial instruments within EU regional policy, more research examining the effectiveness of these interventions in different spatial and economic environments seems highly compelling. Meanwhile, local policy makers operating financial instrument programmes will need to measure the long-term impact of interventions to ensure that the design of these policies is adapted accordingly.

Notes

1. A type of financing based primarily on soft information gathered by loan officers through personalised contact with SMEs (Beck, Demirgüç-Kunt and Pería, 2011).
2. Industrial policies have a long and chequered history within various countries which often entailed the use of protective import tariffs against foreign competition (Peneder, 2016).
3. Morgan (2017) notes how EU regional policy has become increasingly focused on innovation-related measures which now account for a third of overall Cohesion expenditure in the 2014-20 programme period compared to less than 10% in 1988-94.
4. Microcredit in the form of smaller loans made to people sometimes excluded from financial services, such as the third sector or social enterprises, is also deemed to be a financial instrument but is much less prevalent than the other three .
5. Bootstrapping refers to a collection of financing methods which minimise the need for debt and equity financing from lenders and investors (Harrison et al., 2004; Ebben and Johnson, 2006). Examples include: renting rather than buying equipment; withholding the managerial salaries; delaying payment to suppliers; hiring temporary employees; and using personal credit cards to finance business operations.

6. See Hall (2002) for a comprehensive review on the problems firms confront when raising finance for R&D.
7. Similarly, other studies also observe spatial variations in access to finance for SMEs in other EU economies (Alessandrini et al., 2010; Donati and Sarno, 2015).
8. For example, see evidence from Korea in Oh et al. (2009).
9. Various scholars note the obsession policy makers have for schemes which target high-tech firms despite their relatively small overall contribution within many typical economic environment (Brown and Mason, 2016; Welter et al., 2017).
10. At the EU level the European Investment Fund plays a crucial role. The European Commission allocates resources to the European Investment Fund on a trust basis, making use of European Investment Fund operational expertise to manage the different programmes. The European Investment Fund usually acts as a fund of funds.
11. Anecdotal evidence obtained by the authors has discovered that some GVC funds operated in the United Kingdom do not even have representation at board meetings of their clients.
12. Under this scheme the KfW Group guarantees 80% of the credit risk while the commercial banking partner bears the residual element.
13. As previously mentioned, an additional paper has been commissioned to examine the practicalities of how the concept has been operationalised within EU Cohesion Policy at the programme and project level.
14. This issue seems particularly salient for EU countries with centralised banking systems, such as the United Kingdom (Lee and Brown, 2017) and Italy (Presbitero et al., 2014).
15. Research by the current authors found that less than 5% of UK high-growth SMEs seek recourse to VC (Brown and Lee, 2014), a figure which drops to less than 2% for the population of SMEs as a whole.

References

- Acs, Z. et al. (2016), “Public policy to promote entrepreneurship: A call to arms”, *Small Business Economics*, Vol. 47/1, pp. 35-51, <http://dx.doi.org/10.1007/s11187-016-9712-2>.
- Akerlof, G. (1970). The Market for Lemons: Qualitative Uncertainty and the Market Mechanism. *Quarterly Journal of Economics*, 84(3).
- Alessandrini, P., Presbitero, A. F., & Zazzaro, A. (2009). Bank size or distance: what hampers innovation adoption by SMEs?. *Journal of Economic Geography*, 10(6), 845-881.
- Almus, M. (2004). Job creation through public start-up assistance?. *Applied Economics*, 36(18), 2015-2024.

- Arping, S., G. Lóránth and A.D. Morrison (2010), “Public initiatives to support entrepreneurs: Credit guarantees versus co-funding”, *Journal of Financial Stability*,
- Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative science quarterly*, 50(3), 329-366.
- Baum, J.A. and B.S. Silverman (2004), “Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups”, *Journal of Business Venturing*, Vol. 19/3, pp. 411-436, [https://doi.org/10.1016/S0883-9026\(03\)00038-7](https://doi.org/10.1016/S0883-9026(03)00038-7).
- Beck, T. and A. Demirgüç-Kunt (2006), “Small and medium-size enterprises: Access to finance as a growth constraint”, *Journal of Banking & Finance*, Vol. 30/11, pp. 2931-2943, <https://doi.org/10.1016/j.jbankfin.2006.05.009>.
- Beck, T., A. Demirgüç-Kunt and M.S.M. Pería (2011). “Bank financing for SMEs: Evidence across countries and bank ownership types”, *Journal of Financial Services Research*, Vol. 39/1-2, pp. 35-54, <http://dx.doi.org/10.1007/s10693-010-0085-4>.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different?. *Journal of Financial Economics*, 89(3), 467-487.
- Becker, B. (2015), “Public R&D policies and private R&D investment: A survey of the empirical evidence”, *Journal of Economic Surveys*, Vol. 29/5, pp. 917-942, <http://dx.doi.org/10.1111/joes.12074>.
- Begg, I. (2016), “The economic theory of Cohesion Policy”, Chapter 3 in: Piattoni, S. and L. Polverari (eds.), *Handbook on Cohesion Policy in the EU*, pp. 50-64, <http://dx.doi.org/10.4337/9781784715670.00016>.
- Bellavitis, C. et al. (2017), “Entrepreneurial finance: New frontiers of research and practice”, Editorial for the special issue: *Embracing Entrepreneurial Funding Innovations*, *Venture Capital: An International Journal of Entrepreneurial Finance*, Vol. 19/1-2, pp. 1-16, <https://doi.org/10.1080/13691066.2016.1259733>.
- Berger, A.N. and G.F. Udell (1998), “The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle”, *Journal of Banking & Finance*, Vol. 22/6-8, pp. 613-673, [https://doi.org/10.1016/S0378-4266\(98\)00038-7](https://doi.org/10.1016/S0378-4266(98)00038-7).
- Berger, A. N., & Schaeck, K. (2011). Small and medium-sized enterprises, bank relationship strength, and the use of venture capital. *Journal of Money, Credit and banking*, 43(2-3), 461-490.
- Bertoni, F., Colombo, M. G., & Grilli, L. (2011). Venture capital financing and the growth of high-tech start-ups: Disentangling treatment from selection effects. *Research Policy*, 40(7), 1028-1043.
- Bondonio, D. and R.T. Greenbaum (2014), “Revitalizing regional economies through enterprise support policies: An impact evaluation of multiple instruments”, *European Urban and Regional Studies*, Vol. 21/1, pp. 79-103, <http://dx.doi.org/10.1177/0969776411432986>.
- Boschi, M., A. Girardi and M. Ventura (2014), “Partial credit guarantees and SMEs financing”, *Journal of Financial Stability*, Vol. 15, pp. 182-194, <https://doi.org/10.1016/j.jfs.2014.09.007>.

- Bradshaw, T.K. (2002), “The contribution of small business loan guarantees to economic development”, *Economic Development Quarterly*, Vol. 16/4, pp. 360-369, <http://dx.doi.org/10.1177/089124202237199>.
- Brander, J. A., Du, Q., & Hellmann, T. (2015). The effects of government-sponsored venture capital: international evidence. *Review of Finance*, 19(2), 571-618.
- Bravo-Biosca, A. (2013), “Access to finance for innovation: Rationales and risks of public intervention”, Policy Brief, The Innovation Policy Platform, https://demo-ipp.nuvole.org/sites/default/files/rdf_imported_documents/Financing%20innovation%20-%20Market%20and%20Goverment%20Failures%20Policy%20Brief.pdf.
- Brown, R. (2016), “Mission impossible? Entrepreneurial universities and peripheral regional innovation systems”, *Industry and Innovation*, Vol. 23/2, pp. 189-205, <https://doi.org/10.1080/13662716.2016.1145575>.
- Brown, R. and N. Lee (2014), *An Examination of Funding Issues Confronting High Growth SMEs in the UK*, Institute for Chartered Accountants in Scotland, Edinburgh.
- Brown, R. C., & Lee, N. (2017). *Reluctant borrowers? Examining the demand and supply of finance for high growth SMEs in the UK*. Institute of Chartered Accountants of Scotland.
- Brown, R., & Mason, C. (2014). Inside the high-tech black box: A critique of technology entrepreneurship policy. *Technovation*, 34(12), 773-784.
- Brown, R. and C. Mason (2017), “Looking inside the spiky bits: A critical review and conceptualisation of entrepreneurial ecosystems”, *Small Business Economics*, Vol. 49/1, pp. 11-30, <http://dx.doi.org/10.1007/s11187-017-9865-7>.
- Brown, R. and S. Mawson (2016), “Targeted support for high growth firms: Theoretical constraints, unintended consequences and future policy challenges”, *Environment and Planning C: Government and Policy*, Vol. 34/5, pp. 816-836, <http://dx.doi.org/10.1177/0263774X15614680>.
- Brown, R., S. Mawson and N. Lee (2017), “High growth firms in Northern Ireland: A strategic appraisal and policy assessment”, Final Report for Department for the Economy, Northern Ireland, <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Strategic-Policy-Assessment-of-High-Growth-Firms.pdf>.
- Brown, R., S. Mawson and C. Mason (2017), “Myth-busting and entrepreneurship policy: The case of high growth firms”, *Entrepreneurship & Regional Development*, Vol. 29/5-6, pp. 414-443, <https://doi.org/10.1080/08985626.2017.1291762>.
- Brown, R., Z, J. and Wilson, J.O. (2018) Sticking it on Plastic: Credit Card Finance and Small and Medium-Sized Enterprises in the UK, *Regional Studies*, forthcoming.
- Caliendo, M. and S. Künn (2011), “Start-up subsidies for the unemployed: Long-term evidence and effect heterogeneity”, *Journal of Public Economics*, Vol. 95/3, pp. 311-331.
- Canales, R. and R. Nanda (2012), “A darker side to decentralized banks: Market power and credit rationing in SME lending”, *Journal of Financial Economics*, Vol. 105/2, pp. 353-366, <https://doi.org/10.1016/j.jfineco.2012.03.006>.

- Canales, R. and R. Nanda (2008), “A darker side to decentralized banks: Market power and credit rationing in SME lending”, *HBS Working Paper Series*, No. 08-101, Harvard Business School, Cambridge, Massachusetts, <https://www.hbs.edu/faculty/Pages/item.aspx?num=32501>.
- Carpenter, R.E. and B.C. Petersen (2002), “Capital market imperfections, high-tech investment, and new equity financing”, *The Economic Journal*, Vol. 112/477, pp. F54-F72, <http://dx.doi.org/10.1111/1468-0297.00683>.
- Carter, R. B., & Van Auken, H. (2005). Bootstrap financing and owners’ perceptions of their business constraints and opportunities. *Entrepreneurship & Regional Development*, 17(2), 129-144.
- Cassar, G. (2004), “The financing of business start-ups”, *Journal of Business Venturing*, Vol. 19/2, pp. 261-283, [https://doi.org/10.1016/S0883-9026\(03\)00029-6](https://doi.org/10.1016/S0883-9026(03)00029-6).
- Colombo, M.G. and Grilli (2007), “Funding gaps? Access to bank loans by high-tech start-ups”, *Small Business Economics*, Vol. 29/1-2, pp. 25-46, <http://dx.doi.org/10.1007/s11187-005-4067-0>.
- Colombo, M.G., D.J. Cumming and S. Vismara (2016), “Governmental venture capital for innovative young firms”, *The Journal of Technology Transfer*, Vol. 41/1, pp. 10-24, <http://dx.doi.org/10.1007/s10961-014-9380-9>.
- Cosh, A., Cumming, D., & Hughes, A. (2009). Outside entrepreneurial capital. *The Economic Journal*, 119(540), 1494-1533.
- Cowan, K., A. Drexler and Á. Yañez (2015), “The effect of credit guarantees on credit availability and delinquency rates”, *Journal of Banking & Finance*, Vol. 59, pp. 98-110, <https://doi.org/10.1016/j.jbankfin.2015.04.024>.
- Cowling, M. (2010), “The role of loan guarantee schemes in alleviating credit rationing in the UK”, *Journal of Financial Stability*, Vol. 6/1, pp. 36-44, <https://doi.org/10.1016/j.jfs.2009.05.007>.
- Cowling, M. and J. Siepel (2013), “Public intervention in UK small firm credit markets: Value-for-money or waste of scarce resources?”, *Technovation*, Vol. 33/8, pp. 265-275, <https://doi.org/10.1016/j.technovation.2012.11.002>.
- Cressy, R. (2002). Introduction: Funding gaps: A symposium. *Economic Journal*, F1-F16.
- Cressy, R. and C. Olofsson (1997), “European SME financing: An overview”, *Small Business Economics*, Vol. 9/2, pp. 87-96, www.jstor.org/stable/40228632.
- Cumming, D.J. and J.G. MacIntosh (2006), “Crowding out private equity: Canadian evidence”, *Journal of Business Venturing*, Vol. 21/5, pp. 569-609, <https://doi.org/10.1016/j.jbusvent.2005.06.002>.
- Cumming, D.J., L. Grilli and S. Murtinu (2014), “Governmental and independent venture capital investments in Europe: A firm-level performance analysis”, *Journal of Corporate Finance*, Vol. 42, pp. 439-459, <https://doi.org/10.1016/j.jcorpfin.2014.10.016>.
- Dąbrowski, M. (2015), “‘Doing more with less’ or ‘doing less with less’? Assessing EU Cohesion Policy’s financial instruments for urban development”, *Regional Studies, Regional Science*, Vol. 2/1, pp. 73-96, <http://dx.doi.org/10.1080/21681376.2014.999107>.

- Davila, A., G. Foster and M. Gupta (2003), “Venture capital financing and the growth of startup firms”, *Journal of Business Venturing*, Vol. 18/6, pp. 689-708, [https://doi.org/10.1016/S0883-9026\(02\)00127-1](https://doi.org/10.1016/S0883-9026(02)00127-1).
- De Meza, D. and D. Webb (2000), “Does credit rationing imply insufficient lending?”, *Journal of Public Economics*, Vol. 78/3, pp. 215-234, [https://doi.org/10.1016/S0047-2727\(99\)00099-7](https://doi.org/10.1016/S0047-2727(99)00099-7).
- Devereux, M.P., R. Griffith and H. Simpson (2007), “Firm location decisions, regional grants and agglomeration externalities”, *Journal of Public Economics*, Vol. 91/3-4, pp. 413-435, <https://doi.org/10.1016/j.jpubeco.2006.12.002>.
- Donati, C., & Sarno, D. (2014). Are firms in “backward” areas of developed regions more financially constrained? The case of Italian SMEs. *Industrial and Corporate Change*, 24(6), 1353-1375.
- ECB (2017) Survey on the Access to Finance of Enterprises in the Euro Area, <https://www.ecb.europa.eu/pub/pdf/other/ecb.accesstofinancesmallmediumsizedenterprises201705.en.pdf?17da4ff2a730b7ababea4037e4ce8cae>
- European Commission (2015), The European Regional Development Fund: Financial Instruments, FI Compass, European Investment Bank, Advisory Services.
- European Commission (2010), “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee for Regions: An integrated industrial policy for the globalisation era: Putting competitiveness and sustainability at centre stage”, COM(2010)614, SEC(2010)1272-1276, European Commission, Brussels, <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC0614>.
- European Parliament (2012), “Potential of venture capital in the European Union”, Directorate-General for Internal Policies, European Union, Brussels, [www.europarl.europa.eu/RegData/etudes/etudes/join/2012/475088/IPOL-ITRE_ET\(2012\)475088_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/475088/IPOL-ITRE_ET(2012)475088_EN.pdf).
- Feldman, M.P. (2014), “The character of innovative places: Entrepreneurial strategy, economic development, and prosperity”, *Small Business Economics*, Vol. 43/1, pp. 9-20, <http://dx.doi.org/10.1007/s11187-014-9574-4>.
- Fraser, S., S.K. Bhaumik and M. Wright (2015), “What do we know about entrepreneurial finance and its relationship with growth?”, *International Small Business Journal*, Vol. 33/1, pp. 70-88, <http://dx.doi.org/10.1177/0266242614547827>.
- Freel, M.S. (2007), “Are small innovators credit rationed?”, *Small Business Economics*, Vol. 28/1, pp. 23-35, <http://dx.doi.org/10.1007/s11187-005-6058-6>.
- Freel, M. et al. (2012), “The latent demand for bank debt: Characterizing ‘discouraged borrowers’”, *Small Business Economics*, Vol. 38/4, pp. 399-418, <http://dx.doi.org/10.1007/s11187-010-9283-6>.
- Gregson, G., S. Mann and R. Harrison (2013), “Business angel syndication and the evolution of risk capital in a small market economy: Evidence from Scotland”, *Managerial and Decision Economics*, Vol. 34/2, pp. 95-107, <http://dx.doi.org/10.1002/mde.2595>.

- Grilli, L. and S. Murtinu (2014), “Government, venture capital and the growth of European high-tech entrepreneurial firms”, *Research Policy*, Vol. 43/9, pp. 1523-1543, <https://doi.org/10.1016/j.respol.2014.04.002>.
- Hall, B.H. (2002), “The financing of research and development”, *Oxford Review of Economic Policy*, Vol. 18/1, pp. 35-51, <http://dx.doi.org/10.3386/w8773>.
- Harris, R. and C. Robinson (2005), “Impact of regional selective assistance on sources of productivity growth: Plant-level evidence from UK manufacturing, 1990-98”, *Regional Studies*, Vol. 39/6, pp. 751-765, <https://doi.org/10.1080/00343400500213648>.
- Hart, M. et al. (2008), *Evaluation of Regional Selective Assistance (RSA) in Scotland 2000-2004*, Scottish Executive Social Research, Edinburgh, www.gov.scot/Resource/Doc/216893/0058124.pdf.
- Hellmann, T., & Puri, M. (2002). Venture capital and the professionalization of start-up firms: Empirical evidence. *The Journal of Finance*, 57(1), 169-197.
- Honohan, P. (2010), “Partial credit guarantees: Principles and practice”, *Journal of Financial Stability*, Vol. 6/1, pp. 1-9, <https://doi.org/10.1016/j.jfs.2009.05.008>.
- Hsu, D. H. (2007). Experienced entrepreneurial founders, organizational capital, and venture capital funding. *Research Policy*, 36(5), 722-741.
- Huergo, E. and L. Moreno (2014), “National or international public funding? Subsidies or loans? Evaluating the innovation impact of R&D support programmes”, *MPRA Paper*, No. 54218, https://mpra.ub.uni-muenchen.de/54218/1/MPRA_paper_54218.pdf.
- Hyytinen, A., & Toivanen, O. (2005). Do financial constraints hold back innovation and growth?: Evidence on the role of public policy. *Research Policy*, 34(9), 1385-1403.
- Infelise, F. (2014), “Supporting access to finance by SMEs: Mapping the initiatives in five EU countries”, *ECMI Research Report*, No. 9, April, https://www.ceps.eu/system/files/ECMI%20RR%20No%209%20Infelise%20SME%20Access%20to%20Finance_0.pdf.
- Jaffee, D. M., & Russell, T. (1976). Imperfect information, uncertainty, and credit rationing. *The Quarterly Journal of Economics*, 90(4), 651-666.
- Jones-Evans, D. (2015), “Access to finance to SMEs at a regional level: The case of Finance Wales”, *Venture Capital*, Vol. 17/1-2, pp. 27-41, <https://doi.org/10.1080/13691066.2015.1052624>.
- Kaplan, S.N. and P. Strömberg (2003), “Financial contracting theory meets the real world: An empirical analysis of venture capital contracts”, *The Review of Economic Studies*, Vol. 70/2, pp. 281-315.
- Klepper, S. (2010), “The origin and growth of industry clusters: The making of Silicon Valley and Detroit”, *Journal of Urban Economics*, Vol. 67/1, pp. 15-32, <https://doi.org/10.1016/j.jue.2009.09.004>.
- Knockaert, M. et al. (2010), “Agency and similarity effects and the VC’s attitude towards academic spin-out investing”, *The Journal of Technology Transfer*, Vol. 35/6, pp. 567-584, <http://dx.doi.org/10.1007/s10961-009-9138-y>.
- Kon, Y. and D.J. Storey (2003), “A theory of discouraged borrowers”, *Small Business Economics*, Vol. 21/1, pp. 37-49, <http://dx.doi.org/10.1023/A:1024447603600>.

- Lee, N. and R. Brown (2017), “Innovation, SMEs and the liability of distance: The demand and supply of bank funding in UK peripheral regions”, *Journal of Economic Geography*, Vol. 17/1, pp. 233-260, <https://doi.org/10.1093/jeg/lbw011>.
- Lee, N., H. Sameen and M. Cowling (2015), “Access to finance for innovative SMEs since the financial crisis”, *Research Policy*, Vol. 44/2, pp. 370-380, <https://doi.org/10.1016/j.respol.2014.09.008>.
- Leland, H.E. and D.H. Pyle (1977), “Informational asymmetries, financial structure, and financial intermediation”, *The Journal of Finance*, Vol. 32/2, pp. 371-387, www.jstor.org/stable/2326770.
- Lerner, J. (2010), “The future of public efforts to boost entrepreneurship and venture capital”, *Small Business Economics*, Vol. 35/3, pp. 255-264, <http://dx.doi.org/10.1007/s11187-010-9298-z>.
- Lerner, J. (2002), “When bureaucrats meet entrepreneurs: The design of effective public venture capital programmes”, *The Economic Journal*, Vol. 112/477, pp. F73-F84, www.jstor.org/stable/798492.
- Levitsky, J. (1997), “Credit guarantee schemes for SMEs: An international review”, *Small Enterprise Development*, Vol. 8/2, pp. 4-17.
- Luukkonen, T., M. Deschryvere and F. Bertoni (2013), “The value added by government venture capital funds compared with independent venture capital funds”, *Technovation*, Vol. 33/4-5, pp. 154-162, <https://doi.org/10.1016/j.technovation.2012.11.007>.
- Mac an Bhaird, C., J.S. Vidal and B. Lucey (2016), “Discouraged borrowers: Evidence for eurozone SMEs”, *Journal of International Financial Markets, Institutions and Money*, Vol. 44, pp. 46-55, <https://doi.org/10.1016/j.intfin.2016.04.009>.
- Martin, B.R. (2016), “R&D policy instruments: A critical review of what we do and don’t know”, *Industry and Innovation*, Vol. 23/2, pp. 157-176, <https://doi.org/10.1080/13662716.2016.1146125>.
- Martin, R., & Sunley, P. (2015). On the notion of regional economic resilience: conceptualization and explanation. *Journal of Economic Geography*, 15(1), 1-42.
- Mason, C. and R. Brown (2014), “Entrepreneurial ecosystems and growth oriented entrepreneurship”, background paper prepared for the workshop “Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship”, www.oecd.org/cfe/leed/entrepreneurial-ecosystems.pdf.
- Mason, C.M. and R.T. Harrison (2015), “Business angel investment activity in the financial crisis: UK evidence and policy implications”, *Environment and Planning C: Government and Policy*, Vol. 33/1, pp. 43-60, <http://dx.doi.org/10.1068/c12324b>.
- Mazzucato, M. (2013), “Financing innovation: Creative destruction vs. destructive creation”, *Industrial and Corporate Change*, Vol. 22/4, pp. 851-867, <http://dx.doi.org/10.1093/icc/dtt025>.
- McCann, P. and R. Ortega-Argilés (2016), “Smart specialisation, entrepreneurship and SMEs: Issues and challenges for a results-oriented EU regional policy”, *Small Business Economics*, Vol. 46/4, pp. 537-552, <http://dx.doi.org/10.1007/s11187-016-9707-z>.

- Meuleman, M. and W. De Maeseneire (2012), “Do R&D subsidies affect SMEs’ access to external financing?”, *Research Policy*, Vol. 41/3, pp. 580-591, <https://doi.org/10.1016/j.respol.2012.01.001>.
- Morgan, K. (2017), “Nurturing novelty: Regional innovation policy in the age of smart specialization”, *Environment and Planning C: Government and Policy*, Vol. 35/4, pp. 569-583, <http://dx.doi.org/10.1177/0263774X16645106>.
- Munari, F. and L. Toschi (2015), “Assessing the impact of public venture capital programmes in the United Kingdom: Do regional characteristics matter?”, *Journal of Business Venturing*, Vol. 30/2, pp. 205-226, <https://doi.org/10.1016/j.jbusvent.2014.07.009>.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2), 187-221.
- Nadler, M. and C. Nadler (2017), “Promoting investment in sustainable urban development with JESSICA: Outcomes of a new EU policy initiative”, *Urban Studies*, first published online, <https://doi.org/10.1177/0042098017702815>.
- Nightingale, P., Murray, G., Cowling, M., Baden-Fuller, C., Mason, C., Siepel, J. & Dannreuther, C. (2009) *From Funding Gaps to Thin Markets: UK Government Support for Early-stage Venture Capital*. London: NESTA.
- North, D., R. Baldock and F. Ullah (2013), “Funding the growth of UK technology-based small firms since the financial crash: Are there breakages in the finance escalator?”, *Venture Capital*, Vol. 15/3, pp. 237-260, <https://doi.org/10.1080/13691066.2013.804755>.
- OECD (2017), *Financing SMEs and Entrepreneurs 2017: An OECD Scoreboard*, OECD Publishing, Paris, http://dx.doi.org/10.1787/fin_sme_ent-2017-en.
- Oh, I. et al. (2009), “Evaluation of credit guarantee policy using propensity score matching”, *Small Business Economics*, Vol. 33/3, pp. 335-351, <http://dx.doi.org/10.1007/s11187-008-9102-5>.
- Ozmel, U., J.J. Reuer and R. Gulati (2013), “Signals across multiple networks: How venture capital and alliance networks affect interorganizational collaboration”, *Academy of Management Journal*, Vol. 56/3, pp. 852-866, <http://dx.doi.org/10.5465/amj.2009.0549>.
- Pack, H. and K. Saggi (2006), “Is there a case for industrial policy? A critical survey”, *World Bank Research Observer*, Vol. 21/2, pp. 267-296, <https://elibrary.worldbank.org/doi/abs/10.1093/wbro/lkl001>.
- Parker, S.C. (2002), “Do banks ration credit to new enterprises? And should governments intervene?”, *Scottish Journal of Political Economy*, Vol. 49/2, pp. 162-195, <http://dx.doi.org/10.1111/1467-9485.00227>.
- Plummer, L.A., T.H. Allison and B.L. Connelly (2016), “Better together? Signaling interactions in new venture pursuit of initial external capital”, *Academy of Management Journal*, Vol. 59/5, pp. 1585-1604, <http://dx.doi.org/10.5465/amj.2013.0100>.
- Presbitero, A. F., Udell, G. F., & Zazzaro, A. (2014). The home bias and the credit crunch: A regional perspective. *Journal of Money, Credit and Banking*, 46(s1), 53-85.

- Riding, A.L. and G. Haines (2001), “Loan guarantees: Costs of default and benefits to small firms”, *Journal of Business Venturing*, Vol. 16/6, pp. 595-612, [https://doi.org/10.1016/S0883-9026\(00\)00050-1](https://doi.org/10.1016/S0883-9026(00)00050-1).
- Riding, A., Madill, J., & Haines, G. (2007). Incrementality of SME loan guarantees. *Small Business Economics*, 29(1-2), 47-61.
- Robb, A. M., & Robinson, D. T. (2014). The capital structure decisions of new firms. *The Review of Financial Studies*, 27(1), 153-179.
- Rodrik, D. (2008), “Industry policy for the twenty-first century”, John F. Kennedy School of Government, Harvard University, Cambridge, Massachusetts, .
- Rostamkalaei, A., & Freel, M. (2016). The cost of growth: small firms and the pricing of bank loans. *Small Business Economics*, 46(2), 255-272.
- Silver, L., B. Berggren and F. Veghohn (2010), “The impact of investment readiness on investor commitment and market accessibility in SMEs”, *Journal of Small Business & Entrepreneurship*, Vol. 23/1, pp. 81-95.
- Sørensen, M. (2007), “How smart is smart money? A two-sided matching model of venture capital”, *The Journal of Finance*, Vol. 62/6, pp. 2725-2762, <https://doi.org/10.1080/08276331.2010.10593475>.
- Stiglitz, J.E. (1993), “The role of the state in financial markets”, *Proceedings of the World Bank Annual Conference on Development Economics*, World Bank, Washington, DC, <http://documents.worldbank.org/curated/en/239281468741290885/pdf/multi-page.pdf>.
- Stiglitz, J.E. (1989), “Markets, market failures, and development”, *The American Economic Review*, Vol. 79/2, pp. 197-203, www.jstor.org/stable/1827756.
- Stiglitz, J.E. and A. Weiss (1981), “Credit rationing in markets with imperfect information”, *The American Economic Review*, Vol. 71/3, pp. 393-410, www.jstor.org/stable/1802787.
- Stiglitz, J.E., J.Y. Lin and C. Monga (2013), “Introduction: The rejuvenation of industrial policy”, in: Stiglitz, J.E. and J.Y. Lin (eds.), *The Industrial Policy Revolution I: The Role of Government Beyond Ideology*, pp. 1-15, Palgrave Macmillan UK.
- Tamasy, C. (2007), “Rethinking technology-oriented business incubators: Developing a robust policy instrument for entrepreneurship, innovation, and regional development?”, *Growth and Change*, Vol. 38/3, pp. 460-473, <http://dx.doi.org/10.1111/j.1468-2257.2007.00379.x>.
- Tirole, J. (2015), “Market failures and public policy”, *American Economic Review*, Vol. 105/6, pp. 1665-82, <http://dx.doi.org/10.1257/aer.15000024>.
- Tödting, F. and M. Tripl (2005), “One size fits all?: Towards a differentiated regional innovation policy approach”, *Research Policy*, Vol. 34/8, pp. 1203-1219, <https://doi.org/10.1016/j.respol.2005.01.018>.
- Udell, G. F. (2015) SME Access to Intermediated Credit: What Do We Know, and What Don't We Know? Reserve Bank of Australia, Conference Volume.
- Ughetto, E., G. Scellato and M. Cowling (2017), “Cost of capital and public loan guarantees to small firms”, *Small Business Economics*, Vol. 49/2, pp. 1-19, <http://dx.doi.org/10.1007/s11187-017-9845-y>.

- Vanacker, T. R., & Manigart, S. (2010). Pecking order and debt capacity considerations for high-growth companies seeking financing. *Small Business Economics*, 35(1), 53-69.
- Vanacker, T., A. Heughebaert and S. Manigart (2014), “Institutional frameworks, venture capital and the financing of European new technology-based firms”, *Corporate Governance: An International Review*, Vol. 22/3, pp. 199-215, <http://dx.doi.org/10.1111/corg.12046>.
- Vogel, R.C. and D.W. Adams (1997), “The benefits and costs of loan guarantee programs”, *The Financier*, Vol. 4/1, pp. 22-29.
- Warwick, K. (2013), “Beyond industrial policy: Emerging issues and new trends”, *OECD Science, Technology and Industry Policy Papers*, No. 2, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k4869clw0xp-en>.
- Welter, F., Baker, T., Audretsch, D. B., & Gartner, W. B. (2017). Everyday entrepreneurship—a call for entrepreneurship research to embrace entrepreneurial diversity.
- Winborg, J., & Landström, H. (2001). Financial bootstrapping in small businesses: examining small business managers' resource acquisition behaviors. *Journal of business venturing*, Vol. 16/3, pp. 235-254.
- Wishlade, F., Michie, R., Familiari, G., Schneiderwind, P., & Resch, A. (2016). Financial Instruments for Enterprises-Final Report: Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF). <https://publications.europa.eu/en/publication-detail/-/publication/c35f1350-383c-11e6-a825-01aa75ed71a1/language-en>
- Wishlade, F. and R. Michie (2017), “Financial instruments in practice: Uptake and limitations”, background paper to the OECD Seminar on Financial Instruments, 28 June 2017, Paris.
- Wren, C. (2005), “Regional grants: Are they worth it?”, *Fiscal Studies*, Vol. 26/2, pp. 245-275, www.jstor.org/stable/24440021.
- Zecchini, S. and M. Ventura (2009), “The impact of public guarantees on credit to SMEs”, *Small Business Economics*, Vol. 32/2, pp. 191-206, <http://dx.doi.org/10.1007/s11187-007-9077-7>.
- Zhao, T. and D. Jones-Evans (2016), “SMEs, banks and the spatial differentiation of access to finance”, *Journal of Economic Geography*, Vol. 17/4, pp. 791-824, <https://doi.org/10.1093/jeg/lbw029>.