Financial instrument facilities
supporting access to risk finance for research and innovation
in Horizon 2020

Ex ante evaluation

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<tr>
<td>AECM</td>
<td>European Association of Mutual Guarantee Societies</td>
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<td>BAE</td>
<td>Business Angels Europe</td>
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<td>BAs</td>
<td>business angels</td>
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<td>bn</td>
<td>billion</td>
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<td>CIP</td>
<td>Competitiveness &amp; Innovation Framework Programme</td>
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<td>EAFRD</td>
<td>European Agricultural Fund for Regional Development</td>
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<td>EBAN</td>
<td>European Business Angels Network</td>
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<td>EBRD</td>
<td>European Bank for Reconstruction &amp; Development</td>
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<td>ECB</td>
<td>European Central Bank</td>
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<td>EIB</td>
<td>European Investment Bank</td>
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<td>EIF</td>
<td>European Investment Fund</td>
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<td>ERDF</td>
<td>European Regional Development Fund</td>
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<td>ESIF</td>
<td>European Structural &amp; Investment Funds</td>
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<td>EVCA</td>
<td>European Private Equity &amp; Venture Capital Association</td>
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<td>EVFIN</td>
<td>European Venture Fund Investors Network</td>
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<tr>
<td>FI</td>
<td>financial instrument</td>
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<td>FLP</td>
<td>first-loss piece</td>
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<td>FoF</td>
<td>fund-of-funds</td>
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<td>FP7</td>
<td>Seventh Framework Programme for Research &amp; Technological Development</td>
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<td>GIF</td>
<td>High-Growth &amp; Innovative SME Facility</td>
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<td>GP</td>
<td>general partner</td>
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<td>IMF</td>
<td>International Monetary Fund</td>
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<td>IRR</td>
<td>internal rate of return</td>
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<td>JRC</td>
<td>Joint Research Centre</td>
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<td>LLP</td>
<td>limited liability partnership</td>
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<td>LP</td>
<td>limited partner</td>
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<td>MFF</td>
<td>Multi-annual Financial Framework</td>
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<td>mn</td>
<td>million</td>
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<td>NVCA</td>
<td>National Venture Capital Association (USA)</td>
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<td>OECD</td>
<td>Organisation for Economic Cooperation &amp; Development</td>
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<td>PE</td>
<td>private equity</td>
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<td>PRO</td>
<td>public research organisation</td>
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<td>R&amp;I</td>
<td>research and innovation</td>
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<td>RSI</td>
<td>Risk-Sharing Instrument</td>
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<td>RSFF</td>
<td>Risk-Sharing Finance Facility</td>
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<td>SMEG</td>
<td>SME Guarantee Facility</td>
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<td>SMEs</td>
<td>small and medium-sized enterprises</td>
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<td>TT</td>
<td>technology transfer</td>
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<td>TTP</td>
<td>Technology Transfer Pilot</td>
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<td>TTFF</td>
<td>Technology Transfer Finance Facility</td>
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<td>TTO</td>
<td>technology transfer office</td>
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<td>VC</td>
<td>venture capital</td>
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1. Introduction

1.1 About this report

The Rules of Application of the new Financial Regulation stipulate that "Financial instruments shall be based on ex-ante evaluations identifying market imperfections or failures, or sub-optimal investment situations and assessing investment needs", and state that an ex ante evaluation is required where the impact assessment of the host programme does not cover the financial instrument concerned.

This report has been prepared because the impact assessment of the Horizon 2020 proposal does not cover the issues or points mentioned above in relation to the new financial instrument facilities proposed under the programme.

1.2 Policy commitments and programme proposals

The Innovation Union Europe 2020 Flagship Initiative of 2010 contains the following commitment:

By 2014: on the basis of Commission proposals, the EU should put in place financial instruments to attract a major increase in private finance and close the market gaps in investing in research and innovation. Contributions from the EU budget should create a major leverage effect and expand on the success of FP7 and CIP. The Commission will work with the European Investment Bank Group, national financial intermediaries and private investors to develop proposals addressing the following critical gaps: (i) investment in knowledge transfer and start-ups; (ii) venture capital for fast growing firms expanding on EU and global markets; (iii) risk-sharing finance for investments in R&D and innovation projects; and (iv) loans for innovative fast growing SMEs and midcaps. The proposals will ensure a high leverage effect, efficient management and simple access for businesses.

In 2011, the European Commission proposed that Horizon 2020 and COSME, the programmes succeeding FP7 and CIP, should jointly support an equity and a debt financial instrument designed to foster the growth of SMEs and small midcaps and their ability to undertake R&I, with Horizon 2020 also providing debt finance for larger entities.

For equity, the Commission proposed that both programmes should make seed, early-stage and growth-stage investments, with Horizon 2020 mainly focusing on risk-capital funds investing in seed, start-up and early-stage, R&I-driven SMEs and small midcaps, and COSME mainly focusing on venture capital (VC) and mezzanine funds investing in SMEs in the expansion and growth phases.

For debt, the Commission proposed that both programmes should provide loan guarantee facilities, with COSME additionally enabling the securitisation of SME debt finance portfolios, and Horizon 2020 also supporting direct loans to larger firms, research bodies, universities and R&I infrastructures.

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1.3 Building on financial instruments in CIP and FP7

Under CIP:

- The SME Guarantee (SMEG) facility, managed by EIF, provides guarantees or counter-guarantees to financial intermediaries extending loans to SMEs. As of end-2012, SMEG had mobilised €13.4 bn in lending to over 218 000 SMEs (the overall target is to reach 315 000 SMEs).
- The High-Growth and Innovative SMEs (GIF) facility, also managed by EIF, provides risk capital for innovative SMEs in their early stages (GIF-1) and for SMEs with high growth potential in their expansion phase (GIF-2). As of end-2012, GIF had mobilised over €2.3 bn in VC funding to nearly 290 SMEs.

Under FP7:

- The Risk-Sharing Finance Facility (RSFF), managed by EIB, had by October 2013 mobilised some over €10 bn in EIB signed loans to more than 100 companies (midcaps and large firms), research infrastructures and universities undertaking R&I. The overall target is up to €11 bn over the whole programming period;
- The Risk-Sharing Instrument (RSI), managed by EIF, aims to mobilise over €2.5 bn in loans from intermediary banks to up to 1000 SMEs and small midcaps undertaking R&I. Offering both guarantees and counter-guarantees, RSI is targeting the signature of agreements with 25 financial intermediaries by mid-2014; 18 agreements in 12 countries had been signed by October 2013, after 1½ years of operation, with over 170 loans already made.

1.4 Sources of evidence

This report draws on evaluations and audits of current instruments under CIP and FP7 (summarised in section 4); the impact assessment of the COSME proposal (especially the equity components); the outcomes of workshops, expert groups and field-trips; studies commissioned by the European Parliament, individual Member States, EIB and EIF, the European Research Area Board, and various European Commission DGs; studies produced by think-tanks, trade bodies and stakeholder associations; data and analyses from the OECD, the European Central Bank, the World Bank, and other sources; and, since the beginning of 2011, discussions between the Commission services and a variety of trade, industry and scientific bodies and less formally constituted stakeholder groups.

2. Problem analysis and needs assessment

2.1 Financing innovation

2.1.1 Investment in innovation is different from other investments and is harder to do

Investment in innovation by a firm typically covers R&D, capital equipment, design and marketing, and training. The most important item of expenditure in most sectors is R&D, accounting for over half the spend on innovation. R&D investments have three key

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characteristics that make them different from other investments: most of the R&D expenditure goes towards paying researchers; returns on the R&D investment are highly uncertain; and the capital created from such investment is largely intangible.

Researchers' efforts underpin the firm's knowledge-base, which also comprises the capacity created by training staff in new products and processes plus the knowhow stemming from investments in design and marketing. Where this knowledge-base is tacit rather than codified, it is undermined when researchers or other knowledge-workers leave. Coupled with the general uncertainty associated with the eventual commercial value of any R&D output — exacerbated by the need to reassess the value of investing in a particular project depending on the outcome of each stage in the R&D process — R&D investments require higher than average rates of return to compensate for the costs of adjusting to often drastic changes in a given project's outlook. Furthermore, any capital created is not only intangible, but has little resale value: it is often firm-specific, and tends to move with the employee.6

2.1.2 Innovative firms have more financing problems than other firms

Looking at the costs of financing innovation, economic theorists suggest two main reasons why external funding is more expensive than using a firm's internal funds: asymmetry between the information held by the innovator and that known to the investor; and conflicts of interest between an innovating firm's managers and its shareholders (known as the principal-agent conflict).

The asymmetric information problem comes about because an innovator knows more about their innovation and the likelihood of its success than potential investors do. Such investors find it more difficult to work out which R&D projects are likely to give them an adequate rate of return compared to investing in other types of activity, and so must make funds available on more onerous terms to compensate for the risk of a poor outcome or outright failure. The information asymmetry could be reduced if the innovator were to disclose more about their innovation, but they are inhibited in doing so because this would risk revealing information to competitors, so reducing their competitive advantage.

The principal-agent conflict in an established firm may arise where managers are risk-averse and so avoid starting or continuing innovation projects that, in their eyes, put the firm in jeopardy. On the other hand, an entrepreneur (in a start-up) or an R&D manager (in an established firm) may wish to continue a project that investors or shareholders would like to terminate. Together, these situations can lead to under- or over-investment, the inefficient funding of projects over time, the perception by investors of higher risk, and hence a widening of the gap between internal and external costs of capital.

The implication is that external sources of debt or equity finance to support R&D and innovation are likely to be more expensive than for investments in other domains, while the lack of tangible collateral will increase the difficulties of obtaining debt finance on reasonable terms. Start-ups and younger firms, the most reliant on outside financing, will find obtaining finance particularly difficult.

6 Though there are several initiatives afoot to create patent or other forms of IP aggregation fund to enable the commercial exploitation of unused inventions.
2.1.3 Funding R&I projects over time is often problematic: the 'valley of death'

Although there is no formula for calculating the appropriate capital structure or debt / equity mix over time needed by an R&I-intensive firm or project, there are some typical profiles:

- **Equity**: a company looking for equity investment is usually at the start-up early stage or at a point where accelerated growth is in the offing. All available cash is needed for developing and expanding the firm's means of production and working capital, rather than servicing debt. Such firms have yet to establish the stable pattern of cash-flow required by banks and other lenders, given that they are often breaking new ground.

- **Debt** is commonly used to fund an R&I project or initiative with a clear business plan or plan of execution, and a clear timetable for implementation. Sufficient cash-flow is needed to repay the loan, and collateral may be required.

In this context, policy papers and research studies tend to identify two troughs in the supply of capital to, in particular, innovative SMEs and midcaps. The first 'valley of death' refers to the financial risks that a start-up faces, due to a dearth of early-stage risk capital, during the technical and economic feasibility stage of the innovation process as the original idea is developed into a first prototype. The second 'valley of death' refers to the move from the prototype to the commercial production stage, and coincides with the tailing-off of government or EU-level grant support. Fig. 1 conflates the two valleys into one:

Fig. 1 - 'Valley of Death' in relation to cumulative profit and loss

![Fig. 1 - 'Valley of Death' in relation to cumulative profit and loss](image)

Source: Osawa & Miyazaki

Fig. 2 differentiates between the two valleys in terms of VC stages, position along the innovation sequence, and size of firm:

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Fig. 2 - The 'Two Valleys of Death' in relation to VC stages and innovation sequence

The dotted line --- demonstrates the tapering off of grant support during the early stage.
Source: PwC8, who refer in particular to Ford, Koutsky & Spiwak9, and to Johnson10.

2.2 Market gaps and deficiencies

2.2.1 R&I sectors

Problems regarding access to finance and the financing of innovation are particularly striking in R&I sectors with a high degree of dynamism and rate of company creation. They are also present in sectors that are capital intensive, or where many years are needed for the commercialisation of new products and services. A joint analysis in 2011 by several Commission departments looked at access to risk finance issues in the bio-based economy, climate mitigation and adaptation, eco-innovation, energy, healthcare, ICT, transport, and resource efficiency and natural capital sectors11.

Looking at market deficiencies, the analysis found that high and sustained investments are needed to achieve EU policy goals for the uptake and deployment of innovative products, systems, infrastructures and services, in particular those addressing societal challenges. There is a shortfall in the availability of debt finance for riskier firms (especially SMEs and notably microenterprises) engaged in R&I activities, and also for riskier R&I activities themselves at all scales and particularly at the demonstration and commercialisation stage, where companies seek to finance first-of-a-kind products, plants, systems, services and infrastructures.

8 PricewaterhouseCoopers EU Services (2012), EIB Innovative Mid-Cap Financing Study.
11 Financial instruments supporting research and innovation in the next Multiannual Financial Framework: an integrated approach, May 2011 (informal interservice working paper).
The paramount financing goal identified is to support and facilitate access to sources of debt and equity financing by innovative companies of all sizes and also by research centres and universities, public-private partnerships, special-purpose companies or projects, and joint ventures. Particular support is needed for innovative SMEs (and in some sectors, microenterprises), particularly in the start-up phase or after diversifying into new markets. The availability of early-stage and growth-stage equity finance for innovative firms needs improvement, with better access to finance for the concept and PoC stage of the innovation process. For commercial-scale, first-of-a-kind demonstration plants and their market uptake and wider deployment, a more predictable and stable supply of risk capital is needed: this is a key factor in attracting the public and private stakeholders needed for commercialisation. The availability of debt finance for R&I infrastructures also needs enhancement.

2.2.2 SMEs

2.2.2.1 Financing needs of innovative SMEs

Access to finance for new and innovative SMEs involves both debt and equity finance. During the recent financial crisis, support by the financial system for firms, particularly for new entrants, contracted greatly. Risk aversion and the lack of exit opportunities for investors continue to constrict sources of seed, early-stage and growth capital, though surveys show that many angel investors are supporting more and more companies through to the exit stage instead of relying on VC investors to step in. Furthermore, debt financing is actually the most common source of financing for small, young firms, including innovative ones, although innovative, high-growth firms seek equity financing more than other types of SME.

In the early investment stages, seed financing is aimed at researching, assessing and developing an idea or initial concept, while start-up and early-stage funding supports the development of the product and initial marketing. In the later or expansion stage, the business approaches or reaches breakeven and VC is used to increase production capacity and sales, develop new products, and finance acquisitions. In the growth stage, the business typically seeks capital to finance acquisitions, expansions or to restructure operations.

2.2.2.2 Supply of debt finance available to innovative SMEs

Regarding loans, supply-side and demand-side data compiled by the OECD and incorporating material from ECB/EC surveys continues to indicate that SMEs overall remain, to a very large extent, dependent on banks for their external financing and have few alternatives. The volume of SME loans has declined markedly in most Member States, especially in Southern Europe, despite sporadic upsurges in some countries, while loan authorisation rates have decreased considerably in a number of countries due to tighter credit standards and more negative prospects as a result of the crisis. Overall, the share of SME loans has decreased in many parts of Europe because SME lending has declined more than lending to large enterprises. SMEs continue to face more severe credit conditions than in large enterprises in the form of higher interest rates, shorter loan periods, partial financing, and more requests for collateral (or for greater collateral). The slowdown in lending recorded on

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13 For example, in OECD (2012), Financing SMEs and Entrepreneurs 2012: An OECD Scoreboard.
14 Survey on access to finance by SMEs in the euro area (SAFE): http://www.ecb.int/stats/money/surveys/sme/html/index.en.html
the supply side is matched by SMEs' perceptions of the poor availability of credit and of reluctance of banks to lend.

The situation is worse for SMEs undertaking R&I, as banks typically lack the ability to value knowledge assets, and are therefore often unwilling to invest in knowledge-based companies or to do so only with a risk premium. In consequence, many established and innovative SMEs find it hard to obtain loans for R&I activities.

2.2.2.2.1 Crowdlending

Peer-to-peer lending to businesses (crowdlending) may be gaining traction in a few Member States\(^\text{15}\), though evidence of its impact on or potential benefit for improving access to debt finance in support of R&I is absent at present.

2.2.2.3 Financing gap for innovative SMEs seeking debt finance

The size of the gap for debt financing for SMEs is typically expressed in terms of the number of viable firms unable to obtain a loan on reasonable terms. Evidence for and estimates of the size of the financing gap are summarised in the study\(^\text{16}\) supporting the impact assessment of the COSME programme. Based on Eurobaromenter, ECB and Commission surveys of EU firms in recent years, the authors estimate that 5 to 10% of all types of SME had their applications for bank loans rejected or only partially accepted, while another 5 to 7% anticipated rejection and so did not apply.

Applying these percentages to the approximately 20.77 million SMEs in the EU implies, according to the study, that at any one time 2 to 3.5 million firms are experiencing problems in accessing bank finance. Noting that rejection rates do not in themselves demonstrate a market failure, the authors draw on industry sources and other studies to suggest that 15 to 30% of rejections — equating to between 300 000 and just over 1 million firms — cover potentially bankable operations "that do not materialise for reasons linked to the existence of market imperfections", and point to the lack or insufficiency of collateral as often the decisive factor. The authors go on to argue that given the broad definition of "innovativeness" currently in use:

… the financing needs of innovative enterprises are scarcely distinguishable from those of other firms, and therefore the related 'financing gap' can be largely considered to be included in [the figure for all SMEs]. Comparatively more severe gaps might occur for certain types of risk and/or specific lines of business, but they cannot be meaningfully quantified based [...].

Further insight, however, can be gained from the 2012 Community Innovation Survey, which reveals that some 53% of enterprises reported "innovation activity" between 2008 and 2010; this suggests that at any one time, 150 000 to 500 000 innovating SMEs are originating bankable operations that the market cannot support\(^\text{17}\).

\(^{15}\) See, for example, Banking on Each Other — Peer-to-Peer Lending to Business: Evidence from Funding Circle, Nesta (April 2013).


2.2.2.4 Supply of equity finance available to innovative SMEs

2.2.2.4.1 Technology transfer financing

For the purposes of this report, technology transfer (TT) is defined as comprising both the funding of the proof-of-concept (PoC) of the technologies developed by universities or public research organisations (PROs) as well as the commercialisation of the resultant PoC.

The financing of TT comprises pre-seed, seed and start-up funding until early commercialisation. Part of the challenge in transferring the results of publicly funded research to the market is that the follow-on costs of development are not typically met, though such funding is needed to take forward the PoC. Public grants usually dry up as a concept moves from the basic research stage, through to applied research, and then to piloting, while private capital is not available until the later stages, when technological and commercial risks have diminished.

Apart from a handful of specialised private funds and a limited number of public schemes, TT is not served by classical VC, as the industry is not equipped to handle small transactions at the pre-seed or seed financing stages: there are many issues with compensation structures, which tend to incentivise larger fund sizes to the detriment of smaller deals. Furthermore, the lifespan of VC funds is often too short for the many innovative opportunities in TT that require a long time to mature. In addition, the inflexible structure of many funds means that negotiating non-standardised, tailored financial packages is often not feasible.

To help determine the extent of any need to intervene at EU level, staff of the Joint Research Centre (JRC) and DG Research & Innovation visited and interviewed operators of TT investment funds, national innovation agencies and technology transfer offices (TTOs) attached to universities over the period October 2012 to April 2013. The operators, funds and schemes concerned are listed in Table 1.

Table 1 - TT operators, funds and schemes visited by European Commission staff

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<tr>
<th>Operator, fund or scheme</th>
<th>Main characteristics</th>
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<tr>
<td>Chalmers Innovation Seed Fund, Sweden</td>
<td>TT fund linked to Chalmers University</td>
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<tr>
<td>Enterprise Ireland, Ireland</td>
<td>development agency; dedicated TT scheme</td>
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<tr>
<td>INRIA, France</td>
<td>national institute for ICT; dedicated TT fund</td>
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<tr>
<td>Imperial Innovations plc, UK</td>
<td>TTO and TT fund for Cambridge and Oxford Universities, University College London, and Imperial College; TT + VC finance</td>
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<tr>
<td>High-Tech Gründerfonds, Germany</td>
<td>national TT and early-stage fund</td>
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<tr>
<td>Max-Plank-Gesellschaft, Fraunhofer Venture, Ascension, Germany</td>
<td>TTOs and TT fund PRO spin-outs</td>
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<tr>
<td>Scottish Enterprise, UK</td>
<td>Scottish development agency; dedicated TT scheme</td>
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<tr>
<td>TT funds, Israel, including the Technological Incubators Programme of the Ministry of Industry &amp; Trade and the TT scheme of the Weizmann Institute of Science</td>
<td>TT funds linked to universities; nation-wide scheme</td>
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<tr>
<td>University of Leuven, CD3, Belgium</td>
<td>TT fund of Leuven University</td>
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These schemes were selected because they have developed independently from each other and represent a variety of approaches to TT. In all, discussions took place with some 50 people responsible for TT in eight Member States plus Israel. The questions posed during semi-structured discussions are listed in Annex 2. The main findings follow below.

Provided it does not crowd out existing national or regional schemes, there is broad support for establishing an EU support scheme that increases the availability of TT finance and allows risk-sharing. However, there was no consensus on whether this should be designed in a centralised or decentralised manner. Those interviewed agreed that co-investors should share risks and rewards on an equal basis, and expressed interest in the possible use of equity or equity-like instruments for a TT fund, although no common view on a specific form emerged.

Views differed, varying by sector, on where the funding gap lies: for example, more upstream in biomedicine than in engineering. All interlocutors said that if more financing were available, much more TT could occur, as the supply of promising ideas is not a constraint.

Financing the phases of TT can be based not only on equity but also on combinations of equity plus various permutations of grants, repayable grants, loans, and convertible loans. Private capital is only available after proof-of-concept, and, with one exception, not before the creation of a new firm with legal personality. As commercialisation, according to the interviewees, can take various forms, TT finance should cover both licensing IPRs and creating new companies through spin-outs, though creating a spin-out occurs less frequently than licensing or providing funding for further research.

Interviewees stressed that identifying potential projects or deal-flow is crucial, with independent assessment and selection essential to minimise the risks of bringing forward projects of little commercial value. It was also emphasised that TT is a hands-on business that requires both close proximity to a technology's developers and deep understanding of the research fields concerned. In most cases, successful TT is carried out by TTOs that are linked to a specific institution or are geographically close to one. Finding the right strategic partner (often from industry) as co-investor in the final development of the technology is also critical.

These findings complement conclusions on the potential for EU support for TT financing reached in the study supporting the impact assessment of the COSME programme. This looked at EIF analyses, studies, surveys by trade associations, a case-study and a quantification of socio-economic impacts to conclude that additionality is likely to be very

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20 By the Association of European Science & Technology Transfer Professionals (ASTP) and ProTon Europe (European Knowledge Transfer Association).
high for EU-supported TT deals\textsuperscript{21}, given the relative difficulty of accessing alternative sources of investment.

2.2.2.4.2 Equity crowdfunding

Equity crowdfunding, a comparatively novel form of fundraising, is the offering of securities by a privately held business, usually in the start-up phase, to the general public through the medium of an online platform. There are currently over a dozen equity crowdfunding platforms in Europe\textsuperscript{22}.

Data on the funding raised in Europe is currently fragmented, and its potential for funding R&I is unclear. According to crowdfunding platforms active in all forms of crowdfunding, platforms raised €446 mn in 2011 and €735 mn in 2012, funding some 470 000 projects in that year\textsuperscript{23}. There is anecdotal evidence that equity crowdfunding may well offer a complementary source of early-stage funds to help fill a financing gap between the friends, family and business angels stage and VC.

2.2.2.4.3 Business angel (BA) finance

A recent study of Member States' BA policies\textsuperscript{24} concluded that there are about 250 000 BAs in the EU, of whom 28 000 to 30 000 are members of networks that make data on their activities available. This latter group is often referred to as the 'visible segment'. The average network contains some 70 angels. Using data from EBAN and other sources, the study estimates that the total value of the visible segment of the BA market in Europe was around €0.66 bn in 2010. The comparative figure for VC in 2010 (from EVCA) was €1.9 bn. Data on the non-visible segment — i.e., angel activity taking place outside BA networks — is very limited: however, taking the non-visible part to be seven times the visible part in terms of numbers of BAs (based on reasonable assumptions) and assuming similar investment values, the study's authors conclude that the total investment by BAs in Europe in 2010 was €4 bn to €5 bn, which is about 25% of the US market.

Focusing on the visible segment, data from EBAN suggests that the median investment per angel is around €50 000, with individual investments ranging from as low as €18 000 to more than €150 000. Per firm, investments generally range, in most Member States, from €100 000 to €200 000. Survey data from Germany and Italy indicates a decline in the average size of investment per BA in recent years, with similar trends in some other countries.

Comparing VC investment at the seed stage with visible angel investments alone, the OECD has concluded\textsuperscript{25} that total investment via angel networks has already surpassed seed VC investment (Fig. 1):

\textsuperscript{21} The contractors set the deadweight parameter at 15%.
\textsuperscript{22} See list at http://crowdfunduk.files.wordpress.com/2013/02/crowdfunding-equity-platforms-europe.pdf, which also gives details of fees, etc., and provides links to the current leading platforms.
\textsuperscript{23} Quoted by Commissioner Barnier in his introductory speech to the European Commission-hosted workshop Crowdfunding: untapping its potential, reducing the risks, Brussels, 3 June 2013.
\textsuperscript{24} Evaluation of EU Member States' Business Angel Markets and Policies, CES (for DG Enterprise & Industry, European Commission) (October 2012).
\textsuperscript{25} Financing High-growth Firms: the Role of Angel Investors, OECD (2011).
BAs usually co-invest with other angels, and also with early-stage funds, institutional investors (including government schemes) and VCs. Although relatively uncommon at present, cross-border investments are attracting increasing interest, especially for syndicates, as a way of spreading and hence reducing investment risks: a recent Commission-convened expert group\(^{26}\) saw great potential for encouraging more cross-border investment through improving framework conditions (such as tax incentive structures) and via the provision of toolkits, guidelines\(^{27}\) and more pan-European data on returns and the potential for exits.

### 2.2.2.4.5 Venture capital

A recent study commissioned by the European Parliament's Committee on Industry, Research and Energy (ITRE)\(^{28}\) draws on and synthesises the outputs of a wide range of sources to examine, amongst other topics, the interrelated questions of whether innovative EU SMEs suffer from an insufficient supply of VC and if VC funds suffer from a lack of demand for what these funds have to offer.

The study found that the supply of VC is low in Europe because many institutional investors either withdrew from the VC market following losses from the bursting of the dot.com bubble and have not returned, or, in the wake of the financial crisis, have ceased to invest in VC or have moved their focus from seed and start-up VC investments to later-stage VC or private equity investments. Europe lacks a pool of large pension funds, university endowments, foundations and family offices willing and able to fill the gap, though public efforts have gone

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\(^{26}\) See *Report of the Chairman of the expert group on the cross-border matching of innovative firms with suitable investors*, (September 2012), and especially section 4.3.1, *Angel investor capacity-building and cross-border investing*.

\(^{27}\) Building on, for example, the EU-funded cross-border early-stage investor stimulation project EASY – [www.proinno-europe.eu/project/easy](http://www.proinno-europe.eu/project/easy).

some way to compensate29, with government agencies significantly stepping up investments over the past few years:

In addition, Europe suffers from a problem in the quality of the funds supplying VC: not many are large enough to attract institutional investors or sufficiently experienced in selecting promising companies. Furthermore, the persistent segmentation of the market along national lines reduces cross-border operations and undermines attempts to achieve economies of scale in both fund-raising and investment.

On the demand side, the study found that a common complaint of VC funds in Europe is the limited number of high-potential firms available for investing in, especially in the early stages, and particularly regarding firms that can be expected to deliver an acceptable rate of return. The causes identified include low relative and absolute levels of R&D expenditure in most Member States, disadvantaging the generation of new ideas; insufficient investment in mechanisms supporting TT and commercialisation; lack of business skills on the part of company management teams; and a raft of framework conditions linked to IP rights, public procurement practices, tax regimes, and the flexibility of labour markets.

Views regarding the relative importance of supply and demand factors in the VC field, and the nature of their causal relationship, differ among stakeholders and analysts. What is clear is that the European VC industry is relatively undeveloped, especially compared to the situation found in the USA, the most-used benchmark: US VC investments amount to around 0.1% of GDP compared to Europe's figure of some 0.04%, with only a handful of Member States reaching higher levels. The EU trails the US by a factor of 2 to 3 annually with respect to fundraising and investments. Moreover, apart from the dot.com bubble period from 1997-2000, the average annual return to European VC funds has been below 10%, and for the past ten years or so, negative, with not even the performance of the best-managed funds high enough to deliver the returns sought by institutional investors.

29 In 2012, just under 40% of funding for VC came from government agencies, according to EVCA (2012 EVCA Yearbook), and the total amount raised from such agencies for VC funds in Europe was just under €1.2 bn.
2.2.2.5 Financing gap for innovative SMEs seeking equity finance

In the study on financial instruments accompanying the impact assessment for COSME\(^\text{30}\), the authors reject the idea of equating the aggregate financing gap in the EU with the size of what would be needed to approach the ratio of VC investments to GDP found in the US. They argue that this method overlooks structural differences between the two economies and neglects issues of absorption capacity, such as difficulties in increasing the numbers of skilled VC fund-managers, or the dearth of investment opportunities. Instead, their approach is to target a doubling of the recent level of VC investments over five years, requiring, so the authors estimate, a progressively gap-filling increment of about €800 million per year.

In mature VC markets in the EU, the equity financing gap at firm level is often expressed in the form of upper and lower limits on the amount of equity finance sought that potentially viable and profitable businesses find themselves unable to raise, though it is not realistic to assume that the supply of VC suddenly increase outside such boundaries: rather, there is a progressive scale of difficulty in obtaining funding. Players perceive the boundaries or size of the equity gap to have increased over time as private-sector venture capitalists have either left the field or favoured larger investments\(^\text{31}\).

Regarding angel financing, the authors of the already-cited policy study, when discussing policy choices\(^\text{32}\), note that the small proportion of projects that, once brought to the attention of networks, are actually funded — some 3% to 5% — may be interpreted as indicating that the funding gap at this funding level and firm development stage may not be large.

Further insight at the firm level can be gained from analysing the questionnaire-based submissions to the 2012 consultation associated with the revision of the State aid rules for SME access to finance, the Risk Capital Guidelines\(^\text{33}\), where views were sought, amongst other things, on the size of funding gap experienced by SMEs at different stages and in different sectors and countries. To quote from the Issues Paper\(^\text{34}\):

[Most comments received emphasised that the funding gap] affects SMEs not only at their seed/start-up and early expansion stages, but also at later expansion/growth stages. The funding gap is not a specific number, but can best be understood as being a function of many different factors, such as the sector concerned, the business cycle, supply and demand conditions in the financial markets and the characteristics of the company. Hitherto the Commission has generally considered there to be a funding gap for equity and quasi-equity investments [of] up to €2.5 million. According to certain stakeholders … this funding gap would be significantly higher … of a size of €10 to 15 million, which is considered the level at which private equity providers would normally consider investing. In one specific recent case\(^\text{35}\), the Commission has found … evidence of a funding gap affecting early-stage SMEs reaching GBP 5 million [ca. €6 mn].


\(^{31}\) EVCA and discussions with VC fund and FoF managers at conferences and workshops, 2011-2013.

\(^{32}\) In section 6.2 of Evaluation of EU Member States’ Business Angel Markets and Policies, CES (October 2012).


\(^{34}\) Revision of the State aid rules for SME access to risk finance: Issues Paper (2012), DG Competition.

\(^{35}\) SA.33849 – UK – Amendments of the Enterprise Investment Scheme and the Venture Capital Trusts Scheme.
2.2.3 Midcaps

2.2.3.1 About midcaps

A 2012 study commissioned by EIB assessed the demand for capital, the supply of capital, and the financing market gap affecting innovative midcaps. 'Midcaps' were defined as having 250 to 3000 employees, operating in the Member States, and restricted to those active in domains covered by the NACE (Rev. 2) areas related to innovation activities as laid down in the Community Innovation Survey. The study identified over 28 000 such midcaps, of whom some 14 000 (in autumn 2012) were bringing innovations to market.

Consumer goods and retail, together with business and industrial products, are the dominant sectors in which innovative midcaps operate, each accounting for some 20% of the target group; while financial services, business / industrial services and transportation are each the focus of about 10% of target companies. Germany has the largest number of innovative midcap firms (over 3500), followed by the UK (nearly 2000) and France (almost 1550). In Germany, nearly two-thirds of all midcaps are commercialising innovations, compared to half in the UK and France. Austria, Belgium, Spain and Sweden each have 400-550 such firms.

The 14 000 or so innovative midcaps in the EU employ over 9 mn people — including 2.3 mn in Germany, 1.3 mn in the UK, 1 mn in France, and nearly 700 000 each in Italy and the Netherlands — and generate turnover of more than €3140 bn — €790 bn in Germany, €522 bn in the UK, and €263 bn in France. The turnovers of innovative midcaps in Austria, Belgium, Spain and Sweden each range from €100 mn to €140 mn.

In all sectors save financial services, most innovative midcaps have under 500 employees and are therefore 'small midcaps', less than twice the size of the largest SMEs. However, most of the demand for finance comes from companies with over 500 employees (see section 2.2.2.3).

2.2.3.2 Financing needs of innovative midcaps

The results of the survey of midcaps and the interviews with private and public investors reveal that most innovative midcaps have maintained or increased their R&I spending despite the economic downturn. The projects invested in are typically long-term and hence need long-term financing. The primary form of R&I expenditure (55% of firms surveyed) is the cost of research staff. As for SMEs, this is a concern for investors, as such staff typically generate intangible assets that are often not regarded as adequate collateral for securing funding. Expenditure that generates tangible assets is the main expense for well under half the firms.

36 There is no official or widely accepted definition of midcaps at present. For the purposes of this report and in implementing the Horizon 2020 financial instrument facilities until such time as an official definition is agreed, 'midcaps' are deemed to be enterprises comprising 250 to 3000 employees (or full-time equivalents). They are divided into 'small midcaps' of between 250 and 499 employees, and 'medium and large midcaps' of from 500 to 3000 employees. 'Enterprises' are defined as in Article 1 of Title 1 of the Annex of Commission Recommendation 2003/361/EC (OJ L124, 20.05.2003, p. 36). Headcount is calculated in accordance with Articles 3, 4, 5 and 6 of Title 1 of the same Annex.

37 PricewaterhouseCoopers EU Services (2012), EIB Innovative Mid-Cap Financing Study. Commissioned under the EU-EIB RSFF Cooperation Agreement.

38 Based on the findings of PwC’s online, questionnaire-based survey of a representative sample of 300 innovative midcaps, supplemented by semi-structured interviews with private investors — 3TS Capital (Austria, Czech Republic, Hungary, Poland, Romania); BPI (Portugal); CIC Mezzanine (France); Earlybird (Germany); Euroventures (Hungary); Global Life Science Ventures (GLSV) (Austria); H.I.G. Europe (UK); IRIS Capital (France); Zouk Capital (Austria) — and public institutions — Cassa Depositi e Prestiti (Italy); EBRD; KfW (Germany); National Capital Fund (Poland); OSEO (France).
For two-thirds of the innovative midcaps surveyed, debt is the preferred form of financing, while 30% preferred equity or hybrid financing. Over 80% of respondents said their company had used banks for obtaining funding in 2011. Self-financing by company owners is the second most frequently used source of funding (31%), followed by government (21%) and public institutions (17%). Private investors were only used in 12% of cases.

Access to both debt and equity finance has become harder for a significant proportion of innovative midcaps, and almost half are dissatisfied with the conditions attached to what is available. On the other hand, over three-quarters of respondents felt they had sufficient access to debt financing, while the attractiveness of equity or hybrid financing is shown by the view held by nearly 60% of respondents that access to this type of financing is insufficient.

2.2.3.3 Financing demands of innovative midcaps

Extrapolating the survey's findings to the total population of innovative midcaps, the bulk of the demand appears to come from firms with 500 employees and above, with this segment accounting for 86% of the annual demand for debt financing and almost all (97%) of the demand for equity financing. The average total annual demand for debt financing is estimated to be €250.5 billion for debt financing and just under €39 billion for equity.

Three-quarters of medium-sized midcaps (500 to 999 employees) seek debt financing of up to €30 mn, while three-quarters of larger midcaps (1000 to 3000 employees) look for up to €40.4 mn. Demands can be as high as €225 mn and €300 mn respectively. Equity financing is of particular interest to medium-sized midcaps, with annual investments of from €13.4 mn to €30 mn typically sought.

2.2.3.4 Supply of risk finance available to innovative midcaps

While the supply of debt financing, estimated as between €800 bn and €893 bn, appears at first sight to be several times larger than the demand, most of what is available is for short-term, highly collateralised financing, usually fee-heavy, that does not match the characteristics of the long-term, flexible debt required by innovative midcaps seeking to fund investments primarily in intangible assets (research staff, working capital and acquisitions). The demand exceeds the available supply of suitable offerings.

PwC's analysis estimates the supply of equity finance available to innovative midcaps in 2011 to have been €2.8 bn to €4.4 bn, showing a ten-fold shortfall compared to demand.

2.2.3.5 Financing gap for innovative midcaps seeking debt finance

Although capital is available, banks are not offering appropriate lending terms. Debt maturity, security and price do not meet the expectations of innovative midcaps. The interviews with public investors accompanying the PwC study indicate that the characteristics of the debt on offer, with its reliance on pledgeable assets, makes it unsuitable for financing long-term R&I investments. Looking at the loans sought by the innovative midcaps surveyed (Table 2), the average size for small, medium and large midcaps is €11.1 mn, €52.6 mn and €63.8 mn respectively, while 75% of each of these segments intend to raise annual debt financing of €2.5 mn, €30 mn and €40.4 mn respectively over the period 2013-2015.
Table 2 – Average size of loan sought per year by innovative midcaps

<table>
<thead>
<tr>
<th>Company size</th>
<th>QUARTILE</th>
<th>AVERAGE</th>
<th>MIN</th>
<th>25%</th>
<th>MEDIAN</th>
<th>75%</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤500 – 500</td>
<td></td>
<td>11,080,000</td>
<td>400,000</td>
<td>500,000</td>
<td>2,000,000</td>
<td>2,500,000</td>
<td>50,000,000</td>
</tr>
<tr>
<td>500 – 999</td>
<td></td>
<td>52,583,333</td>
<td>500,000</td>
<td>12,000,000</td>
<td>25,000,000</td>
<td>30,000,000</td>
<td>225,000,000</td>
</tr>
<tr>
<td>1.000 – 2.999</td>
<td></td>
<td>63,722,222</td>
<td>5,000,000</td>
<td>6,750,000</td>
<td>10,833,333</td>
<td>40,416,667</td>
<td>300,000,000</td>
</tr>
<tr>
<td>All mid-caps</td>
<td></td>
<td>94,056,449</td>
<td>500,000</td>
<td>3,250,000</td>
<td>10,000,000</td>
<td>30,000,000</td>
<td>300,000,000</td>
</tr>
</tbody>
</table>


### 2.2.3.6 Financing gap for innovative midcaps seeking equity finance

There is a significant quantitative gap between the supply and demand of equity-type financing. The qualitative gap relates to the discrepancy between the optimal investment product and the characteristics of the products available. Equity financing appears to be of most interest to medium-sized midcaps, with an annual demand ranging from €13.4 mn to €30 mn with an average of €23 mn, lower than for debt financing (see Table 2).

#### 2.2.4 Large firms

Evidence that larger, established R&I-intensive firms have problems in accessing debt finance to fund innovation projects is mixed and harder, methodologically, to establish. However, a recent econometric study suggests that large EU R&I companies face liquidity constraints that could be eased if public intervention improved the availability of risk finance. The study points out, though, that more knowledge is needed of the share of different sources for the funding of R&D, i.e. internal financing, stockmarket shares, bond issues, and debt financing.

Empirically, the EIB’s experience suggests that demand for the debt financing of R&I is much higher than what the market provides, as it lent some €23 bn under its i2i scheme to 122 RDI projects and has so far signed (as of mid-2013) €8.9 bn in loans under the RSFF. EIB prices the risk in line with market rates and only finances part of any funding operation (typically 30-35%), with the rest coming from private and public sources.

### 2.3 Public policy

#### 2.3.1 Debt finance and public policy

At EU level, the main R&I-focused lending scheme has been the RSFF under FP7, covering mainly large firms with direct lending via the EIB, and more recently SMEs and small midcaps under the RSI loan guarantee scheme run by the EIF. Under CIP, the SME Guarantee Facility, SMEG, has also supported innovation to a significant degree, though the facility has a broader scope and aims at a wider range of SMEs.

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39 Over 3000 full-time equivalent employees.
41 Financing constraints and R&D investments of large corporations in Europe and the US, Cincera, M. & Ravet, J., Science and Public Policy, 37(6), July 2010, 455-466. The study drew on the EU Industrial R&D Investment Scoreboard (JRC-IPTS) and covered nearly 2000 firms responsible for some 80% of all R&D carried out in the private sector worldwide. Complemented by personal communications with Cincera, M.
42 Only two of which involved SMEs. See Ex post evaluation of i2i RDI projects: synthesis report, Silvé, A. et al., 2007, EIB Operations Evaluation.
Governments, sensitive to the increasing difficulties faced by companies undertaking R&I, have responded in many Member States by injecting capital into their dedicated R&I loan guarantee and direct lending programmes. With the adoption of the Temporary State Aid Framework, most existing schemes were expanded in terms of the total amount of guarantee funds and direct lending available, the percentage of the loan guaranteed, the size of the guaranteed or direct loan, and the number or range of characteristics of eligible enterprises.

2.3.1.1 Policy developments likely to affect the supply of and demand for debt finance

The ongoing economic and financial crisis in the EU has had a lasting impact on the financial position of many public and private players, affecting the confidence of investors and lenders and the effectiveness of the financial sector. The tensions in sovereign debt markets and within the banking sector have fed on each other, creating severe funding problems for many borrowers. These developments have also led to the fragmentation of the financial system along national borders, with a retrenchment of financial activities to domestic markets.

Basel III, the main bank-related regulatory reforms developed in response to the financial crisis, tightens the rules relating to minimum capital requirements and introduces new strictures on managing liquidity. The objective is to improve the ability of banks to absorb shocks arising from financial and economic stress. If Basel III is fully implemented over the next few years, it could have a positive effect on growth and, as a result, on lending.

Regarding credit guarantee schemes, a diminution in the intensity of state support can be anticipated as the State aid regime returns to 'normal', and further reductions are likely in the support for such schemes by those Member States experiencing budgetary difficulties.

Regarding securitisation, the European securitisation market in general has performed, in terms of losses, relatively well so far. The track record of SME securitisation in Europe is relatively short, with the market starting only towards the end of the 1990s: at the time, this segment was unknown to investors and rating agencies, and the technique of securitisation was also new to most players. The related uncertainty was one of the reasons for the generally conservative structures found in the SME securitisation segment. The tightening of credit conditions for SMEs has indirectly had a positive effect for new loan vintages, and hence for the quality of newly securitised portfolios, as banks have become more risk averse. However, the sovereign crisis and weak macroeconomic fundamentals in many European countries have also had negative effects on SME transactions, and it is expected that the credit quality of existing portfolios in stressed markets will further deteriorate, as the performance of SME portfolios is typically dependent on GDP growth-trends. Moreover, many counterparties in SME-related transactions will continue to suffer from ongoing stresses in the European banking system.

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45 The key regulatory changes are to be implemented in stages between 2013 and 2018.
46 This section draws on analyses in Ex ante assessment of the EU SME Initiative, DG Economic & Financial Affairs, European Commission (2013).
2.3.1.2 Summary of likely impacts on medium-term access to debt finance for R&I

Incumbent lenders:
- are less likely to lend to market segments, such as R&I, that they perceive as too risky;
- may increase their lending costs;
- will probably set higher collateral requirements;
- are more likely to lend on shorter terms;
- could well reduce their cross-border operations;
- may be challenged, however, by non-bank entrants, such as peer-to-peer crowdlending platforms.

2.3.2 Equity finance and public policy

2.3.2.1 Technology transfer financing

EIF has supported several TT-oriented funds either via a pilot scheme or under GIF-1 (see section 4.2.3 below for more details). However, investments into such dedicated funds remained limited.

Some Member States support both PoC and commercialisation through dedicated TT schemes that are institutional, city-based, regional or national, usually provide TTO functions, and are often supplemented by funds that support various TT stages and facilitate start-ups.

FP7 supports PoC via grants under demonstration projects and the ERC's proof-of-concept scheme\(^{47}\), and CIP likewise via pilot and market replication projects. Other instruments support the growth of SMEs. These activities will be continued and extended under Horizon 2020. The precise amount and percentage allocated to PoC under FP7 is not yet known with precision, though it is estimated that some 20% of FP7 grants cover some form of PoC. However, this form of PoC funding is limited to projects that have received FP7 grants — i.e., less than 10% of all research in Europe. Furthermore, as these schemes are not integrated and only address the PoC challenge without making follow-on funding available for commercialisation, they do not cover enough of the value-chain.

2.3.2.2 Equity crowdfunding

Research is needed both to better understand how this rapidly growing field is developing and how to address issues such as attracting experienced investors to participate in platforms and for the crowd to collectively benefit from their expertise; how to ensure that investors have access to transparent and reliable information about a project; the provision of guarantees to promoters and investors if a platform fails; exit strategies for investors; and IP protection.

The need for any specific EU-level regulation or other form of intervention is unclear: some Member States, such as Belgium, France and Germany, have issued guidance on how crowdfunding could be regulated, while others, such as Italy, are establishing a specific framework to help high-tech, innovative SMEs gain access to finance via crowdfunding.

\(^{47}\) For details, see http://erc.europa.eu/proof-concept
2.3.2.3 Business angel finance

A recent OECD study\textsuperscript{48} reviewed BA policies in Europe. Taking its findings together with the few evaluations, so far, of national support programmes (Sweden, UK) reveals that some governments (e.g. in Germany, Spain and Sweden) have financially supported the formation of national BA associations or of federations of networks and also the provision of consulting services to entrepreneurs to help make them investment-ready; in some countries, support for syndicates has been provided, such as via the Technostarter Funds in the Netherlands and the LINC scheme in Scotland, UK; several countries have deployed tax incentive schemes (for example, France, Spain and UK); and co-investment funds have been set up in several countries including Belgium, Denmark, Netherlands, Sweden and UK.

Tax and co-investment schemes have generally received positive assessments in terms of their return on public investment, though evidence of their added value and long-term viability is mixed. Support for networks has also been favourably reviewed as a policy measure that raises awareness and, in some cases, connects investors with potential investees\textsuperscript{49}.

EIF made a significant entrance into the BA co-investment market in 2012 with the European Angels Fund (EAF). The initiative is already operational in Germany with a €70 mn \textit{EAF Germany} fund in association with Business Angels Netzwerk Deutschland (BAND), and set-ups are underway in Spain — the €30 mn \textit{EAF Spain-Fondo Isabel La Católica} — and Austria — the €22.5 mn \textit{EAF Austria – aws Business Angel Fonds}.

The counter-cyclical approach of the EIF may have a significant impact, if maintained. However, exit strategies are a particular concern in several Member States. Most exits are through trade sales and buy-backs, followed by the closure of a business and, the least prevalent method, IPOs. Most studies suggest that angels hold their investments for either 4 to 7 or 3 to 5 years. Exits are strongly influenced by prevailing economic conditions: in Italy, for example, there were substantially less exits reported in 2011 than in 2010 due to an inability to find purchasers in the prevailing financial climate. Firm data on returns to BAs is not widely available (EBAN is sponsoring a long-term research project in this area), though a relatively recent study of the UK experience\textsuperscript{50} provides some useful information:

The most likely outcome in any one angel investment is failure, but 'winning' investments are very attractive. 56\% of the exits failed to return capital, while 9\% generate more than ten times the capital. Because the 44\% of investments that generate positive exits win at a larger multiple than the costs of the negative exits, the overall return to business angels [...] is 2.2 times the invested capital. These 9\% large investment exits produced nearly 80\% of all the positive cash-flows. Given the holding period of just under four years, this is approximately a 22\% gross internal rate of return.

2.3.2.4 Venture capital

Given the generally pro-cyclical nature of the activities of equity investors, the health of the economy overall is very likely to dominate the evolution of both Europe's VC and BA industries, though some analysts advocate and predict a considerable downsizing of the VC

\textsuperscript{48} Financing High-Growth Firms: The Role of Angel Investors (2011), OECD.

\textsuperscript{49} For more information about the stance of particular Member States' administrations, see section 6.2 of Evaluation of EU Member States' Business Angel Markets and Policies (October 2012), CES for DG Enterprise & Industry, European Commission.

\textsuperscript{50} Wiltbank, R.E., Siding with the Angels (May 2009), NESTA.
sector in both Europe and the USA in order for a smaller number of funds to enjoy a reasonable level of return and profitability\textsuperscript{51}. 

At EU level, EIF plays a crucial role: by end-2011, its total net equity commitments came to €5.9 bn (with a record €1.1 bn in 2011 alone), covering investments in over 370 funds and over 300 fund manager teams\textsuperscript{52}. VC-related initiatives can be grouped into three categories:

- Initiatives supported by the EU budget and managed by EIF, covering the European Technology Facility Start-up implemented under first the G&E and then the MAP programmes (1998-2006) with €344 million allocated for early-stage investments; the High-Growth & Innovative SME Facility (GIF) under the current CIP, allocating €623 mn to seed, early-stage and later-stage investments; and the Technology Transfer Pilot Project (see section 4.2.3), with a budget of €2 million.

- Facilities managed by EIF on behalf of EIB, covering €5 bn under the Risk Capital Mandate and €1 bn under the Mezzanine Facility for Growth\textsuperscript{53};

- Equity funds (VC) as a delivery mechanism for Structural Funds\textsuperscript{54}, with currently 124 such funds operating with Structural Funds resources, some of them selected by the EIF as a holding fund manager. Over the past four years, these funds have made more than 2000 investments in enterprises using some €380 million of Structural Funds and at least the same amount of additional resources. While these funds contribute to cohesion policy objectives, the investment decisions are privately driven, always seeking economic and commercial returns. The European Structural & Investment Funds (ESIF) framework for 2014-2020 gives special attention to equity funds and contains provisions adapted to market practices, covering possibilities paying management costs and fees beyond the usual period (an additional 6 years after the end of the eligibility period); financing follow-on investments beyond the usual period (up to 4 years after the end of the eligibility period, under certain conditions); preferential remuneration to private investors or public investors operating under market economy principles, provided that this is justified by an ex-ante assessment and is compatible with State aid rules; and a more attractive management costs and fee structure in order to attract professional fund managers and incentivise their performance.

In the Member States, the lack of sufficient capital flows from private VC funds into, in particular, early-stage innovative firms has led to the creation of a large number of public-sector schemes, taking several forms\textsuperscript{55}, at the regional and country level. In France, for example, CDC Enterprises manages the €2.2 bn France-Investissement programme, while in Germany there is the €500 million ERP-EIF Dachfonds managed by EIF plus the €272


\textsuperscript{52} See *EIF Annual Report 2011*.

\textsuperscript{53} For more information, see *EIF Venture Capital Operations: ETF and RCM Mandates*, Silvé, A. et al., 2007, EIB Operations Evaluation.

\textsuperscript{54} See, for example, *European Commission* (2013), *Summary of the progress made in financing and implementing financial engineering instruments co-financed by the Structural Funds, programming period 2007-2013: situation as at 31 December 2012*.

\textsuperscript{55} For more examples, see section 5 of European Parliament, DG for Internal Policies (2012), *Potential of Venture Capital in the European Union*.
million High-Tech Gründerfonds. In the UK, a series of government-backed investment funds have provided over €1 bn of public money in support of VC. In many Member States, however, with pressure mounting to reduce budget deficits, the relatively modest returns achieved by some VC operations backed with public funds, coupled with the significant management costs involved, may undermine support for future initiatives.

The regulatory framework varies significantly between Member States, and hence the VC market is highly fragmented, with each country having created a different operating environment for VC. Cross-border fundraising and investing, while possible, is complex and costly, with funds usually needing to set up an additional legal entity in each Member State concerned. In addition, fund managers are confronted with problems of double taxation, tax-related administrative obstacles, and uncertainties over tax treatment. In this context:

- The European Venture Capital Funds Regulation (EVCFR), which entered into force on 22 July this year, creates an opt-in regulatory regime for fund managers whose funds are below the €500 million threshold requiring registration under the Alternative Investment Fund Managers Directive (AIFMD). EVCFR introduces the protected designation of "European Venture Capital Fund" (EVCF). After a domestic registration process, a fund manager can market EVCF-qualified funds in all Member States without further national registration or approval by national regulators. The hypothesis is that the implementation of EVCFR will lead to larger and more cost-effective funds that can also specialise by type of investment or sector, increased competition between funds, a wider diversification of funds' investments, and hence to SMEs having greater access to equity finance.

- Although diminishing obstacles to cross-border fund-raising, EVCFR will not in itself solve any taxation problems that funds invested across borders may face, because the Regulation does not contain rules on taxation. In 2010 a group of tax experts published a report on the taxation problems which might arise when VC is invested across borders. However, the 2012 Commission public consultation on VC-related cross-border direct tax problems did not yield sufficient evidence to conclude either that the potential tax problems identified occur in practice, or to be able to estimate the real extent of such problems, the frequency with which they occur, and their financial impact. Given this outcome, the Commission is currently reflecting on what, if any, steps it could take in the tax field.

- The Commission is currently reviewing the Risk Capital Guidelines as part of the modernisation of the State aid regime.

- The prudential regulation of VC investors, such as Solvency II for insurers, has increased investors' risk aversion and further constrained fundraising.

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56 See Overview of publicly backed venture capital and loan funds in the UK, 2012, Capital for Enterprise Ltd.
57 See, for example, National Audit Office (UK) (2009), Venture Capital Support to Small Businesses.
58 Funds must meet certain requirements, such as that 70% of commitments are invested in SMEs.
60 See http://ec.europa.eu/taxation_customs/common/consultations/tax/2012_venture_capital_en.htm
2.3.2.4.1 Funds-of-funds as an equity investment mechanism

The European VC industry has stressed that the rise in public-sector funding (see Fig. 2) represents a long-term structural change in the VC landscape, noting that the market now faces a lack of private-sector capital as many investors have, since the onset of the financial and economic crisis, switched attention to less risky asset classes with a more attractive history of financial returns. To attract back private investors, various proposals for establishing pan-European VC funds-of-funds (FoFs), several involving direct support from the EU budget, have recently come to the fore.

A FoF is an investment vehicle that invests in other funds. The funds in which the FoF invests then themselves invest in individual firms. A pan-European VC FoF could potentially act as an intermediary by raising and aggregating money from institutional investors (pension funds, family offices, endowments, etc.), public financial institutions, supranational institutions (such as the EU) and private investors, and investing the pooled funds in VC or other risk-capital funds.

![Fig. 3 – Basic structure of a VC-focused fund-of-funds with EU investment](source: European Commission)

Four main ways of setting up and structuring public-private, pan-European VC FoFs are currently advocated:

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62 See, for example, the discussion in Bright sparks: nurturing Europe's innovation (2012), EVCA.
1. EVCA's views on the general design principles for a VC FoF include private-sector management, using incentives to attract private-sector investors, investing across all industry sectors (and not by theme), and a strategy of investing in VC funds with a high target allocation of EU firms.

2. A group of 14 national VC operators and long-term investors, EVFIN, has developed a proposal for pooling the capital and expertise of member institutions in a €250 mn fund. Such a FoF would aim to build up a portfolio of 15 to 20 VC funds, and would invest on equal terms with other market-oriented investors in the expectation of attracting private investment. Its focus would primarily be on cross-border VC funds managed by both established and newly created management companies, with the emphasis on teams located in the countries of EVFIN members. It would mainly target early-stage funds.

3. An informal group involving several state investment funds and some private operators envisages the EIB Group supporting three to five FoFs, each with €2 bn to €3 bn under management. The emphasis would be on developing local, regional and sector-specialised VC markets in conjunction with state-owned or government-sponsored national operators. All the funds invested in would be cross-border and multistage, and the investment mandate would, as well as VC, cover mezzanine and private equity.

4. EIF is setting up a pan-European FoF-type initiative called the Corporate Innovation Platform (CoriP). This has a thematic approach, with four sub-funds — 'Digital Life', 'Smart Things', 'Health & Wellbeing', 'Sustainability' — within the investment vehicle. It focuses on attracting corporate investors, with up to 10 to be admitted to each sub-fund and an entry-ticket of €10 mn. There is a cornerstone commitment of €50 mn, per sub-fund, by EIF itself, and a stated openness to engage with BAs. Another approach proposed in some quarters is for the Commission to minimise its exposure by investing in national or transnational FoFs that have already been launched, attracted private investors, and demonstrated the quality of the FoF managers concerned.

Annex 1 examines the rationale for using FoFs as an equity investment mechanism.

2.3.2.5 Summary of likely impacts on medium-term access to equity finance for R&I

- Investors may severely curtail their exposure to early-stage VC.
- Member States may cut back on support for VC via government-backed investment funds.
- Angel finance, and possibly equity crowdfunding, may come to supply a higher proportion of the needs for early-stage equity.
- The entry into force of the European Venture Capital Funds Regulation (EVCFR) may start to lead to SMEs having greater access to VC finance.

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63 Accelerating Innovation: using Public Sector Capital to Attract Private Sector Investors to the European Venture Capital Industry (2011), EVCA.
64 Axis (Spain), CDTI (Spain), Caixa Capital (Portugal), Capital Dynamics (UK), CDC Entreprises (France), Enterprise Ireland (Ireland), Finnish Industry Investment (Finland), KFK (Krajowy Fundusz Kapitałowy (Poland), MFB Invest (Hungary), New Economy Development Fund (TANEO) (Greece), PMV (Belgium), SRIW (Belgium) and Vækstfonden (Denmark). Membership as on 31 July 2013.
65 Outlined in EU Growth Agenda: the Contribution of National Venture Capital Operators (June 2012), EVFIN.
66 With a fluid membership. Some have become members of EVFIN.
67 For details see http://www.eif.org/what_we_do/equity/coriP/index.htm
2.4 Summary of financing and market gaps

2.4.1 Debt finance

There is a gap in the market between the demand for and supply of loans and guarantees for risky R&I investments for undertakings of all sizes, with banks remaining largely absent from higher-risk lending. Where capital is available, banks are often not offering acceptable lending terms in terms of loan periods, collateral required and price. The demand for debt financing by innovative midcaps exceeds the available supply of suitable offerings, based on a survey and interviews with public investors. The potential for other players to fill the gap, such as crowd-lending platforms, is unclear.

For innovative SMEs, looking at the analysis in section 2.2.2.3, at any one time, 150000 to 500000 innovating SMEs are originating bankable operations that the market cannot support. Experience with the RSI under the current RSFF suggests an average loan size of some €750 000, suggesting a funding gap of between, roughly, €112 bn and €375 bn. For innovative midcaps, section 2.3.3.3 indicates (2011 figures) that the average total annual demand for debt financing is estimated to be €250.5 billion for debt financing, though the shortfall compared to supply is difficult to estimate.

2.4.2 Equity finance

A dearth of finance for the TT stage of the innovation process is undermining the potential for commercialising new products and services. While the decline in the availability of classical VC may be offset by a rise and extension along the value-chain of BA financing, problems with exits may inhibit angel investors. The future of national support schemes for VC is uncertain. The potential for equity crowdfunding for R&I is unclear.

For SMEs, analysts differ over appropriate the choice of methodology for expressing the equity finance gaps (see section 2.2.2.5): at firm level, this may be some €5 mn per firm, and at aggregate level, some €800 mn per year.

For innovative midcaps, there is a significant gap between the supply and demand of equity-type financing, though this assertion is based on a survey only. The average total annual demand (2011 figures) for equity finance is estimated (section 2.2.3.3) to be just under €39 billion for equity, falling far short of the estimated €2.8 bn to €4.4 bn demand.

3. Justification for action and European added value

3.1 Why use financial instruments?

In the Commission's "A Budget for Europe 2020" policy paper68, FIs are highlighted as a way of advancing the EU's key policy priorities, thanks to their leveraging of investment:

By working with the private sector on innovative financial instruments it is possible to magnify the impact of the EU budget, enabling a greater number of strategic investments to be made, thus enhancing the EU's growth potential. Experience in working most notably with the European Investment Bank (EIB) Group, national and international financial institutions has been positive and will be taken forward in the next MFF. Guarantees and risk-sharing arrangements can allow the financial sector to provide more equity and lend more money to innovative companies, or to

infrastructure projects. In this way, such financial instruments can also contribute to the overall development of post-crisis financial markets.

The Commission considers69 FIs particularly suitable for addressing sub-optimal investment situations in a wide range of policy areas whenever activities or operations are potentially capable of being financially viable, but are not yet attracting funding from market sources that is either adequate or available on reasonable terms.

3.2 Justification for EU-level intervention

EU-level intervention to improve access to risk finance is justified because of a market failure caused by significant information asymmetries and high transaction costs, exacerbated by the credit crunch associated with the financial crisis and the low supply of VC in Europe.

For debt financing, EU-level intervention is needed to increase the likelihood that loans are made and guarantees extended to help achieve EU-level R&I policy objectives. The current gap in the market between the demand for and supply of loans and guarantees for risky R&I investments, addressed by the RSFF, is likely to persist, with banks remaining largely absent from higher-risk lending. Typically, banks lack the ability to value knowledge assets, such as intellectual property, and are therefore often unwilling to invest in knowledge-based companies, which usually lack tangible assets at the early stage. In consequence, many companies — both large and small — cannot obtain loans for R&I activities, or at least not on reasonable terms. Credit constraints for small firms are also due to risks arising from information asymmetries between lenders and borrowers: lenders are not able to easily separate potentially successful businesses and projects from less successful ones without incurring high transaction costs. Another disincentive for lenders is that even if R&I activities give rise to a commercial product or process, it is not at all certain that the company that has made the effort will be able to exclusively appropriate the benefits deriving from it.

For equity financing, EU-level intervention is needed to help improve the availability of finance for early and growth-stage investments and to boost the development of the EU’s VC market. During the TT and start-up phase, new companies have to bridge the gap between the cessation of public research grants and the possibility of attracting private finance. Public support aiming to leverage seed and start-up funds to fill this gap is too fragmented and intermittent. Also, most VC funds in Europe are too small to support the growth of innovative companies and do not have the critical mass to specialise or operate across borders.

In both cases, however, financial instruments must be designed to operate on market-based terms in order to minimise the possibility of introducing their own distortions to the market. They must also seek to mobilise additional funding that would not otherwise have been committed, and avoid crowding-out investors.

3.3 Subsidiarity and European added value

The European Commission's right to act in the domain of access to risk finance is based on Article 173 of the Lisbon Treaty, which includes a statement that the EU should, with the Member States, encourage "an environment favourable to initiative and to the development of undertakings throughout the Union, particularly small and medium-sized undertakings" and

The European added value of EU-level intervention to foster access to risk finance has six principal components:

**Helping achieve EU policy objectives:** EU-level financial instruments can support the achievement of the EU's innovation policy objectives by addressing market failures that lead to insufficient funding being available from market sources, typically because the field is perceived as too risky by other lenders or investors.

**Facilitating the financing of cross-border projects:** Funding conditions for cross-border projects at national level are difficult, and particularly so in the R&I domains to be covered by Horizon 2020; EU-level financial instruments can ease the fund-raising process.

**Demonstration and catalytic effects:** In addition to their financial impact, financial instruments implemented at EU level can have important non-financial effects such as demonstration effects in the targeted markets, triggering wider application to other sectors. The expertise of the EU and the financial institutions responsible for the implementation of EU-level financial instruments can be transferred to national, regional or local authorities. Transferring skills and knowledge across frontiers could play a significant role in aligning national policies with growth and innovation-oriented measures, reducing disparities between Member State economies, and enhancing the EU's competitiveness.

**Economies of scale:** Interventions by financial instruments at EU level generate economies of scale due to the enhanced capacity of the EU to mobilise public and private resources from the full range of Member States.

**Multiplier effect:** EU-level financial instruments multiply the effect of the EU budget by attracting other public and private financing along the implementation chain comprising entrusted entities (such as EIB), financial intermediaries (such as banks) and final beneficiaries. Through risk coverage or risk participations, the EU intervention may induce investors to invest (or to invest more) in cases where they would have not invested at all (or invested less) without support from the EU budget. This can be achieved through co-financing by international financial institutions or through, for example, the additional debt volumes banks and guarantee institutions are requested to provide to final beneficiaries. For example, in the case of the RSFF, by end-2013 an EU outlay of just over €1 bn is expected to mobilise over €11 bn of EIB loans and support a total investment of approximately €30 bn.

**Capacity-building:** National and local institutions can benefit from EU-level entrusted entities' knowhow about the design of financial products which otherwise would not have been available to them. An example is the European loan guarantee schemes implemented under the CIP and the RSFF's RSI in FP7. In many Member States, guarantee societies are scarce or do not exist, and a European counter-guarantee scheme is important in encouraging new entrants and in supporting newer guarantee institutions still building up their portfolios. The presence of a European guarantee and/or counter-guarantee can either help new guarantee societies boost their volumes in their early stages of development, or facilitate the creation of such schemes, and in both case contribute to capacity-building.
4. Lessons learnt

4.1 Lending to innovative firms

4.1.1 Risk-Sharing Finance Facility (RSFF): achievements

Under FP7 and launched in 2007, the RSFF, managed by EIB, had by mid-2013 mobilised €8.9 bn in signed loans to 94 beneficiaries, who are mainly large firms and a few midcaps, plus several research infrastructures and special project vehicles. Up to €11 bn in signed loans is likely to be achieved by end-2013 (the end of the programming period), supporting total investments in R&I of around €30 bn.

The Risk-Sharing Instrument (RSI), managed by EIF as a facility of the RSFF and launched in 2012, aims to mobilise over €2.5 bn in loans from intermediary banks and other financial institutions to up to 1000 SMEs and small midcaps undertaking R&I. Offering both guarantees and counter-guarantees, RSI is targeting the signature of agreements with 25 financial intermediaries by mid-2014. As of mid-2013, 12 intermediaries had concluded agreements and committed a total of €775 mn.

4.1.2 RSFF: first interim evaluation

The findings of the first RSFF interim evaluation²⁰, conducted in 2010 by a group of independent experts, were largely positive. The experts concluded that the RSFF had been successfully introduced into the EU’s research funding scheme within FP7, was a model example of an EU financial instrument, and should be further developed and strengthened. The experts felt that some target groups, however (SMEs, research infrastructures) needed more focused support. The experts’ recommendations, which drew on an evaluation of RSFF activities conducted by the EIB’s independent Operations Evaluation function²¹, included the need to better target SMEs and research infrastructures.

Subsequent amendments to the contract between the EU and the EIB changed the risk-sharing mechanism from a project-by-project to a portfolio first-loss-piece (PFLP)²² approach, with the EU assuming a higher risk. It was judged that this would optimise the leverage effect of EU funds and enhance the EIB’s capacity to finance loans, especially to SMEs and research infrastructures. Three compartments were created: primarily corporate finance and project finance transactions; the RSI (see above), an SME and small midcaps guarantee facility run by the EIF; and research infrastructures. Changes were also made to facilitate lending to universities and public research institutions, and also loans to medium and large midcaps. In addition, a counter-guarantee mechanism for the RSI was also introduced.

²⁰ For the report by a group of independent experts on the first interim evaluation of the RSFF, see http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/mid-term_evaluation_of_the_risk-sharing_financial_facility_(rsff)_-_expert_group_report.pdf
²² In the PFLP approach, the EU contribution is used first to cover any losses in a portfolio of loans, but only up to a pre-defined percentage of losses (the so-called ‘first-loss piece’ or cushion). If losses exceed the EU contribution, the EIB covers all further losses.
4.1.3 RSFF: second interim evaluation

The findings of the second interim evaluation of the RSFF, conducted in 2013 by a further group of independent experts, were also largely positive. The evaluation focused on lessons learnt for the design of future debt instruments. The experts concluded that the RSFF had proved to be attractive to RDI companies and had met or exceeded its loan volume targets, improved its geographic coverage, and enabled EIB to increase the bank's capacity to make riskier loans. The experts supported the demand-driven approach taken in implementing the RSFF, and underlined the importance of the Commission's and EIB Group's ability to quickly adapt the design of the instrument to changing circumstances. The expert group's recommendations again drew on an evaluation of RSFF activities conducted by the EIB's independent Operations Evaluation function, and encompassed the better targeting of innovative midcaps with specific financing products, including higher-risk finance (such as mezzanine).

The group also called for close interconnection between COSME and Horizon 2020, and drew attention to the potential for joint instruments involving centrally managed programmes such as COSME and Horizon 2020 and shared management programmes using European Structural & Investment Funds (ESIF).

4.1.4 RSFF: European Court of Auditors' special report on the implementation of FP7

The Court found that the RSFF has enhanced the research-funding landscape and that beneficiaries had found it useful, with Commission and EIB promotional events the main method by which they had become aware of the instrument. The availability of debt financing for riskier R&I projects had been particularly valuable in times of financial crisis, as the RSFF had been one of the few financial instruments remaining available for companies to help maintain their R&I activities. Regarding the leverage (6.6) and multiplier (28) effects achieved, the Court found that the RSFF had exceeded initial expectations (5 and 15 respectively), and that as the instrument had enabled EIB to finance investments well above its usually accepted level of risk, its purpose had been achieved. The Court noted that the concentration of RSFF lending in some countries reflected the relatively high investment activities in R&I of private companies in the countries concerned and was, by and large, in line with the relative proportions of private investment compared to the whole of the EU.

However, the Court also found that the Commission had not sufficiently demonstrated that RSFF funding had led to investments above the level that beneficiaries would have undertaken without public money. The Court stated that its survey of RSFF beneficiaries showed that access to finance was not a major barrier to beneficiaries investing in R&I, as over half of respondents had stated that the lower interest rate was a decisive or major factor for taking a RSFF loan. It recommended that the Commission improve its targeting of those beneficiaries with limited access to finance and should demonstrate that RSFF targets those beneficiaries unable to secure loan financing from other lenders.

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73 For the report by a group of independent experts on the second interim evaluation of the RSFF, see http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/interim_evaluation_report_rsff.pdf


75 Has the Commission ensured efficient implementation of the Seventh Framework Programme for research?, Special Report No. 2, European Court of Auditors (2013).
On these points, the Commission said it was normal for beneficiaries to state that a lower interest rate was a decisive factor in taking an RSFF loan, and that the views of beneficiaries about access to other sources of debt finance should be interpreted knowing that RSFF funding was commonly used alongside debt finance from commercial sources, with RSFF loans, on average, forming 30–35% of a project's total finance. In the Commission’s opinion, access to long-term loan finance for investments in riskier R&I projects at reasonable interest rates remained a major barrier for companies in many Member States.

The Court also stated that the survey's findings indicated that the RSFF could have had a crowding-out effect, and that a number of RSFF projects would anyway have been financed by commercial banks, albeit at a higher cost to the beneficiaries. The Commission noted that it considered, on the basis of the evidence available, that it already satisfactorily targeted beneficiaries with limited access to finance. It also noted that 'additionality' encompassed not only pure project additionality (i.e., whether the project would have been undertaken without public support), but also additionality in terms of improving the scale and enlarging the scope of a project, accelerating its execution, or increasing its outputs.

4.2 Investing in innovative firms

4.2.1 High-Growth & Innovative SMEs facility (GIF): achievements

GIF\textsuperscript{76}, managed by EIF, provides risk capital for innovative SMEs in their early stages (GIF-1) and expansion phase (GIF-2).

4.2.2 GIF: final evaluation of the Entrepreneurship & Innovation (EIP) Programme

In looking at the GIF financial instrument under the EIP sub-programme of CIP, the evaluators found\textsuperscript{77} strong evidence of additionality, with about two-thirds of beneficiaries indicating that they would not have set up their business or made a particular investment without the financial support received, while some 40% stated that the funding was the only way to access the full amount of finance needed. On this basis, the evaluators concluded that GIF has addressed a clear gap in SMEs' access to finance. Given that most GIF beneficiaries surveyed declared that they were active in innovation — 83% in product or service innovation, 70% in process innovation, and 76% in innovations in strategy or business practices — the evaluators found that GIF has reached the right target groups and had had the effects intended. Over three-quarters of beneficiaries surveyed reported that receipt of the investment had made it easier to obtain additional financing, indicating considerable leveraging effects, and more than 90% said that the financial support would most likely have a positive or fairly positive impact on their long-term growth prospects, with nearly 90% attributing new or saved jobs to the support received.

4.2.3 Technology Transfer Pilot (TTP)

This pilot scheme, set up in 2007, invested €1.7 mn in 2009 in Sweden's Karolinska Innovation Co-investment Fund, with an investment period of four years. The fund had

\textsuperscript{76} Horizon 2020 will host the successor of CIP's GIF-1, covering risk capital for innovative SMEs in their early stages, while COSME will host the successor of GIF-2, covering SMEs with high growth potential in their expansion phase. The evaluative analysis available does not tend to differentiate between the two.

\textsuperscript{77} Final Evaluation of the Entrepreneurship and Innovation Programme, CES (April 2011).
invested in eight companies by mid-2013. The pace of investment in beneficiary firms has been slower than expected, and the investment period may be extended.\textsuperscript{78}

Under GIF-1 (early-stage innovative SMEs), investments of about €61 mn have so far been made into five technology transfer funds, representing around a fifth of both the total number of risk-capital funds invested into (24) and of the total GIF-1 investment (some €306 mn). 66 beneficiaries had been supported by mid-2013, which is again slower than expected.\textsuperscript{79}

4.4 Overall lessons learnt

For both the RSFF (leaving aside the recently launched RSI) and GIF-1, evaluative assessments broadly confirm their relevance, utility and efficiency. As for effectiveness, it is too early to draw conclusions, though both interventions appear to be on track to achieve the original outcomes anticipated. There are five aspects of particular relevance to the design of future financial instrument facilities under Horizon 2020:

4.4.1 Additionality\textsuperscript{80}

For financial instruments, additionality has two main aspects: financial, and policy-related. Financial additionality from EU support can result when the intervention is targeted where the capacity of the market to deliver is lacking; if there is an improvement in the terms and conditions under which a promoter can fund an R&I activity (i.e., an improvement in a sub-optimal investment situation); where their portfolio of financial liabilities is diversified (in terms of spread of creditors) and optimised (in terms of lowering the cost of servicing debt); and where the EU intervention brings about additional investments from other sources. Policy additionality can result if the promoter's capacity to undertake R&I is enhanced, or at minimum preserved; where the competitiveness of the promoter, compared to non-EU promoters, is improved; and where the commercialisation and deployment of innovations that strengthen the EU's competitiveness is accelerated.

For the successor to the RSFF, this suggests the following possible approach in designing an ex ante additionality assessment as part of the eligibility-checking process for each potential direct lending operation: identifying the various funding sources in the financial package planned by the promoter (excluding grants); share of EIB's potential contribution to this package; assurance that EIB is pricing the risk in line with market rates; complementarities between EIB support and commercial support; and the number of commercial banks having initially declined to finance the operation. Comparable criteria could be used in interim and ex post evaluations.

4.4.2 Externalisation

Implementing the instruments via and in partnership with entrusted entities — so far the EIB and the EIF — with long-standing experience in delivering EU financial instruments has proved to be an efficient use, in FP7 and CIP, of both European Commission resources (notably in terms of human resources) and EU budget (in terms of leverage effects). This should be continued in Horizon 2020, subject to the successful conclusion of negotiations.


\textsuperscript{79} Data supplied by DG Economic & Financial Affairs.

\textsuperscript{80} Drawing on exchanges with EIB Group officials, to whom due acknowledgment is made.
4.4.3 Commitment of resources

By mid-2013 (i.e., six months before the end of the current programming cycle), the RSFF had committed, in terms of signed loans, an amount equivalent to xx% of the funds available, with investment commitments under GIF-1 at xx%. The financial crisis affected these two instruments in different ways: the RSFF benefited from the tightening of credit conditions, with many project promoters turning to EIB for finance and demand outstripping supply; while GIF-1 was hampered in its early years by a sharp fall-off in the VC market.

These consequences demonstrate the importance of macroeconomic changes in shaping the take-up of EU financial instruments, and suggest the need for a flexible approach in allocating budgetary resources in response to changes in market conditions, and hence demand, during an instrument's lifetime.

4.4.4 Geographical coverage

For both instruments, EU-15 countries account for the large majority of operations. GIF-1 has mainly invested in multi-country VC funds, though the focus of investments at the firm level has largely remained in France, Germany and the UK. While RSFF operations are concentrated in Germany, France, Italy, Spain, Sweden and the UK, EIB has met its geographical deconcentration target, linked to a fee-based financial incentive, of ensuring that the RSFF portfolio does not have more than 60% of its signed operations in the three Member States with the largest share of RSFF operations by volume (the figure in mid-2013 was around 46%). The relative scarcity of operations in Central and Eastern Europe appears to derive from the region's still comparatively thin technological base and infrastructure, together with a comparative underdevelopment of its financial sector and a lack of measures to foster access to risk finance.

This suggests two considerations for the design of future instruments: the need to further deploy geographic performance incentives (as pioneered in the RSFF) to nudge entrusted entities to undertake operations in countries underserved in the current programming period; and ensuring the more targeted deployment of awareness-arising events and marketing campaigns, coupled with investor-readiness training and assistance.

4.4.5 Links with instruments planned under COSME and ESIF

The legal bases proposed for COSME and Horizon 2020 foresee that they will jointly support, in a complementary fashion, an equity and a debt financial instrument designed to foster the growth of SMEs and small midcaps and their ability to undertake R&I. This objective needs to be translated, in particular, into eligibility criteria that clearly target the appropriate financial intermediaries and final beneficiaries of each programme. It must also be reflected in the programmes' governance structures.

Regarding links to ESIF, clauses in the proposed Horizon 2020 legal base and the Common Provisions Regulation allow the pooling of financial resources from Horizon 2020 with those of Member States willing to contribute part of the Structural Funds (now ESIF) allocated to them. Taking advantage of this opportunity, in June 2013, the European

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Commission and EIB Group submitted to the European Council an initiative to complement and utilise synergies between existing SME support programmes at national and EU level. More specifically, a joint-instrument, the "SME Initiative", blending EU funds from COSME and Horizon 2020 and ESIF resources in cooperation with EIB/EIF was proposed in view of generating additional lending to SMEs. This Initiative is designed to complement actions taken at national level in support of SMEs. To foster investment and improve access to credit, the June European Council called for the mobilisation of European resources including those of the EIB and launched a new "Investment Plan" to support SMEs and boost the financing of the economy, endorsing the expansion of joint risk-sharing instruments between the European Commission and the EIB Group. To leverage the private sector and incentivise capital market investments in SMEs it was agreed that "The Council, in consultation with the Commission and the EIB, will specify without delay the parameters for the design of such instruments co-financed by the Structural Funds, aiming at high leverage effects. The necessary preparations should be made to allow these instruments to begin operating in January 2014". Three options — a guarantee option, and two securitisation options — are currently under consideration.

5. Objectives

5.1 Strategic priorities

The European Commission’s strategic priorities are contained in Europe 2020, the EU’s ten-year growth strategy. Europe 2020 aims to create the conditions for growth that is smarter, more sustainable and more inclusive than hitherto.

The strategy also includes seven ‘Flagship Initiatives’ to provide a framework within which the EU and national authorities can reinforce their efforts in areas supporting the achievement of Europe 2020's priorities: innovation, the digital economy, employment, youth, industrial policy, poverty, and resource efficiency.

SMART Growth

- Innovation Union
- Digital Agenda for Europe
- Youth on the Move

SUSTAINABLE Growth

- Resource-efficient Europe

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84 See European Commission and European Investment Bank (2013).
85 See European Council (2013).
5.2 General objectives

Europe 2020 contains five headline targets chosen to represent the strategy's priority themes. One of these targets is that, by 2020, 3% of the EU’s GDP should be invested in R&D. The current figure is below 2%, compared to 2.6% in the US and 3.4% in Japan. This is mainly a result of lower levels of private investment, which in turn stem from the difficulties many companies face in getting access to finance on attractive terms.

In helping implement Europe 2020's 'smart growth' priority, the Innovation Union Flagship Initiative's commitments to improving access to finance for innovative companies focus on developing a new generation of EU-level FIs for R&I to overcome market gaps and attract a major increase in private finance for R&I.

5.3 Sectoral objectives

Based on the problem analysis in section 2, the key objective is to support and facilitate easier access to a wide range of sources of debt and equity financing by innovative companies at different developmental stages and by other entities of all sizes.

5.3 Specific objectives

The general and sectoral objectives can be translated into the following specific objectives, corresponding to the results to be achieved by the financial instrument facilities of Horizon 2020:

- increase private investment in R&I;
- provide a range of debt and equity financing products and facilities in line with the variety of potential final beneficiaries at different developmental stages seeking access to risk finance on reasonable terms;
- increase the debt and equity financing of R&I in terms of the number of firms and other entities funded and the volume of funding mobilised;
- strengthen the EU VC industry in terms of its ability to attract institutional and other investors and to operate on a pan-European basis;
- increase the involvement of business angels in funding R&I in terms of [tbc]
- increase investments in TT in terms of the number and volume of deals.

5.4 Operational objectives

The outputs to be delivered en route to achieving the specific objectives can be defined in terms of operational objectives as follows:

- increase the supply of direct loans to larger firms and other entities in terms of the number of operations and the volume of funding mobilised;
- increase the supply of intermediated loans to SMEs, small midcaps and other midcaps in terms of the number of agreements reached with financial intermediaries and the volume of funding mobilised;
- increase the supply of 'formal' early-stage equity financing available to innovative SMEs and small midcaps in terms of the number of agreements reached with VC funds and the volume of funding mobilised;
- increase the supply of 'less formal' early-stage equity financing available to innovative SMEs and small midcaps in terms of the number of agreements reached with business angel groups and other less institutionalised groups and the volume of funding mobilised;
- increase the supply of TT financing in terms of the number of agreements reached with TT funds and vehicles and the volume of funding provided.

6. Policy options

6.1 Main options

In theory, there are three main policy options:

- **Option #1 – Maintain EU intervention at baseline budgetary level:** continue support in Horizon 2020 at the FP7 levels for RSFF and RSI, allowing for inflation, given that these have received largely positive evaluations and that the relevant market deficiencies or sub-optimal investment situations persist and are likely to persist over the duration of the programme.

- **Option #2 – Discontinue EU intervention:** no financial instrument facilities in Horizon 2020, with EU-level action, if any, limited to measures favouring the emergence of more appropriate conditions for access to risk finance (such as improving the regulatory climate for business angels and crowdfunding, fostering exchanges of best practice on TT, or supporting investment-readiness schemes for SMEs and small midcaps).

- **Option #3 – Expand EU intervention compared to the current programming period:** increase budgetary allocations for the financial instrument facilities supported in FP7 (RSFF and RSI) where these have received positive evaluations and where the relevant market deficiencies or sub-optimal investment situations persist and are likely to persist over the duration of the programme, and also broaden the range of issues addressed and facilities deployed.

In practice, the Commission's legislative proposal for Horizon 2020 is in line with Option #3. The range of issues addressed now includes TT and early-stage VC (with some scope for growth-stage investments), while midcaps are more clearly targeted as a set of potential final beneficiaries; furthermore, following discussions in the first half of 2013 between the Commission, the Council and the European Parliament, the budget for 'Access to Risk
Finance' is likely to be set at a figure of around €2.73 bn in current prices compared to just over €1 bn in FP7.

6.2 Exploring sub-options under Option #3

6.2.1 Principles governing the relative weight of possible financial instrument facilities

The first principle is one of continuity, given that the financial instrument interventions that will be carried forward into Horizon 2020 from FP7 (RSFF, covering debt) and CIP (GIF-1, covering early-stage equity) have received largely positive evaluations and that the relevant market deficiencies or sub-optimal investment situations are likely to persist at least in the medium term.

This would mean allocating, in current prices, around €1 bn to the successor to the RSFF, while adjusting the eligibility criteria (as outlined in section 4.4.1) to take account of the Court of Auditors' findings on additionality (see towards the end of section 4.1.4).

Given the problems identified for innovative midcaps seeking access to debt finance (see section 2.2.2.5), and taking into account that large firms have, in general, more options available for sourcing finance, the RSFF's successor should devote more attention to this category of firm: an appropriate performance incentive could be helpful. Although the evidence of an equity-type funding gap for innovative midcaps is less compelling than for debt finance, the possibility of offering hybrid or mezzanine funding should be kept open as a way of testing market demand.

For the successor to GIF-1, as trends indicate that by end-2013 total investments are likely to have reached over €0.42 bn, an equivalent amount should be allocated to its successor. However, as other equity players appear to be increasing their presence in the market (see section 2.2.2.4.3), it would be sensible to enlarge the definition of eligible funds to encompass 'risk capital'.

The second principle is to scale-up existing pilots where enough evidence has accumulated to suggest that a market deficiency exists and is likely to persist. The prime pilot in question is the RSI, implemented over a two-year period (2012-2013) with a budget of €0.27 bn. This appears to be on the right track (see section 4.1.1). Extrapolating the current budget to the seven-year period of Horizon 2020 and then applying the principle of continuity would mean allocating a budget of around €1 bn to its successor.

6.2.2 Supporting TT with a specific facility

Section 2.2.2.4.1 suggests there is potential for significant European added value in supporting TT, though this is hard to quantify given the variety of organisations and activities involved.

The target of an intervention through an EU-level TT financing scheme would be, as final beneficiaries, researchers in universities and other public research organisations undertaking PoC studies, pilot projects or demonstration activities, and commercialisation of the outcomes of the PoC. Finance from such a scheme would reach them via a TT investment fund operating as a financial intermediary. Such intermediaries could include public or private investment vehicles financing TT at regional or national level; patent service companies; or institution-specific TTOs. Based on the findings of the field research, TT support should be in the form of equity, quasi-equity, loans or a combination of these.
Two possible models could be followed: decentralised, with investment decisions made by each TT intermediary concerned, or centralised, with a dedicated fund and centrally organised governance and decision-making. On the basis of the analysis in Annex 3, the decentralised approach has more advantages and fewer risks than the centralised one. However, it would be prudent to make a first intervention on a pilot basis.

For these reasons, the preferred option for EU-level under Horizon 2020 is a decentralised scheme starting with a pilot phase over three years (2014-2016). The total financing available for this period could be up €400 mn, made up of a minimum EU contribution (to achieve visibility and critical mass) of €100 mn, a matching €100 mn from the entrusted entity, and an aggregate co-investment from financial intermediaries of €200 mn. The scheme would target 200 to 300 investments in final beneficiaries. This approach offers the best balance in terms of ensuring cost-effectiveness, reducing reputational risks, and minimising potential market distortions. The experience with TT support so far, described in section 4.2.3, suggests that a strong awareness-raising and marketing effort may be required to stimulate uptake.

6.2.3 The question of FoFs

Section 2.3.2.4.1 and Annex 1 demonstrate that the range of models for pan-European VC-focused FoFs is wide; the cost-effectiveness of the FoF approach is uncertain; the design choices to be made are many and complex; the evidence-base is thin; and the EU budgetary contribution needed to make an impact is likely to consume a significant proportion of the budget for 'Access to Risk Finance'.

For these reasons, it would be prudent to take a stepwise approach and commission a feasibility study in 2014 into the advantages and disadvantages of the Commission taking the lead in establishing one or more pan-European VC-focused FoFs and acting as the channel for the EU becoming a cornerstone investor.

6.2.3 Crowdfunding and business angels

Sections 2.2.2.2.1 (crowdlending) and 2.2.2.4.2 plus 2.3.2.2 (equity crowdfunding) indicate the need for more research to clarify the potential for crowdfunding in improving access to risk finance in support of R&I and the need for any EU-level intervention. This should build on the outcome of the public consultation on "Crowdfunding in the EU" launched by the European Commission’s Internal Market DG in October 2013.

Regarding BAs, sections 2.2.2.4.3 and 2.3.2.3 point to the need for more research to quantify the amount of activity taking place outside BA networks and to further determine the characteristics of angel investments (such as returns to BAs). However, given that EIF has gained some experience since 2012 in the BA co-investment market, it would be sensible to further explore the potential with a pilot co-investment action under Horizon 2020.

6.3 Preferred option

6.3.1 Contribution, leverage and funding gap

The preferred option involves allocating a likely budget of €2.73 bn (current prices) on the following basis:

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88 The consultation is open until 31 December 2013. See [link to consultation]
• Continuing support for the RSFF (FP7) intervention at around the same level going forward under Horizon 2020, i.e., for about €1 billion from the EU budget.

This sum will be allocated almost entirely for risk-taking through a first-loss piece (FLP) approach on a portfolio basis. Subject to the outcome of negotiations with EIB, the EU contribution will most probably be matched by EIB in at least three ways: i) a 5% participation in the FLP under the EU window; ii) second-loss taking (the residual risk) under the EU window; and iii) full liability by the EIB for losses under its own window. The likely leverage effect\(^9\) of the EU contribution will depend on the level of the FLP agreed with EIB: this is expected to be between 14 and 16%. On the basis of an envisaged loan volume under the EU window of €10 bn for the period 2014-2020, the leverage would then be around 6.5 to 7. This outcome would be matched by a similar anticipated leverage under the EIB window (envisaged loan volume of some €9 to 10 bn and a leverage of around 6.5).

• Continuing support for the GIF-1 (CIP) intervention at around the same level going forward under Horizon 2020, i.e., for some €0.42 bn.

The EIF has not made a matching contribution in implementing GIF-1 under CIP and is unlikely to do so in implementing its successor, given the limited size and capacity of the EIF’s balance-sheet. A small contribution from EIF’s resources would be sufficient to ensure alignment of interest. The current co-investment of EIF’s own resources alongside EIB’s Risk-Capital resources (RCR) mandate is 5%, and a similar level of co-investment with the Horizon 2020 equity facility could be envisaged\(^9\). Based on the experience of GIF-1, the leverage effect at the level of a fund is likely to be between 4 and 6.

• Scaling up the two-year RSI pilot in a linear manner over the seven years of Horizon 2020, i.e. to around €1 bn.

The EU contribution, as for the successor to the RSFF, would be allocated almost entirely for risk-taking in the form of an FLP of around 20%. It is unlikely that EIF would participate with a contribution to this FLP, though it would be liable, subject to negotiations, for second-loss taking with respect to the guaranteed portfolio of loans. On this basis, a total guarantee volume of up to €5 bn, in round figures, could be expected. Given a 50% loan guarantee level (as in the pilot), financial intermediaries could provide a total volume of loans of some €10 bn to innovative SMEs and small midcaps. The leverage effect of the EU contribution would then be 5 with respect to guarantees, and 10 with respect to the finance available to final beneficiaries.

• Setting up a three-year TT pilot, on a decentralised, co-investment basis, with a critical-mass provision of at least €0.1 bn.

\(^9\) Article 223(1) of the Rules of Application of the Financial Regulation state that "The leverage effect of Union funds shall be equal to amount of finance to eligible final recipients divided by the amount of the Union contribution." In other words, leverage is the ratio between the financial resources allocated to a financial instrument (input) and the finance provided to eligible final recipients (output). DG Economic & Financial Affairs is developing a methodology to rigorously define the terms and concepts involved. Once the methodology is finalised, the estimated leverage effects in this section will be adjusted accordingly. For purposes of simplification, management fees and other operating costs have not been taken into account.

\(^9\) The RCR figure may be scaled down in future. If this proves to be the case, the level for Horizon 2020, for consistency, should follow suit.
Given that losses might be significant, the EU contribution could be allocated to cover the first loss. In that case, the contribution of the entrusted entity would need to be greater, in compensation, than a matching amount. The direct leverage effect would be at least 2 if the EU and entrusted entity match funding, or 3 if, exceptionally and with appropriate justification, there is first-loss taking by the EU and the entrusted entity's contribution was, for example, twice the EU's. As the TT financing facility and a financial intermediary (i.e., a TT fund) would co-invest in a final beneficiary, an additional leverage of 2 would be achieved. In this way, a €100 mn EU contribution could translate into a total amount of TT financing to final beneficiaries of €400 million if risk-taking is equally shared (the norm for EU financial instruments).

- Exploring the potential for using securitisation transactions to improve the flow of credit to innovative SMEs and small midcaps, especially in the context of a joint instrument involving ESIF (for more details, see section 4.4.5 above).
- Keeping a margin of manoeuvre of about €0.18 bn for meeting unforeseen needs and demands; a potential contribution to the joint instrument involving ESIF; capacity-building, investment-readiness demand-stimulation and other accompanying measures; and the feasibility and other studies referred to above.

### 6.3.2 Re-use of additional resources

The proposed Rules of Participation of Horizon 2020 stipulate that both the revenues and the annual payments generated by a Horizon 2020 financial instrument should be assigned to that same financial instrument.

Furthermore, the proposed Rules also state that the revenues and annual repayments generated by the RSFF (where the RSI pilot is a sub-facility) under FP7 should be assigned to its successor (and hence to the successor to the RSI) under Horizon 2020, and in addition that revenues and annual repayments generated by GIF-1 under CIP should be assigned to GIF-1's successor, also under Horizon 2020.

Though precise calculations are not possible at this stage, DG Research & Innovation estimates the consequences as follows over the 20014-2020 duration of Horizon 2020:

- successor to RSFF: roughly up to an additional €400 million, taking into account the FP7 RSFF first-loss piece (FLP) portfolio approach, which imposes the maintenance of the FLP level in absolute terms until a positive balance has been created. This figure takes into account the closure figure of the FLP level in compartments 1 and 3 of the current RSFF; assumes a default rate equal to half of the FLP; and keeps in mind the fact that a significant volume of RSFF loans will only be reimbursed after 2020.

- successor to RSI: roughly up to an additional €100 million, taking into account the FP7 RSFF-RSI FLP approach as mentioned above. This figure takes into account the closure figure of the FLP level in compartment 2 of the current RSFF; assumes a default rate equal to half of the FLP; and keep in mind that while the vast majority of the loans will be reimbursed by the end of 2020, some may only be reimbursed after that date.

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91 Article 49a(2), by way of derogation from the Financial Regulation.
92 Article 49a(3), by way of derogation from the Financial Regulation.
93 Decided by the RSFF Steering Committee at its meeting on 10 October 2013.
successor to GIF-1: roughly up to an additional €100 million, assuming that EU financial commitments will be fully invested, taking into account the likely level of the IRR (internal rate of return) at the end of 2013, and keeping in mind that a substantial part of the investments may only generate repayments after 2020.

7. Indicators

For financial instrument facilities implemented via financial intermediaries, the output indicator per facility or sub-facility will be the number of agreements signed with financial intermediaries, i.e., with risk-capital funds in the case of the successor to the GIF-1 facility; with TT funds or investment vehicles for the TT Financing Facility; and with banks or guarantee institutions for the successor to the RSI.

The results indicators for intermediated operations will be the number and volume of loans made or guarantees extended in the case of debt facilities, and the number of final beneficiaries and the volume of investments made in the case of equity facilities. For both debt and equity facilities, the intermediate impact indicator will be the share of beneficiary SMEs and small midcaps introducing innovations new to the company or the market, with a provisional target of 50%. Impact in terms of growth in numbers of employees will also be tracked.

For the successor to the RSFF and any other facilities where direct loans or investments are made without intermediation, the number and volume of loans or of investments, as the case may be, will serve as indicators.

Targets will be set during negotiations with entrusted entities (initially EIB and EIF).

Performance indicators and targets will also be agreed covering and incentivising, at minimum, the disbursement of loans and investments, the volume of operations (loans, investments), the numbers of Member States and countries associated to Horizon 2020 in which operations have taken place, and geographical dispersal (deconcentration).

Entrusted entities may also agree indicators and targets with financial intermediaries.

8. Monitoring and Evaluation

Monitoring will be undertaken in line with the requirements laid down in the Financial Regulation (Article 140) and the Delegated Regulation (Article 225) and as interpreted in the Financial and Administrative Framework Agreements with EIB and EIF and consequent Delegation Agreements.

A set of interim evaluations in 2016 will give feedback on the implementation of the financial instrument facilities implemented in 2014-2015 and provide recommendations for their improvement. These evaluations will be carried out following an open call for tenders. The evaluations will assess the relevance and effectiveness of each facility with respect to helping achieve EU R&I-related policy objectives, their efficiency, their utility in addressing market deficiencies and sub-optimal investment situations, and the overall coherence of the facilities themselves. Coherence with respect to other financial instruments and facilities in the 2014-2020 MFF, particularly those implemented under COSME, will also be assessed. The evaluators will be required, in each case, to make a series of recommendations on how the design and functioning of each facility, and their coherence under Horizon 2020 and with the
COSME facilities, can be improved. Particular attention will be paid to lessons learnt with respect to the viability, potential scaling-up (or otherwise) and evolution of pilot facilities. These evaluations will contribute to the interim evaluation of Horizon 2020.
Annexes

Annex 1

*Rationale for using funds-of-funds (FoFs) as an equity investment delivery mechanism*

The rationale is based on the idea that investing across a wide range of funds, VC or otherwise, as well as geographies, lowers the risk to investors because their risk exposure is diversified. Allied to this is the belief that the specialist expertise of a FoF’s managers enables them to make better fund investment decisions than private- or public-sector investors could on their own. Furthermore, as a VC or other fund seeking investments will have minimum commitment requirements that individual investors are often unable (in terms of amount) or unwilling (in terms of concentrating their risk exposure) to meet, a FoF’s aggregating or wholesaling role is felt to ease access to specific funds and markets and enable a better overall match to be made between underlying funds and investors than would otherwise be the case.

While FoFs were arguably important during the development of the EU’s private equity (PE) industry in helping to connect investors with funds, their role has been increasingly questioned in recent years on the grounds that their overall performance, measured by return on investment, has been significantly lower than the average for PE overall; that their returns tend to be lower than those achieved by institutional investors such as pension and endowment funds, which are the very type of investors who are supposed to derive more benefit from the services of a FoF compared to going it alone; and that many LPs find the double layer of fees (i.e., at FoF level plus at the underlying funds level) unacceptable.

A recent industry report notes a number of developments. Firstly, investors are becoming increasingly sophisticated, with many looking to invest directly in the underlying funds to avoid the double layer of fees associated with FoFs and also to concentrate their investments on strategies and geographies that they judge will bring them the best returns and/or better match specific ethical or political investment strategies and goals. Secondly, an increasing number of FoF managers are operating separate sub-funds to allow investors to tailor their investments and avoid commingling with other LPs: this 'separate account' approach often comes with more favourable fees and terms. And thirdly, the track-record of FoF managers is taking on even more importance as the financial and economic crisis continues.

Although no public-private pan-European VC-focused FoF yet exists, the various public-private early-stage equity support programmes created at regional, country and (via EIF and the GIF scheme in CIP) EU level help illustrate the main mechanisms, components and associated parameters that would need to be considered when assessing alternative designs for such a FoF. The overall design objective is to incentivise both the general partner and the limited partners, in a proportionate manner, to help deliver public policy goals while avoiding perverse incentives, the creation of moral hazards, or the crowding-out of private investors.

The most common structure is one that involves symmetric distribution of the profits between the public and private limited partners. However, if the public investor wishes to use VC fund

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94 See, for example, *The dirty little secrets of private equity funds of funds*, Demaria, C. (30 June 2009), IPE - Investment & Pensions Europe.


96 E.g., by targeting firms managed by women or by ethnic minorities, or developing eco-innovations.

97 EIF’s CoriP scheme enables such tailoring.
managers to channel funds to an area experiencing a supply-side market failure, such an arrangement may not encourage sufficient private investment.

To enhance the expected returns to the limited partners, alterations can be made in one or more of the rules determining the distribution of profits, the timing of investments and returns, downside protection, and the payment of fees. Mechanisms typically include:

- **Differential timing of investment draw-downs of public and private funds.** Public funds are drawn down first, followed by private funding. The earlier commitment of public funds shortens the length of time that private investors must keep their assets in the VC fund, which increases their internal rate of return.

- **Using debt to increase the return to private investors.** Arranging state participation as a loan to the fund increases the private investors' profits whenever the internal rate of return of the fund exceeds the interest rate on the debt.

- **Capping the public investor's entitlement to profits.** This increases the relative share of any profits received by the private investors, and can be implemented by limiting the public investor's profits and/or providing private investors with an early buy-out option.

- **Differentiated timing of repayments.** After achieving a minimal return for both public and private investors (such as repaying initially invested capital), subsequent repayments can first go to private investors up to a defined amount, and then to public investors.

- **Guaranteeing private investors against the loss of a proportion of the capital they have invested.** A guarantee from the public investor gives some downside protection to private investors. However, if this is the only incentive mechanism in place, it will reduce the penalty for poor decision-making and create a moral hazard. For this reason, guarantees are usually not the only mechanism in a public-private fund structure.

Turning to the fund manager (GP), the aim is to align their interests with those of the LPs, discourage self-interested behaviour, and encourage investment decisions that help achieve public policy goals. Mechanisms include ensuring that the compensation of the GP is highly dependent on the commercial success of the fund. A GP typically receives 20% of the net capital gain of the fund (the 'carry'), but before participating in the distribution of capital gains, GPs are usually required to return the LPs' capital with the addition of the yield from a minimum agreed level of interest. Once this 'hurdle' has been met, the GP typically receives all the capital gains until the carry has been reached. In addition to these capital gain incentives, the GP usually receives an annual management fee.

The main components of a potential public-private, pan-European FoF with the European Commission investing money on behalf of the EU demonstrate the further range of design choices to be made. These include the proportion of the total asset-base of the FoF coming from the EU budget; set-up options, including management mode, selection of FoF manager, and human resource impacts in the Commission; the focus of the FoF (generalist, sector-focused, stage-focused, geographic focus), the funds covered (VC funds only, cross-border criteria, other types of risk-capital fund), and the investment strategy; the risk-sharing approach, coupled with mechanisms to alignment the interest of the GP and LPs, and with the Commission's goals; governance structure and reporting requirements; the rewards to the GP, and the returns targeted; and finally, the number of FoFs to be established over the lifetime of Horizon 2020 and COSME, and the life-span of each FoF.
Annex 2

Questions used in semi-structured interviews with operators of TT schemes during field-visits (October 2012-April 2013) (main findings summarised in section [x])

1. What does Technology Transfer mean or cover in your view and in your organisation?

2. Technology Transfer can be made via licensing or the creation of new companies. Are you active in both fields (licensing and company creation/spin-offs)? Is it necessary for a Technology Transfer fund to be active in both fields?

3. Technology Transfer finance involves a hands-on approach and includes a very good understanding of IPR issues on the fund's side. How do you ensure the necessary level of expertise (in-house or via third party expertise)?

4. How important are your links to research organisations and universities, and are you involved in their networks?

5. Technology Transfer finance usually seems to include the very early phase before companies are created (pre-seed phase). How do you actually invest into companies that do not yet exist?

6. Technology Transfer finance typically addresses the stages of proof-of-concept of R&D and its commercialisation potential involving a high risk of failure. In order to set up a sustainable fund or scheme for TT, how far downstream should Technology Transfer finance go (to which subsequent stages where successful business may produce returns)? Should it also participate in the up-side potential of successful spin-offs?

7. Technology Transfer finance addresses a funding gap where private investors are more or less absent. Do you think that Technology Transfer is a permanent public task, or are there ways to get private capital on board? Do you successfully attract private capital, and if so, do you apply the pari-passu principle, or do you provide incentives (downside protection; first-loss taking; preferential fees)?

8. Is your Technology Transfer financing based on a commercial approach (aiming at returns) in order to be able to provide sustainable funding? If so, what is the implication for the way of financing (equity, quasi-equity such as silent participations, subordinated debt) and its pricing? Do you set internal rates of return?

9. What are your criteria for measuring success? Is "success" primarily related to achieving policy goals (support of Tech Transfer as such; creation of new companies) or rather to commercial/financial milestones (reflow/return from investments made; minimum ROI etc.)?

10. It is currently discussed at the level of Commission services whether a European funding scheme or European fund dedicated to the support of Technology Transfer could be useful in order to bridge the "Valley of Death". What is your view? If positive, what elements should it contain? How could it add value for your funding of TT at national level?
Annex 3

Key characteristics of the two main options for a TT financing facility

Decentralised: The European Commission would dedicate an EU budget contribution, matched by funding from the entrusted entity, to established TT funds or schemes on an equal risks, equal rewards basis for investments in final beneficiaries. Selected TT funds or schemes would make decisions to invest in a final beneficiary in line with eligibility criteria specified by DG Research & Innovation and according to the investment policy of the fund or scheme concerned. Implementation costs could be held to some 5% of the EU contribution.

Investing in technology-based, very early-stage companies is risky. Losses could be significant, so the EU contribution could be allocated to cover the first loss. In that case, the contribution of the entrusted entity would need to be above a matching contribution. The overall leverage effect of the decentralised approach would be at least 2 if the EU and entrusted entity match funding, or 3 if there is first-loss taking by the EU and the entrusted entity's contribution was, for example, twice the EU's. As the TT facility and a financial intermediary would co-invest in a final beneficiary, an additional leverage of 2 would be achieved, with a hypothetical €100 mn EU contribution translating into total TT financing of €400 million if risk-taking is equally shared, or €600 mn if the EU takes the first loss.

With respect to potential market distortions and crowding-out effects, a decentralised intervention would not be based on more favourable conditions than existing funds or schemes at national, regional or institutional level: it would reinforce these funds or schemes by using them as financial intermediaries.

Centralised: The Commission would set up a dedicated investment fund, run by a fund manager, to which the EU and the entrusted entity would make matching contributions. The fund would be responsible for screening and examining investment opportunities with support from evaluation and investment committees, who would make investment decisions in a centralised manner at the level of the fund. The fund would also hold assets, manage them, and disinvest as required. The source of investment opportunities would be broader compared to the decentralised approach, as investment proposals could be sent directly to the fund without the involvement of selected financial intermediaries. Regarding risk-sharing, the EU contribution to the fund would probably be subordinated and also include subordination in terms of paying a return first to other investors, including the entrusted entity.

The fund would have a lifespan of 10-15 years. Its administrative and management costs are estimated by EIF and JRC to be in the order of €90 million over a 15-year period based on a fund size of €560 million (made up of €280mn each from the EU and the entrusted entity), equivalent to 32% of the EU contribution or 16% of the total size of the fund. The overall leverage effect of the centralised approach would be 2 at TT facility level and up to an additional 1.5 at investment or project level, as partial co-financing of some 30-40% is expected from third parties for PoC + and seed compartments.

The centralised approach would provide particular additionality at EU level by offering a channel for assessing investment opportunities that do not have access to national, regional or local TT finance, notably in the newer Member States.

Comparison of options: The key features of the two options are summarised in Table 4.
The centralised scheme offers a channel for assessing investment opportunities that do not have easy access to national, regional or local TT finance, notably in the newer Member States. However, the running costs would be high, as the Commission would have to create a large central management structure; it would require a clearly defined single model of intervention, which may not be suitable for all investments; and the Commission would be a subordinated investor, taking any first loss and only making a return after other investors had received theirs.

In the decentralised scheme, the Commission would not incur large running costs, as investment decisions would be taken by TT funds or vehicles, and it would not have to adopt a specific one-size-fits-all investment model. Such a scheme would also be relatively quick to implement and would be easy to rescale or otherwise adjust in the light of experience, though it could not cater for investment opportunities that do not come from the funds or vehicles acting as financial intermediaries.

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<th>Table 3 – Summary comparison of principal TT funding options</th>
<th>CENTRALISED</th>
<th>DECENTRALISED</th>
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<td>Implementation costs</td>
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<td>low</td>
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<td>- as % of EU contribution</td>
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<td>low: est. 5%</td>
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<td>Speed of implementation</td>
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<td>Complexity of set-up</td>
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<td>Responsiveness to changing circumstances</td>
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<td>Risk of crowding-out</td>
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<td>Potential to crowd-in</td>
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<td>good after pilot</td>
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<td>Accessibility</td>
<td>good: deals come from anywhere</td>
<td>poor: deals from intermediaries</td>
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<td>Ease of monitoring</td>
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<td>Control of events and PR by Commission</td>
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<td>Reputational risk to Commission</td>
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<td>European added-value</td>
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<td>Flexibility in forms of investment</td>
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<td>Leverage</td>
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<td>Potential to cover different TT stages</td>
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<td>Risk of financing technologies or firms with poor commercial prospects</td>
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<td>Distance of investment decision-makers from final beneficiaries</td>
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<td>Probability of high-quality deal-flow</td>
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<td>Potential for links to innovation ecosystem</td>
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