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Improving access to finance: which schemes best support the emergence of high-growth innovative enterprises?

A mapping, analysis and assessment of finance instruments in selected EU Member States

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Abstract
This Science for Policy Report describes national support instruments to improve access to finance for high-growth innovative enterprises and analyses available evidence for their effectiveness and economic impact on beneficiary companies. The analysis covers Germany, Finland, Lithuania, Poland and the United Kingdom.

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Executive Summary

Policy interest and research questions

Supporting the emergence of high-growth innovative enterprises (HGIE), or young innovative companies' ability to develop into one, has received attention from industrial and innovation policy for a number of years, since this class of companies creates a disproportionate number of jobs, is more active in research and innovation, and has high productivity growth. We focus our study on access to finance because this is found to be a major and persistent barrier to scaling up for a large share of young innovative companies. In this paper we describe funding instruments in five EU Member States (Germany, Finland, Lithuania, Poland and the United Kingdom) intended to improve access to finance for young innovative companies, which is one of the key framework conditions to enable such companies to develop into HGIE. We furthermore analyse the evidence for those policy instruments' effectiveness and economic impact on beneficiary companies. Having established our framework for analysing innovation systems (conceptually positioning access to finance within the resource mobilisation function), we introduce the main financing types and sources for SMEs, differentiating them according to their capital type - equity, debt, and mezzanine. We combine this with a discussion of the specific issues young innovative companies face in using each of these financing types, and the types of support instruments available to governments to mitigate difficulties.

Data and methodology

In a data collection effort based on the JRC Research and Innovation Observatory (RIO) Country Reports, policy databases, OECD compilations, expert advice and our own web search, we have identified the policy instruments in place in the 28 EU Member States that are relevant for supporting young innovative companies' access to finance. In the paper we concentrate on Germany, Finland, Lithuania, Poland and the United Kingdom and analyse available evaluations of these countries' support instruments for evidence on their policy effectiveness and economic impact on beneficiary companies. We furthermore assess the quality of these evaluations. With this country coverage we attempt to strike a balance in representing countries of different size as well as economic structure and history, and a broad variety of instrument types.

Findings

The policy mix supporting access to finance for scale-ups in the countries we analyse is quite diversified, except for Lithuania. In contrast, few evaluations of those instruments are available (twelve in total for all five countries of 41 (national level) instruments), which is partly explained by the relative newness of most schemes. The available evaluations mostly focus on instrument performance in terms of financial indicators, and only a few contain an in-depth assessment of economic impact. While most of the evaluated schemes seem to be effective in helping to improve the opportunities and providing more favourable conditions for companies to scale-up, the magnitude of some schemes' economic impact is not very substantial. An equally important finding is that developing the quality of evaluations should be a priority. Better evaluations would help to strengthen successor schemes' effectiveness, both through better company targeting and increases

in successful outcomes. Collection and publication of more and better data would also facilitate more policy experimentation as well as cross-country learning.

Equity-based support instruments

Public venture capital (VC) funds investing directly in companies are used in all five countries. They concentrate their investments in ICT, biotech, and advanced production technology. Although some focus explicitly on the scale-up stage, the share of more developed, growing companies in their portfolios is usually small. Apart from this shortcoming, direct public VC seems to be an effective and cost-efficient instrument to boost young firms' growth. Public fund-of-funds that invest in private VC funds receive larger funding volumes than direct public VC, apart from Lithuania and the UK. Reasons for this may be higher portfolio diversification and, in connection, the possibility to harness the sector-specific experience of private fund managers in multiple sectors. There is no evaluation available in the five countries that assesses the economic impact of a fund-of-funds instrument.

Debt-based support instruments

Loan guarantees are used by all countries to improve SMEs' access to finance, but in terms of funding volume they are lower than equity instruments for supporting the scale-up of young innovative companies,. Whereas evaluations show that guarantees are very successful in leveraging private loans, there is no evidence of positive economic impact specifically on HGIE (this is, however, also because most evaluations of guarantees do not assess this question). Direct loans or grants explicitly supporting scale-up exist in all five countries, but have much lower volumes than the financial instruments summarised above. They often finance international expansion in particular. The impact of a Finnish programme that combines loans and grants, as well as coaching and networking support, has been deemed very positive in an evaluation.

Tax incentives for venture capital investment

Tax incentives are used to a much greater extent in the United Kingdom, where they have a long history as instruments to support venture capital investments and account for the largest funding share in the mix of instruments. There is only one evaluation available, and its assessment of the economic impact of the tax incentive is methodologically not very robust. Nevertheless, it shows very limited effects on beneficiary companies' turnover and job growth. This calls into question the instrument's efficiency, given the high costs in the form of forgone tax revenue.

Public support for accelerators

Of the sample countries all except Lithuania provide public support to accelerators that focus on scaling up young innovative companies. This type of support differs strongly, ranging from funding operational costs over coaching services to co-financing stakes in client firms. The funding volumes vary accordingly from country to country, but are generally low compared to the other instrument types (which is partly due to the type of support being funded). Evaluations generally find a positive impact of such public support on the development of the country's scale-up ecosystem.

Relative effectiveness of instrument types

Since there are few available evaluations and these are not representative of the range of instrument types present in the five countries, our analysis does not permit to draw conclusions on instrument types' effectiveness that are independent from the national context. However, **our findings suggest that equity instruments (public VC funds and fund-of-funds) have a stronger positive impact on the growth of young innovative companies than debt instruments (loans and loan guarantees) and tax incentives, and are thus particularly suited for supporting HGIE emergence. Moreover, co-funding accelerators appears to be a cost-efficient no-regrets policy option to complement financial instruments. In terms of specific instrument design, evaluation results indicate that schemes which combine funding with coaching and networking support are the most effective, and should ideally involve regular performance evaluation of beneficiary companies to assess their ability to translate the support received into sustained growth.**

Evaluation quality

From this study, we underline that evaluations should put a greater emphasis on assessing the economic impact of instruments, both on beneficiary companies and the wider start-up and scale-up ecosystem. In particular, the additionality effects of public support schemes should be evaluated using a more robust methodology, including use of counterfactual designs. To this end, more data has to be collected at firm level for longer periods of time during and after participating in support schemes. This should also be the case to some extent for unsuccessful applicant companies, which would enable a relatively simple approach to constructing valid control groups necessary for counterfactual designs. Data collection for evaluation should moreover become an integral part of programme design and planning. Developing evaluation cultures in that direction would improve both the explanatory power of evaluations and their value in helping to make policy decisions.

Avenues for further research

This study finds a number of areas where further research is needed. One is to explore the relative advantages of fund-of-funds versus public VC funds investing directly in companies. Such an analysis might focus on two questions: which instrument type works better in attaining a specific policy objective, and in what ways both instrument types complement (or potentially compete with) each other. Another avenue for further research concerns the impact of tax incentives. Too few robust evaluations of this type of support instrument exist to enable definitive conclusions about the impact of a given scheme, let alone its effectiveness as an instrument to support HGIE in general. Furthermore, having analysed national support policies, the logical next steps are to assess the effectiveness of EU-wide financial support instruments and/or of regional schemes, as well as their interplay with national-level instruments. Accordingly, the second part of our project on access to finance for high-growth innovative enterprises will analyse the economic impact on beneficiary firms of EU support schemes administered through the European Investment Fund, such as the 2007-2013 High Growth and Innovative SME Facility and the 2014-2020 Equity Facility for Growth.

1. Introduction

Since the 1970s, there has been an active academic and policy interest in High Growth Firms (HGF) or Gazelles (Birch 1979, Henrekson and Johansson 2010, Moreno and Coad, 2015). High growth firms constitute 3-6% of all firms in European economies, but they are responsible for over 70% of the new jobs generated in the EU (Hölzl 2016). A specific type of HGF are those firms which are active in innovation. Firms are defined as innovative either through their reported activity or, by approximation, through operating in a sector classified as innovative (e.g. high-tech manufacturing and many knowledge intensive services). Academic research, international organisations and policy makers have developed and use several definitions of high-growth innovative enterprises (HGIE), some of which differ significantly in their classification criteria.[1] Since this paper does not analyse policies directly aiming to support HGIE, as will be explained further below in this section, we do not further discuss those different definitions and their differing implications for analysis and policy design (for an overview see e.g. Nightingale and Coad 2014). HGIE tend to experience higher productivity growth, are more active in R&D, and are thus assumed to promote re-allocation of resources to more knowledge-intensive sectors (Aghion et al. 2007, Hölzl 2016, Praag and Versloot 2008). Some evidence also suggests that compared to other fast-growing firms, jobs created by HGIE tend to require higher human capital levels and are more persistent (e.g. Ciriaci et al. 2014). Whereas the EU does not lag systematically behind the United States in the numbers of fast-growing firms in general, it has fewer cases of *young innovative* companies that enter early into an extended period of high growth (OECD 2015, Bravo Biosca 2010). These differences are often presumed to be a major factor for explaining the variation in innovation and productivity performance between these regional blocs (Coad et al 2014).

Our focus on this specific class of companies is motivated by policy-makers' need of identifying effective policy levers for supporting the emergence of high-growth innovative firms, or put differently, for facilitating the entry of young innovative companies into periods of high growth. The academic literature seems to be converging around the view that it is difficult to target HGIE with direct support measures because not only is high growth transitory, it is also difficult to anticipate. As an alternative to direct support measures governments are therefore trying to improve those framework conditions which facilitate resource allocations to the most productive investment options from an economy-wide point of view (Brown and Mason 2014). This in turn should increase the likelihood for HGIE to emerge and survive. Since high growth is not a fixed firm characteristic, it could also be put the following way: good framework conditions increase the likelihood that innovative firms enter into and/or continue to experience periods of high growth.

This report presents findings from the first part of a research project on policies to improve access to finance, one of the central framework conditions for the emergence of high-growth innovative enterprises. The project is carried out jointly by JRC's Unit for Finance, Innovation and Growth, and the Units for Territorial Development and Digital Economy. Our research questions are the following:

[1] The OECD and the European Commission define HGIE as companies which have grown by 20% (OECD) or 10% (Commission) annually on average for the past 3 years, either in terms of employment or turnover. To meet the definition, those companies furthermore must have had at least 10 employees at the start of the growth period and be active in NACE sectors classified as innovative by Eurostat (see e.g. Vértesy and Tarantola 2014).

1. What policy instruments aiming to improve young innovative companies' access to finance exist in EU Member States?
2. To what extent are these policy instruments evaluated, and what is the level of quality of those evaluations?
3. What is the evidence for different policy instrument types' effectiveness in improving access to finance, and for their economic impact on beneficiary companies?

One of the most common obstacles for young innovative companies is access to finance (Hölzl and Janger 2014), which is also critical to ensuring that business enterprises are able to grow (Beck and Demirguc-Kunt 2006; OECD 2006). Other important barriers have been identified as well, notably access to highly-skilled human resources (regarding both technical and managerial capacity) and punitive insolvency regulation (Acharya and Subramanian 2009). However, Hölzl and Janger (2014) show that access to finance is reported to be the most pressing problem by those firms not directly at the technological frontier, which constitute the majority of HGIE in Europe. Furthermore, access to finance was cited most consistently as a main barrier to innovation over consecutive rounds of the EU's Community Innovation Survey (Hölzl and Janger 2013). These survey results are in line with empirical analyses, using micro data on company establishment and growth from business registers or tax databases, which find that market entry and growth of young and efficient firms increases with the development of the financing environment (Aghion et al. 2007, Alfaro and Charlton 2006). We therefore focus this study on framework conditions related to financing, as this is a crucial aspect for the emergence of HGIE during their start-up phases as well as for their sustained development during the growth phase (start-up, scale-up, VC exit, etc.). Finance supply for the seed and early start-up stages has greatly increased in Europe in the course of the last two decades, although there is still considerable variation across Member States. Access to finance becomes increasingly difficult during the process of scaling up, especially for companies having the potential for rapid growth (e.g. Coutu 2016).

In the first project part, the findings of which this report presents, we identify EU Member State policies designed to improve access to finance for young innovative companies, and analyse to what extent they have achieved this goal, based on available evidence from policy evaluations. This interest in policy effectiveness is a second reason for focusing on access to finance. Over the past decade, many EU countries have set up numerous policy instruments that are supposed to improve young innovative companies' access to finance. Even if the latter is only one among several major constraints to high growth, it is therefore important to determine the effectiveness of those policy measures.

We analyse five EU Member States: Germany, Finland, Lithuania, Poland, and the United Kingdom. The report is structured as follows. In Section 2 we outline our analytical framework and discuss key concepts regarding financing types and the constraints young innovative companies face in connection with each of them. We explain our choice of evaluation synthesis as methodological approach in Section 3, where we also describe the data collection and country selection process. The policy analysis for each of the five countries is then presented in section 4. It is followed by a discussion of the findings in terms of a comparison across countries and across policy instruments (section 5), before providing concluding remarks and an outlook on avenues for further research (section 6).

2. Types of financing and their implications for young innovative companies

The broader theoretical framework for the analysis in this report is provided by the functional approach to innovation systems (Hekkert et al, 2007; Bergek et al 2008). This analytical framework has recently gained ground in the comparative study of innovation systems (Bleda and Del Río, 2013, Mahroum and Al-Saleh, 2013, Wieczorek and Hekkert, 2012). It is characterised by a focus on core processes or "functions" which innovation systems are supposed to perform, and subsequent analysis of structural components regarding their role for function performance. The two main advantages of functional approaches are that, first, they enable comparisons of innovation systems with different institutional setups and structures (like EU Member States), and, second, they facilitate the formulation of clear policy targets and recommendations (Hekkert et al, 2007, 420) – or, in our case, comparisons of the extent to which policy targets have been reached.

Financing of young innovative companies falls largely under the main function of "resource mobilisation". This function not only refers to the provision of and access to funding from a variety of sources., it also refers to the mobilisation of human capital, in the form of financing-related knowledge and experience, and to the mobilisation of complementary assets in the form of advisory/coaching services and network connections between investors and entrepreneurs (Bergek et al, 2008, 417).

In our analysis of five EU Member States, we first identify the structural components in the financing environment which act as inducement or blocking mechanisms for function performance (i.e. funding provision): main actors (entrepreneurs, investors, finance intermediaries), the different channels through which companies can tap funds, the degree of connectedness between firms and investors, and institutional characteristics (e.g. capital market regulation, venture capital demand and supply, bank lending structures). We will then analyse what public policy instruments are in place to improve or complement such structural components, and what evidence exists regarding their success.

Firms can make use of different types of financing sources. Their choice of a particular financing mix depends on firm size, legal form, industry, growth stage and growth ambition, and the availability of different types of finance in their national system, including access to foreign investors (Cassar, 2004; Colombo and Grilli, 2006; Ueda, 2004; Vanacker and Manigart, 2008). Roughly three types of finance can be distinguished; debt finance, equity finance, and financing from a firm's own resources. The latter may be possible for an SME that has been making profits consistently and is now entering a period of higher growth. In contrast, for young companies, or those that operate in sectors where innovations take a longer time to generate profits, internal financing is usually not an option (Mas-Tur and Ribeiro Soriano 2014, Wang 2014).

The scientific literature on the type of financing firms seek for growth is vast and longstanding. Myers and Majluf (1984) developed a pecking order theory of capital which explains that firms seek debt financing over equity financing because the latter can interfere with decision making (see also Aboody and Lev 1998; Kortum and Lerner 2000), and because it tends to reduce capital costs after taxation (Modigliani and Miller 1958). Robb et al. (2009) also report that new firms rely heavily on external debt (especially bank financing) and less on equity financing. Ben-Ari & Venortas (2007), Baldwin, Gellatly and Gaudreault (2002) and Riding et al (2012) argue that high tech or R&D intensive firms are more likely to use equity financing in an attempt to grow their firm. A potential reason for this observation is that the higher risk and uncertainty associated with R&D intensive ventures and the greater difficulty in assessing the value of the intellectual capital they possess or

are developing makes it more difficult for such firms to receive bank loans, whereas equity investors may be less risk-averse and attracted by the higher potential returns. This is echoed by the OECD (2015) which highlights the challenges posed to young innovative companies in accessing traditional bank finance due to their higher risk-return profile.

The availability of diverse financing sources depends heavily on the state of financial markets and equity markets in particular (Aghion et al. 2007). The relative development of capital and equity markets as well as the relative access to debt finance differs significantly across European Member States.

Equity finance is a form to raise capital by issuing "shares" in one form or another, i.e. investors acquire an ownership interest in the company. Equity can be raised from a variety of sources, which generally differ according to the size of the individual investments: from informal business angels who contribute a few thousand Euros, over more professional business angel networks, venture capital firms and funds, large private equity investors, to initial public offerings (IPOs) at stock markets. Seed and early stage equity finance can boost firm creation and development, whereas other equity instruments, such as venture capital (VC) funds or specialised platforms for public listing, can provide financial resources for HGIE (OECD, 2015).

If a start-up finances its growth (partially) through equity investments, it will seek equity financing over several rounds as it evolves and expands.[2] Since a start-up typically attracts different types of investors at various stages of its evolution, it may use different equity instruments for its financing needs. At the founding stage and immediately afterwards, business angels (who may be professional investors or even from the entrepreneur's friends or family) are common equity providers. In many countries, national or regional authorities also support business idea development and firm creation with diverse (usually small sized) loans and grants. Equity crowdfunding can be a complement or substitute for seed financing for entrepreneurial ventures and start-ups that have difficulties in raising capital from traditional sources (OECD, 2015). Once a firm has established its operations and is perceived to hold a certain growth potential, it may be able to attract venture capital investors over several rounds of financing (Cassar 2004). Both business angels and venture capital firms usually demand a high degree of influence on firm management decisions. Once the company has grown large enough to consider going public, it may consider selling common equity to institutional and retail investors. It may also opt to take on private equity which is not publicly traded on traditional stock markets. Whereas the trading of private equity and stocks is highly institutionalised and governed by national regulation[3], equity types relevant for earlier growth stages like venture capital, angel investment and crowdfunding are often characterised by some degree of regulatory uncertainty (e.g. Coutu 2016).

Issuing stocks is usually not an option for young innovative companies, since stock exchanges impose minimum thresholds for capitalisation and turnover. Companies with innovative products or services lacking a track record of commercial success may have difficulties in raising sufficient capital for their scale-up ambitions from a population of dispersed and non-specialised investors that prevails on public stock markets. Moreover, the amount of fees as a proportion of the company

[2] In the case of venture capital, staging investment in consecutive "rounds" is also a way for VC investment companies to assess growth prospects of the target company before committing new money, thus reducing risk (Gompers and Lerner 2001).

[3] With work advancing on the Capital Market Union, EU-level regulation increasingly plays a role as well.

value is often prohibitively high for smaller firms (Filippov and Hofheinz 2016, p. 13).[4] Furthermore, not many financial intermediaries may be willing to underwrite a highly innovative small firm's initial public offering and take on the associated risk. Venture capital thus seems like a preferred means for innovative fast-growing companies to raise equity, and it has been shown that they find it easier to obtain such investment than other types of SMEs (Müller and Reize 2013). Nevertheless, many European companies with fast growth ambitions seeking venture capital do not find an investor, especially when they are in need of larger amounts to finance later-stage expansion (Coutu 2016, Filippov and Hofheinz 2016). On the other hand, many companies that might be attractive investments for VC companies shy away from this financing source because they want to avoid business decisions being influenced by outside stakeholders (Bonini et al. 2012). A common fear is that due to their short time horizon, VC firms can be focused more on quick returns on investment than on the long term health of companies. There is no consensus in the academic literature on whether the low levels of venture capital investments compared to GDP in most EU Member States are predominantly a supply- or a demand-side problem, i.e. whether there is insufficient VC supply or whether there are insufficient companies to invest in.

Debt financing refers firstly to traditional bank lending – companies take out loans or draw down credit lines or overdraft facilities. Secondly, companies may issue corporate bonds to individual and/or institutional investors. Investors profit from corporate bonds through the associated interest and possible re-selling on the secondary market. Debt financing can also include “asset-based finance” which refers to funding borrowed on the basis of the value of specific assets, including accounts receivables, inventory, machinery, equipment and real estate, rather than on the basis of a firm's credit standing. Asset-based lending can provide more flexible terms than collateralised traditional bank lending secured by collateral and has therefore expanded in recent years (OECD, 2015). If such asset-based financing agreements are turned into securities and traded on capital markets, it is sometimes referred to as "alternative debt" (ibid.).

European SMEs, and especially young ones, use bank lending to a much greater extent than corporate bonds (European Central Bank 2016). Access to a bond exchange requires prior vetting procedures, due diligence, and underwriting services of a financial intermediary. The associated organisational and monetary costs often exceed young firms' capacities (e.g. Riccio 2016). Moreover, on the demand side: European investors might be too risk averse to invest in debt securities issued by young and small companies at a large scale. However, young firms often find it difficult to receive bank loans, without sufficient assets suitable as collateral, and the potential for success of their business model is hard to assess. The latter is true especially for innovative and R&D-intensive companies, as highly innovative solutions tend to need longer time to generate a positive return (Pyka and Burghof 2013). Even for an established company seeking to scale up, past performance is not necessarily a reliable predictor for the commercial success of a new innovative project. Asset-based financing, finally, poses a similar constraint as traditional bank lending to young innovative companies: often they lack enough assets that could be securitised. Moreover, R&D-intensive firms' potentially most valuable assets are often intangible, especially if R&D results have not been translated into a fully commercial product or service yet, which complicates their market valuation and thus their usability for asset-based financing.

[4] Regulatory and institutional barriers preventing young innovative companies from accessing stock markets, and their comparison across countries, are a complex topic, a detailed analysis of which is beyond the scope of this paper. In our analysis of national policy instruments in Section 4, we do however take into account instruments designed to support or facilitate access to stockmarkets if those exist in a country we analyse.

Mezzanine capital is used as a financing means by many companies. Legally, mezzanine capital can take the form of debt ("subordinated debt") or equity ("preferred shares"), but economically it combines features of the two capital types (Jain and Myburgh 2013). It increases investor certainty compared to standard equity since its repayment priority in case of default is higher and because it usually carries an interest or dividend that is either fixed or floating within a narrow bandwidth. On the other hand, mezzanine either represents an ownership share itself or includes the possibility of being converted into such, which means that investors can benefit to a greater extent from increasing company valuations than would be possible with pure debt (Hartmann-Wendels et al. 2011). The advantages for companies are that no collateral is required and interest or dividend payments are lower than for debt, and the investor does not gain formal influence on company decisions as is the case for equity. For young innovative companies aiming for high growth, mezzanine can "represent an appealing form of finance [at] a turning point in their life cycle, when the risks and opportunities of the business are increasing, a capital injection is needed, but they have limited or no access to debt financing or equity, or the owners do not want the dilution of control that would accompany equity finance" (OECD 2015). In practice, how attractive mezzanine capital is for a young innovative company seeking fast growth depends strongly on the structuring of an individual mezzanine deal (e.g. the balance between equity and debt characteristics), and the specific need of the company raising capital (Vasilescu 2010).

Crowdfunding (which can take the form of equity or debt financing) is increasingly used to raise seed money and early-stage start-up funds, but is currently rarely being used to finance scaling-up. The overall volumes of crowdfunding markets are still small (although growing steadily) and the development of platforms matching firms and investors is still in an early stage (Massolution 2016, European Commission 2016). However, with rapidly increasing professionalization of crowdfunding providers and a growing risk aversion of venture capital firms in Europe, its financing role is expected to increase in the coming years (ibid.). In most EU Member States, the current lack of investment regulation holds back the development of crowdfunding as a significant financing source. This is in some cases because of regulatory gaps or ambiguity, which creates uncertainty for investors, in others because crowdfunding falls under standard requirements for retail investment (high transparency and information obligations), which young and small companies often do not have the capacity to fulfill (European Commission 2016). Austria, Germany, Spain, France, Italy, Portugal and the UK have so far introduced bespoke regulatory frameworks for crowdfunding activities (both for investment-based crowdfunding and for lending-based crowdfunding)

One group of measures through which governments can promote young innovative companies' access to finance is by offering them direct support themselves in the form of grants. A number of different types of programmes exist, targeting companies in different growth stages but generally focused on the provision of seed funding, bridging capital and/or direct support to specific activities such as R&D. However, many analysts argue that direct support may not be the best way for governments to support HGIE in part because it is so difficult for governmental policy makers to identify which firms are going to be HGIE in the first place (high growth is not a fixed characteristic of a firm – it is transitory and its occurrence difficult to predict). Thus, governments often resort to financial support instruments that aim to improve, directly as well as indirectly, young innovative companies' access to the different forms of capital discussed above. Such support not only consists in public funding, Governments can also improve access to finance through the provision of facilitating services and through new or revised regulation.

The types of instruments available on the equity side include:

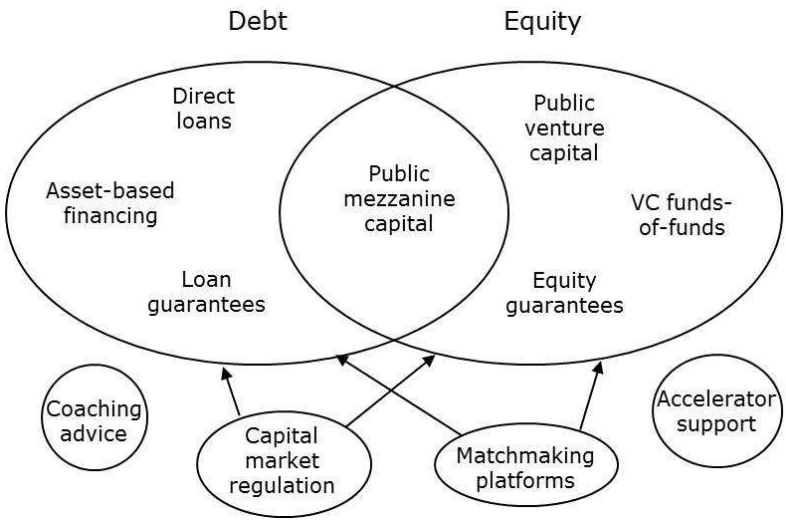
- Direct provision of venture capital: Public venture capital funds invest in companies, usually alongside a private co-investor. Regulation related to public VC can for example grant preferential tax treatment to private co-investors' capital gains.
- Indirect provision of venture capital: Public fund-of-funds invest in private VC funds. They may influence private funds' investment decisions through guidelines or conditions governing investment criteria or individual deals.
- Equity guarantees or loans: Governments extend money to private financial intermediaries (funds or banks) to finance their VC investments, or issue guarantee such investments by covering potential losses to a certain extent and up to a defined limit.
- Stock-market related actions: Regulation that imposes less stringent requirements for young innovative firms to get listed on stock markets, or coaching and financial support to increase their capacity to undergo preparations for an initial public offering.

Regarding debt, the following general options for public support exist:

- Direct loans: Government loans to innovative companies to finance expansion of their activities, often beyond their domestic market.
- Loan guarantees: Agreements with private financial intermediaries that governments will cover losses from defaulted loans extended in the context of the programme, to a certain extent and up to a defined limit.
- Asset-based financing: Public loan programmes that accept unconventional assets (e.g. patents) as collateral, or guarantees or co-financing of commercial banks' asset-based debt instruments.

In addition, governments can facilitate the development of crowdfunding services and platforms, and devise regulation that is conducive to market development and ensures legal certainty. Finally, accelerator programmes (either publicly run or privately run and publicly co-financed) often include access-to-finance elements: they usually act as matchmakers between investors and their portfolio companies, and sometimes themselves acquire equity stakes in the latter.

Figure 1. Types of public support instruments.



3. Methodology and data

3.1 Research design: evaluation synthesis

To respond to our two research questions, we examine: a) whether the policy interventions studied are embedded in an appropriate evaluation culture in a system with adequate evaluation capacity and b) whether we can derive general statements on the success, or positive impact, of this type of policy intervention.

Evaluations can be used to inform politicians, policy-makers, programme managers, policy analysts and other stakeholders about the effectiveness, efficiency, appropriateness and impact of policy interventions (Edler et al, 2008). In this paper we follow Edler et al. (2008) in arguing that combining the analysis of several evaluations of different policy instruments can provide an insight beyond the specific policy intervention each one evaluates. The intention of this approach, which we outline in this subsection, is to make statements on the impact of different types of policy initiatives.

Based on R&I evaluation reports collected in the context of several EU-funded research programmes, a literature is emerging which seeks to exploit existing evaluations to address questions regarding the nature and quality of evaluations of R&I policy measures carried out in the member states. Additional goals of this research agenda are to explore to what extent those evaluations have an impact on the policy making process and, most relevant for this study, to gain an insight in the impact of specific *types* of policies beyond the single cases to which individual evaluations are applied (Edler et al, 2008, Edler et al, 2012; Gök and Edler, 2012).

Evaluations can be viewed as case studies of the impact of individual policy interventions. Re-analysing a large number of evaluations of similar policy interventions jointly would increase the number of cases and allow one to come to more robust statements on the impact of a certain type of policy instrument (Edler et al. 2008). Edler et al (2008) analyse the potential of meta-analysis and evaluation synthesis in assessing the impact of specific types of policies. In order to carry out a meta-analysis one needs a relatively large amount of evaluations on a specific topic. For some conceptualisation of meta-analyses, one moreover needs access to the raw data of these evaluations which are then pooled for a subsequent larger scale analysis. This can then be used to assess, both quantitatively and qualitatively, the effect of characteristics of programme design and effects of the policy intervention. Of course, such an approach would lead to a loss in the context-specific information contained in each individual analysis. Nonetheless, a meta-analysis is a promising avenue for obtaining robust insights into the impact of a specific type of policy intervention (for example to complement and cross-validate a micro-econometric analysis). However, too few evaluations exist on the types of policy instruments this study focuses on to carry out a robust meta-analysis; moreover, access to their raw data is difficult for most of them. For this reason, we instead adopt an evaluation synthesis approach.

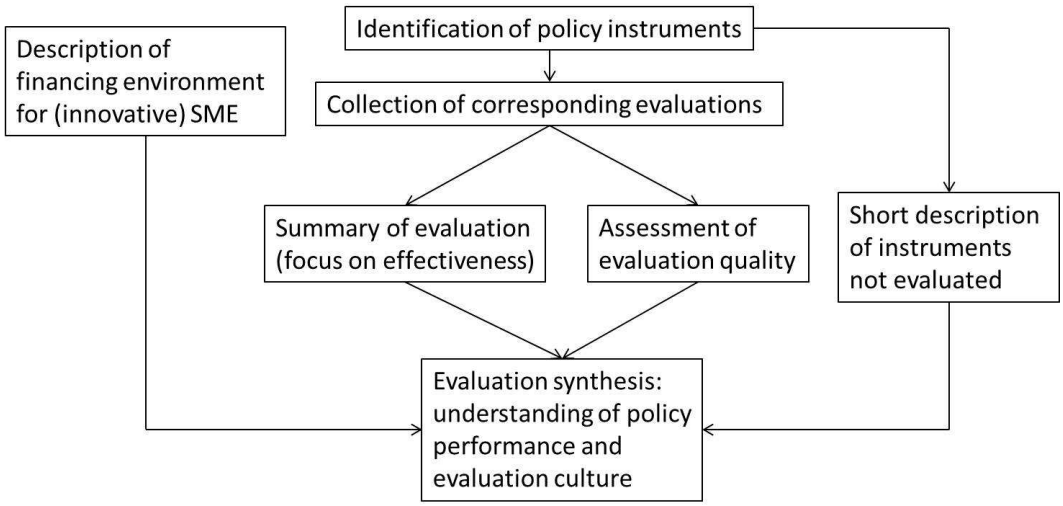
Evaluation synthesis is best understood as a content analysis of multiple evaluation reports on similar programmes or projects in the field of interest. Such a synthesis is, in contrast to a meta-analysis, based on the main findings from the evaluation reports and thus does not directly rely on the raw data analysed in the evaluation process (Univation 2016).

In order to do a robust valid evaluation synthesis, Edler et al (2008) argue that it is important to first engage in a meta-evaluation of the evaluation reports following similar approaches as

developed by Widmer (1996), Stufflebeam (2000, 2001) and Cooksy and Caracelli (2005). They consider a meta-evaluation to be an "evaluation of evaluations", i.e. a meta-evaluation is a systematic review of evaluations to determine the quality of their findings and of how they were carried out. In such a meta-evaluation, all relevant existing evaluations on a specific type of policy interventions are collected and characterised. Cooksy and Caracelli (2005) propose such a meta-analysis step as an adequate preparation for an evaluation synthesis. For its implementation in our study, we follow the approach developed in Edler et al. (2008) and use a checklist of criteria for assessing the evaluations identified along different aspects that allows us to engage in a synthetic analysis which provides an answer to our two research questions. The evaluations we analyse in this study vary strongly not only according to their design and research questions, but also the outcome variables they consider (e.g. economic impact on the beneficiary, effectiveness in reaching the policy goal, or mere financial performance of the instrument). Nevertheless, we have attempted to focus in our synthesis on those outcome variables in each evaluation that come closest to the actual economic impact on the beneficiary. By giving a brief description of the general financing environment for SMEs in the country, we do not only attempt to contextualise the support instruments analysed, but also to make the reader aware of factors that may influence their effectiveness. Although controlling in a strict sense for such potential confounding factors is difficult in a qualitative approach, the extent to which a given evaluation analyses the policy context is one of the quality criteria we use (see Table 1).

Figure 2 provides a schematic overview of the research design. It shows how the outcomes of the meta-evaluation feed into the synthetic review, and which additional analyses we carried out to complement this main part of our work.

Figure 2. Methodological approach (adapted from Edler et al. 2008)



According to Edler et al (2008) there is no need to "rigidly, comprehensively or ambitiously" apply the meta-evaluation approach in order to serve as a basis for the evaluation synthesis. Instead, they consider checklists of typification and quality as sufficient. Table 1 shows the criteria on which our quality assessment of evaluations is based. Compared to Edler et al.'s original assessment framework we do not use the criterion "Documentation of data and evaluation", since the degree of the reports' usability for a meta-evaluation is not our primary interest. We furthermore reduce the original five qualitative scoring values to three (good, satisfactory, unsatisfactory) due to the low number of evaluations available for the policy instruments we are interested in. Such a degree of

differentiation would firstly have made it difficult to arrive at comparisons and secondly might have led to some scoring values not being assigned. Scoring is done by comparing the benchmark to the evaluation.

Table 1. Criteria for assessing evaluation quality and corresponding benchmarks (adapted from Edler et al 2008).

Criterion	Benchmark
Clarity of goals	The goals for the evaluation are derived from the explicit goals of the programme (including their hierarchy and relation) and a clearly and accurately documented evaluation.
Design	The evaluation design – including the mix of qualitative (interviews, case studies) and quantitative methods used – is appropriate, given the objectives of the evaluation and the policy measure.
Methods	Qualitative and quantitative information are gathered and analysed in an appropriate, systematic way, so that the evaluation questions can be effectively answered.
Context analysis	The societal, institutional, policy and – if relevant – economic context of the evaluation are examined and analysed in enough detail.
Transparency of evaluation	The purposes, questions, and procedures of an evaluation, including the applied methods, are accurately documented and described, so that they can be identified and assessed.
Quality of information sources	The information sources used in the course of the evaluation are documented in appropriate detail, so that the reliability and adequacy of the information can be assessed. All relevant data needed for a certain methodology and to test all programme goals are included.
Reliability and validity	The data collection procedure is chosen or developed and then applied in a way that ensures the reliability and validity of the data with regard to answering the evaluation questions. This includes the usage of transparent indicators for output, outcome and overall success of a programme.
Systematic data review	The data collected, analysed, and presented in the course of the evaluation are systematically examined for possible errors.
Clarity of conclusion	The conclusions reached in the evaluation are explicitly justified, so that the audiences can assess them.
Standing of the evaluators	The evaluators are independent and credible and the process of choosing them was transparent.

3.2 Data collection

The first step was to compile a comprehensive overview of all policy instruments currently in place (or recently discontinued/completed) that are designed to support access to finance of young innovative companies in the EU28 Member States.

The identification of relevant policy documents relied, as a starting point, on the JRC Research and Innovation Observatory's 2015 Country Reports.[5] These reports are co-written with a network of R&I experts on each Member State as well as selected associated and other countries. The country reports examine framework conditions for young innovative companies and access to finance, and are complemented with a repository of policy documents corresponding to the policies and support instruments described. While these reports cover a wide range of policy instruments relevant for

[5] https://rio.jrc.ec.europa.eu/en/country-analysis

access to finance, they do not capture all potentially relevant instruments in all Member States. One reason for this is that some relevant support measures are not classified or administered as R&I policies and therefore fall outside the scope of the RIO Country Report. In a workshop with the 28 national experts, further feedback and suggestions was collected regarding relevant policy initiatives. We used additional sources, including the OECD SME financing scoreboard (OECD 2016) and a number of existing studies on HGIE, to complement the list of policy instruments, and in some instances to validate the relevance of instruments identified from the RIO Country Reports.

The selection criteria for inclusion in the list of instruments were:

- Objective: supporting the growth, expansion, or internationalisation of young innovative companies or SMEs with growth potential. Access to finance had to be at least one main avenue envisaged for reaching this objective.
- Target beneficiaries: young innovative companies and SMEs with growth or internationalisation potential after the initial start-up stage, i.e. the company had to be already established and operational.
- Certain types of support instruments we included only if specific conditions were met:
    - Direct R&I support (grants, loans) were included only if scaling up or internationalisation was among their explicit objectives
    - Guarantee schemes were included only if their goal was to support growth of young SMEs, as opposed to alleviating liquidity constraints or facilitating restructuring, for example.
    - Accelerators were included only if they concentrated their portfolio on young firms at a later stage than initial seed or start-up.

After identifying the set of relevant support instruments for each Member State, a second step in the data collection strategy consisted of a systematic search for evaluations, impact assessments, or other analyses concerning outcomes or effects of each instrument.

Again, the RIO Country Reports and in particular the accompanying policy document repositories are an important source for identifying such evaluations. For each Member State, the latter list the research and innovation policies and support instruments currently in place and provide their main characteristics like policy objective, funding volume, and duration. They also cover the most important policy instruments that have recently been abandoned or concluded. In addition we carried out web searches in English and in the country's national language, using the name of the support scheme or the underlying policy initiative as search term. The researchers coordinating the SIPER (Science and Innovation Policy Evaluation Repository) database[6] provided access to the list of evaluations collected by February 2016. This data is currently being set up in the context of the RISIS project.[7] In February – April 2016, this database already contained a large number of evaluations from the UK, Germany, and the Nordic countries, which enabled us for these countries to retrieve evaluations and additional analyses of support schemes we had already identified as well as check for other policy instruments that we had missed before.

[6] http://datasets.risis.eu/metadata/siper
[7] http://risis.eu/

For instruments co-funded through Structural Funds or EIF, EU or EIB assessments were sometimes available in the absence of national evaluations. For some countries, very few or no evaluations or other analyses exist.

3.3 Case selection

We selected five EU Member States for an in-depth analysis of policies supporting access to finance for young innovative companies: Germany, Finland, Lithuania, Poland, and the United Kingdom. This selection is based on geographical as well as policy criteria. We aimed at including large and small, old and new, and "Northern" and "Southern" Member States. At the same time support instruments of a given type should be present in more than one of the selected countries to increase potential for comparisons. In practice we faced two constraints in implementing the selection based on these criteria: existence of relevant policy instruments in a country, and availability of evaluations or other analyses of their (potential) effects. This meant that we were not able to include a Southern Member State. While there are a number of potentially relevant support instruments in place e.g. in Spain, Italy or Greece, we were not able to locate any corresponding evaluations. This observation already points to a general finding in our analysis regarding the availability of evaluations, which we discuss further in Section 5.2.

4. Instrument and support scheme analysis

The analysis consists of three sections: 1) provides an introduction to the current situation of access to finance in the country to put the following policy analysis into context; 2) lists the existing instruments relevant for young innovative companies' access to finance in an table; 3) consists of a synthesis of available evaluations. For each, we provide a summary of the evaluation's conclusions regarding the instrument's effectiveness. A short description of each instrument and an assessment of each evaluation's quality can be found in the annex to this report. Those assessments also contain further details on the design and methods used and how the evaluation's conclusions were reached. Each country analysis also contains a table summarising the results of our evaluation synthesis for the country, with more details in the annex.

4.1 Germany

4.1.1 Access to finance: current situation

According to the European Commission's 2015 SAFE survey, only 7% of German SMEs perceive access to finance as their most important current problem, compared to 10% EU average. Moreover, according to the same survey, SMEs in Germany most often saw no obstacles to future financing. Finally, less SMEs reported to be innovative in Germany (49%), compared to the EU average (57%).[8]

According to Invest Europe, in 2015 there are 272 private equity (PE) firms headquartered in Germany, of which 138 are VC firms, 79 are buyout firms and 55 are generalist firms. In the same year, a total of 1,319 German companies received PE investment, out of which 146 portfolio companies received later stage venture funding and 418 received growth funding (Invest Europe, 2016). As far as divestments are concerned, a total of 942 German companies were exited in 2015 which marks a growth trend since 2008.

Germany is among the seven EU Member States that have introduced bespoke regulatory frameworks for crowdfunding activities, with requirements for issuers/borrowers, platforms and investors/lenders (European Commission 2016).

EIF financing for (innovative) companies in Germany[9]

The EIF is the major vehicle for distributing **EU level funding** to German companies. In 2015, the amount of EIF's **equity participations** in Germany was €278m (with expected mobilisation of €1.2bn of capital in total). EIF has committed resources into 12 German funds and in several pan-European equity funds which also invest in Germany. Four of the transactions also benefit from the support of the European Fund for Strategic Investments (EFSI), which is at the core of the Investment Plan for Europe.

On behalf of the German Federal Ministry of Economic Affairs and Energy (BMWi), EIF manages the €1bn ERP-EIF Dachfond (ERP) which is investing in venture capital funds mainly focusing on high-

[8] It should be noted that the SAFE survey covers all kinds of SMEs, most of which do not see access to finance as a great barrier because they do not plan to expand their business, have a reliable relationship with a bank lender that sufficiently covers their financing needs, etc. We therefore report data from SAFE specifically on gazelles for those countries where it is available, and in some instances also data on scale-up financing from other sources. We consider the general SAFE results nevertheless informative to get an impression of financing conditions for SMEs in general in each country we analyse.

[9] The information below is based on European Investment Fund 2016a

tech early and growth stage companies based in Germany. On behalf of LfA Förderbank Bayern (LfA), EIF manages the €150m LfA-EIF Dachfond (German for fund-of-funds), which is investing in VC funds supporting technology oriented early and development stage SMEs in Bavaria.

Additionally, EIF manages the European Angels Fund (EAF) Germany, together with the Business Angels Netzwerk Deutschland (BAND), a co-investment initiative funded by both the ERP-EIF and the LfA-EIF Dachfonds. By the end of 2015, EAF Germany has made more than 60 co-investments.

More recently, an initiative targeting **hybrid debt/equity** fund investments in Germany is the Mezzanine Dachfonds für Deutschland (MDD). MDD is a €200m fully invested programme managed and co-financed by EIF. Half of the funding was provided by BMWi, LfA and NRW.BANK. MDD has invested in 7 mezzanine funds and as of June 2015, 21 German companies have benefited from the facility's resources (€132m).

EIF also supports German SMEs through **loans and loan guarantees**. It has committed a total of €358m in 2015 expecting to enable SMEs to benefit from new loans totalling €2.7bn.

Under the Programme for the Competitiveness of Enterprises and SMEs (COSME), EIF signed portfolio guarantees with KfW Bankengruppe (KfW) to support start-ups and young companies with a total loan volume of €1.2bn (Unternehmerkredit Plus) and with all German Bürgschaftsbanken (Guarantee banks) for a counter-guarantee covering a portfolio of guarantees supporting loans to SMEs in the agricultural sector. Both transactions are also using the EFSI guarantee.

Under Horizon 2020, a guarantee and two counter-guarantee agreements were signed under the InnovFin SME Guarantee Facility with Deutsche Bank, Bürgschaftsbank Baden-Württemberg and L-Bank, making available €375m of new lending to innovative SMEs and small mid-caps.

4.1.2 Instruments to support access to finance in Germany

The table below presents the main sources of public funding for HGIE (more details in Annex 1)

Table 2. Schemes to support high-growth company scale-up in Germany

Capital type	Instrument type	Mode of public support		
		Public funding	**Facilitation**	**Regulation**
Equity	**Direct (public VC)***	ERP Start Fund; INVEST; Coparion; *Länder*-level funds*		INVEST
	Indirect (fund-of-funds)	EIF/ERP Fund-of-funds; ERP VC Funds Investments; ERP/EIF Growth Facility MDD Fund		
	Stock market-related			
	Equity guarantees/loans			
Debt	**Direct loans**	Innovation Loan (North Rhine-Westphalia); Unternehmerkredit Plus		
	Loan guarantees			
	Asset-based			
Both/other	**Accelerators**		German Accelerator	
	Crowdfunding			Regulatory framework introduced
Direct grants				

* Public funds that predominantly provide mezzanine capital are marked with an asterisk. Mezzanine capital provided through the support instruments type we analyse is usually legally classified as equity.

4.1.3 Evaluation synthesis of instruments in Germany

Table 3. Summary of the evaluation synthesis for Germany The overall score on "evaluation quality" is the score attained most frequently on the individual quality criteria.

Evaluated instrument	ERP Start Fund (federal)	Risk Capital Fund (Baden-Württemberg)	VC Technology Fund (Berlin)
Effectiveness assessment	Good	Unsatisfactory	Satisfactory
Main method used	Survey, quantitative panel analysis	Performance indicators, interviews	Performance indicators, survey, interviews
Evaluation quality	Good	Satisfactory	Satisfactory
Clarity of goals	*Good*	*Satisfactory*	*Good*
Design	*Good*	*Satisfactory*	*Satisfactory*
Methods	*Satisfactory*	*Unsatisfactory*	*Unsatisfactory*
Context analysis	*Good*	*Good*	*Satisfactory*
Transparency	*Good*	*Unsatisfactory*	*Satisfactory*
Quality of information sources	*Good*	*Satisfactory*	*Cannot be assessed*
Reliability and validity	*Satisfactory*	*Satisfactory*	*Satisfactory*
Systematic data review	*Satisfactory*	*Unsatisfactory*	*Unsatisfactory*
Clarity of conclusions	*Good*	*Satisfactory*	*Satisfactory*
Standing of evaluators	*Good*	*Good*	*Satisfactory*

ERP Start Fund (federal level)

The ERP Start Fund was evaluated in 2011 as part of a comprehensive evaluation of the programmes funded through the ERP special fund (Bøggild et al. 2011). This fund was established using the assets and capital earnings from the post-WWII European Recovery Programme allocation to Germany. It is used mainly for SME support and development cooperation.

At the time of evaluation, the Start Fund was predominantly investing in the sectors ICT (36%), system/process technology (31%), and biotech (25%). Average investment amounts were around €490,000; funding requests had until then not come close to the €3m maximum funding amount. This suggests that most funded firms were still in the early phases of scale-up, even if 53% of portfolio companies were older than 5 years.

The evaluation concludes that the ERP Start Fund has been effective and is attaining its objectives. The scheme seems successful in targeting the intended beneficiaries (small, young technology-oriented companies). Based on the interviews with beneficiary SMEs, Start Fund investments have on average created 8 new jobs and secured 10 existing ones per deal/company. Around three quarters of the surveyed beneficiaries expected their turnover and staff to increase in the following year.

The success rate for funding applications was 90%, which seems largely due to pre-selection of high-quality applicants by the private-sector lead investors that are necessary for applicants to receive ERP funding. Additionality of the instrument is high, as only 6% of successful applicants reported that they would have carried out the planned projects or business expansion on the same scale without the Start Fund investment. The interviewed experts and banks saw this percentage as somewhat too low, but agreed that even taking into account potential self-reporting bias, the Start Fund's additionality had been remarkable. The evaluation attributes this partly to the strict selection criteria and partly to the high risk of investing in such firms, implying that they would have found it very difficult to raise capital in another way). The default rate of 18% was much lower than that of average private VC investments in Germany (32%). However, since 89% of investments had not yet had an exit at the time of evaluation, this highly positive rate might go down in the future.

The panel and counterfactual analyses do not show differences between Start Fund-supported firms and the control group. Therefore, the impacts of the fund cannot be directly inferred from their results. To mention a few findings, the equity share of ERP-supported companies was eight percentage points higher than that of companies in the control group, and the number of their staff had grown by 9% between 2006 and 2010 as opposed to 4% in the control group.

Risk Capital Fund (Baden-Württemberg)

The Risk Capital Fund ("Risikokapitalfonds", RCF) was examined in 2013 in the context of an evaluation of the revolving financing instruments co-financed by ERDF in the programming period 2007-2013 (Bötel et al. 2013). The analysis of this specific instrument makes up only a small part of the evaluation.

Between 1995 and 2012, 130 companies received investments and there were 32 successful exits. The evaluation does not specify how it defines "successful" in this context. At the time of the evaluation, all investments had been during the seed and start-up phases and taken the form of

mezzanine capital. The fund had therefore not reached one type of its intended target beneficiaries, companies in the scale-up phase. According to the fund management interviews, the focus would move increasingly to standard equity financing in the following years, as start-ups in Baden-Württemberg were perceived as getting more open towards this type of financing. More recent information on whether this shift has been realised is not available. In terms of target sectors the RCF invested mainly in IT and medical technology.

Interviewees highlighted the value of combining financing from federal and state level public VC funds. This is firstly because it allows each participating fund to invest smaller amounts in individual firms and thus increase portfolio diversification (at a given total fund volume). Secondly, investment by both federal and state level funds gives beneficiary firms access to several and different networks of potential advisers, partners and investors.

VC Technology Fund (Berlin)

The results of business support by revolving ERDF co-funded instruments in Berlin were reviewed in-depth in 2013 in an evaluation on "finance instruments for innovation in Berlin" (Meyer et al. 2013). Three instruments were evaluated: the SME Fund (including the Berlin Capital Fund and the Berlin Mezzanine Fund), the VC Technology fund and the VC Creative Industries Fund. They were co-financed by the ERDF in the amount of €75 million.

The evaluation examines both the financial results of the funds and their "material" results and effects. For example, for the SME fund, not only the number of new enterprises but also of new jobs created (including for women and people of migration background) is examined in detail. The evaluation also looks at the innovativeness of the funded companies, i.e. introduction of new products to the market.

The results and effects of the funding from "Berlin Capital" are limited due to the low number of funded companies but there is evidence that the funded companies' capital base strengthened. However, the evaluation recognises that it is unknown to what extent other sources of finance which could also contribute to the aforementioned effect. (e.g. grants, guarantees) were used.

As far as the VC Technology Fund is concerned, the majority of the funds in terms of volume go to the start-up phase (61%) and only 12% go to the expansion phase. The majority of the funded companies are from the ICT sector (40%), followed by the Biotech sector (19%). The funds invested by private co-investors are considerable: about 7-8 euros of private funds per 1 euro of spent public funds were invested. Many of the private investors come from outside the Berlin region (81%). For most of the surveyed companies access to finance improved as a result of the measure (although more so in the case of the VC Creative Industries Fund). On a 1-6 scale (1 being very highly appreciated), the majority (about 80%) of the respondent companies gave the VC Technology Fund a score of 1 or 2. In terms of R&D activities of the funded companies, around 40% of them said that they introduced new or improved products or services to the market. This value is however only slightly higher than the German average (39%). The share of these products in the total sales of the companies is 67%, and thus quite high, for VC Technology Fund supported firms.

An evaluation of **INVEST** was due to be finalised in June 2016 but was not yet available at the time of writing.

4.2 Finland

4.2.1 Access to finance: current situation

According to the SAFE survey 2015[10] the proportion of SMEs that applied for **bank loans** but did not get the financing they planned for was the lowest in Finland (only 3%). Only 7% of the surveyed Finnish SMEs cite access to finance as the most important barrier which is below the EU average of 10% This low figure is confirmed by a survey[11] of the Confederation of Finnish Industries (June 2015) which indicates that only 7% of SMEs in Finland have had remarkable difficulties in access to finance and by the Business outlook barometer[12] (August 2015) which indicates that only 6% of industrial SMEs and 2% of service sector SMEs have difficulties in access to finance (CFI 2015a, 2015b). These figures indicate that access to finance is not a major problem in Finland in general. However, for the sample of European innovative companies participating in the SAFE survey, access to finance is a more pressing problem than for the non-innovative ones (11% vs 9% of the respondents). Also, access to finance seems to be among the most pressing problems for the sample of gazelles across the EU (14%). Limited risk-taking ability of investors, requirements of high return on invested capital, and the division of capital into a number of small domestic-focused investments are seen as restrictions to the availability of funding (Halme et al. 2016). Thus, access to finance is especially a challenge for companies aiming to grow by internationalisation.

European Investment Fund financing for (innovative) companies in Finland[13]

EIF's offering of **loan guarantee products** in Finland has until recently been limited to one intermediary, Finnvera, the national specialised financing company and the official export credit agency. However, in March 2016, Pohjola Bank (part of the OP Financial Group) and EIF signed a guarantee agreement covering a portfolio of new lending to SMEs and small mid-caps under the InnovFin SME Guarantee Facility. The agreement, which also benefits from EFSI support, will allow the OP Group and its 180 cooperative member banks to support innovative SMEs and small mid-caps with €150m of new lending (€75m committed amount from EIF).

From 2011 until March 2016 EIF committed €170m into 7 venture capital and **private equity** funds leveraging around €650m of investments to Finnish SMEs. In total, since it first started operating in Finland in 1999, EIF has invested into 24 equity funds managed by partners in Finland, with more than 240 Finnish SMEs receiving financing from EIF-backed funds (European Investment Fund 2016b).

The EIF has in recent years invested resources from the Competitiveness and Innovation Framework Programme (CIP) into 5 VC/PE funds[14]: Conor Technology Fund II, Inventure Funds I and II and Open Ocean Fund III, which target innovative ICT companies, and into Power Fund III to support SMEs in the cleantech sector. One of EIF's most recent investments (Open Ocean Fund IV) also benefits from the European Fund for Strategic Investments (EFSI).

[10] http://ec.europa.eu/growth/access-to-finance/data-surveys_en
[11] http://ek.fi/wp-content/uploads/PKyritysten_toimintaymparisto_kesakuu2015.pdf
[12] http://ek.fi/wp-content/uploads/SB-elo2015.pdf
[13] Source: http://www.eif.org/what_we_do/where/fi/index.htm (European Investment Fund 2016b)
[14] http://ec.europa.eu/growth/access-to-finance/cip-financial-instruments/index_en.htm

Private equity and venture capital in Finland

According to FVCA (Finnish Private Equity and Venture Capital Association) VC market statistics of the PE industry, VC investments in Finland were 0.06% of GDP (2014), which is the second highest value among European countries[15] but still very low compared with the leading R&I countries globally. According to Invest Europe (2016) all PE investments were 0.5% of GDP in 2015, higher than the EU average (0.28% of GDP). In 2015 there were 55 PE firms headquartered in Finland, of which 27 are VC firms, 13 are buyout firms and 15 are generalist firms. In the same year, a total of 229 Finnish companies received PE investment. However, out of those, only 37 portfolio companies received later stage venture funding and 25 received growth funding. As far as divestments are concerned, a total of 98 Finnish companies were exited in 2015 which marks a stagnating trend since 2009 when 93 firms were exited (Invest Europe, 2016). In sum, although yearly VC investments are relatively high, the consensus in Finland currently seems to be that the major challenges are more related to the later stage PE investments (FVCA 2014).

4.2.2 Instruments to support access to finance in Finland

Supporting the business environment of innovative high growth firms is a priority of research & innovation policy in Finland. Enhancing dynamism and structural change is seen as vital in a country where traditionally a few strong sectors and large companies are dominant. Guidelines by the Research and Innovation Council for 2015–2018 urge to strengthen the equity market for start-ups and growth enterprises by targeting public funding at start-up phase companies facing the greatest risks (RIC, Reformative Finland 2014). Despite cuts to public R&D funding, the new government programme aims to enhance access to funding (especially equity capital) and the risk-taking capacity of high-growth innovative firms.

[15] http://www.fvca.fi/files/920/Pa_a_omasijoittaminen_Suomessa_2014.pdf

Table 4. Schemes to support high-growth company scale-up in Finland

Capital type	Instrument type	Mode of public support		
		Public funding	**Facilitation**	**Regulation**
Equity	**Direct (public VC)***	Finnish Industry Investment		
	Indirect (fund-of-funds)	Tekes VC; VIGO; Finnish Industry Investment		
	Stock market-related			
	Equity guarantees/loans	YIC programme		
Debt	**Direct loans**	Finnvera		
	Loan guarantees	Finnvera		
	Asset-based			
Both/other	**Accelerators**	VIGO; YIC programme;	VIGO; YIC programme;	
	Crowdfunding			New legislation under preparation
Direct grants		YIC programme; GrowthTrack; Planning for Global Growth	YIC programme	

* Public funds that predominantly provide mezzanine capital are marked with an asterisk. Mezzanine capital provided through the support instruments type we analyse is usually legally classified as equity.

4.2.3 Evaluation synthesis of instruments in Finland

Table 5. Summary of the evaluation synthesis for Finland. The overall score on "evaluation quality" is the score attained most frequently on the individual quality criteria.

Evaluated instrument	Vigo accelerators	YIC programme	Finnish Industry Investment
Effectiveness assessment	Good	Good	Satisfactory
Main method used	Survey, interviews	Survey	Interviews, desk research
Evaluation quality	Satisfactory	Satisfactory	Good
Clarity of goals	*Good*	*Good*	*Good*
Design	*Satisfactory*	*Satisfactory*	*Satisfactory*
Methods	*Satisfactory*	*Satisfactory*	*Satisfactory*
Context analysis	*Good*	*Unsatisfactory*	*Good*
Transparency	*Satisfactory*	*Satisfactory*	*Good*
Quality of information sources	*Satisfactory*	*Satisfactory*	*Satisfactory*
Reliability and validity	*Good*	*Satisfactory*	*Satisfactory*
Systematic data review	*Unsatisfactory*	*Good*	*Unsatisfactory*
Clarity of conclusions	*Satisfactory*	*Good*	*Good*
Standing of evaluators	*Good*	*Good*	*Good*

Vigo accelerator programme

The Vigo programme essentially supports the creation of private accelerators through providing funding and coordination services for accelerators, and favoured treatment for Vigo accelerators' portfolio firms when they apply for other public support instruments (e.g. for the YIC programme). Supported accelerators not only have to provide managerial support, experience and expertise to client companies, but are also expected to take equity stakes in them (using their own funds) and to help them raise additional equity from other private investors.

One of the programme's objectives is to attract at least €200m of equity investments to companies within Vigo accelerators over its 6-year life (2009-2016). Related to this, the number of successful funding rounds per year in the range of €2m - €5m is to be increased from 2-4 to 10-20. Beyond those direct effects, Vigo accelerators' investment activities are supposed to foster a livelier and self-sustaining financing ecosystem for potential high-growth firms.

A mid-term evaluation of Vigo was carried out in late 2012 (Autio et al. 2013). By then, around €50m of public and €60m of private funds each had been invested into client companies. The programme seemed thus on course to achieve its €200m target. More specifically, Vigo accelerator firms attracted €21m from the YIC programme, €19m public R&D funding, and €7m from Finnvera. On the private side, accelerators' own investment stood at €7m, that of other private domestic investors at €21m and that of private international investors at €28m.

A survey carried out by the evaluators shows that 50% of respondent firms rated their access to finance after joining the programme as 6 or 7 on a 7-point scale (with 7 being "very easy"), while the highest ratings concerning the time before joining are 5. 61% of respondent firms received new VC investments during participation (13% did not seek new VC, so the effect might be even larger than at first sight). Moreover, whereas most client companies would have usually been able to attract funding anyway, participation in the programme enabled them to garner higher amounts of investment. In interviews with entrepreneurs and accelerator managers, better access to private funding was the programme's benefit most often mentioned: 68% (for domestic funding) and 60% (for international funding).

The evaluation does not provide information regarding to what extent the goal of 10-20 funding rounds of €2m - €5m has been (or is likely to be) achieved. Judging from individual funding round results and expert interviews, Vigo accelerators have been successful in improving the VC investment environment, but there is still a large potential for the market to grow. In this context the evaluation addresses the issue that if accelerators themselves take overly large stakes in portfolio firms, they risk crowding out private investment, either because remaining available stakes are too small for external private VC firms' business models or because entrepreneurs' own stakes become too small to appropriately incentivise their efforts. Vigo accelerators had an average share of 13% in their portfolio firms. Interviewees mostly agreed that accelerators' investment shares were small enough to avoid this risk, but stressed the need for continued attention to this issue. Finally, the evaluation notes that robustly assessing the sustainability of the programme's positive effects on the Finnish high-growth potential ecosystem is not yet possible at its current stage.

Young Innovative Companies (NIY) programme

An assessment of the impact of the Young Innovative Companies Programme (NIY) was carried out in 2013 by The Evidence Network (TEN) under contract from Tekes (The Evidence Network 2013). The results of this evaluation have also been analysed in Autio and Rannikko (2015). Although the NIY Program engages companies from a broad range of sectors, companies were most frequently in the ICT sector, representing 49% of participants. 43% of the surveyed companies had fewer than 10 employees, 41% reported their annual revenues to be less than 500k or that their company was pre-revenue, and 63% of companies allocated more than 30% of their total expenditure to R&D efforts.

The evaluation had three objectives, the results of which we summarise below.

Evaluation Goal 1: What are the results and outcomes of the NIY Program from the perspectives of firms themselves and innovation policy? The evaluation finds that the total NYI program funding provided to companies was the best predictor of impact on company performance related to growth. From the perspective of firms, the NIY Program is achieving results, consistent with its intent, in helping innovative Finnish companies grow in terms of annual revenues, export revenues, number of international customers, and number of employees. For the 108 companies that participated in the impact assessment survey, the NIY Program has contributed to an increase of approximatively 99.1 million in companies' revenues and 1172 jobs. 93% of companies attribute positive impact to the NIY Program on revenues or employment.

Evaluation Goal 2: What is the experience of participants of the NIY Program? What was its value added? How has the cooperation with networks, other participants and Tekes succeeded? How has Tekes funding helped firms to find private funding networks?

The experience of companies participating in the program is overwhelmingly positive. Participants indicate that in addition to the provision of funding, the value added component of the NIY Program is that it lends organisational and critical thinking capabilities to its participants.

Among all **direct impact** measures on companies' resources and capabilities, the NIY Program has the largest impact on improvements to companies' leadership or governance, business planning, selling into new markets and strategic knowledge. Lesser impact was found on companies' resources and capabilities related to raising capital and linkages to networks and other NIY participants.

The average direct impact on the resources and capabilities of companies was greater for respondents that received both funding and non-financial (e.g. mentoring, providing networking opportunities) support than those that received only funding. 67% of the companies received funding but no other non-financial support from the NIY program.

Among all **indirect impact** performance measures, the NIY Program has greatest impact on the acquisition of new international customers, change in employment and time to market. NIY funds were used to a higher degree to strengthen international sales networks and marketing, compared to funds from other sources. Overall, the tendency to attribute impact to the NIY Program increases as company performance increases, which could raise some concerns about a sort of confirmation bias among respondents – this should be borne in mind when interpreting the findings. It was found that years elapsed since the first participation in the NIY Program is a significant predictor of

company performance related to growth. Companies that have had more years elapsed since their first participation in the program, and are therefore slightly older and possibly larger, attribute greater impact to the NIY Program on their performance related to growth.

Evaluation Goal 3: What is the impact of the NIY Program vis-à-vis market failure and early stage funding in Finland?

The NIY Program is having impact on market failure and the lack of early stage funding in Finland. The financial and non-financial support provided by the NIY Program is important in mitigating market failure and stimulating innovation activity, leading to market investments that otherwise would not have been possible, which is enabling participant companies to survive the 'valley of death' and achieve performance in the innovation gap. This impact can be assessed by improvements in time to market, additional financing received and changes in innovation activities of the participating in the survey companies.

TEN recommends that Tekes ensures program participants not only understand the importance of leveraging NIY Program money, but that they also have the capabilities to do so. The NIY needs to continue providing introduction to private and public investors, locally and internationally and, if the mandate allows, provide all companies with assistance in creating investor pitches.

It was found that improvements to companies' strategic business knowledge and linkages and improvements to international marketing capabilities are significant predictors of company growth. Therefore, the NIY Program needs to continue offering support that leads to improvements in companies' strategic business knowledge and linkages, in particular through non-financial support related to the strategy, business planning, linkages and relationships, as well as information on selling into new markets.

To maximise the impact attributed to the NIY Program, TEN recommends that Tekes continue to focus on helping growing companies that invest more in research and development, as these companies attribute greater impact to the NIY Program on their performance.

Finnish Industry Investment Ltd

The evaluation (Saarikoski et al. 2014) assesses the Finnish Industry Investment (FII) activities as a part of the Finnish private equity system, FII investment decision-making and management model, and the governance of FII as a part of the Ministry of Employment and the Economy (MEE). The Ministry evaluated Tekes and Finnvera in 2012 and in the autumn of 2013 it commissioned an external international evaluation of the third funding organization under its guidance – FII.

According to the evaluation findings, Finland has developed a relatively well functioning later-stage private equity market but is lacking a well-functioning VC ecosystem. The country is found to have a funding gap in the €1-5 m investment range. Finland has an adequate number of venture initiatives but with much smaller resources per company compared to peer countries (Denmark, Sweden, UK, Germany, France, Netherlands, Norway, Switzerland, Israel, Singapore, USA) - less than half in early stage and two thirds in the growth stage. Finnish funds are smaller compared to peer countries and the VC system has a high public sector share of funding. The Finnish private equity exit markets lack liquidity compared to international peer markets both in terms of M&A and IPO volumes, especially for smaller companies. From the fund manager's perspective the Finnish investor base is very narrow and very local – with lower than average share of commitments from

international investors. Moreover, the evaluation claims that Finland lacks active private investors especially in the early stage. The problem is magnified by the fact that the majority of early-stage funding is pooled and distributed through the FII managed FoF Growth, effectively making FII a "gatekeeper" for new funds in Finland (based on interview comments, FII is regarded as a de-facto decision maker whether a new fund is launched or not).

The evaluation finds that the FII cost of impact has been low (compared to direct subsidies where all impact is achieved through substantial direct costs) and that FII has had a strong positive impact on the market development in the growth and buyout stages. FII has invested in the majority of the PE funds in Finland and based on interviews these investments have accelerated growth of funds and of target companies. On the other hand, the study points out that the FII has not yet been successful in building a functioning early-stage private equity financing market. FII has demonstrated almost the same results with both direct and indirect (fund) investments, with the performance of the former being slightly lower than the latter type of investment.

On the negative side, the FII's profit motive on portfolio level and the poor performance of the VC segment have made the FII risk averse and its investment capacity has not been fully utilised. The FII (and the public support system in general) has been found to have a relatively complex and fragmented structure and multidimensional target setting making the system difficult to govern.

All in all, the evaluation team perceives FII activities as professional and generally in line with prior target setting. Overall, FII is a well-functioning industry policy tool from a public sector perspective and a professional market-based investor from a market perspective. The evaluation also recommends certain modifications on the FII operating and governance model as well as on its market focus to better address the needs of the market in the future.

4.3 Lithuania

4.3.1 Access to finance: current situation

14% of Lithuanian SMEs consider access to finance as the most important barrier they are facing, according to the European Commission's 2015 SAFE survey (European Central Bank 2016).[16] This is above the EU average of 10%. The proportion of SMEs applying for bank loans in Lithuania (32%) is above the EU average of 28%. However, the percentage of Lithuanian SMEs which received the full amount of the bank loan they applied for is among the lowest in the EU (46% compared to 67% EU28 average). Finally, the share of gazelles among participating in the survey SMEs in Lithuania is the highest in Europe (10% vs 2% EU average).

According to Invest Europe (2016), the number of companies receiving private equity investment in Lithuania continued its upward trend to reach 35 in 2015, making it the third largest CEE country (after Poland and Hungary) by number of companies invested. In 2015, the total private equity investment in Lithuania was €49 m or 0.13% of GDP which is about twice lower than the EU average. As far as divestments are concerned, a total of 7 Lithuanian companies were exited in 2015 which marks an increase from 2014 (2 exits).

[16] http://ec.europa.eu/growth/access-to-finance/data-surveys/

European Investment Fund financing for (innovative) companies in Lithuania

Business access to venture capital markets has increased substantially in Lithuania during 2011-2014, largely due to EU funding instruments, mainly channelled through the European Investment Fund (EIF). To support entrepreneurship in Lithuania, the EIF has launched a broad spectrum of debt and equity finance instruments, primarily implemented under JEREMIE (Joint European Resources for Micro to Medium Enterprises). The EIF has launched a €170m Holding Fund under JEREMIE, using the EU Structural Funds allocated in the 2007-2013 Economic Growth Operational Programme, which provides loan and equity products to Lithuanian SMEs through several EIF partner banks and funds, acting as local financial intermediaries - Šiaulių bankas, Unicredit Leasing and Pohjola Bank (European Investment Fund 2013). At the end of 2012, the management of **debt and guarantee instruments** (until then under JEREMIE) was transferred to the national guarantee agency INVEGA which provides four types of funding instruments: micro-credits, open credit fund, risk-shared loans, and portfolio guarantees. Since 2016 INVEGA guarantees can also be provided to large enterprises, not just SMEs.

Finland's Pohjola bank (which changed its name in 2016 to "OP Corporate Bank") recently announced that during the next two years it will allocate at least €20m in the Baltic countries, including Lithuania, in the form of debt and guarantee instruments.[17] The funds will be allocated to innovative and high-growth small and medium-sized companies.

From early 2013, the EIF is managing a €67.1m JEREMIE Holding Fund which focuses exclusively on **equity investments**. Five equity transactions have been completed under the JEREMIE holding fund since its launch to fill the market financing gap for Lithuanian SMEs: a pilot scheme co-investing together with private business angels – Business Angel Fund I (which has financed 15 SMEs), and 4 venture capital funds: LitCapital I, Lithuanian SME Fund, Practica Venture Capital Fund and Practica Seed Capital Fund[18].

Another noteworthy initiative – the Baltic Innovation Fund (BIF) – was launched by the EIF in 2012, in cooperation with the governments of Lithuania, Latvia and Estonia, with the aim of boosting equity investments into **high-growth SMEs** located in the Baltic States. The BIF is the first European multi-country "fund-of-funds" created by the EIF. It represents a €52m investment by the EIF with each Baltic Government committing €26m through their respective national agencies (INVEGA in Lithuania).[19] Over the years 2013 -2016, the BIF started to invest €130m into private equity and venture capital funds with the aim of attracting additional funding from private investors. Under the BIF, three investments have already been approved: BPM Capital Mezzanine Fund, BaltCap Private Equity Fund II and Livonia Partners.

In sum, the key venture capital funds in Lithuania are currently dependent on EU investments (i.e. the JEREMIE umbrella). However, in 2014 a 100% privately-owned venture capital fund emerged – Nextury Ventures.

[17] http://www.baltic-course.com/eng/good_for_business/?doc=118762
[18] The Practica Venture Capital Fund is mandated to potentially provide follow-up investments for business ideas developed under the Seed Fund, but also invests into existing high-growth companies. Similarly, LitCapital I is aimed at long term investments in private enterprises seeking faster growth and expansion.
[19] http://www.eif.org/what_we_do/resources/BIF/

4.3.2 Instruments to support access to finance in Lithuania

There are no specific grant schemes targeting HGIE in Lithuania, although funding to support start-ups is available. The table below shows schemes that aim to support scaling up of new and/or small companies.

Table 6. Schemes to support high-growth company scale-up in Lithuania

Capital type	Instrument type	Mode of public support		
		Public funding	**Facilitation**	**Regulation**
Equity	**Direct (public VC)***	SME Fund; LitCapital I; Practica VC		
	Indirect (fund-of-funds)	Baltic Innovation Fund		
	Stock market-related			
	Equity guarantees/loans			
Debt	**Direct loans**	Invega		
	Loan guarantees	Invega		
	Asset-based			
Both/other	**Accelerators**			
	Crowdfunding			
Direct grants				

* Public funds that predominantly provide mezzanine capital are marked with an asterisk. Mezzanine capital provided through the support instruments type we analyse is usually legally classified as equity.

4.3.3 Evaluation synthesis of instruments in Lithuania

Table 7. Summary of the evaluation synthesis for Lithuania. The overall score on "evaluation quality" is the score attained most frequently on the individual quality criteria.

Evaluated instrument	Practica Venture Capital Fund, Lithuania SME Fund, LitCapital I, Risk-shared loans, Portfolio guarantees
Effectiveness assessment	Satisfactory
Main method used	Desk research, Performance indicators, survey
Evaluation quality	Satisfactory
Clarity of goals	*Good*
Design	*Satisfactory*
Methods	*Satisfactory*
Context analysis	*Satisfactory*
Transparency	*Unsatisfactory*
Quality of information sources	*Satisfactory*
Reliability and validity	*Unsatisfactory*
Systematic data review	*Unsatisfactory*
Clarity of conclusions	*Unsatisfactory*
Standing of evaluators	*Satisfactory*

Practica Venture Capital Fund, Lithuania SME Fund, LitCapital I, Risk-shared loans, Portfolio guarantees

These policy instruments have been evaluated in 2014 in a comprehensive evaluation of SME support measures which are funded or co-funded by EU Structural Funds (BGI Consulting 2014). Within this evaluation, several instruments are assessed, partly using different methodologies. A counterfactual analysis using propensity score matching was performed on four schemes, but none of the schemes relevant for HGIE access to finance was included in this exercise due to data availability. The analysis below refers to those parts of the evaluation assessing the six schemes listed above; we explicitly note instances where methodologies, data sources etc. differ between individual schemes.

The instruments were successful in attracting additional private funds, with an average leverage of 2.5 across all schemes co-funded by Structure Funds (CSIL et al. 2015). The highest leverage was observed for the Invega guarantee schemes. Guarantees facilitated the granting of loans in the amount of almost LTL 1.2 billion. As regards equity instruments, in the first year after the investment turnover and employment of participating firms increased by 42.9% and 11.7%, respectively, in the first year after the investment. Losses decreased substantially by 71% (presumably a framing in terms of losses instead of profits was chosen because many portfolio companies are young and thus not making profits yet). These are average figures for pooled data from all four schemes; a breakdown by scheme is not included in the evaluation. The interpretability of these figures is somewhat limited by several caveats concerning the research design (see the detailed assessment in Annex 2). In a case study on R&I support measures in Lithuania co-funded through Structural Funds, the investment ceiling imposed by the fund's statute was found to be a constraint for financing later investment rounds, as the capital needs of companies at those development stages often exceed the ceiling. This seems to have induced bias in the selection of portfolio companies, with an overrepresentation of firms from sectors that typically are less capital-intensive to scale up (e.g. ICT) (CSIL et al. 2015).

4.4. Poland

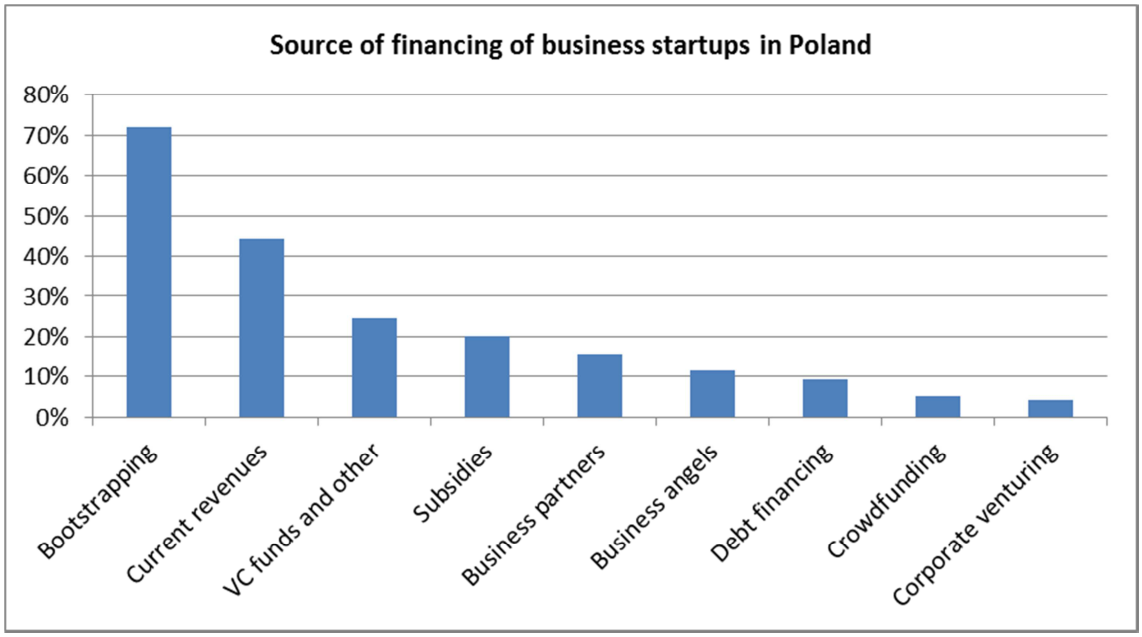
4.4.1 Access to finance: current situation

According to the European Commission's 2015 SAFE survey, only 8% of Polish SMEs perceive access to finance as their most important current problem, compared to 10% EU average (European Central Bank 2016).[20]

According to Invest Europe, Poland is the largest private equity market in Central and Eastern Europe, recording a significant increase in private equity investments in 2015 to €803m. It also remains the leading country in terms of number of companies invested, with 102 in 2015. However, only 6 Polish companies received later stage venture and 19 received growth funding. In 2015 there are 40 PE firms headquartered in Poland, of which 21 are VC firms, 14 are buyout firms and 5 are generalist firms. As far as divestments are concerned, a total of 43 Polish companies were exited in 2015 which marks a growth trend since 2009 when only 9 companies experienced an exit (Invest Europe 2015).

[20] This information is based on: http://ec.europa.eu/growth/access-to-finance/data-surveys/.

Figure 3. Sources of financing for business start-ups in Poland (based on Deloitte 2016, p. 78). Percentages do not add up to 100% since they are not based on funding volume and companies can list several sources



.EIF financing for (innovative) companies in Poland[21]

EIF investments in Poland cover the whole range of the **equity** spectrum. Recently, EIF has invested €13.5m into Equitin CEE Fund. EIF is managing the Polish Growth Fund of Funds (PGFF), a €90m fund-of-funds launched in 2013 in close cooperation with state-owned Bank Gospodarstwa Krajowego (BGK) to stimulate equity investments into growth-focussed enterprises. Locally, the initiative is named Polski Fundusz-funduszy Wzrostu (PFFW). PGFF combines a €30m commitment from EIF with €60m from BGK. Depending on performance and demand, additional commitments from EIF and BGK will be considered to maximise the impact of the initiative. Under PGFF, EIF committed €10m in Avallon MBO Fund II and €10m in 21 Concordia.

EIF also supports Polish SMEs through **guarantees and securitisation** transactions with Millennium Leasing, Raiffeisen-Leasing Polska and Raiffeisen Bank to support their risk-taking capacity. Under the EU Competitiveness and Innovation Programme (CIP), EIF`s financial partners include Europejski Fundusz Leasingowy (European Leasing Fund), Polski Fundusz Gwarancyjny (Polish Guarantee Fund), BNP Paribas Poland, Bank Pekao – UniCredit Group and Bank BPH – GE Capital Group, which provided so far a total volume of €499.7m of loans and leases to Polish SMEs. Under the Risk Sharing Initiative (RSI), agreements were signed with Deutsche Bank Poland, Bank Pekao and Raiffeisen-Leasing Polska mobilising over €185.2m of loans to innovative SMEs and Small Mid-Caps.

4.4.2 Instruments to support access to finance in Poland

The Polish innovation and SME policy mix includes a wide array of instruments from which young innovative companies can access. Many of these have a financing component and some explicitly target firms seeking to expand beyond the domestic market. The table below presents the main sources of public support for HGIE. Note that several of the instruments listed are part of the

[21] The information is based on http://www.eif.org/news_centre/publications/country-fact-sheets/poland.htm (European Investment Fund 2015).

Operational Programme of the 2014-2020 Structural Funds programming period and are not yet implemented (see Annex 1 for details).

Table 8. Schemes to support high-growth company scale-up in Poland

Capital type	Instrument type	Mode of public support		
		Public funding	**Facilitation**	**Regulation**
Equity	**Direct (public VC)***	BRIdge VC; PFR Ventures; Biznest		Act on Amendments of Some Acts
	Indirect (fund-of-funds)	KFK; PFFW; PFR Ventures; KOFFI	KFK	
	Stock market-related		Support for SMEs' access to capital markets	
	Equity guarantees/loans			
Debt	**Direct loans**			
	Loan guarantees	EIF Credit Guarantees; EIF Risk Sharing Initiative		
	Asset-based			Act on Amendments of Some Acts
Both/other	**Accelerators**	GO_GLOBAL.PL	GO_GLOBAL.PL	
	Crowdfunding			
Direct grants		Polish technological bridges	Polish technological bridges	

* Public funds that predominantly provide mezzanine capital are marked with an asterisk. Mezzanine capital provided through the support instruments type we analyse is usually legally classified as equity.

4.4.3 Evaluation synthesis of instruments in Poland

Table 9. Summary of the evaluation synthesis for Poland.

Evaluated instrument	EIF Credit guarantees	KFK National Capital Fund
Effectiveness assessment	Satisfactory overall; Unsatisfactory for Poland [a]	Unsatisfactory
Main method used	Panel analysis with counterfactual	Performance indicators
Evaluation quality [b]	Good	Cannot be assessed
Clarity of goals	*Good*	*Cannot be assessed*
Design	*Satisfactory*	*Cannot be assessed*
Methods	*Good*	*Cannot be assessed*
Context analysis	*Good*	*Cannot be assessed*
Transparency	*Good*	*Cannot be assessed*
Quality of information sources	*Good*	*Cannot be assessed*
Reliability and validity	*Good*	*Cannot be assessed*
Systematic data review	*Good*	*Cannot be assessed*
Clarity of conclusions	*Good*	*Cannot be assessed*
Standing of evaluators	*Satisfactory*	*Cannot be assessed*

[a] See summary on effectiveness assessment below for details.
[b] The overall score on "evaluation quality" is the score attained most frequently on the individual quality criteria.

EIF credit guarantees

EIF staff carried out a counterfactual analysis of the impact on beneficiary firms of the loan window of the EU SME Guarantee Facility (SMEG) in Central, Eastern and South-eastern Europe between 2003 and 2010 (Asdrubali and Signore 2015). Within this area, guarantees were concentrated (in terms of loan amount, number of deals, and firm employees) in Poland, the Czech Republic, Bulgaria, and Romania. Results are broken down by country and thus give relevant insights for the purpose of this study.

The analysis shows that credit guarantee beneficiaries increased their staff by 17% over the five years after signing the guarantee, compared to the control group (average across all countries in the dataset). This effect was even larger for smaller (< 50 employees) and younger (< 10 years) firms. Turnover increased by 19% within five years after guarantee signature, but a breakdown by country shows this effect to be driven almost entirely by Romanian and Czech firms. Profits seem not to have been affected (positively or negatively) by participating in the scheme.

The within-country estimations for Poland show no significant effect of participating in the guarantee scheme on employment and turnover. This may however be due to the comparatively small sub-sample (compared to those countries where significant effects are detected), which leads to rather high standard errors. The analysis and discussion of results by country is rather limited, so that more nuanced conclusions on the scheme's effectiveness in Poland cannot be made. Since this was not the focus of the study, however, the following quality assessment relates to the overall study unless explicitly stated otherwise.

KFK National Capital Fund

The assessment summarised below is part of an ex-ante evaluation of financial instruments in the 2014-2020 Structural Funds Operational Programme "Smart Growth" (WYG 2013). It contains

shorter analyses of various SF-related financial instruments active in the previous programming period, which cannot be considered fully-fledged evaluations. Furthermore, the different data sources used in the analysis and its presentation in connection with other financial instruments make it difficult to assess evaluation quality along our criteria. We thus limit ourselves to a summary of the scheme's performance assessment.

In late 2013 funds co-financed by KFK had invested PLN 194m (almost €50m) in 95 companies, which amounts to only 22% of the fund-of-fund's total capitalisation. Portfolio firms increased their staff on average by 7.5 persons between the (varying) deal date and 2013. 77% of portfolio companies were active in the ICT sectors. Compared to beneficiaries of other equity instruments, those companies tended to be more mature, which suggests some success in targeting scale-ups specifically. For 20% of portfolio companies, exports to foreign markets made up a significant share of their activity. KFK had only four exits, on three of which the fund lost invested capital. Since most investments were scheduled to run for several years after the study, this does not allow for a performance assessment of the scheme.

The study argues that KFK's low investment limits for each individual VC fund have often prevented the construction of sufficiently diversified portfolios at the level of the intermediary VC funds, which may partly explain the low success rate so far. On the other hand, an upward learning curve might be observable in the management's investment decisions, as deals in 2012 and 2013 resulted in better initial development of portfolio firms as in the preceding years. The assessment furthermore recommends that investments are withdrawn earlier from intermediary funds that exhibit continuously negative performance, and that the calculation of management fees should be revised to increase incentives for investing larger sums earlier during the period of KFK's involvement.

4.5 United Kingdom

4.5.1 Access to finance: current situation

According to the 2015 SAFE survey[22], 9% of UK Small and Medium Enterprises (SMEs) cite access to finance as their most important current problem, which is roughly on par with the EU-28 average of 10% (European Central Bank 2016). However, according to the UK Innovation Survey 2015 the highest self-reported barrier to innovation was availability of finance, which suggests that despite the range of programmes currently on offer in the UK (see next section) more could be done in this area (Department for Business, Innovation and Skills, 2016). Firms were also asked what public financial support they had received: only 7% of companies answered this question, with 4% stating they had received 'UK central government' funding while 3% reported receiving funding from 'UK local or regional authorities'. Of those who received 'UK central government' funding, 70% said they had benefited from indirect support while 34% reported receiving direct support.

An analysis of another survey, the UK Small Business Survey 2010 and 2012, shows that the most rapidly growing British SMEs tend to draw finance from banks, rather than raising equity finance (Brown and Lee 2014). High growth firms are also significantly more likely to apply for finance than other firms but are not more or less likely to find it hard to access finance than other firms. Last but not least, the research found many of the high growth firms draw on their own internal financial resources to fund their growth and are thus "reluctant borrowers".

[22] http://ec.europa.eu/growth/access-to-finance/data-surveys/

Private equity and venture capital in the UK

Britain has one of the largest and most successful venture industries in Europe. According to Invest Europe, in 2015 there are 416 PE firms headquartered in the UK, of which 144 are VC firms, 204 are buyout firms and 68 are generalist firms. According to recent academic research, the geography of venture capital in the United Kingdom has been shaped since the year 2000 by a significant increase in public sector venture capital funds (Mason and Pierrakis 2013). Venture capital investments are now less concentrated in the South East. However, investment activity in the Midlands and North is dominated by the public sector and deal sizes in these regions are small. Thus, venture capital, measured by the total amount invested, remains over-concentrated in London and the South East where private sector investors continue to dominate.

In 2015, a total of 509 British companies received PE investment, out of which 85 portfolio companies received later stage venture funding and 100 received growth funding (Invest Europe, 2016). As far as divestments are concerned, a total of 229 UK companies were exited in 2015 which marks a stable trend since 2009 (250 exits).

Alternative financing

The UK is among the seven EU Member States that have introduced bespoke regulatory frameworks for crowdfunding activities (both for investment-based crowdfunding and for lending-based crowdfunding), with requirements for issuers/borrowers, platforms and investors/lenders (European Commission 2016).[23] Donation-based crowd-funding is the fastest growing alternative finance model in the UK – growing 500% from 2014 to 2015, reaching £12m (c. €15m) (Cambridge Centre for Alternative Finance and NESTA, 2015)

EIF financing for (innovative) companies in the UK[24]

The European Investment Fund (EIF) is the main vehicle for the provision of **EU-level finance** to benefit SMEs across Europe. Its investments in the UK cover the full range of the equity spectrum, from technology transfer to mezzanine and lower-midmarket private equity funding. In the recent years EIF has also invested into a number of venture capital funds in the UK to support the commercialisation of research.

In 2015, EIF's **equity participations** in the UK amounted to €655.8m, which is expected to mobilise €2.87bn in capital. EIF invested into 2 co-investments and in 16 funds (out of which 11 are multi-country funds which are also investing outside the UK). Several of the transactions also benefit from the support of the European Fund for Strategic Investments (EFSI).

Among the range of resources managed by the EIF on behalf of third parties is the UK Future Technologies Fund (UK FTF), a technology focused fund-of-funds launched by EIF together with the UK Government in 2010. UK FTF invests into venture capital funds targeting ICT, life sciences and advanced manufacturing sectors, and by 2015 it is fully invested.

EIF has supported UK SMEs through a number of **guarantee and securitisation** transactions as well and in 2015 it signed five transactions totalling €280.3m.

[23] The other countries are Austria, Germany, Spain, France, Italy and Portugal.
[24] The text below is based on http://www.eif.org/news_centre/publications/country-fact-sheets/uk.htm (European Investment Fund 2016c).

In the framework of Horizon 2020, two guarantee agreements have been signed in 2015 under the InnovFin SME Guarantee Facility with Santander UK PLC and Barclays Bank PLC, making available to innovative SMEs and small mid-caps ca €274m (£200m) of new lending over 2015-2017. The transactions benefit also from the EFSI guarantee.

Under the EU Programme for Competitiveness of Enterprises and SMEs (COSME), EIF entered into guarantee agreements with EZBOB and Iwoca, UK based providers of business loans operating through online platforms. The agreement with Iwoca also benefits from the EFSI guarantee. The two agreements are expected to result in ca €103m (£80m) of additional lending to support over 5,000 small businesses in the UK.

4.5.2 Instruments to support access to finance in the UK

Supporting company scale-up is gaining policy attention in the UK as a way to address weak labour productivity, low growth and unemployment. Various factors have been shown to present a barrier to growth that could be addressed with minor policy or programme adjustments (Coutu 2016). Compared to performance in other EU countries, the UK has average-to-low levels of new-to-market innovations, and low numbers of innovative SMEs (ranking 23rd for SMEs introducing product or process innovations, European Commission 2015).

Table 10. Schemes to support high-growth company scale-up in the United Kingdom

Capital type	**Instrument type**	**Mode of public support**		
		Public funding	**Facilitation**	**Regulation**
Equity	**Direct (public VC)***	British business bank (BBB); Venture Capital Trusts; Business Angel Co-Investment Fund* (BBB)	British Business Bank	Venture Capital Trusts; Enterprise Investment Schemes
	Indirect (fund-of-funds)	Business Finance Partnerships		
	Stock market-related			
	Equity guarantees/loans			
Debt	**Direct loans**	Help to Grow (BBB)		
	Loan guarantees	Help to Grow (BBB)		
	Asset-based	ENABLE (BBB); Investment Programme		Business Finance Partnerships
Both/other	**Accelerators**	Growth Accelerator		
	Crowdfunding			Regulatory framework (investment and lending)
Direct grants				

* Public funds that predominantly provide mezzanine capital are marked with an asterisk. Mezzanine capital provided through the support instruments type we analyse is usually legally classified as equity.

4.5.3 Evaluation synthesis of instruments in the United Kingdom

The Government adopts an open approach to the publication of the majority of its evaluation activities. Many government-commissioned evaluations are available on the Inside Government website, while HM Treasury produces guidelines on evaluation and assessment practice across Government, for example in its Green Book (H.M. Treasury 2013).

Table 11. Summary of the evaluation synthesis for the UK.

Evaluated instrument	Venture Capital Trusts; Enterprise Investment Scheme	Growth Accelerator	Enterprise Capital Funds
Effectiveness assessment	Satisfactory	Good	Good
Main method used	Quantitative panel analysis	Survey, interviews	Survey, interviews, performance indicators
Evaluation quality	Satisfactory	Satisfactory	Good
Clarity of goals	*Good*	*Good*	*Good*
Design	*Satisfactory*	*Satisfactory*	*Good*
Methods	*Satisfactory*	*Satisfactory*	*Satisfactory*
Context analysis	*Unsatisfactory*	*Satisfactory*	*Satisfactory*
Transparency	*Good*	*Good*	*Good*
Quality of information sources	*Satisfactory*	*Satisfactory*	*Satisfactory*
Reliability and validity	*Satisfactory*	*Unsatisfactory*	*Satisfactory*
Systematic data review	*Satisfactory*	*Satisfactory*	*Good*
Clarity of conclusions	*Satisfactory*	*Satisfactory*	*Good*
Standing of evaluators	*Good*	*Satisfactory*	*Good*

The overall score on "evaluation quality" is the score attained most frequently on the individual quality criteria.

Venture Capital Trusts* and *Enterprise Investment Scheme

VCT and EIS were evaluated together in 2008 using panel data that included also unsupported companies (Cowling et al. 2008). The overall conclusion was that both instruments had positive but very small effects. The evaluation examines the schemes' effect on an array of outcome variables, the most important ones being the following:

- Gross profits: VCT did not have a significant effect on supported companies' gross profits. The effect found for EIS is not robust against different model specifications.
- Sales turnover: Both VCT and EIS had a significant positive effect, which was however minuscule: regression coefficients for VCT and EIS investment sums were $8.6e^{-8}$ and $4.8e^{-8}$, respectively.
- Fixed asset (=physical capital) formation: both VCT and EIS increase the formation of physical capital in the two years after investment. Effects are extremely small however, with coefficients of 0.00000015 for EIS and 0.00000013 for VCT.
- Additional private investment: None of the instruments had an effect on other private investment apart from those through VCT and EIS. This finding is however not very robust due to many missing values in the data on private investment.
- Job creation: Again, both schemes have significant but very small effects on job creation (regression coefficients for investment sums: $2.0e^{-7}$ for EIS and $3.0e^{-7}$ for VCT).

Given the consistently very small size of estimated effects, the conclusions of the evaluation even seem to overplay the impact of the two schemes. As Gill and Parnell (2014) point out, the

instruments at least sustained some degree of private venture capital investment into innovative young companies after the dotcom bubble had burst. However, given that even statistically significant differences between supported and unsupported companies are so small that they are economically negligible, it is doubtful whether these investments would not have occurred without the schemes.

Growth Accelerator

Growth Accelerator was evaluated by two interim evaluations in late 2014 (Department for Business, Innovation and Skills 2014; Braidford et al. 2014), one based on a survey of beneficiary companies, the other based on interviews with beneficiary representatives, investors, and accelerator managers, and other stakeholders (e.g. local authorities, chambers of commerce). Given that the programme was running for less than 2 years at the time of evaluation, the findings cannot be expected to provide a robust effectiveness assessment.

In the survey, 94% of beneficiary companies reported that they were more likely to grow in the future than before the programme. 52% said their ability to attract external finance had improved. 62% said the programme had developed their financial management skills. Both are important points as the instrument had a strong focus on finance-related capacity and network building. In the separate interviews the positive effect on capacity, in particular regarding pitching towards investors, were confirmed. Of the firms that participated in the special access to finance arm of the programme, 27% subsequently applied for external finance with a success rate of 87% (compared to 71% for beneficiary companies who had applied for finance before entering the programme). Investors in the accelerator, who were also surveyed, responded ambiguously: 87% recommended Growth Accelerator as a source for investment target, but at the same time, 81% found Growth Accelerator companies to be "similar or worse" investment opportunities than their other options. In the separate interviews, investors said that the matchmaking done by accelerator coaches and managers had been somewhat erratic at the start of the programme but improved noticeably during its duration.

The instrument's economic impact is assessed using expectations reported in the survey. Firms were asked to estimate their growth prospects for the coming three years (in terms of turnover and employment), and what share of this growth they ascribed to participation in the Growth Accelerator (see below for a quality assessment of this design). According to this exercise, firms were expected to create on average 6 new jobs because of the programme during the following 5 years. Supported firms were expected to generate an additional £1.7m turnover on average due to the programme in the following five years.

Enterprise Capital Funds

The ECF scheme was evaluated in 2014 and the evaluation subsequently published as a scientific journal article (Baldock 2016), on which this summary is based. Since most investments had not experienced an exit yet in 2014, this has to be seen as an interim evaluation.

The evaluation judged the ECF relatively successful in providing additional funding for young innovative firms with high-growth potential. The ratio of public to private funding in ECFs was 1:1 on average (although ECFs are not required to leverage additional private funding). Fund managers interviewed considered that beneficiary companies would mostly not have been able to raise the funds received through ECFs from other sources, putting the average estimated crowding-out share

at only 2%. The largest sectors represented in the survey were technology/telecoms (30%) and industrial activities (24%).

Funded companies recorded an average employment increase of 85% from the time of investment until 2014 (138% for firms that received investment after the onset of the financial crisis)[25]. Sales turnover increased by 170% (64% for the post-crisis subsample). Thus, while the crisis seems to have affected turnover of funded companies negatively, the scheme might have been able to mitigate the crisis' employment effects to some extent – also the author cautions that the higher relative employment creation of firms funded post-crisis could also be an artefact of their smaller average initial size. 41% of firms expected an increase in staff in the year following the survey and 55% and increase in turnover. 93% had introduced product or process innovations. A "control group" of firms that initially applied for, but did not receive funding, reported only 22% staff and 43% turnover increase (see *Design* below regarding explanatory power of this part of the analysis).

Fund managers interviewed said that ECF investments had the greatest effect for those beneficiary companies that also benefitted from other (public or private) support instruments like accelerators or coaching. Many furthermore stressed that supply of later-stage scale-up finance (mostly B- and C-rounds) often remained a bottleneck for their portfolio companies.

[25] This figure refers to companies still in the programme at the time of evaluation. Exits and failed firms are excluded, but both together represent only around 10% of the population.

5. Discussion of instrument analysis results

In this section we summarise and discuss our findings from the policy analysis of support instruments in Germany, Finland, Lithuania, Poland and the United Kingdom. We first compare the mix of instruments in each country, and then discuss the implementation and impact of similar types of instruments in different countries.

5.1 Comparing countries' mix of instruments

Table 12 gives an overview of the policy mix in the five countries according to instrument types and enables a comparison of the relative emphasis on each instrument type by showing aggregate funding volumes. In the case of Poland, the table may somewhat overstate the amount of funding available, as several of the instruments which make up the sums are part of the Operational Programme of the 2014-2020 Structural Funds programming period and are not yet implemented. Whereas Lithuania provides only direct public VC and loan guarantees to support young innovative companies' access to finance, the policy mix of the other four countries is more diversified. Germany and Poland rely to a larger extent on equity (as opposed to debt) schemes than Finland and the UK. Germany in particular only employs one relatively small direct loan programme to support innovative scale-ups (although the country's public promotional bank runs a few very general loan and loan guarantee schemes to support SMEs, from which HGIE may also benefit). In contrast, the other four countries provide debt-based financing instruments for young innovative companies predominantly in the form of loan guarantees. While those guarantee schemes explicitly target growth or expansion of young and small companies, innovativeness or innovation activities are only ancillary criteria for applicant selection. The sums shown in the table may therefore somewhat overstate the extent to which these guarantees support HGIE as opposed to HGF in general. On the equity side, Germany, Finland and Poland put the emphasis on fund-of-funds. The German and Polish fund-of-funds are mostly co-financed by the EIF (which never invests directly in companies) or Structural Funds. Lithuania and the United Kingdom do not use dedicated fund-of-funds to support fast growth of young innovative companies. The UK is the only country where tax incentives play a large role – indeed, the most prominent one – in the access-to-finance policy mix. Germany and Poland also grant tax exemptions for VC capital gains, but these do not constitute the main aspect of the support instrument (in Germany) or take effect only in the fiscal year starting in 2016, so the magnitude of their effect cannot be assessed yet (in Poland). Their share in the policy mix looks thus likely to remain limited at least in the short term; although no estimates on forgone tax revenue due to these measures is available. Finally, the table shows that volumes of support for accelerators differ strongly between Germany, Finland and the UK. This is due to the number of accelerators supported, which is much higher in the UK than in Finland, but also than in Germany whose economy is significantly larger than the UK's. However, also the kind of support provided differs: Finland co-finances accelerators' investment stakes in portfolio companies, whereas Germany supports only operational costs.

Table 12. Instrument mix to support young innovative companies' access to finance by type of instrument and aggregated funding volume. The German *Länder*-level instruments analysed in Section 4.1 are not taken into account here.

Capital type	Instrument type	Sum of instrument volumes (€ million)				
		DE	FI	LT	PL	UK (£m)
Equity	Direct (public VC)	806	169	60	283	803
	Indirect (fund-of-funds)	2,600	719	43 [d]	1,028 [e]	
	Equity guarantees/loans					
Debt	Loan guarantees		2,258 [b]	126	265	1,120 [g]
	Asset-based					602
	Direct loans	48	134 [c]			n/a
Direct grants					48	
Other	Tax incentives	n/a [a]			n/a [f]	3,935
	Accelerators	3	83		10	200

[a] Capital gains from the investment shares contributed through INVEST are tax exempt. No estimate on forgone tax revenue is available.
[b] Includes all Finnvera guarantees, not only specifically for scale-up
[c] The Young Innovative Companies programme is provides an integrated mixture of loans and grants.
[d] Sum assumes equal distribution of EIF's contribution to Baltic Innovation Fund across Baltic countries.
[e] Includes PFR Ventures created in 2016, which will also be able to invest directly in individual companies.
[f] Capital gains from venture capital investments in innovative start-ups in 2016 and 2017 are tax exempt. No estimate on forgone tax revenue is available.
[g] Includes Business Finance Partnership (support to "challenger banks" with a volume of £920m).

Germany

Among policy schemes explicitly targeting young innovative firms with growth potential, Germany relies strongly on equity instruments (or on the regional level mezzanine capital funds). These are however embedded in a well-developed and historically rooted system of loan guarantee schemes that are administered by the national promotional bank KfW. While being open for most types of SMEs, potential HGIE are among the natural beneficiaries of such schemes. On the federal level, the combined volume of fund-of-funds instruments is about three times that of direct public VC instruments. On the *Länder*-level, direct public VC seems to be the more prevalent option. An explanation may be that subnational administrations perceive themselves as closer to individual companies in the region, and in consequence direct portfolio selection by public fund managers to be easier. Compared to the size of these financial instruments, direct loans or grants targeting (potential) HGIE play a smaller role. The same is true for public support of accelerators. Furthermore, Germany has only to a limited extent experimented with tax incentives, which are essentially confined to business angels' capital gains under the INVEST scheme.

Finland

Finland uses both direct public VC and fund-of-funds instruments on the equity side. On the debt side, an array of loan guarantee schemes exists, some of which are strongly geared towards promoting the growth of innovative companies. Finland also provides public support of (predominantly privately set-up) accelerators, according to the evaluations summarised previously, contributed to their effectiveness. Moreover, Finland is the only country that directly and explicitly targets young innovative companies with growth potential through a programme that brings together debt, equity, and coaching support. Finally, some direct loans and grants specifically support the internationalisation of SMEs.

Lithuania

Lithuania is the only country in our analysis whose instrument mix is weakly diversified, even if it does use both debt and equity instruments. Part of the reason is certainly the young age of the R&I system compared to the other countries. All financial instruments, and thus also those that focus on supporting the emergence of HGIE, are heavily co-financed by EU Structural Funds. Given the relatively high potential volumes which loan guarantee schemes or public VC funds need for a minimum degree of effectiveness, such high shares of co-funding seem essential for small new Member States. Whereas the Lithuanian public VC funds seem to have facilitated the emergence of private VC in the country, rather than crowding it out. Since several funds exist which are very similar in all aspects, Further analysis should look into potential implications of this fragmentation of direct public VC instruments.

Poland

Poland has again a very diverse array of young innovative companies support schemes, although several of the instruments listed are part of the Operational Programme of the 2014-2020 Structural Funds programming period and have not yet been implemented. Loan guarantees predominantly funded by Structural Funds through the EIF, play a relatively less important role than equity instruments. Not all of them however explicitly target young innovative firms. Several equity schemes exist that invest both directly in companies and in private VC funds. Most of them are still young and have not yet seen many exits from their investments, whether successful or not. Like in Finland, some direct loan and grant schemes aim to support international expansion of SMEs. Poland has started granting tax incentives for some VC investments from 2016 onwards. New legislation facilitating the transfer of IP to start-ups may also improve access to finance for young innovative firms, since intangible assets can act as a positive signal for equity investors or serve as debt collateral. As the only one among the five countries analysed, Poland plans to subsidise SMEs' purchase of auditing and advisory services for issuing stocks or bonds.

United Kingdom

The United Kingdom does provide public VC - more often in the form of mezzanine capital than standard equity - to young innovative companies through various schemes, which since 2013 have progressively been integrated into the British Business Bank. Compared to the other four countries however, the UK places a strong emphasis on improving the supply of private VC through two tax incentive schemes. One (the Enterprise Investment Scheme) grants tax relief for capital gains from individual investors' direct investments in innovative SMEs, the other one (Venture Capital Trusts) for gains from investments via specific trust funds. Having undergone a number of reforms, this type of instruments has a decade-long tradition in the country's industrial and innovation policy. The British Business Bank also provides loan guarantees and (relatively few) direct loans, which aim to support young firms' expansion. Furthermore, accelerator programmes have received significant public funding. Uniquely among the five countries, in two support schemes the UK is exploring securitisation of more unconventional assets (e.g. production and intangible assets, invoices) to increase access to finance.

5.2 Comparing relative effectiveness of instrument types

Evaluations or other analytical assessments are available only for relatively few of those support schemes we identified as relevant for HGIE emergence. Partly, this is because many of those

schemes are quite new and not enough data has been generated to analyse their effectiveness or impact.

In our country sample, the availability of evaluations by country does not correlate with the degree to which a policy evaluation culture has developed in a country. Neither does the quality of evaluations differ noticeably across the five countries, although this impression cannot be generalised based on just 12 evaluations which we have identified in total. Moreover, from our data search it appears that assessments of financial instruments (in particular loan guarantees, public VC, and fund-of-funds) often focus on the performance of the instrument itself and rarely attempt to assess the economic impact of the support scheme on beneficiary companies. Table 13 summarises our evaluation synthesis results from Sections 4.1-4.5.

Table 13. Instrument effectiveness according to evaluation, assessment of evaluation quality, and main evaluation methods used by country and support instrument.

	Evaluated instrument	Instrument effectiveness	Evaluation quality	Main methods used
Germany	ERP Start Fund	Good	Good	Survey, quantitative panel analysis
	Risk Capital Fund	Unsatisfactory	Satisfactory	Performance indicators, interviews
	VC Technology Fund	Satisfactory	Satisfactory	Performance indicators, survey, interviews
Finland	Vigo accelerators	Good	Satisfactory	Survey, interviews
	Young Innovative Companies programme	Good	Satisfactory	Survey
	Finnish Industry Investment	Satisfactory	Good	Interviews, desk research
Lithuania	Practica Venture Capital Fund, Lithuania SME Fund, LitCapital I, Risk-shared loans, Portfolio guarantees	Satisfactory	Satisfactory	Desk research, Performance indicators, survey
Poland	EIF Credit guarantees	Unsatisfactory	Good	Panel analysis with counterfactual
	KFK National Capital Fund	Unsatisfactory	Cannot be assessed	Performance indicators
UK	Venture Capital Trusts; Enterprise Investment Scheme	Satisfactory	Satisfactory	Quantitative panel analysis
	Growth Accelerator	Good	Satisfactory	Survey, interviews
	Enterprise Capital Funds	Good	Good	Survey, interviews, performance indicators

A comprehensive comparison of instruments' relative effectiveness across countries based on existing evaluations is thus not possible.[26] In this discussion, we concentrate on evaluations of direct public VC schemes, because those exist for schemes in four of our countries. We also briefly discuss evaluation results of loan guarantees, tax incentives, and accelerator support.

[26] Furthermore, we would like to stress that our assessment of evaluations' quality in this paper does not permit any inference on the quality of policy evaluation in general, or the performance of the evaluation system, in each of the five countries. The evaluations we have analysed are few, pertain to a very specific policy area, and cannot be considered representative for a country's evaluation system as a whole.

Table 14. Overview: availability of instruments by country

	DE	FI	LT	PL	UK
Public VC			EU funded	EU funded	
Fund-of-funds	Yes	Yes	Yes	Yes	-
Loan guarantees	Yes	Yes	Yes	Yes	Yes
Loan &/or grant	Yes	Yes	EU funded	EU funded	Yes
Tax incentive	-	-	-	-	Yes
Accelerator	Yes	Yes	-	Yes	Yes
Crowdfunding Framework	Yes	Forthcoming	-	-	Yes

Direct public venture capital

Whereas the majority of public VC funds aims to support start-ups in their early stages, the instruments we identified explicitly target more developed firms in the scale-up stage as well (or sometimes exclusively). However, in the portfolios of those that support both stages, scale-ups represent a minor share. It is unclear whether this results from a shortage of good investment opportunities, too risk-averse portfolio management, or fund sizes that are too small to cater to scale-ups' funding needs. The evaluations we have analysed in this study sometimes note this as an issue (e.g. when discussing the extent of policy goal achievement), but do not attempt to provide an explanation. Nevertheless, studies on the financing context in Finland and the UK establish a clear gap in funding at the scale-up stage – between the start-up phase well-supported by public programmes and the pre-IPO/merger phase where private VC funds are strongly engaged since expected returns for investments in this phase are high (Gill and Parnell 2014; Saarikoski et al. 2014). That financial support instruments often seem to fail in narrowing this gap is thus an important shortcoming.

Investments are heavily concentrated in certain sectors: ICT, and to a lesser extent in advanced production technologies, biotech/pharma, and healthcare. Such "herding" of investors into a few preferred target sectors is also commonly observed in private VC companies. Evidence is inconclusive on whether this is a rational behaviour (because those sectors have the best growth prospects and yield the highest expected returns) or whether other incentives for fund managers play a role (going with the crowd may be perceived as less risky; e.g. Khanna and Matthews 2011). More research looking specifically at incentive structures for public VC fund managers is needed on this topic. Almost all public VC funds require a private co-investor for their deals, with 50% or less being the maximum public investment. There are no such requirements for the JEREMIE-supported funds in Lithuania (probably due to the still-weak VC industry in the country), and for the VC Catalyst Fund in the UK. The latter is run by a commercial subsidiary of the British Business Bank operating on market terms and can thus be considered "more private" than other public schemes. Deal sizes are by far the biggest in the UK, probably reflecting that VC in this country is more developed as a financing source and more established in financing culture than anywhere else in the EU.

In Poland and Lithuania, EU Structural Funds contribute substantial portions to public VC funds' capitalisation volumes. However, our analysis of *Länder*-run public VC in Germany suggests that on the regional level this is also the case in high-income Member States. Besides providing equity, many such funds also offer mezzanine capital. For most regional German funds, this seems to be the preferred type of capital investment. Advantages for both sides include more predictable

financial flows, as dividends and exit profits are fixed within narrow bands. Furthermore, mezzanine investment do not give investors as much influence on company strategy, preserving companies' independence from external shareholders, and potential losses for the public investor can be capped to a larger degree than with standard equity. The latter may be a reason why German states, with generally tighter budget constraints than the federal government, prefer mezzanine investments.

The evaluations of public VC funds show generally positive results, although the meaningfulness of results is constrained by the young age of most instruments, which have not yet recorded many exits. The ERP Start Fund in Germany is estimated to have created 8 new jobs per beneficiary firm, which is a higher staff growth than observed in the control group. Its financing additionality was put at above 90%. Even if there are reasons to view this estimate as somewhat optimistic, it suggests that crowding-out of private investment through the fund was minimal. Regional funds in Baden-Württemberg and Berlin were also found to have had positive effects on turnover and staff growth. The direct deals of Finnish Industry Investment also had a positive impact on company growth. Moreover, in contrast to the German instruments, they were more successful in targeting scaling-up companies as opposed to start-ups. However, a focus on financial performance may have reduced fund managers' risk appetite and thus compromised both additionality and the policy objective to some extent. The JEREMIE-supported VC funds in Lithuania increased turnover by 43% and employment by 12%, and seem to have facilitated the development of a nascent private VC market rather than crowding it out. However, low individual investment ceilings led to a certain bias with the funds disproportionately supporting firms in less capital-intensive sectors. The UK's Enterprise Capital Funds led to a growth in beneficiary firms' employment and turnover that was 63 and 95 percentage points, respectively, higher than in the control group of unsuccessful applicant firms. The evaluation puts the estimated crowding-out rate at only 2%. In sum, public VC funds seem to be effective and cost-efficient instruments to raise young companies' turnover and employment growth. Nevertheless, it appears more difficult for them to fully meet their policy target in terms of sectors and types of companies they are intended to support. Several evaluations found that firms benefit the most if the scheme offers complementary coaching and advice.

Fund-of-funds

Finland, Germany and Poland have established fund-of-funds instruments on a larger scale, with the former having the most advanced and longest-running schemes. In Lithuania, the transnational Baltic Innovation Fund is active. Some public VC funds in the UK can also invest in private funds, but such activities appear to make up a smaller share of their portfolios. Governments' reasons for preferring either direct or indirect equity support are difficult to discern. Most fund-of-funds seem to pursue the same broad strategic policy objectives than direct public VC funds. Instead of direct portfolio selection, they try to achieve this through criteria for selecting their target funds and conditions for specific participation deals. One rationale may be that especially for high-volume, non-specialised national funds, average returns are likely to be higher when investments are diversified across multiple private funds, whose portfolio managers are more experienced in selecting promising companies in their specific field. This should also increase policy effectiveness in terms of economic impact on young innovative companies.

Apart from an evaluation of Finnish Industry Investment, which also includes indirect VC support, we were unable to identify evaluations that analyse instruments of a fund-of-funds type, except a cursory assessment of Poland's KFK National Capital Fund. This prevents a cross-country discussion

of such instruments' effectiveness and a comparison with directly-investing public venture capital funds.

Loan guarantees

Loan guarantees are extensively used by all five countries to improve access to finance for growing innovative firms, even if those instruments are usually conceived broadly as SME support and are not specifically designed to foster the emergence of HGIE. However, loan guarantees have a lower relative importance than equity instruments. The terms and conditions of these guarantees are fairly similar across countries, but tend to reflect the financing conditions on national debt markets. The schemes differ in their choice of financial intermediaries. In Germany almost all guarantees are administered through the public promotional bank KfW, which in turn normally works through private banks as second-order intermediaries. This is also the case with Finland's Finnvera. In Lithuania and Poland, a substantial share of loan guarantee commitments derives from EU Structural Funds and is mostly managed by the EIF and channelled through large private banks; a process which is usually governed by specific individual agreements.

Evaluations of loan guarantees are available only for Lithuania and Poland. Since the respective instruments are co-financed by Structural Funds, regular evaluation is an external requirement. Whereas the Invega administered programmes in Lithuania exhibited a high leverage, there is no information on the characteristics of beneficiary firms or their economic development after receiving the loans. The counterfactual analysis of the SME Guarantee Facility's impact on companies does not find a significant effect of programme participation for Polish firms.

Direct loans and grants

Direct loans or grants to companies to support their scale-up efforts exist in all five countries except Lithuania. Both the total volume of the schemes and the funds disbursed to individual firms are considerably lower than in the case of financial instruments. The most common objective of direct support schemes targeting prospective HGIE seems to be to facilitate the expansion of firms' activities beyond the domestic market by financing initial costs of such a move, rather than lowering the wider business risk associated with internationalisation projects.

Finland's Young Innovative Companies programme is the only instance where direct loans or grants to support HGIE have been evaluated. This programme, which combines loans, grants, coaching and networking support in a specific way, was judged very effective in enabling young innovative companies to grow (cf. Section 4.2.3).

Tax incentives

Tax incentives for equity investments in young innovative companies have been explored to a very limited extent in our country sample, except in the United Kingdom. In 2013 Germany introduced partial tax deductions for capital gains of individual business angels participating in the co-funding instrument INVEST. Poland introduced tax reliefs for investments in innovative start-ups in 2016. In contrast, the UK has a long-standing tradition of tax reliefs for funds and individual investors that invest in SMEs, young innovative companies, or start-ups. Whereas in the other two countries, tax incentives are (at least for the time being) a minor aspect of the policy mix to support the emergence of HGIE, in the UK they seem to have long been viewed as an important tool

complementary to public VC schemes in achieving the goal of creating and sustaining a thriving private VC ecosystem.

As to what extent this goal has been achieved – or, put differently, in how far those tax incentive schemes have contributed to the emergence of the UK's thriving VC market – the findings have been inconclusive (e.g. Da Rin et al. 2006; Mason 2009). In terms of policy evaluation, the UK's previous tax incentive schemes for investments in young innovative companies (or respective private investment funds) had been judged to be of limited effectiveness, which led to several reforms in the programmes' rules and structures. Nevertheless, the 2008 evaluation of Venture Capital Trusts and the Enterprise Investment Scheme again estimates effect sizes to be economically extremely small, if statistically significant. Perhaps partly for that reason, the design of new policies in the past few years has concentrated on the establishment of other types of instruments, notably public VC programmes run by the British Business Bank, as well as loan guarantee and asset-based debt-financing schemes. Regarding the potential of tax incentives in other countries, our data do not permit extending these findings beyond the British case without further analysis of the underlying causes for this one scheme's low impact.

Accelerator support

Public support for private accelerators exists in all five countries but Lithuania. This type of instrument takes on very heterogeneous forms. Sometimes public funds merely subsidise private accelerators' operational costs, but in other cases governments get more involved by providing professional advice to accelerator management or issuing guidelines for accelerator portfolio selection and services. In the case of VIGO in Finland, the essential aspects of the programme are determined by the government innovation agency and only the operation of individual accelerators is contracted out to private management teams. In this scheme, public support involves also accelerators' financial stakes in their portfolio firms.

The evaluations of Finnish and UK accelerator support programmes show strong growth effects on accelerators' portfolio firms and indicate a positive impact on the development of national ecosystems' capacity to enable young innovative companies' growth. While direct effects are small seen from a macroeconomic perspective (due to the relatively low overall number and size of supported companies), and the indirect effects on ecosystems are difficult to quantify, the cost of such schemes is rather moderate. They may thus represent a kind of no-regrets policy option to complement other financial instruments to support the emergence of HGIE.

Crowdfunding

Two of the five countries (Germany and the UK) have introduced bespoke regulatory frameworks for crowdfunding activities, with requirements for issuers/borrowers, platforms and investors/lenders. While Germany has introduced in 2015 a framework only for investment-based crowdfunding, the UK has adopted legislation both for investment-based and for lending-based crowdfunding since 2014. The United Kingdom is currently the most developed European market for peer-to-peer lending, with a trade association (UK peer-to-peer finance association) representing 90% of the lending market in the United Kingdom (European Commission 2016). Its members must apply so called Operating principles setting out the standards of business conduct, such as clarity and transparency, including on bad debt rates, returns performance and full loan

book availability, risk management and reporting. Finland is also in the process of preparing new relevant legislation but at the time of writing this report it hasn't been adopted yet.

None of the five countries employs equity guarantees or loans, where governments co-finance or guarantee private VC investments. By contrast, the EIF has used such an instrument at the European level in the 2007-2013 Competitiveness and Innovation Framework Programme (the High Growth and Innovative SME Facility), and is continuing this type of support in 2014-2020 as the Equity Facility for Growth.[27]

[27] http://ec.europa.eu/growth/access-to-finance/cip-financial-instruments/; http://ec.europa.eu/growth/access-to-finance/cosme-financial-instruments_en.

6. Conclusion

In this study we have identified the policy instruments existing in EU Member States that aim to improve access to finance for young innovative companies, one of the key framework conditions to enable such companies to develop into high-growth innovative enterprises (HGIE), and have analysed the evidence for the effectiveness of those instruments' and their economic impact on beneficiary companies. We find that the support instrument mix providing access to finance in the countries we analysed is quite diversified, except for Lithuania. In contrast, only a few evaluations of those instruments are available (twelve for a total of 41 schemes in the five countries), which is partly explained by the newness of most schemes. These evaluations mostly focus on instrument performance in terms of financial indicators, and very few contain an in-depth assessment of economic impact. While most of the evaluated schemes seem to be effective in helping to improve the opportunities and providing more favourable conditions for companies to scale-up, the magnitude of some schemes' economic impact is not very substantial.

A general conclusion is therefore that it would be important to improve the quality of evaluations. Better evaluations help to strengthen successor schemes' effectiveness, both through better company targeting and increases in successful outcomes. Collection and provision of more and better data would also facilitate more policy experimentation as well as cross-country learning.

Supporting the emergence of HGIE, or young innovative companies' ability to develop into one, has been a main interest for policy-makers and researchers in industrial and innovation policy for a number of years, since this class of companies creates a disproportionate number of jobs, is more active in research and innovation, and has high productivity growth. Attaining this goal would be facilitated through better instruments as well as better data collection and provision. Below we discuss the findings related to these different instruments.

Public venture capital funds investing directly in companies are used in all five countries. Investments tend to be concentrated in certain sectors: ICT, biotech, and advanced production technology. Although some focus explicitly on the scale-up stage, the share of more developed, growing companies in their portfolios is usually small. Apart from this shortcoming, **direct public VC seems to be an effective and cost-efficient instrument to boost young firms' growth**. Public fund-of-funds that invest in private VC funds receive larger funding volumes than direct public VC, apart from Lithuania and the UK. Reasons for this may be higher portfolio diversification and, in connection, the possibility to harness the sector-specific experience of private fund managers in multiple sectors. There is no evaluation available in the five countries that assesses the economic impact of a fund-of-funds instrument.

Loan guarantees are used by all countries to improve SMEs' access to finance, but for supporting the scale-up of young innovative companies, they have a lower importance in terms of funding volume than equity instruments. Whereas evaluations show that guarantees are very successful in leveraging private loans, there is no evidence of positive economic impact specifically on HGIE (this is, however, also because most guarantee evaluations do not assess this question at all). Direct loans or grants explicitly supporting young innovative companies' scale-up exist in all five countries, but have much lower volumes than the financial instruments summarised above. They often finance international expansion in particular. **The impact of a Finnish programme that combines loans and grants, but also coaching and networking support, has been assessed to be very positive in an evaluation.**

Tax incentives are available to a larger extent only in the United Kingdom, where they have a long history as instruments to support venture capital investments and represent the largest funding share in the instrument mix. Only one evaluation is available of such a scheme, and its assessment of the economic impact of the tax incentive is methodologically not very robust. Nevertheless, it shows very limited effects on beneficiary companies' turnover and job growth. This calls into question the instrument's efficiency, given the high costs in the form of forgone tax revenue.

Finally, the sample countries except Lithuania provide public support to accelerators that focus on scaling up young innovative companies. The type of this support differs strongly, ranging from funding operational costs over coaching services to co-financing stakes in client firms. The funding volumes vary accordingly from country to country, but are generally low compared to the other instrument types (which is partly due to the type of support being funded). Evaluations generally find a positive impact of such public support on the development of the country's scale-up ecosystem.

Since there are few available evaluations and these are not representative of the range of instrument types present in the five countries, our analysis does not permit to draw conclusions on instrument types' effectiveness that are independent from the national context. **However, our findings suggest that equity instruments (public VC funds and fund-of-funds) have a stronger positive impact on the growth of young innovative companies than debt instruments (loans and loan guarantees) and tax incentives, and are thus particularly suited for supporting HGIE emergence.** Moreover, co-funding accelerators appears to be a cost-efficient no-regrets policy option to complement financial instruments. In terms of specific instrument design, evaluation results indicate that schemes which combine funding with coaching and networking support are the most effective, and should ideally involve regular performance evaluation of beneficiary companies to assess their ability to translate the support received into sustained growth.

Given the apparent greater effectiveness of equity instruments, and their larger funding share in the policy mix of most of the countries we have analysed, an avenue for future research would be to explore the relative advantages of fund-of-funds versus public VC funds investing directly in companies. Many EU Member States seem now to move towards a mix between both instrument types. Such analysis should focus on two questions: which instrument type works better in attaining a specific policy objective, and in what ways both instrument types complement (or potentially compete with) each other. Since most of those schemes are still relatively new, such research might only be possible in a few years, when enough data has been generated on the performance of those schemes (in particular on exits and their success rate).

Another Other avenues for further research concerns the impact of tax incentives and access to stock markets. Too few robust evaluations exist of this type of support instrument to enable definitive conclusions about the impact of a given scheme, let alone this instrument type's its effectiveness as an instrument to support the growth of young innovative companies in general. Particularly challenging in this regard are probably the causal attribution of observed high growth to receiving tax-exempted investments, and availability of data on the individual VC investments whose returns benefitted from tax relief. Regulatory and institutional barriers for young innovative companies to access stock markets have been analysed in the literature (e.g. Brown et al. 2013),

but more work could be done on how to design policies to reduce such barriers or help companies overcome them.

Furthermore, the logical next steps after having analysed national support policies are to move one level up or down, and assess the effectiveness of EU-wide financial support instruments and of regional schemes (e.g. run by German *Länder* or devolved administrations in the UK). It is also crucial to explore the interplay of such schemes with national-level instruments. Accordingly, the second part of our project on access to finance for high-growth innovative enterprises will analyse the economic impact on beneficiary firms of EU support schemes administered through the European Investment Fund, like the 2007-2013 High Growth and Innovative SME Facility and the 2014-2020 Equity Facility for Growth.

Finally, we suggest that improving methodologies hand in hand with data collection and availability is needed. A significant barrier to a more comprehensive comparison of policy instruments' effectiveness that we encountered lies not only in the existence of few evaluations. This situation may improve as schemes mature and more experience and data is generated. Rather, evaluations should put a greater emphasis on assessing the economic impact of instruments, both on beneficiary companies and the wider start-up and scale-up ecosystem. In particular, the additionality of public support schemes' effects should be evaluated using more robust methodology, making greater use of counterfactual designs. To illustrate, a study on the quality of evaluations by the What Works Centre found that out of 1700 evaluation studies from the UK and other OECD countries covering all aspects of support for innovation, only 3.7% were found to be have a robust counterfactual analysis and only 0.4% of them found a clear positive impact of innovation policies (grants, loans, tax credits). [28] To make counterfactual approaches feasible more data has to be collected at firm level for longer periods of time during and after participating in support schemes. This should be the case to some extent also for unsuccessful applicant companies, which would enable a relatively easy and natural approach to constructing valid control groups necessary for counterfactual designs. Developing evaluation cultures in that direction would improve both the explanatory power of evaluations and their value in helping to make policy decisions.

[28] http://www.whatworksgrowth.org/policy-reviews/innovation/

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Annex 1: Descriptions of policy instruments relevant for young innovative companies' access to finance

Germany

KfW Loans for entrepreneurs Plus (Unternehmerkredit Plus) Through this instrument, the German public promotional bank KfW allocates InnovFin and EFSI funding. Innovative SMEs can receive loans of up to €7.5m at preferential interest rates. One eligibility criterion for defining "innovativeness" is job growth of over 20% in three consecutive years (there are other criteria, and only one needs to be fulfilled). €48m were granted in 2015, the starting year of the instrument.

INVEST – Subsidised Venture Capital (Zuschuss Wagniskapital) Since 2013 INVEST has been retroactively supporting VC from private investors such as business angels by refunding 20% of their investment (up to a maximum of €500,000 per year since 2016). Target firms have to be young (below 10 years) and innovative (active in an innovative sector as defined in the German business register, hold a patent, or having received R&I support previously). To obtain the refund, business angels have to hold their initial equity investment (minimum €10,000) for three years. Capital gains deriving from the subsidy amount are tax exempt. By end-2014, €23m had been disbursed.

ERP Start Fund provides equity financing for small technology-intensive firms during their scale-up phase. Financing is supposed to enable these firms to invest into R&D as well as commercialisation. The fund provides co-financing if there is a private lead investor (e.g. VC company) which provides management support to the target firm. It matches the private investment pari passu (on the same terms). Maximum investment in an individual firm is €5m. By the end of 2015, ERP investments totalled €558m.

ERP Venture Capital Funds Investments Since 2015 this €400m fund-of-funds is run jointly by KfW and the Ministry for Economic Affairs and Energy. Its aim is to close the funding gap in scale-up finance many young innovative companies in Germany face. The fund invests in European VC funds that include young innovative German firms in their portfolio.

ERP/EIF Growth Facility This €500m-strong fund-of-funds, to which the EIF (one third) and the Ministry for Economic Affairs and Energy (two thirds) contribute, was established in March 2016. It is supposed to enable strong growth of young innovative firms with high potential in Germany. Individual investments by target VC funds are planned to be around €20m.

In March 2016, the public VC fund **Coparion** was established jointly by the Federal Ministry for Economic Affairs and Energy and KfW promotional bank. The fund is run as an independent legal entity and will replace the ERP Start Fund (which will however continue to manage existing investments). Like its predecessor, Coparion requires that a private lead investor co-funds the public stake. The fund has a volume of €225m.

EIF/ERP Fund-of-funds (Dachfonds) aside from support for early-stage technology transfer investments, the fund-of-funds invests in VC funds that finance the expansion of technology companies which typically have already garnered VC investment before. The German federal

government and the EIF each contribute with 50% to the fund's investment volume of €1700m. Applicant VC companies must hold portfolios comprised entirely of SME.

German Accelerator provides support and mentoring for start-ups seeking to expand their business into the US, while remaining headquartered in Germany (total volume €3m). The programme mainly consists of a 3-month stint of company managers in either Silicon Valley, New York City, or Boston (for Life Sciences.

Sub-national support instruments on the *Länder* (state) level play an important role in Germany. Whereas all states have set up various policy schemes to improve access to finance for SME in general or innovative start-ups, only some have established instruments that are particularly relevant for fast-growing firms at the scale-up stage.

In Berlin, the **VC Fund Technology** invests in young technology-oriented companies, also over several funding rounds. Maximum total investment in one company is €3m and can be provided in the form of equity or mezzanine capital. Notably, this instrument's effectiveness has been examined as part of an extensive evaluation, in contrast to most German support measures at the sub-national level which have not been evaluated.[29]

In Bremen, the **Bremen Equity Investment Company** also provides equity and mezzanine capital to innovative companies. One funding criterion is above-average growth. The **Innovation Starter Fund** in Hamburg invests up to €1m in young innovative companies. The Hessian Equity Management Society administers several equity funds that target innovative SMEs with high growth potential, in particular **Hessen Capital** and the **MBGH Growth and Innovation Programme**.

In North Rhine-Westphalia, the state-owned NRW Bank provides the low-interest rate **Innovation Loan** to SMEs to finance innovative investments. Public VC funds targeting primarily fast-growing young innovative companies also exist in Rhineland-Palatinate (**Fund for Innovation and Employment**), Saarland (**VC Finance Corporation Saarland**), and Thuringia (**Growth Investment Fund**).

Baden-Württemberg established its **Risk Capital Fund** already in 1995. The fund was intended to cover all stages from seed to scale-up and offers both mezzanine capital and equity. The recently established **VC Fund Baden-Württemberg** invests up to €1.25m in growing innovative companies at market conditions, acting either as lead or co-investor. Many of these support instruments are co-financed by ERDF and part of the corresponding Operational Programmes.

Finland

Young Innovative Companies scheme, (established 2008), is the key scheme in HGIE. Run by Tekes, it provides a mix of grant and loan funding for promising ventures in Finland. By providing funding up to €1.25m (covering up to 75% of the total costs) YIC aims to substantially accelerate the global growth of the most promising small companies. The programme is very selective and

[29] DG GROW Regional Innovation Monitor Plus 2016, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/support-measure/funds-innovation-and-employment-fib.

designed for companies that aim for international ambitious growth and that have been in operation less than 6 years and have proven its business concept. Funding is provided in three phases (€250,000 grants + €250,000 grants + €750,000 loans), each dependent on the achievement of specific milestones. By 2015 the total volume of the programme was at €134m. A total of 260 companies have been selected to the programme and 75 companies have completed all three funding phases (Tekes YIC).

Planning for Global Growth instrument (earlier called KKS, since 2016 "Tempo") introduced in 2013 by Tekes with the purpose of helping companies examine their readiness for achieving rapid international growth. The maximum funding for companies less than 5 years old is €50,000 and for other growth-oriented companies €100,000. The funding must comply with the EU de minimis regulation (Tekes KKS).

VIGO business accelerator programme, established in 2009. VIGO bridges the gap between early stage technology firms and international venture funding by combining public and private funding. By 2014 the share of public funding was around 26% (€83m) of the total funding. The programme has been implemented through 9 independently run companies, who have acted as "co-entrepreneurs" and invested in the companies they work with. Tekes was responsible for the implementation of the programme and it was coordinated by an independent contractor (VIGO). Since 2016 the VIGO programme is an independent private network and runs on its own since the ultimate target of the programme to creating a self-sustaining accelerator ecosystem has now been reached.

Tekes Venture Capital Ltd (established in July 2014) invests in VC funds which invest in early stage Finnish companies. The purpose is to develop Finland's VC market by "fixing shortcomings that exist in the availability of funding for the initial stages of the operations of a company". In the new government programme of December 2015, additional funds of €10m will be allocated to Tekes Venture Capital Ltd (Tekes VC) to increase the total volume to €26m.

Finnish Industry investment Ltd is a government-owned special purpose investment company which makes private equity investments directly and through funds to correct market bottlenecks in private funding and to contribute to Finnish innovation, entrepreneurship and growth (total direct investments by end-2015: €143m, fund investments: €719m).

Finnvera loans – Finnvera participates in the financing of small company's together with intermediary banks. It supplements the financing arranged by the bank by granting loans and guarantees that can be used as security for a bank loan (total volume €2258m).

Lithuania

Of the four public venture capital schemes within the JEREMIE Programme Holding Fund (financed by Structural Funds), three are relevant for company growth and scale up:

- **Lithuania SME Fund** (€20m, launched in 2010) – the fund provides equity growth financing for SMEs based in Lithuania. The Fund invests up to EUR 3m per enterprise.
- **LitCapital I** (€25m, launched in 2010) – the fund is aimed at long-term investments in the authorised capital of private enterprises seeking faster business growth and expansion. The

investment size varies between €1-3m and the investment horizon is between three and six years.

- **Practica Venture Capital Fund** (€15.7m; since 2012) can provide follow-on investments for the ideas developed under the Practica Seed Fund, but also invests into other high-growth companies.

Invega provides **risk-shared loans,** with credits of up to €4.78m to SMEs granted for the purpose of investments and the working capital if this leads to the development of the company. Banks contribute 50% of credit. It also offers **Portfolio Guarantees** to facilitate loans for high-risk investments, in the form of a first-loss guarantee capped at 80% of the loan. The total volume of both instruments combined is €126m.

Poland

EIF credit guarantees Since 2013 the EIF finances a credit guarantee scheme for innovative SMEs under the EU Competitiveness and Innovation Programme (CIP). The guarantees are allocated through several financial intermediaries, among which are both private commercial banks and public promotional banks/funds. The support instrument has a total volume of €80m and has so far resulted in €500m of loans. Under the **EIF Risk Sharing Instrument (RSI)**, another €185m had been provided until 2015 to innovative SMEs (European Investment Fund 2015). CIP and RSI will be continued in the 2014-2020 programming period as the InnovFin SME Window and SME Guarantee Facility, respectively.

GO_GLOBAL.PL After a pilot project in late 2012, this programme will run from 2015 to 2023. Its objective is to help SMEs in high or medium high tech manufacturing or services expand abroad by supporting their application to a foreign accelerator. Partner accelerators are situated in various countries, among them Germany, Spain and the US. The funding (maximum amount €35,000) is intended for the preparation an internationalisation strategy and for advisory services in finding suitable investors (total volume 2015-2023 €10m).

Polish technological bridges This instrument aims at supporting SMEs' international expansion. Besides opening up new markets for Polish innovative products, it facilitates both integration of participating companies into global knowledge transfer activities and their access to international investors for financing their R&I activities. The programme subsidises strategy development for foreign markets and consultancy services regarding IPR protection and sales strategy implementation. The first call is planned to be issued in late 2016, the total volume for 2015-2020 is €42.3m.

BRIdge VC After a pilot in 2012/2013, this instrument is envisaged to be implemented in the 2014-2020 Structural Funds Operational Programme Smart Growth, but has not issued calls so far. It provides public VC to co-fund private VCs' investments, focusing on accelerating the growth of successful innovative companies. The instrument is coupled with BRIdge Alfa, which provides seed funding for start-ups in early stages. The instrument has a total budget of €225m for the period 2015-2020.

KFK National Capital Fund Bank Gospodarstwa Krajowego, the Polish state's development and promotional bank, has run this fund-of-funds since 2005. Its capitalisation in 2015 was €235m, consisting of Polish Government Funds, EU Structural Funds and a contribution from the Swiss-Polish development cooperation. The fund co-invests (up to 50% stake) in VC and private equity funds that focus on innovative SMEs with high growth potential. In selecting its portfolio investments, KFK puts an emphasis on the quality of fund managers and accordingly also provides technical assistance and advice to the funds in its portfolio (Kapil et al. 2013).

Polish Growth Fund-of-funds (PFFW) In 2013 the EIF and the Polish national development bank BGK launched this joint instrument. It provides standard private equity, venture capital and mezzanine capital to funds that invest predominantly in SMEs in growth phases. The EIF contributes one third and BGK two thirds to the fund volume of €90m. Both institutions will consider increasing their commitments if financing demand is high and the fund performs well. The fund has an initial investment period of 5 years (European Investment Fund 2015).

PFR Ventures In 2016, the creation of this public VC fund and fund-of-funds was announced. Under the headline of a programme "#StartInPoland", €630m from Structural Funds are planned to be made available over the rest of the current programming period to support both young high-tech companies and the development of the Polish VC market. The fund is planned to be able to invest in companies directly as a co-investor of a private fund as well as invest in private VC funds.

The 2014-2020 Structural Funds Operational Programme Smart Growth includes several other schemes to improve access to finance for small innovative firms (the first calls in these instruments are expected to be issued towards the end of 2016). **Biznest** will co-fund business angels' investments in innovative high-tech companies (total budget €58.2m 2015-2020). **KOFFI (National Innovation Fund-of-funds)** will provide finance to VC funds investing in young innovative companies (€73m 2015-2020). The scheme **Support for SMEs' access to capital markets** intends to make it easier for small innovative companies' to meet their financing needs on classical capital markets (bond markets, stock exchanges). Between 2015 and 2020, €6.3m are available to subsidise beneficiary firms' use of professional services related to IPOs or issuing of corporate bonds (e.g. on the NewConnect stock exchange or the corporate bond market Catalyst).

Act on Amendments of Some Acts with respect to the Support for Innovativeness. The Act lays down that investors in innovative start-ups will enjoy tax reliefs, allowing them to contribute intangible assets (with the exception of software copyrights) or provide financial capital to start-up companies without the need to pay taxes on profits from the subsequent disposal of the shares or public listing of the company (the original limitation of the tax relief to the fiscal years 2016 and 2017 was removed in an amendment in September 2016).

United Kingdom

Growth Accelerator (est. 2012-2015, total volume £200m) is a Government-backed service that aimed to help up to 26,000 of England’s brightest businesses realise their growth ambitions and potential. It was launched in May 2012, and closed operations in 2015. It provided a comprehensive business support package to SMEs. While it was subsidised, firms had to pay a fee to take part. It was delivered by a consortium of private sector companies led by Grant Thornton UK LLP, and

provided expert business coaching, tailored to addressing each business's needs. *Access to Finance* was available to help businesses improve their investment readiness. The intervention was split into three phases: 1. Funding requirements: Full assessment of the company's suitability and potential for raising finance. 2. Investment/finance readiness: Support to develop and consolidate the building blocks to attract investment. 3. Fund-raising: Help to secure suitable finance to enable business growth/expansion. The "A2F" (access to finance) service provided a bespoke approach integrating specialist 1:1 coaching, access to four unique masterclasses and close interaction with a dedicated investor relations team.

Venture Capital Trusts (1995) VCTs allow investors to support some of the UK's smallest businesses by providing the capital needed to grow and develop. To encourage investment in this crucial and higher risk area, the government offers generous tax benefits to investors.

Enterprise Investment Scheme (1994). The scheme is designed to help smaller higher-risk trading companies to raise finance by offering a range of tax reliefs to investors who purchase new shares in those companies.[30] Foregone tax revenue from VCT and EIS combined amounted to £3935m in the period of fiscal years 2002/2003-2012/2013 (National Audit Office 2014).

Figure A1. EIS types of tax relief according to eligibility rules. Source: UK Government HMCR, 2013 Guidance Report

Reliefs available depend on whether an investor is connected with the company

Item	Unconnected	Connected
Income Tax relief on subscriptions	Yes	No
Capital gains exemption on disposal of shares eligible for Income Tax relief	Yes	No
Loss Relief on disposal of shares disposed of at a loss	Yes	In some cases
Capital gains deferral (unlimited)	Yes	Yes

Companies must be an unquoted company at the time the shares are issued – therefore it cannot be listed on the London Stock Exchange or any other recognised stock exchange, it can subsequently become a quoted company without the investors losing relief, but only if there were no arrangements for it to become quoted in existence when the shares were issued. Companies are not allowed to raise more than £5 million in total in any 12 month period from the venture capital schemes. The schemes are the EIS, the SEIS and Venture Capital Trusts. Investments from any of these schemes must fall within the £5 million limit. The £5 million limit must also take into account any other investment which the company has received in the relevant 12 month period which is an investment deemed to be State Aid under any other scheme covered by the European Commission's Guidelines on State Aid to promote Risk Capital Investments inSmall and Medium-sized Enterprises.

British Business Bank, (established 2013) is a state-owned economic development bank established by the UK Government. Its aim is to increase the supply of credit to small and medium enterprises (SMEs) as well as providing business advice services. It is structured as a public limited

[30] UK Government HMCR, 2013 Guidance document: https://www.gov.uk/government/publications/the-enterprise-investment-scheme-introduction/enterprise-investment-scheme

company and is owned by the Department for Business, Innovation and Skills (BIS). The bank has its headquarters in Sheffield.[31] Schemes include:

- **Help to Grow**, established in 2015, targets smaller firms with ambitious expansion plans. The instrument provides loan guarantees and directly co-funds loans. The target of the first programme phase is to generate at least £200m of lending.
- The **Venture Capital Catalyst Fund** focuses on early-stage technology companies with high-growth potential and has a volume of £125m. In the business year 2014 it made four new investments with a total amount of £30m. Individual deal sizes thus strongly exceed those of comparable public VC funds in most other Member States. The instrument provides also indirect support through investing in private VC funds.
- The **Enterprise Capital Funds**, to which £400m in new funds were added in 2014, also support predominantly companies in the early scale-up phase (total volume £620m).
- The **Business Angel Co-Investment Fund** co-invests between £100,000 and £1m alongside business angel syndicates in (predominantly technology-oriented) companies with strong growth potential. It takes only minority stakes (maximum 30% of a companies' equity) and has a volume of £58m.

Furthermore, the British business bank runs programmes to support "challenger banks" in order to diversify the British banking sector (which is made up almost entirely by four large banks) and thus improve the supply of private financing for SMEs. These programmes are the **Business Finance Partnerships** (£920m total commitments) and **ENABLE**, the latter of which employs asset financing and securitisation (£202m by May 2016). The **Investment Programme**, which has a similar goal, also supports alternative financing intermediaries that use debt funds, asset finance, or invoice financing (£400m allocated).

[31] http://annualreport2015.british-business-bank.co.uk/

Annex 2: Detailed assessments of evaluation quality

Germany

ERP Start Fund (federal level)

Clarity of goals: Good. The evaluation goals are formulated for the entire evaluation, but apply equally to all ERP programmes. They are clearly structured into three parts, which are explained in detail: impact, implementation and coherence of the programmes with other SME support instruments. The evaluation goals are derived from the goals of the programme, which is facilitated by the elaboration of causal mechanism diagrams for each programme that explain the intended chain of effects of the support measure.

Design: Good. The design includes several methods that complement each other. After desk research on the fund's working and an analysis of the financial environment (including other support measures) of the population of potential beneficiary firms, the evaluators interviewed a random sample of supported companies. In addition, banks were surveyed regarding the financing behaviour of the types of beneficiary firms, and experts were interviewed to confirm or counterbalance the survey results that might have been distorted by self-reporting biases. The evaluation assesses some effectiveness aspects quantitatively using the KfW SME Panel that includes both ERP programme beneficiary and non-beneficiary firms. In addition, it contains a counterfactual assessment comparing supported companies to a randomly drawn sample of non-supported companies with similar characteristics. The latter however does not differentiate between the different ERP programmes and is meaningful only to a limited extent for an effectiveness assessment of the Start Fund in particular.

Methods: Satisfactory. The surveyed companies were selected by stratified random sampling, and the sample is weighted appropriately to ensure representativeness. Questionnaires have been developed and tested carefully (the process of which is explained in detail in the evaluations). The analyses of the KfW SME Panel and the counterfactual analysis are rigorously structured in terms of answering the corresponding research questions. However, the analysis of the KfW SME Panel does not differentiate between companies supported through the Start Fund and those supported through other start-up support programmes within the ERP instrument mix. The latter, target the seed and early stage phases of firms to a much larger extent. The reason for this is not explained. The construction of the control group in the counterfactual analysis is based on observable firm characteristics of both groups and some form of matching procedure, which is not explained in detail either. As for all designs based on matching or discontinuities, there is a risk that some unobservable firm characteristic may influence the assessment of the effectiveness of the support measure.

Context analysis: Good. The main evaluation work was preceded by desk research which analysed extensively the financing context of the type of SME that are targeted or may benefit from investment through the Start Fund. While the coherence of the ERP Founding Equity programme with other similar federal and state-level instruments is assessed, this is not the case for the Start Fund.

Transparency: Good. Purposes and research questions are set out clearly and explained in detail. Especially for the main part of the evaluation (surveys, expert interviews, panel analysis), the applied methods are described extensively, except the matching method used for the counterfactual analysis (see *Methods* above). The implementation of the research design, in particular the way how the surveys are conducted, is also documented in a comprehensive manner.

Quality of information sources: Good. The structure of information sources (SME and bank surveys data, expert interview protocols, KfW SME Panel) is documented in detail. This is not the case to the same extent for the Hoppenstedt firm data base from which the random sample for the control group in the counterfactual analysis is drawn. The different data sources are used sensibly to complement each other in answering the research questions, for example bank surveys validate SME survey responses, expert interviews detail and nuance survey results, and panel data contextualises self-reported programme benefits with measured firm development.

Reliability and validity: Satisfactory. Quantitative and qualitative indicators and descriptors are derived from the research questions and the causal logic diagrams of all programmes. The indicators and the descriptors are sufficiently well captured by the collected data. They are presented and discussed in a systematic way in the results section. The results of the panel and counterfactual analysis are reported together, with some indicators using data from the panel and others data from the counterfactual analysis. It is not spelled out clearly what the reasons are for using one or the other dataset.

Systematic data review: Satisfactory. The data was checked for reporting and coding errors during the collection and preparation of datasets, though a detailed description of these checks is not given.

Clarity of conclusions: Good. The conclusions on the effectiveness of the Start Fund follow clearly the discussion of data analysis. The recommendations are derived from these conclusions and justified by referring back to relevant sections of the data analysis.

Standing of evaluators: Good. Rambøll is a large international consulting firm with a long track record in advising the public sector and evaluating public policies. The survey fieldwork was carried out by Forsa, one of the leading survey companies in Germany.

Risk Capital Fund (Baden-Württemberg)

Clarity of goals: Satisfactory. The overall evaluation goals, and how the analysis of individual financing instruments is supposed to contribute to their attainment, are clearly articulated. This is not the case, however, for the individual analysis of the RCF. The evaluation goals are not explicitly derived from the goals of the programmes.

Design: Satisfactory. The design includes an analysis of quantitative financial performance indicators of the fund, interviews with fund management representatives and interviews with independent experts. The interviews are mainly used to explain the quantitative financial performance and to assess implementation quality. The design is not described in sufficient detail to assess its quality beyond these observations.

Methods: Unsatisfactory. There is no specific information on how the different methods chosen (see *Design*) were applied in the evaluation. For the RCF, the use of interview findings seems somewhat

anecdotal. No attempt was made to compare the financial performance of the fund to a control group.

Context analysis: Good. Since the evaluation looks at all ERDF-funded revolving financing instruments in Baden-Württemberg, the RCF is analysed in a larger context of support measures. The private VC environment in Baden-Württemberg is briefly discussed. The fund management interviews also targeted the issue of interaction between federal and state level support instruments.

Transparency: Unsatisfactory. The purpose and the research questions of the evaluation are set out relatively clearly. However, the choice of methods, their application, and the data collection and analysis processes are poorly explained and documented.

Quality of information sources: Satisfactory. The fund performance data are reliable and adequate to describe the fund's activity. The interviews are not documented in sufficient detail, so that their quality cannot be assessed.

Reliability and validity: Satisfactory. The financial performance indicators are relatively simple and provide valid and reliable measurements. The low transparency regarding applied methods and the difficulty in judging information source quality makes an assessment beyond that impossible.

Systematic data review: Unsatisfactory. No information is given in this regard.

Clarity of conclusions: Satisfactory. Conclusions on the RCF's effectiveness are derived from the financial performance and interview results. As these do not provide very robust evidence on effectiveness, the conclusions are appropriately cautious and not far-reaching.

Standing of evaluators: Good. Rambøll is a large international consulting firm with a long track record in advising the public sector and evaluating public policies.

VC Technology Fund (Berlin)

Clarity of goals: Good. The goals of the evaluation are derived from the goals of the programmes. They are clearly structured for each of the evaluated funds.

Design: Satisfactory. A mix of 4 methods is used: document analysis, analysis of financial and other company indicators, a company survey and structured interviews. The design is not described in sufficient detail to assess its quality beyond these observations.

Methods: Unsatisfactory. The use of interview findings seems somewhat anecdotal. There is no counterfactual analysis based on a comparison of financial performance and other company indicators to a control group. Only occasional comparisons are made with German average figures (e.g. share of companies introducing new or improved products and services to the market).

Context analysis: Satisfactory. Since the evaluation analyses all revolving ERDF-co-funded finance instruments in Berlin from the 2007-2013 programming period, the VC Technology Fund is assessed per definition within its immediate context of support instruments. The evaluation contains a short history of the fund's conception, which gives an indication about the wider context of innovative company financing in Berlin. However, the interactions between the evaluated instruments and other support measures or the general financing environment are not explored.

Transparency: Satisfactory. Purpose and research questions of the evaluation are set out relatively clearly. The method section could however benefit from further elaboration.

Quality of information sources: Cannot be assessed. Funds' performance data are reliable and adequate to describe their activity. However, the survey and the interviews are not documented in sufficient detail, so that their quality cannot be assessed.

Reliability and validity: Satisfactory. The output, outcome and overall performance indicators are transparent. The financial performance, employment and R&I indicators are relatively simple and provide valid and reliable measurements. Concerning the survey and interview data, see *Quality of information sources*.

Systematic data review: Unsatisfactory. Very little information is given in this regard, except a discussion that the survey response rates for some of the evaluated measures were very low and conclusions could therefore not be made.

Clarity of conclusions: Satisfactory. The conclusions on the effectiveness of Funds follow clearly from the discussion of data analysis. As the data does not always provide very robust evidence on effectiveness, the conclusions are appropriately cautious and not far-reaching.

Standing of evaluators: Satisfactory. Kovalis, ifs (Institute for urban research and structural policy), and MR (consultancy for regional policy) have a track record of carrying out studies on regional structural policy contracted out mostly from German Länder ministries, but also DG REGIO. Their reputation within the evaluation community in Germany is difficult to assess as there is not much information on them (probably due to their small size).

Finland

Vigo accelerator programme

Clarity of goals: Good. Evaluation goals are clearly listed at the beginning (p. 6): achievement of programme's early-stage goals (which are reiterated in the same section); actual existence of the gap the programme is intended to address; achievement of longer-term effect of creating a self-sustaining accelerator ecosystem; and prospective long-term role of Vigo in the HGIE ecosystem. The first three are explicit objectives of the Vigo programme, the fourth is a logical forward-looking derivation from the other three.

Design: Satisfactory. The study contains a concept evaluation and a performance evaluation, which is a suitable split to address all four research questions. The concept evaluation is qualitative. Data that would allow for a counterfactual analysis is not available, so the authors construct a (non-formal) model of framework conditions for a sustainable accelerator ecosystem mainly based on existing literature. From this, they derive hypotheses regarding programme design elements and outcomes which they test by analysing a) the structure of the programme and b) information from stakeholder interviews. The performance evaluation is not based on a theoretical model or a counterfactual approach and uses standard performance indicators (e.g. deal flow, application numbers) and data from a survey among portfolio firms.

Methods: Satisfactory. Semi-structured interviews were conducted which cover "the various" (p. 13) stakeholder groups. Interview results were used both for testing initial hypotheses and for progressively deriving additional hypotheses regarding the effectiveness of the Vigo concept. While this allows for exploratory flexibility and taking into account emerging issues, it might have been desirable to separate these two objectives: conduct one set of interviews purely for deriving further hypotheses, and another set to generate data for hypothesis testing. The survey used for performance evaluation received 23 responses out of at least 60 portfolio firms. This low number almost certainly introduces bias, which the authors also acknowledge. Survey responses are triangulated with data from LinkedIn profiles and firm financial statements, which should help assure validity of data collected through the survey.

Context analysis: Good. The evaluation analyses the position of the programme within the Finnish entrepreneurship ecosystem and its likely influences on other components. Given that it is an interim evaluation covering a relatively short period of time since inception, this analysis is necessarily brief and consists largely of propositions for future effective development.

Transparency: Satisfactory. Purposes and questions are presented transparently and results are reported clearly and discussed extensively. However, the processes of data collection remain partly unclear and could have been described in more detail. There is no explanation how stakeholders were selected for interviews.

Quality of information sources: Satisfactory. The data sources used are suitable for the methodologies employed. Data sources on quantitative performance indicators are sufficiently reliable. Interview and survey data carry the usual caveat of self-reporting bias, but are mostly interpreted with sufficient caution. Triangulation with other sources on portfolio firm data further attenuates potential effects from such bias.

Reliability and validity: Good. Barring the related assessment under "methods" and "quality of information sources", the data collected are reliable and valid for answering the evaluation questions. The choice and usage of indicators is explained transparently.

Systematic data review: Unsatisfactory. The report does not give information on data quality assurance.

Clarity of conclusions: Satisfactory. Conclusions and recommendations are explicitly derived from the analytical results and extensively justified. A few from the large number of recommendations (24 in total) are difficult to link directly to the stated evaluation questions.

Standing of evaluators: Good. The main authors are independent academics with a good track record in the field of innovation policy. No information is available on how they were chosen.

Young Innovative Companies (NIY) programme

Clarity of goals: Good. Evaluation goals are clearly listed at the beginning and are derived from the programme's goals. Impacts of the measure on company performance are divided into direct (i.e. enhancing the resources and capabilities of the participant firms), indirect (i.e. impact resulting in improved company market performance) and ultimate (longer-term benefits that accrue beyond the companies, but for communities and societies).

Design: Satisfactory. A "logic model" was developed by the evaluators specifically tailored for the NIY programme. The elements include purpose, inputs, outputs and outcomes/impact. The model provides a series of if-then or cause-effect relationships that lead to expected impacts. The achievement of ultimate impact depends on the achievement of indirect impact, which in turn depends on the achievement of direct impact on companies' resources and capabilities. Linear regression is used to test for a significant relationship between indirect impact on company performance and direct impact on resources and capabilities. Three models are compared for goodness of fit, i.e. highest adjusted R^2. However, the evaluation does not explain why exactly linear regression was chosen as the relationship studied may not be obviously linear and there are a lot of data assumptions to be made in order to conduct a proper linear regression. Also, the relatively low number of observations casts some doubt on the predictive strength of the quantitative model. Still, the authors are aware of this and do not claim to have established a robust causality but rather aim for finding the best predictor of indirect growth impact by comparing 3 specifications of the model (one only with control variables, one including "degree of use" of the measure and one including "direct impact" independent variables).

Methods: Satisfactory. During May 2013, 108 companies that had engaged with the NIY Program responded to a customized web-based survey (the response rate was 72%). In addition to the web-based survey, a cross-section of the NIY Programme participants were asked 3 open ended questions regarding their participation in the programme through telephone interviews. One major methodological issue of the study is the relatively low number of observations. As the evaluation itself concedes, data to independent variables ratio should ideally be 20:1 but this study sometimes uses a 5:1 ratio. Beyond this issue and more broadly, the evaluation does not conduct a proper counter-factual analysis.

Context analysis: Unsatisfactory. The societal and policy context of the evaluation (beyond just economic impact) are mentioned but not analysed in enough detail. Even though the concept of "ultimate impact" is introduced in the theoretical framework ("logical model") it is not tackled in sufficient detail. The position of the programme within the Finnish entrepreneurship ecosystem is mentioned but only broadly.

Transparency: Satisfactory. Purposes and questions are presented transparently and results are reported clearly and discussed extensively. However, the processes of data collection could have been described in more detail. For example, there is no explanation on what basis participants were selected for interviews.

Quality of information sources: Satisfactory. The information sources used in the course of the evaluation are described in sufficient detail so the reliability and adequacy of the data can be assessed by the reader. However, interview and survey data carry the usual caveat of self-reporting bias which is not discussed at appropriate level of detail in the evaluation.

Reliability and validity: Satisfactory. The indicators used for input, output and outcome are transparent. The data collection procedure is validly developed to answer the evaluation questions, albeit less so with respect to question 3. Issues such as self-reporting bias are not discussed.

Systematic data review: Good. There are appendices which describe the sample, give examples of the survey questions (but do not list all of them), group qualitative interview responses by theme

and show average direct and indirect impact on company performance scores (out of 10) for each measure segmented according to a set of variables.

Clarity of conclusions: Good. Conclusions and recommendations are clearly written and explicitly derived from the analytical results.

Standing of evaluators: Good. The Evidence Network (TEN) is an independent third party company headquartered in Canada that specializes in assessment of the impact of innovation intermediaries. The evaluation was commissioned via a public tender process.

Finnish Industry Investment Ltd

Clarity of goals: Good. Evaluation goals are clearly listed and are derived from the institution's goals. The evaluation tackles both the FII goals and its organization structure.

Design: Satisfactory. The study contains mostly qualitative methods (desktop analysis of FII and third party materials, non-structured interviews with 58 stakeholders and experts). The performance of FII was benchmarked against a group of established European private equity markets. However, quantitative methods are by and large missing - among the examined desktop materials there are some surveys but no survey was carried out in the context of this evaluation.

Methods: Satisfactory. The qualitative information is gathered and analysed in a systematic way so that the evaluation questions can be answered. However, as the evaluation acknowledges, concepts such as venture capital, growth financing and buyouts are not clearly defined and may vary across the peer group of countries.

Context analysis: Good. The socio-economic, institutional and policy context of the Finnish private equity system is extensively examined in the evaluation.

Transparency: Good. Purposes and questions are presented transparently and results are reported clearly and discussed extensively. There is an explanation on what basis participants (various groups of stakeholders representing both a public policy and a market perspective) were selected for interviews.

Quality of information sources: Satisfactory. The information sources used in the course of the evaluation are described in sufficient detail so the reliability and adequacy of the data can be assessed by the audience. However, interview data carries the usual caveat of self-reporting bias (especially when interviewing the management of the evaluated institution). This is partially mitigated by involving external experts in the interviews. Still, out of the 58 performed interviews the reader does not know how many of them belong to which group of stakeholders.

Reliability and validity: Satisfactory. The data collection procedure is mostly developed and applied in a way that ensures the reliability and validity of the data with regard to answering the evaluation questions.

Systematic data review: Unsatisfactory. The evaluation team has not made adjustments to the data (e.g. regarding different definitions of types of financing across peer countries) which may have affected the analysis to some extent (see the paragraph above on *Methods* for definitional issues). Nevertheless, the evaluation team deems the data reliable and sufficient enough to

support the key conclusions. Whenever possible, the independent views have been verified with third party data.

Clarity of conclusions: Good. The conclusions reached in the evaluation are clearly written and explicitly justified so that the reader can assess them.

Standing of evaluators: Good. The evaluation was carried out by an international evaluation team from the management consulting firm VALOR Partners Oy. To support the evaluation team the Ministry of economy set up a board consisting of national experts from different fields of the Finnish VC system. The evaluation was commissioned via a public tender process.

Lithuania

Practica Venture Capital Fund, Lithuania SME Fund, LitCapital I, Risk-shared loans, Portfolio guarantees

Clarity of goals: Good. The overall goals are stated clearly: assessing the effectiveness, efficiency, and impact of the policy instruments concerned, and make recommendations about the continuation of similar measures under the 2014-2020 programming period. They are explicitly derived from the goals of the Operational Programmes under which the instruments are co-funded. Effectiveness, efficiency and impact are sufficiently unambiguously defined in the report.

Design: Satisfactory. The evaluation of effectiveness is based on a comparison of SMEs' needs in the face of existing financing gaps (derived mainly from existing literature) with policy instruments' structure. The impact assessment is based on performance indicators of the schemes, business performance indicators of participating firms, and macroeconomic indicators, and partly on the survey responses from participating firms. The usefulness of this design to evaluate additionality and effect sizes is limited, as in most cases there are no comparison groups or benchmarks available against which to assess the results.

Methods: Satisfactory. A single survey was conducted for all instruments together that were part of the evaluation, so there is a risk that questions on one scheme influenced responses to questions on other schemes in those cases where companies were beneficiaries of more than one policy instrument. The response rate was relatively low, only 70 companies out of 400 replied. The indicators are taken from reliable sources and analysed mostly descriptively. The results of the analysis of indicators and of the survey do not complement each other in a systematic manner.

Context analysis: Satisfactory. Attention is given in particular to the economic context of post-crisis austerity and adjustment. The evaluation analyses in some detail the influence of these factors on SMEs' needs. However, due to the absence of any form of control groups, effects of support instruments and austerity policies or economic adjustment cannot be disentangled.

Transparency: Unsatisfactory. Descriptions of how methodologies were applied or the analytical work carried out are unclear or lack detail (this applies to the schemes focused on here; e.g. the counterfactual analyses of other schemes is rather extensively explained). The coherence of the method description, the results reporting, and the implications/conclusions is somewhat weak.

Quality of information sources: Satisfactory. Indicator data come from authoritative sources, mainly the national statistical agency, the social security authority, and the Structural Funds Managing Authorities. The nature and structure of the data are described in sufficient detail. More elaboration on the structure of the survey data would have been desirable.

Reliability and validity: Unsatisfactory. Indicator data seem only partially reliable and appropriate for their intended contribution to answering the research questions. One particular shortcoming is the focus on relative performance, which potentially masks effect sizes that are economically negligible. Absolute changes in indicators are not consistently reported. A discussion of how common self-reporting pitfalls have been addressed in the survey is lacking.

Systematic data review: Unsatisfactory. No information is given on that issue.

Clarity of conclusions: Unsatisfactory. Those conclusions that are actually based on the data collected are well justified, but their robustness is limited by the lack of control for other influencing factors, making it difficult to assess effect sizes of the instruments (which the authors acknowledge to some extent). However, these conclusions are preceded by rather lengthy discussions of schemes' impact on the economy and the financing environment in more general terms, which do not seem to be backed sufficiently by the data analysis.

Standing of evaluators: Satisfactory. Information on the tendering process for this evaluation is not available. BGI Consulting is an independent policy consultancy and the lead author has experience in R&I policy analysis, according to information retrieved from BGI's website and LinkedIn.

Poland

EIF credit guarantees

Clarity of goals: Good. The main goal of the evaluation is set out clearly: estimation of the guarantee scheme's economic impact, in terms of employment, turnover, and productivity, on beneficiary firms. The question of the scheme's *economic* additionality is furthermore explicitly contrasted to the assessment of *financial* additionality, which is the focus of many similar evaluations of such schemes. The authors justify this convincingly by arguing that the ultimate objective of the scheme is improving the economic performance of target companies, which it intends to achieve by improving access to finance.

Design: Satisfactory. The authors use a counterfactual design. Treatment and control groups are constructed by propensity score matching and effects evaluated through difference-in-difference estimation. As the authors note the economic impact on beneficiary firms is actually a combination of participation in the guarantee scheme and the characteristics of the loan (e.g. its size) guaranteed by it. The evaluation does not estimate scheme participation effects e.g. conditional on loan size, which would have allowed a more nuanced comparison of the size of economic effects.

Methods: Good. The nearest-neighbour matching procedure is appropriate for the purpose and technically sophisticated. Nevertheless, it left 29% of beneficiary firms unpaired with a control firm (because no sufficiently similar non-beneficiary firms could be found in the Orbis database). Given the large number of observations, this is not a problem in itself, but most of the unpaired firms were located in Poland, which gives rise to concerns about the representativeness of the Polish

sub-sample. The authors ameliorate this potential bias through applying ad-hoc weights based on sample stratification. Robustness tests suggest that the final sample differs only marginally from the overall population on most variables. The final dataset (after pairing and removing outliers and data inconsistencies) includes 2,595 companies, which allows for estimations with high statistical power. The difference-in-difference estimation is based on an OLS regression with autocorrelation-robust estimators, which is appropriate given the multi-period data. The authors run several alternative model specifications (mainly to address unobserved confounding characteristics and clustering), and take the results into account when interpreting their findings.

Context analysis: Good. The authors provide a description of the policy context in which the SMEG loan window was embedded. The combined matching and difference-in-difference approach reduces to a significant extent the need to control for potential spillover effects from other support instruments or differing financing sources.

Transparency: Good. The purposes as well as all methods and procedures are described and documented with rather high accuracy, making assessment of their appropriateness and implementation easy.

Quality of information sources: Good. For the treatment group, the authors merged an EIF dataset containing firm-level data related to the guarantee instrument with firm-level data on balance sheets and profit/loss accounts from Bureau van Dijk's Orbis database. This merged dataset contains all necessary information to apply the counterfactual analysis and answer the study questions (albeit Orbis suffers from missing entries for a non-negligible number of observations, which may reduce the efficiency of the matching procedure and the subsequent effects estimation). Data for the control group are also taken from Orbis. The structure and contents of both source datasets and the final merged dataset are presented in appendices, and there is a data section detailing descriptive statistics.

Reliability and validity: Good. The authors provide a detailed discussion of the key assumptions required for the design used, and show that for those that are not satisfied with certainty, potential bias can be plausibly assumed to be very small. Main outcome indicator choice (employees, turnover, productivity) is transparent, appropriate and their measurement (or estimation in the case of productivity) is unambiguous.

Systematic data review: Good. The merged dataset has been carefully checked for inconsistencies, outliers, and selection bias. Those procedures are presented clearly in an appendix, and the paper explains how they affected the final dataset.

Clarity of conclusions: Good. Conclusions are directly derived from the estimation results and explicitly justified. The authors point to the limitations of their findings in terms of explanatory power and external validity, and interpret them convincingly within these boundaries.

Standing of evaluators: Satisfactory. The authors are from DG ECFIN and from the EIF research department, respectively. Since the study is not a formal instrument evaluation, but rather a scientific paper, the independence criterion does not fully apply – on the contrary, their positions should ensure familiarity with the examined scheme and data source used. Both have a track record of empirical economic analysis in academia and/or public administration, although not strongly related to the topic of the study.

KFK National Capital Fund

The assessment summarised below is part of an ex-ante evaluation of financial instruments in the 2014-2020 Structural Funds Operational Programme "Smart Growth" (WYG 2013). The different data sources used in the analysis and its presentation in connection with other financial instruments make it difficult to assess evaluation quality along our criteria. We thus limit ourselves to a summary of the scheme's performance assessment (Section 4.4.3).

United Kingdom

Venture Capital Trusts and *Enterprise Investment Scheme*

Clarity of goals: Good. Evaluation goals are convincingly derived from the programmes' objectives and are presented in a clearly structured manner.

Design: Satisfactory. The evaluators carry out a panel data analysis. The panel is unbalanced (firms enter or exit the support instruments during the period under study), which may reduce statistical power for some specific tests but does not overall compromise robustness. According to the report, non-supported firms in the panel (the "control group") are matched to supported firms based on observable characteristics, but the matching procedure is insufficiently explained. Complementing the regression analysis with a survey or interviews would have helped to interpret the quantitative results, especially given the extremely low effect sizes found.

Methods: Satisfactory. The panel structure and the use of fixed and random effects are the main strategy to deal with omitted variable bias and causal identification problems. The authors acknowledge that such a design leaves many potential sources of bias in effect estimation unaddressed. Investments likely need time to produce an effect on some of the performance indicators, but some model specifications do not take into account this temporal dynamic at all, whereas others include lags of only two yearly periods. This might be too short to observe effects in particular for companies with highly R&D-driven innovations. However, the results of the econometric analysis are presented and discussed soundly. Missing data lead to small subsamples for the analysis of some interaction effects, which reduces the robustness of those results. The authors acknowledge this and use sufficient caution in their conclusions from such findings.

Context analysis: Unsatisfactory. The evaluation does neither take into account the general financing environment of the target beneficiary companies, nor other support instruments whose effect might interact with VCT and/or EIS. Since the schemes entail potentially high foregone tax revenue, a cost-benefit analysis or similar comparing foregone tax revenues with instruments' impacts would have been desirable.

Transparency: Good. Purposes, questions, procedures and methods are well described and documented, except for the operationalisation of some performance indicators (see *Reliability and validity*) and the matching approach (see *Design*). Limitations and caveats are also openly mentioned and discussed.

Quality of information sources: Satisfactory. Data from the UK tax authorities on companies benefitting from EIS or VCT are reliable and complete. The FAME database, from which the "control

group" firms in the panel were drawn, suffers from incomplete or missing data for some of the variables used. This is however a general problem for databases that rely on self-reporting by SMEs.

Reliability and validity: Satisfactory. Most variables are well-suited to answer the evaluation questions. However, operationalisation of some performance indicators (dependent variables in regressions) is not explained, in particular employment. The main explanatory variables in the various model specifications are either dummy variables (funded-not funded) or continuous variables (investment amounts). Since the effect size of the schemes certainly differs according to the amount invested, it is not clear how meaningful results of models with dummy variables are at all; for these model specifications alone the rating would be unsatisfactory.

Systematic data review: Satisfactory. Data was checked for missing values and the corresponding units of observation are handled with appropriate caution. No other information is given on data and coding quality assurance.

Clarity of conclusions: Satisfactory. Conclusions are plausibly derived from the discussion of quantitative results and the authors point out the limitations in terms of generalisability and potential biases. Nevertheless, given the consistently extremely small size of estimated effects, the conclusions partly seem to overplay the impact of the two schemes.

Standing of evaluators: Good. The Institute for Employment Studies has a track record in evaluation of economic and social policies. The authors are academics or consultants with a publication record in public policy analysis.

Growth Accelerator

Clarity of goals: Good. The goals of the evaluations are explicitly derived from the programme's objectives and are clearly set out. Since the programme has relatively many second-order goals it intends to achieve mainly through coaching and capacity-building, the structuring of the evaluation goals has not been an easy task.

Design: Satisfactory. Surveys and interviews are an appropriate design to achieve at least an indication of a programme's effects, but their analysis does not extend beyond a discussion of descriptive (statistical, in the case of the survey) results. The "counterfactual" used in the economic impact analysis is entirely based on survey respondents' expectation of future growth and their assessment of the programme's contribution to it, which is likely to be very difficult for the companies to assess. Moreover, the construction of the counterfactual, as it is explained in the evaluation, is tautological – the way the estimated effect of the programme is constructed it represents simply the average of firms' self-reported assessment of the programme's contribution to their expected future growth. While it may not have been possible to go beyond this approach based on the available data, it is doubtful to what extent the label "counterfactual analysis" is justified.

Methods: Satisfactory. Survey and interviews have been carried out in procedurally sound ways, and the descriptive analysis of the data is solid. However, survey results would probably have allowed some regression analysis to provide indications on underlying factors for the observed results. Concerning the "counterfactual" approach, see *Design* above.

Context analysis: Satisfactory. The evaluations do not take into account Growth Accelerator's potential interplay with other finance support schemes, but attempt to assess its additionality and potential crowding-out effects. The results of this are clearly presented, but the methodology used could have been described in more detail. The evaluation includes a cost-benefit analysis, which is done convincingly technically. However, since the benefits are based on the problematic "counterfactual" analysis discussed in *Design*, the validity of the CBA's results is doubtful.

Transparency: Good. Methods and procedures are described with sufficient accuracy, except for the additionality analysis (see *Context analysis*). The authors are mostly very open and explicit in pointing to the caveats and limitations of the evaluation design.

Quality of information sources: Satisfactory. The survey questionnaires and interview structure are of sufficient quality to yield reliable responses. Notwithstanding, the usual caveat about self-reported data in the context of impact evaluations applies.

Reliability and validity: Unsatisfactory. Operationalisation and indicator choice are transparent, but some outcome variables rely completely on reported expectations for the future, which raises doubts about their internal validity. This is especially problematic in the attempt to construct a counterfactual, as discussed under *Design.*

Systematic data review: Satisfactory. The approach and software used for processing interview data and preparing it for analysis is described in an annex. This is not the case for the survey data from the other evaluation.

Clarity of conclusions: Satisfactory. Conclusions drawn follow logically from the survey and interview results. Any concerns about the validity of the conclusions stem from the problems in the analytical design. The authors acknowledge many of these shortcomings and exert corresponding caution in generalising their findings.

Standing of evaluators: Satisfactory. The evaluation based on interviews was carried out by members of the Policy Research Group at Durham University who have a publication record in related work. The evaluation based on a survey was done internally at BIS and does not give author names. The survey was carried out by RMG Clarity, whose standing we were not able to verify.

Enterprise Capital Funds

Clarity of goals: Good. The evaluation goals are directly derived from the objectives of the ECF scheme, which are described as two-fold: "plug the early stage finance gap and develop potential high-growth SMEs", and "stimulate the creation of new early stage VC funds". A theoretical discussion explains the intended mechanism of the scheme to achieve these objectives and provides the basis for several research questions that concretise the two above goals.

Design: Good. The evaluation uses a mixed-methods design. Its basis consists of a standardised cross-sectional survey of supported companies in 2014, which is complemented by a much smaller longitudinal survey where companies were surveyed in 2010 and 2013. Interviews with VC fund managers and case studies contribute qualitative data. Beneficiary firms' financial data from the ECF database is compared to financial data of firms with private VC investment from the British Venture Capital Association. Interviews with a few firms that initially applied for funding but did eventually (for different reasons) not enter the programme are presented as a rudimentary

counterfactual, whose limited usefulness for ascertaining causal effects of the scheme the authors clearly acknowledge. Since data on non-successful applicants seems to have been available, it might have been possible with more effort to construct a control group that allows for more robust inferences.

Methods: Satisfactory. Surveys and interviews were carried out in a standardised and technically solid manner. The sampling strategy yielded a sufficiently large number of respondent companies, whose representativeness for the population is convincingly demonstrated by comparing the distributions of firm characteristics. The analysis of the resulting data, as well as of firm financial data, is methodologically sound and transparent. However, it could have gone to a larger extent beyond descriptive analysis to e.g. examine potential interaction effects between funding and firm characteristics.

Context analysis: Satisfactory. The paper concisely describes the development of the private and public VC landscape in the UK and the changes induced through the financial crisis. The actual analysis could have given more thought to potential interactions of the ECF scheme with other equity-related finance support instruments, especially the tax incentive-based Venture Capital Trusts and Enterprise Investment Scheme (see above).

Transparency: Good. Methods and procedures are clearly described and accurately documented. The author openly acknowledges the limitations of the design used.

Quality of information sources: Satisfactory. Firm financial data should be reliable. Surveys and interviews seem to have been designed carefully. Since sample questionnaires are not provided (which, however, is also not a standard approach for a journal article), and survey questions not systematically cited, it is difficult to make further assessments.

Reliability and validity: Satisfactory. Financial data are reliable and valid. Survey and interview items also seem to operationalise well the concepts they intend to measure. The construction of the metric "net positive catalytic impact on business" (share of subsequent business development attributed to scheme participation minus scheme financial contribution to total external funding) seems somewhat simplistic and is not grounded in a conceptual argument.

Systematic data review: Good. Survey and interview data have been checked for consistency and coding errors.

Clarity of conclusions: Good. Conclusions follow directly from the analytical survey results, and the author provides an integrative and well-structured discussion of implications drawn from interview information.

Standing of evaluators: Good. The author's academic career has focused on SME financing and regional economic development and he has a publication record in those fields.

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