New financial instruments for innovation as a way to bridge the gaps of EU innovation support

Final Report
New financial instruments for innovation as a way to bridge the gaps of EU innovation support

Final Report

April 2017

Katarzyna Jakimowicz
David Osimo
Thomas Mayer
Francesco Mureddu
Ilaria Vigo
Emma Fau
LEGAL NOTICE

This document has been prepared for the European Commission however it reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.


Reproduction is authorised provided the source is acknowledged.
# Table of Contents

ACKNOWLEDGEMENTS ................................................................................................................. 9

EXECUTIVE SUMMARY .................................................................................................................. 11

I. Introduction .................................................................................................................................... 11
II. Overview of the instruments ........................................................................................................ 12
III. Recommendations for implementation ...................................................................................... 16

1. INTRODUCTION .......................................................................................................................... 17

1.1. Background and main objectives of the study ........................................................................... 17
1.2. Overview of the methodology .................................................................................................. 19

2. MAIN FINDINGS .......................................................................................................................... 21

2.1. Definitions .................................................................................................................................. 21
2.2. Co-investment ............................................................................................................................ 22
   2.2.1. Defining co-investments ...................................................................................................... 22
   2.2.2. Governance structure ......................................................................................................... 28
   2.2.3. Benefits ............................................................................................................................... 29
   2.2.4. Bottlenecks ........................................................................................................................ 30
   2.2.5. Key lessons learnt. .............................................................................................................. 31
   2.3. Blending .................................................................................................................................. 32
   2.3.1. Defining blended instruments ........................................................................................... 32
   2.3.2. Governance structure ......................................................................................................... 37
   2.3.3. Benefits ............................................................................................................................... 38
   2.3.4. Bottlenecks ........................................................................................................................ 39
   2.3.5. Key lessons learnt. .............................................................................................................. 39

2.4. Royalty-based financing .......................................................................................................... 40
   2.4.1. Definition ............................................................................................................................ 40
   2.4.2. Benefits and challenges ...................................................................................................... 41
   2.4.3. Key lessons learnt. .............................................................................................................. 42

2.5. Revolving nature of funds ....................................................................................................... 43
   2.5.1. Definition ............................................................................................................................ 43
   2.5.2. Benefits and bottlenecks .................................................................................................... 45
   2.5.3. Key lessons learnt. .............................................................................................................. 45

2.6. Claw-back provisions .............................................................................................................. 46
   2.6.1. Definition ............................................................................................................................ 46
   2.6.2. Benefits and bottlenecks .................................................................................................... 47
   2.6.3. Key lessons learnt. .............................................................................................................. 47

3. INTEGRATED ANALYSIS .............................................................................................................. 48

3.1. Overview of the key aspects of instruments ........................................................................... 48
3.2. Benefits and bottlenecks of new financial instruments ............................................................ 49
3.3. Governance structure and resource management ................................................................. 50
3.4. Measuring the performance of new financial instruments ...................................................... 50

4. FINAL CONSIDERATIONS AND RECOMMENDATIONS .......................................................... 53

5. CASE STUDIES ........................................................................................................................... 58

5.1. CASE STUDY on CO-INVESTMENT – INVITALIA (IT) ......................................................... 58
5.2. CASE STUDY on CO-INVESTMENT – CDTI PROGRAMMES: NEOTEC & INNVERTIE (ES) .......................................................................................................................... 62
5.3. CASE STUDY on CO-INVESTMENT – ERP-EIF CO-INVESTMENT GROWTH FACILITY (DE) .......................................................................................................................... 66
5.4. CASE STUDY on BLENDING – INNOVATION CREDIT (NL) .................................................. 70
5.5. CASE STUDY on BLENDING – PARTIALLY REIMBURSABLE LOAN (ES) .......................... 75
5.6. CASE STUDY on BLENDING – FGG (AT) ................................................................................ 79
5.7. CASE STUDY on BLENDING – VFF (NL) ................................................................................ 85

ANNEXES .................................................................................................................................. 90
ANNEX 1 MEASURING SUCCESS OF CO-INVESTMENT ................................................................. 90
ANNEX 2 POTENTIAL ISSUES WHILE DESIGNING VC CO-INVESTMENT SCHEME ............... 96
ANNEX 3 CO-INVESTMENT FUND INTERACTION STRUCTURE ............................................. 99
ANNEX 4 YOZMA FUND ........................................................................................................... 101
ANNEX 5 INNOVFIN MID CAP GROWTH FACILITY AND CONNECTING EUROPE BROADBAND FUND ......................................................................................................................... 104
ANNEX 6 BENEFITS AND CHALLENGES OF NEW FINANCIAL INSTRUMENTS .................. 107
ANNEX 7 LIST OF PERFORMED SCOPING AND IN-DEPTH INTERVIEWS ............................. 109
ANNEX 8 LONG LIST OF FINANCIAL INSTRUMENTS .............................................................. 110
ANNEX 9 APPENDIX TO CASE STUDY ON INNOVATION CREDIT ........................................ 115
ANNEX 10 APPENDIX TO CASE STUDY ON EARLY PHASE FINANCING (VFF) ...................... 118
ANNEX 11 APPENDIX TO CASE STUDY ON BLENDING UNDER FFG .................................... 123
REFERENCES .................................................................................................................................... 124
LIST OF FIGURES
Figure 1 Co-investment fund interaction structure (VC case studies) ........................................... 26
Figure 2 Co-investment fund interaction structure (BA cases) ....................................................... 27
Figure 3 Public body as one of VC fund’s limited partners ............................................................... 28
Figure 4 Public body co-investment in parallel to a VC fund .......................................................... 29
Figure 5 Technology cycle and financial needs .............................................................................. 33
Figure 6 Invitalia Ventures - structure ............................................................................................ 59
Figure 7 Neotec Co-investment structure ....................................................................................... 63
Figure 8 ERP – EIF Co-investment Growth Facility Structure ......................................................... 67
Figure 9– Standard Funding Scheme: mix of grants and loans ....................................................... 80
Figure 10 Applications to IK (2008-2011) ..................................................................................... 115

LIST OF TABLES
Table 1 Overview of methods used for specific objectives ......................................................... 19
Table 2 Definitions of innovative financial instruments ............................................................... 21
Table 3 VC funds vs. Business Angels ............................................................................................. 23
Table 4 Overview of European blending case studies ................................................................ 34
Table 5 Lifecycle of the blending scheme ...................................................................................... 37
Table 6 Overview of new financial instruments .......................................................................... 48
Table 7 Summary of the criteria used to assess the performance of instruments ...................... 51
Table 8 Summary of key lessons learnt .......................................................................................... 54
Table 9 Strength of relationship between co-investment fund and private investors .................. 99
Table 10 Levels of delegation of the decision making in co-investments ..................................... 99
Table 11 Benefits of innovative financial instruments and their features ................................. 107
Table 12 Challenges of new financial instruments ....................................................................... 108
Table 13 Overview of the Innovation Credit .................................................................................. 115
Table 14 Grounds for rejection (IK) ............................................................................................... 115
Table 15 Applications over time (IK) ............................................................................................. 116
Table 16 Development Phase (IK) ................................................................................................. 117
Table 17 Commercial Phase (IK) .................................................................................................. 117
Table 18 Overview of Funding Requests (VFF) ............................................................................ 118
Table 19 Quickscans (VFF) ............................................................................................................ 118
Table 20 Funding Assigned in 2015 (VFF) ..................................................................................... 119
Table 21 Funding Assigned in 2016 (VFF) ..................................................................................... 120
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA</td>
<td>Business Angel</td>
</tr>
<tr>
<td>BDC</td>
<td>Business Development bank of Canada</td>
</tr>
<tr>
<td>BMWi</td>
<td>Federal Ministry of Economic Affairs and Energy</td>
</tr>
<tr>
<td>CDTI</td>
<td>Centre for the Development of Industrial Technology</td>
</tr>
<tr>
<td>CEBF</td>
<td>Connecting European Broadband Facility</td>
</tr>
<tr>
<td>CORFU</td>
<td>Corporación de Fomento de la Producción</td>
</tr>
<tr>
<td>EaSI</td>
<td>Employment and Social Innovation</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EFSI</td>
<td>European Fund for Strategic Investment</td>
</tr>
<tr>
<td>EFTA</td>
<td>European Free Trade Association</td>
</tr>
<tr>
<td>EIB</td>
<td>European Investment Bank</td>
</tr>
<tr>
<td>EIF</td>
<td>European Investment Fund</td>
</tr>
<tr>
<td>ERC</td>
<td>European Research Council</td>
</tr>
<tr>
<td>ERDF</td>
<td>European Regional Development Fund</td>
</tr>
<tr>
<td>ERP</td>
<td>European Recovery Programme</td>
</tr>
<tr>
<td>ERR</td>
<td>Economic Rate of Return</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FFG</td>
<td>Research Promotion Agency</td>
</tr>
<tr>
<td>FoFs</td>
<td>Fund-of-funds</td>
</tr>
<tr>
<td>FMFML</td>
<td>Frontier Markets Fund Managers Limited</td>
</tr>
<tr>
<td>GCIF</td>
<td>Growth Co-Investment Facility</td>
</tr>
<tr>
<td>HCP</td>
<td>Hemodynamic Cardiac Profiler</td>
</tr>
<tr>
<td>HTGF</td>
<td>High-Tech Gründerfonds</td>
</tr>
<tr>
<td>IK</td>
<td>Innovation Credit</td>
</tr>
<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
</tr>
<tr>
<td>JEREMIE</td>
<td>Joint European Resources for Micro to Medium Enterprises</td>
</tr>
<tr>
<td>JESSICA</td>
<td>Joint European Support for Sustainable Investment in City Areas</td>
</tr>
<tr>
<td>KIF</td>
<td>Climate Investment Fund</td>
</tr>
<tr>
<td>KPIs</td>
<td>Key Performance Indicators</td>
</tr>
<tr>
<td>PRL</td>
<td>Partially Reimbursable Loan</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RSFF</td>
<td>Risk Sharing Financial Facility</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>RVO</td>
<td>Netherlands Enterprise Agency</td>
</tr>
<tr>
<td>SFF</td>
<td>Structured Finance Facility</td>
</tr>
<tr>
<td>SMEs</td>
<td>Small and Medium Enterprises</td>
</tr>
<tr>
<td>TDP</td>
<td>Technical Development Projects</td>
</tr>
<tr>
<td>TOK</td>
<td>Technical Development Credit</td>
</tr>
<tr>
<td>VC</td>
<td>Venture Capital</td>
</tr>
<tr>
<td>VFF</td>
<td>Early Phase Financing</td>
</tr>
<tr>
<td>UDFs</td>
<td>Urban Development Funds</td>
</tr>
<tr>
<td>YIC</td>
<td>Young Innovative Companies</td>
</tr>
</tbody>
</table>
The study was led by Open Evidence in collaboration with external experts.

Study team

Katarzyna Jakimowicz – Open Evidence
David Osimo - Open Evidence
Francesco Mureddu – Open Evidence
Ilaria Vigo – Open Evidence
Thomas Meyer – expert
Emma Fau - expert

Acknowledgements

The study team would like to thank all the stakeholders that have contributed to the research by taking part in the interviews and by providing additional information to the study.

In particular, the study team would like to express special acknowledgment to: Luigi Amati (Meta Group), Ausma Bartkute (Invega), Silje Aspholm (Meta Group), Reiner Braun (Technical University Munich), Marco Da Rin (Tilburg University) Gerald Dlesk (FFG), Jean-Luc Eggen (RVO), Rein van Erp (RVO), Alexander van Frankenberg (High-Tech Gruenderfonds), Luis Enrique San Jose Garcia (CDTI), Thomas Hellmann (Said Business School), Heidi van Hooff-Sprangers (RVO), Nelson Gray (Business Angel), Bas Kruijderink (RVO), Anna Krzyzanowska (European Commission), Rachel Lancry (European Commission), Christian Stein (Coparion), Salvo Mizzi (Invitalia Ventures), Laure Reinhart (BpiFrance), Hristo Stoykov (European Investment Bank), Bjoern Tremmerie (European Investment Fund), Andres Ubierna (CDTI), Marco Zappalorto (Nesta).
EXECUTIVE SUMMARY

I. Introduction

In recent years, the European Commission (EC) turned its attention to ‘innovative financial instruments’, defined as instruments that are complementary to grants or subsidies, as part of a move towards a smarter ‘funding mix’.

Those instruments, in the form of loans, equity, quasi-equity and guarantees, are considered as a particularly effective way to increase the impact of EU funding, when compared to the traditional grant-based system, and also to promote a more responsible, result-oriented use of European funds by companies. However, the potential of these instruments is not currently fully exploited for innovation.

The present study, therefore, aims to pursue three objectives: 1) Define and map the relevant new financial instruments; 2) Assess their potential to support the scaling up of innovative SMEs by providing follow up funding, and to get more break-through, disruptive innovations to market; and 3) Formulate policy recommendations focusing on recommendations of the most valid avenue to consider.

Definitions

The study explores only specific types of financial instruments and how they can be used in support of innovation. In particular, it focuses on: 1) co-investment alongside venture capital; 2) blended funding instruments; 3) royalty-based financing, and 4) additional features and clauses of financial instruments: the revolving nature of funds and the claw-back mechanism of grants. As a first step, the study provides refined definitions of the instruments and distinguishes them into three distinctive types: while co-investment, blended instruments and royalty-based financing are ‘pure instruments’, the revolving nature of funds is a ‘feature’ of different financial instruments, while claw-back provisions are particular ‘contract clauses’ attached to funding.

<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-investment</td>
<td>Any form of public equity investment (up to 50%) in private companies alongside a partner organisation of qualified investors (such as VC funds or business angel (BA) networks), excluding direct public investment in VC funds and funds of fund.</td>
</tr>
<tr>
<td>Blending</td>
<td>A combination of grants with 1) loans, or 2) soft loans, or 3) guarantees, or 4) equity, including ‘convertible loans to grants’, ‘convertible grants to loans’, ‘partially repayable loans’.</td>
</tr>
<tr>
<td>Royalty-based financing</td>
<td>Also referred to as revenue-based financing, or a part of quasi-equity financing, it is a broader concept of financial instruments connected to the company’s performance. It is an investment vehicle where the investor lends money to investees against its future revenue streams.</td>
</tr>
<tr>
<td>Revolving nature of a fund</td>
<td>A generic term describing a feature of the financial instrument that allows funding of a continuous cycle of operations, exploiting the revenues that are generated. Any kind of non-grant system is revolving, such as equity or a loan. A revolving fund is ‘…. a fund in which the income delivered from its operations is available to finance the fund’s continuing operations without fiscal year limitations’ (OECD, 2007).</td>
</tr>
<tr>
<td>Claw-back provision</td>
<td>A contract clause. Under the claw-back provision, a public entity can recover the money already given out to a recipient, if certain pre-set conditions are not respected. The clause is typically applied to grant agreements and ensures a more rigid evaluation of the performance.</td>
</tr>
</tbody>
</table>


2 In the recent call for ideas for a European Innovation Council over two thirds of respondents agreed, or strongly agreed, that there are gaps in current EU support for innovation (EC, 2016a). During the validation workshop with stakeholders the need for further exploration of ‘the potential for hybrid equity/loan instruments, alongside venture debt and convertible loans, as well as blending grants with other financial instruments’ was further highlighted (EC, 2016b).
II. Overview of the instruments

<table>
<thead>
<tr>
<th>Co-investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the case of co-investment with venture capital, the government enters into an asymmetric relationship with a partner organisation of qualified investors in order to bring their complementary capabilities together. Moreover, co-investment funds additionally have to meet the following criteria:</td>
</tr>
<tr>
<td>1) The co-investment fund enters into the agreement with the partnering organisation before the first co-investment is done;</td>
</tr>
<tr>
<td>2) Public money is invested directly into a company that is also financed by the partner organisation;</td>
</tr>
<tr>
<td>3) If a public body is an investor, they either: are limited partners of the VC fund; or invest via parallel funds.</td>
</tr>
</tbody>
</table>

How co-investment funds interact with the private sector investors depends on the strength of the relationship between the parties. In turn, the strength of the relationship is an important factor in determining to what degree the responsibility for screening, due diligence and investment decision can be delegated to the private investors as co-investment partners.

- The stronger the relationship between a public body and private parties, the more it can delegate to the VC funds, the less bureaucratic oversight is needed, and the more co-investments can be carried out and more quickly.
- Where there is a weak relationship, the public body needs to do its own due diligence which limits the number of deals that can be done and how quickly they can be done.

There are two main models of public co-investment fund governance structure:

1) **Co-investment as limited partners** is essentially in line with the private sector modus operandi as followed by many institutional investors. For instance, in the ERP-EIF case, EIF invests into funds managed by the same VC firm as limited partner. Consequently, EIF knows these firms very well and the firms would also like to win EIF as an investor in future funds. Therefore, there is already a strong relationship, and EIF can delegate the decision-making to the fund managers.

2) **Investing via a parallel fund** – the public body enters into an agreement with the partner organisation and invests in parallel but without being a limited partner or fund member. Public money is not invested in the fund itself and consequently there is, compared to the previous situation, less alignment of interests between the government and the fund’s limited partners.

The common denominator between the two structures is that there needs to be a formal relationship between the public body and the co-investment fund. This formal relationship is strongest in situations where the public body is one of the VC fund’s LPs, but this requires there to be a public body that invests as a fund-of-funds (FoFs) in VC funds. The apparent focus on the ‘latter scenario’ comes from the fact that there are very few public bodies that are operating as FoFs.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Bottlenecks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-investment brings together the complementary capabilities of VC funds and governments.</td>
<td>Public co-investment funds have to match diverging objectives - dilemma of crowding out and demonstrating success.</td>
</tr>
<tr>
<td>By co-investing, public entities can leverage private money and fund more innovative companies in specific areas or sectors as more capital is provided under less onerous conditions, e.g. with less due diligence and more quickly.</td>
<td>Governments are limited in the way they can influence co-investment funds</td>
</tr>
<tr>
<td>Co-investing in later rounds can be used to support portfolio companies that are underperforming or that are in danger of failing and would otherwise be written off by</td>
<td>Private equity firms that managed to raise multiple funds are less likely to offer co-investments.</td>
</tr>
<tr>
<td></td>
<td>Co-investment requires a critical mass of suitable deals and investment readiness, an established VC market and experienced co-investors (business angels) in the country.</td>
</tr>
<tr>
<td></td>
<td>The lack of trusting relationships established</td>
</tr>
</tbody>
</table>

1 In many situations overlaps with co-investment programs for business angels can be observed, for example, where 1) programs are open to both VC funds and business angel schemes; 2) programs originally targeted venture capital but shifted their focus to include business angels; and 3) programs defining the term ‘venture capital’ widely to include business angels.

4 This only applies to VC funds as governments cannot be member of a business angel network.

5 The European Investment Fund (EIF) has launched the German Growth Co-Investment Facility together with the German Federal Ministry of Economic Affairs and Energy (BMWi) and the European Recovery Program in 2016.

6 For instance, the Invitalia Ventures fund in Italy that co-invest with national and international VC firms.

7 A few examples include: the French BPI, the Finnish FII and the Danish Vaeksfonden.
Blending instruments address sub-optimal investment situations - they are used for projects that have a positive economic rate of return, but that are not attractive to financiers without a grant element. More specifically, blending can be used to attract additional financing for important investments in innovation, by reducing exposure to risk, increasing capital leverage and enhancing the sustainability of financing schemes.

Blending mechanisms for innovation are not very common at Member State level. Nevertheless, the four schemes that have been analysed provided some interesting insights:

- All of the schemes provide at least one portion of funding in advance or during the project implementation;
- Only half of the schemes examined targets company at a specific innovation stage;
- Considering the application process, it is necessary to provide a business plan and a financial plan in most cases;
- The monitoring of beneficiaries is an important activity for all of the schemes involved.

The blending schemes are managed internally, that is by national innovation agencies. With respect to loan elements, blending schemes require additional resources and competences to monitor the execution of the project and to assess if the project has been successful.

**Benefits**

- Greater flexibility of the instrument, as the amount of money supplied can be tailored to the needs of the project.
- Higher sustainability of the instrument as compared to grants (due to the revolving effect).
- Lower moral hazard - the fact that a part of the money provided has to be repaid mitigates the moral hazard and the opportunistic behaviour of the receiver.
- Leverage for other public and private funding opportunities - receiving the funding is a clear signal for the viability of the project for other investors.
- The need to closely monitor the beneficiaries allows the team to assess the progress of the project and its chances of success.
- Companies receiving blended funding spend more on R&D, apply for more patents, and are funded more often with venture capital.

**Bottlenecks**

- The team managing blending schemes require experienced professionals with technical and financial backgrounds, but schemes face difficulties in finding these qualified experts.
- There is a lot administrative and monitoring work involved in all of the schemes (for instance: FFG employs a team of 40 people)
- The costs of managing the instrument are very high due to the large number of applications and projects funded - a large number of advisors have to monitor the ongoing projects and manage the project portfolio, while other advisors have to evaluate the proposals;
- Soft loans are not as attractive as they used to be in the past, as interest rates in Europe are very low.

---

8 The EIF-ERP approach explicitly aims to boost winners, whereas some co-investment funds are more aiming to increase the number of deals.

9 Innovation Credit (NL), Partially Reimbursable Loan (ES), VFF- Early Stage Financing (NL) and funding schemes of the Austrian Research Promotion Agency (FFG).

10 On the basis of evaluation of the Innovation Credit.
Lessons learnt

- Managing institutions should keep the instrument flexible and adapt to all of the deviations from the project plan that the company goes through;
- Projects should be monitored in the development phase in order to distinguish the successful from the unsuccessful ones, stopping the latter halfway in order to contain losses. However, monitoring requires a substantial team with sectorial knowledge;
- Funding should be combined with provision of further consultancy and advice for start-ups;
- Blending instruments should not be sector-specific;
- Well-established connections with the financial ecosystem ensure that finance institutions redirect companies to the scheme;
- Blending instruments do not crowd-out other financing options – other institutions consider obtaining blended financing as a signal for the project’s viability and treat it as complementary source of financing;
- The letter from the investor is not a strong enough commitment to the project;
- There is a funding gap in the market for scale-ups - a lot of companies finish the development phase but they still need additional funding to go beyond the first year of commercialisation;
- The definition of milestones, which set the rate at which funding is paid out in line with project objectives, are essential to provide a financial safeguard and enable the scheme to contain losses.

Royalty-based financing

Royalty-based financing\(^1\) is defined as an investment vehicle where money is lent from an investor to an investee against its future revenue streams. The initial capital plus an additional interest has to be repaid by the company until the pre-established amount is paid back (so called royalty cap), with repayments only starting when the company generates positive cash flow. Investors obtain returns as soon as the investees reach an agreed level of revenue.\(^2\)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Bottlenecks</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Focuses on a company’s success and does not hamper their development in the initial phase.</td>
<td>- The administration of quasi-equity loans requires substantial financial and human resources.</td>
</tr>
<tr>
<td>- Particularly appealing for start-ups in the technology and service sectors that are likely to achieve high profit margins in the future, but need a high level of investment at the beginning of the project (Yjee Lee, 2014).</td>
<td>- The investor participates in the company’s upside but also bears a certain risk of the downside in a situation when company doesn’t generate a positive cash flow. The risk is only partially mitigated by warrants and guarantees.</td>
</tr>
<tr>
<td>For companies, the instrument offers (Revenue Capital Association, 2014):</td>
<td>- Paybacks are usually slow since they are not provided until a certain revenue threshold is reached.</td>
</tr>
<tr>
<td>- No ownership dilution;</td>
<td>- Since a market for royalty-based financing does not exist, once the investment is made, investors have very limited options for liquidity (Yjee Lee, 2014).</td>
</tr>
<tr>
<td>- No personal liability;</td>
<td>- High reporting requirements during the repayment of the loan add to the administrative burden on the companies.</td>
</tr>
<tr>
<td>- Variable, flexible payments;</td>
<td></td>
</tr>
<tr>
<td>- Limited payback amounts (capped);</td>
<td></td>
</tr>
<tr>
<td>- No conflict over company’s valuation.</td>
<td></td>
</tr>
<tr>
<td>Incentives for both parties are focused on increasing revenues.</td>
<td></td>
</tr>
<tr>
<td>The risk of default is mitigated by the flexibility of the payments that are not fixed on a strict schedule (Yjee Lee, 2014).</td>
<td></td>
</tr>
</tbody>
</table>

Lessons learnt

- The financing institution participates both in the upside and downside, thus, the focus should be on the eligibility criteria, evaluation and monitoring;
- The instrument cannot be overly complicated, it should be quick and market-based;
- The instrument should be run in close collaboration with the market to gain advice and knowledge - companies should be required to bring private investors to gain advice and knowledge;
- Financed companies should demonstrate well-established corporate governance structures and reporting standards.

\(^1\) The term is often used in exchange with the term ‘revenue-based financing’ and ‘performance-based financing’, or classified together with the latter under the umbrella of ‘quasi-equity’ where the investments are usually based on the company’s future cash flow growth (Epstein D., 2013 and Issacs A., 2016). Another term that can be related to quasi-equity, and thus to royalty financing, is ‘venture debt’, understood by (Durufle et al., 2017 after Hochberg et al., 2014) as a loan for companies that also raise funds from venture capital investors. These companies have (...) negative cash flow and few collateral assets, therefore lenders rely partially on a due diligence performed by VCs. In this case, banks or VC funds require ‘additional upside in the form of equity or warrants’. The loan is expected to be paid back when 1) company starts generating positive cash flow, 2) on the exit – when company is sold, or when 3) company raises new equity.

\(^2\) http://www.attractcapital.com/what-is-quasi-equity-financing.html
### Revolving nature of funds

A revolving fund is a feature of the financial instrument. Financial instruments other than grants, whether equity, or debt-based, or a mix of both, can be revolving in nature, meaning the revenues come back to the instrument and, as a result, an instrument is more sustainable than grant. The instrument does not imply that all the capital is recovered from project. However, once the capital is recovered, even if partially so, it is reinvested for new operations. Funds that are revolving in nature are thought to be particularly suitable for projects with long-term paybacks and higher risks (van Vliet, 2013). Such projects are often associated with the innovative framework.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Bottlenecks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• It generates a multiplier effect(^\text{13}), as recovered capital can be re-invested. This effect is strengthened by the accumulation of interests generated and dividends paid (EC SWD, 2012).</td>
<td>• It requires substantial upfront investment and might be expensive to administer (Bertoldi and Rezessy, 2010).</td>
</tr>
<tr>
<td>• The revolving character of the instrument increases the efficiency and sustainability of public funds in the long term (Widuto, 2016).</td>
<td>• It requires trained personnel to be effective and significant human resources are needed to control and administer the repayment and disbursement of funds (Kruiderink B., 2017).</td>
</tr>
<tr>
<td>• The requirement to repay stimulates better performance, improves the quality of the projects and promotes better planning and their greater financial discipline (EC SWD, 2012). It increases the efficiency of the instrument with respect to grants, that are typically threatened by moral hazard (Murshed, 1994).</td>
<td>• In order to obtain a valuable revolving effect, the management of the fund and the cycle of repayments should allow the fund to be able to provide projects with the adequate financial support in due time for their development (European Court of Auditors, 2015).</td>
</tr>
<tr>
<td>• Revolving funds are less dependent on external investors and can contribute to a permanent financing structure, which is separate from political influence (Bertoldi and Rezessy, 2010).</td>
<td></td>
</tr>
</tbody>
</table>

### Lessons learnt

- It requires appropriate trained resources and an organisational structure
- It requires the appropriate monitoring system to be established upfront in order for it to be effective
- A financial instrument supporting innovation can only be partially revolving

### Claw-back provisions

The claw-back provisions offer the advantage of permitting the recovery of a part of the funds, if certain requirements are not met. This represents a control mechanism for public bodies over the use of dedicated funds and encourages beneficiaries to use the funds in a more stringent manner. With respect to innovation, the provision can be designed to ensure that the efforts of the beneficiaries remain focused on the agreed objectives and that the support contributes to a specific beneficiary or geographical location.\(^\text{14}\).

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Bottlenecks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Control mechanism for public entities - claw-back provisions ensure that financial resources are used efficiently (in a way that was claimed by beneficiaries), at the same time ensuring the effectiveness of the instrument (by imposing certain policy objectives).</td>
<td>• Strictness of the clause can constitute a disincentive for companies applying for funding.</td>
</tr>
<tr>
<td>• They represent a disincentive for moral hazard.</td>
<td>• The threat of retrospectively applied changes to the rules makes it more difficult for the companies to ensure compliance and increases the riskiness of acquiring funding (CPI, 2012).</td>
</tr>
</tbody>
</table>

### Lessons learnt

- Provisions should not be stringent to the level of discouraging the potential beneficiaries to apply.
- They can play an important role in making sure that the support for innovation contributes to the local ecosystem.

\(^\text{13}\) The multiplier effect is, for any given project or project portfolio, the ratio between public and private funding raised (numerator) versus the funding paid - money injected into the fund - (denominator) (EC SWD, 2012).

\(^\text{14}\) For instance, the Callaghan Innovation Fund (AU), uses claw-back provision to ensure that the R&D grant contributes to the innovative company within the borders of the country (Garry, 2013).
**III. Recommendations for implementation**

The new financial instruments at the core of the study demonstrate unique characteristics. However, it is possible to identify a set of shared features: they are complementary to grants; they are aimed at supporting riskier investments - therefore, they are aimed at addressing market gaps; they are especially appropriate for revenue-generating projects that encounter difficulties in attracting standard funding under market conditions (EC SWD, 2012); and they combine objectives related to policy impact and to financial return. Moreover, the new financial instruments offer some common benefits in the form of:

- a greater sustainability of instruments (through the revolving effect),
- a greater effectiveness of public funding (through attracting additional private funding, a more diverse use of instruments and reuse of funds that allows them to finance an increased number of companies),
- a more efficient use of public resources – due to a market-based approach to investing (co-investment), reduced moral hazard (blending), a more informed decision-making process and better monitoring of the use of resources;
- and higher quality and better performance of projects – obtained by limited market interference (co-investment), and a stricter pre-evaluation and monitoring of projects based on performance indicators.

Nevertheless, public institutions are also faced with challenges while implementing the innovative financial instruments as they require: trained professionals with a very specific set of skills; the development of an effective monitoring and evaluation system of the performance of projects and instruments, and a significant amount of human and financial resources to monitor the performance of projects and their spending, as well as to help manage the repayment of loans to funds.

While taking into consideration the existing landscape of VCs, Bas and EIF initiatives, it seems that there is no need for additional co-investment facilities strictly dedicated to innovative SMEs. There is potential, however, to enrich the concept of the SME Instrument through the introduction of blending instruments in Phase 2 and Phase 3.

Concerning the scalability and transferability of blended instruments, the stakeholders that manage these instruments stated that they do not see any obstacles to similar instruments being adopted at the European level.

Furthermore, certain conditions were highlighted as important for instruments at EU level:

- **Instruments should be managed by market professionals** - as European institutions very often do not have enough market knowledge and skills.
- **Instruments should be designed taking local market differences into account** - the different levels of development of the supply side within Member States need to be taken into account.
- **Instruments should be kept flexible** - they should be designed to take differences in local markets into account. They should also be flexible in adapting to changes in the project’s performance.
- **Instruments should be market-driven but without crowding-out** - financial instruments should be commercially oriented and market driven, but they should not distort the market by providing too much funding under too beneficial conditions.
- **Instruments should leverage private capital for know-how, advice and support** to innovative companies, increasing their chances of success in the market.
- **They should provide follow-up funding mechanisms** - interviewees stressed a need for follow-up funding at the different stages of a company’s development was highlighted. However, the instruments are rarely interconnected, even if managed by the same institution.

- **A monitoring and evaluation system should be embedded in the instrument** - the easily measurable KPIs, together with a data gathering system should be embedded in the design of the instrument from the start. In turn, the evaluation system should be established upfront on the basis of those KPIs. The information should be managed by one entity at European level.
1. INTRODUCTION

This is the Final Report of the study ‘New financial instruments for innovation as a way to bridge the gaps of EU innovation support’ carried out for the Directorate-General for Research and Innovation during the first half of 2017.

This section presents the background, main objectives as well as the methodology of the study. Section 2 provides definitions and an overview of the relevant financial instruments. Section 3 contains the integrated analysis of the instruments and case studies and Section 4 depicts the key policy conclusions. Finally, detailed case studies on chosen instruments are presented in Section 5.

1.1. Background and main objectives of the study

Funding for research and innovation is constantly evolving. The present grant-based system was introduced in the 1980s as a gradual replacement of post-war block-based funding with a more competitive, project-based funding (Laudel, 2006). In fact, the adoption of competitive grant-based funding (with international peer reviews) remains an objective of the European Research Area. Such system, whilst being generally considered more effective in fostering greater transparency, accountability and competition between researchers, has also attracted criticism due to high bureaucratic burden it places on individuals, the high cost of the process and the doubtful capacity of the governing body to select the genuinely promising research projects (Guthrie et al., 2013; Sutherland et al., 2011).

To overcome these limitations, the EC recently introduced several new mechanisms, also in relation to the widening of the scope from research to innovation in the new H2020 programme. Inducement prizes, two stage funding processes, and curriculum-based funding (ERC), amongst others, aimed at reducing information asymmetries, avoiding lock-in effects and favouring the participation of new players.

As part of this move towards a smarter ‘funding mix’, the European Commission (EC) turned its attention to ‘innovative financial instruments’, defined as instruments that are complementary to grants or subsidies15. Those instruments, in the form of loans, equity, quasi-equity and guarantees, are considered as a particularly effective way not only to increase the impact of the EU funding, as compared to the traditional grant-based system (EC, 2015), but also to promote a more responsible, result-oriented use of European funds by companies. Though financial instruments are important in any area of strategic investments, specifically in the field of innovation, ‘innovative financial instruments’ are able to:

- help to ensure access to finance for small and medium-sized enterprises (SMEs) and innovative start-ups that are pursuing more risky projects;
- foster EU policy objectives as they provide necessary financing in areas of strategic EU interest (e.g. innovation), in situations when there is insufficient funding from market sources due to market failures;
- ‘(...) catalyse investments for identified market gaps - by pooling resources from various sources so that they can achieve economies of scale and/or minimise the risk of failure in areas where it would be difficult to achieve the required critical mass’;
- ‘(...) create a multiplier effect for the EU budget by facilitating and attracting other public and private financing for projects of EU interest throughout the various levels of the implementation chain (intermediaries and final beneficiaries)’ (EC, 2011).

The European Union has already been active in employing financial instruments in areas such as cohesion policy or external development policy. However, financial instruments gained importance after the year 2010. The Commission’s Communication on the next

2014-2020 Multiannual Financial Framework (EC, 2011a) and the Budget Review (EC, 2010a) highlighted that innovative financial instruments could provide an important new financing stream for strategic investments, supporting long-term, sustainable investment at a time of fiscal constraint. In addition, the Europe 2020 Strategy (EC, 2010) promoted an increase in the application of innovative financial instruments in an effort to pull together EU and national public and private funding to pursue the objectives of smart, sustainable and inclusive growth.

As far as more recent EU Programmes are concerned, the innovative financial instruments are used in Horizon 2020, COSME, the EU programmes for employment and social innovation (EaSI) and the European fund for strategic investments (EFSI).

Nevertheless, in the recent call for ideas for a European Innovation Council, over two thirds of respondents agreed, or strongly agreed, that there are gaps in current EU support for innovation (EC, 2016a). During the validation workshop with stakeholders, the need for further exploration of ‘the potential for hybrid equity/loan instruments, alongside venture debt and convertible loans, as well as blending grants with other financial instruments’ was further highlighted (EC, 2016b).

**Objectives of the study**

The present study, therefore, aims to pursue three objectives:

- Define and Map the relevant new financial instruments;
- Assess their potential to support the scaling up of innovative SMEs by providing follow-up funding, and to get more break-through, disruptive innovations to market;
- Develop policy recommendations, focusing on the recommendation of the most valid avenue to consider, together with a description of key success factors, challenges and next steps to consider.

**Thematic scope**

Depending on the definition, innovative financial instruments encompass a wide range of instruments, from asset-based lending to crowdfunding (OECD, 2015c). The study explores only specific types of financial instruments and how they can be used in support of innovation.

In particular, it focuses on four types of instruments and their potential to be applied in combination / under with the existing innovation facilities/ instruments (such as the Horizon 2020 SME Instrument) or new instruments under the planned Innovation Council. In that respect, the study will concentrate on:

1) **Co-investment alongside Venture Capital (VC)** - equity investment in private companies alongside VC fund or private capital (excludes direct public investment in VC fund or creation of VC fund-of-funds).

2) **Blended funding instruments**, understood as a combinations of grants with loans and equity (excluding combination of grant and guarantees, or hybrid instruments (mix of loans and equity)).

3) **Royalty-based funding**, understood as quasi-equity loan connected to the future cash flow revenue streams.

4) **Additional features and clauses of financial instruments**: the revolving nature of funds and the claw-back mechanism of grants.

---

16 The Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises

17 Idem

18 Originally the forth type of instruments was considered separately, but as depicted in Section 2.1 that in reality they correspond to different aspects of an instrument, rather than different instrument.
With regard to geographical scope, the study covers instruments currently applied at national, European and international level.

### 1.2. Overview of the methodology

The study objectives are addressed through multiple methods: desk research, interviews, and case studies (as presented in Table 1).

**Table 1 Overview of methods used for specific objectives**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Details</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scoping</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definition and Mapping</td>
<td>• To define new financial instruments relevant for innovation</td>
<td>X X X X</td>
</tr>
<tr>
<td></td>
<td>• To provide a comprehensive map of existing measures</td>
<td></td>
</tr>
<tr>
<td><strong>Assessing</strong></td>
<td></td>
<td>X X X X</td>
</tr>
<tr>
<td></td>
<td>• To carry out an analysis of benefits and underlying success factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• To evaluate trends</td>
<td></td>
</tr>
<tr>
<td><strong>Recommending</strong></td>
<td></td>
<td>X X X X</td>
</tr>
<tr>
<td></td>
<td>• To extract lessons learned</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• To formulate policy recommendations</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration*

**Desk research**

The **literature review** aimed at to find evidence in order to establish the background information, define the scope of the study and map relevant instruments. The study team screened 177 existing literature sources on the matter, mostly relating to general issues on the topic, including: scientific sources, grey literature, administrative sources, existing policy papers, instrument evaluation documents, presentations and documents obtained directly from the identified key stakeholders and experts. In addition, the OECD IPP database of innovation policies (OECD, 2014) has been thoroughly analysed.

**Database of instruments**

On the basis of the literature review, an analysis of the OECD IPP database of innovation policies and input from the scoping interviews, a database of the innovation-relevant financial **instruments** was created (see ANNEX 8). The mapping of financial instruments relevant to the study covered 67 instruments (including 45 European-based), 43 of which are related to co-investment, 8 to blending, 3 to royalty-based financing, 9 to the revolving nature of funds and 4 to claw-back provisions.

**Scoping Interviews**

The team performed 13 scoping interviews and 11 in-depth interviews (see ANNEX 7) during the course of the study, mainly with researchers and stakeholders in charge of relevant financial instruments at national or international level.

The **scoping interviews** aimed to streamline the definition of new financial instruments for innovation, map existing relevant instruments and identify potential instruments for in-depth case studies.
In-depth interviews and case studies

The **in-depth interviews** aimed to gather in-depth qualitative insights on chosen instruments for in-depth cases studies. Due to the limited availability of literature related to innovation as well as the limited availability of the evaluation documents, in-depth interviews with practitioners (stakeholders managing specific instruments) were the main source of information.

As a result of the interviews, the final selection of seven instruments for detailed case studies was carried out on the basis of the following criteria:

- Balance: type of funding, country, sector, organisational structure;
- Excellence: impact, leverage effect;
- Data availability and quality;
- Frequency of being mentioned in the scoping interviews.

The in-depth case studies (as presented in Section 5) include:

- Co-investments: Naotec/INVERTIE (ES), Italia Venture Fund (IT) and ERP-EIF Co-Investment Growth Facility (DE);
- Blending: Dutch Innovation Credit (IK), Spanish Partially Reimbursable Loan (PRL), funding schemes of the Austrian Research Promotion Agency (FFG) providing non-repayable grants mixed with loans or with guarantees (AT), and Dutch Early Stage Financing (VFF).

Furthermore, the study team performed an additional analysis of two BA co-investment funds: the Scottish Co-Investment Fund and the New Zealand Seed Co-investment Fund (see section on Co-investment with business angel co-investment funds) and two European initiatives: Connecting European Broadband Facility (CEBF) and InnovFin Midcap Growth Facility (See ANNEX 5). In addition, the Yozma Fund was analysed (see ANNEX 4).
2. MAIN FINDINGS

2.1. Definitions

The new financial instruments at the core of the study demonstrate unique characteristics. Nevertheless, it is possible to identify a set of common features:

- They are **complementary to grants**;\(^{19}\)
- They are **aimed at supporting riskier investments** - therefore, they are aimed at addressing market gaps;
- They are especially **appropriate for revenue-generating projects** that encounter difficulties in attracting standard funding under market conditions, such as innovative projects with a novelty barrier and little or no track record, pilot projects or low profitability projects in strategic policy areas (EC SWD, 2012);
- They combine objectives related to **policy impact and to financial return**.

Table 2 provides the definitions of the instruments within the context of the study. These definitions are further explored in the subsequent subsections of this chapter.

**Table 2 Definitions of innovative financial instruments**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-investment</td>
<td>Financial instrument</td>
<td>Any form of public equity investment (up to 50%) in private companies alongside a partner organisation of qualified investors (such as VC funds or business angel (BA) networks), excluding direct public investment in VC funds and funds of fund.</td>
</tr>
<tr>
<td>Blending</td>
<td>Financial instrument</td>
<td>A combination of grants with 1) loans, or 2) soft loans, or 3) guarantees, or 4) equity, including ‘convertible loans to grants’, ‘convertible grants to loans’, ‘partially repayable loans’.</td>
</tr>
<tr>
<td>Royalty-based financing</td>
<td>Financial instrument</td>
<td>Also referred to as revenue-based financing, or a part of quasi-equity financing, it is a broader concept of financial instruments connected to a company’s performance. An investment vehicle where the investor lends money to investees against its future revenue streams.</td>
</tr>
<tr>
<td>Revolving nature of a fund</td>
<td>Feature of instrument</td>
<td>A generic term describing a feature of the financial instrument that allows funding through a continuous cycle of operations exploiting the revenues that are generated. Any kind of non-grant system is revolving, such as equity or loan. A revolving fund is ‘(...) a fund in which the income delivered from its operations is available to finance the fund’s continuing operations without fiscal year limitations’ (OECD, 2007).</td>
</tr>
<tr>
<td>Claw-back provision</td>
<td>Contract clause</td>
<td>A contract clause. Under the claw-back provision, a public entity can recover the money already given out to a recipient if certain pre-set conditions are not respected. The clause is typically applied to grant agreements and ensures a more rigid evaluation of the performance.</td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration*

---

As the table shows, the study deals with three distinctive types of entities. While co-investment, blended instruments and royalty-based financing are 'instruments', the revolving nature of funds is a feature of different financial instruments. Furthermore, claw-back provisions are particular contract clauses attached to funding.

2.2. Co-investment

The bulk of venture capital is intermediated through private equity firms raising capital for funds making investments into companies. Such funds are typically established, for tax and other reasons, as limited partnerships with a defined lifespan. Institutional investors are the fund's 'limited partners' (LPs) and do not take an active role in its management. The term 'general partner' (GP) refers to the private equity firm as an entity that is legally responsible for managing the fund's investments and who has unlimited personal liability for the debts and obligations. 'Fund managers' are the individuals involved in the fund's day-to-day management. They form the fund’s management team that include the carried interest holders, i.e. those employees or directors of the firm who are entitled to share in the super profit made by the fund.

Particularly for venture capital, the limited partnership structure stood the test of time and is considered to be a superior framework for long-term investing involving a high degree of uncertainty. Institutions such as pension funds, insurers, university endowments and banks seek such intermediation as few have the experience and incentive structures that would allow them to invest directly in unquoted innovative companies. However, the fund investment modus operandi for venture capital is not uncontroversial, which explains why the market is experimenting with alternative approaches, including co-investments.

2.2.1. Defining co-investments

Discussions and evaluations of co-investment are complicated by the fact that the term is not well-defined and, therefore, referred to in different ways. In the context of public, i.e. government-sponsored, co-investment funds Gray (2015) put forward the following definition: "co-investment funds (...) are defined as commercially-oriented funds backed by public funding dedicated to the provision of (usually) equity finance to SMEs in partnership with investors from the private sector." Public co-investment funds do not have the same capability or capacity as a private fund manager to maximise financial return. Public co-investment funds can be considered as hybrid investors, having both commercial and policy objectives. To be more precise, as they are cooperating with private sector investors they need to fulfil commercial objectives in order to meet their policy objectives (see ANNEX 1 on detailed considerations of policy objectives for co-investment).

The focus of this study is on co-investments alongside VC funds. However, in many situations these overlap with government co-investment programmes for business angels, for example, in situations where:

- Programmes are specifically open to both VC funds and business angel schemes;
- Programmes originally targeted venture capital but shifted their focus to include business angels;
- Programmes that have defined the term 'venture capital' widely to include business angels.

Compared to co-investment funds specific to venture capital, more is documented on co-investment with business angels or on co-investment with business angels in combination

20 According to Wilson (2015) co-investment funds use public money to match private investment. Typically these programmes work by matching public funds with those of private investors, who are approved under the scheme.

21 Informal investments made by private individuals using their own money, in unquoted companies with which they have no family connections.
with seed and early stage VC funds\textsuperscript{22}. Nevertheless, these experiences can be used as a benchmark for the discussion of the VC co-investment.

There are a number of disadvantages and advantages of the VC and the business angel model, respectively. However, such comparisons are mainly based on scarce information and anecdotal evidence. There are many arguments put forward by business angels and venture capitalists, respectively, why theirs is a superior model, but this debate is ongoing and is beyond the scope of this study. In any case, and as Hellmann et al. (2015) pointed out, there is no universally accepted definition of what exactly distinguishes business angel funds from VC funds. Relevant for this study are important structural differences between the two models that, to a large degree, determine their applicability to a specific market situation. These differences relate to the sources of funding and the way they can be invested, as both affect the size of the transactions.

### Table 3 VC funds vs. Business Angels

<table>
<thead>
<tr>
<th>VC funds</th>
<th>Business Angels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raise capital from third parties, mainly institutional investors (e.g.: pension funds, insurers, endowments), based on a defined investment strategy</td>
<td>Invest own money (potential of conflict between fund managers and investors is eliminated)</td>
</tr>
<tr>
<td>Fund managers owe their investors fiduciary duty and need to adhere to the defined investment strategy</td>
<td>Business angels are free to invest in whatever they find attractive</td>
</tr>
<tr>
<td>In the EU, most VC funds are subject to the AIFMD regulation (EP and the Council of European Union, 2011)</td>
<td>Unless they attract further investors outside their core group, business angels are only subject to light regulatory oversight</td>
</tr>
<tr>
<td>Larger fund sizes are driven by the needs of institutional investors and compensate for higher costs associated with regulatory requirements</td>
<td>Business angels rarely manage huge pools of capital</td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration*

The preferences regarding size of transactions, stage focus, and attitude to risk are, to a large degree, a consequence of these differing constraints. There are many small investment opportunities that are accessible to business angels, but that would be too small for VC funding. Smaller businesses are more likely to be in their early stages, whereas venture capitalists are looking for larger transactions that also tend to coincide with later stages.\textsuperscript{23} Hellmann et al. (2015) found that business angels and venture capital appear to be alternative financing modes that do not mix well.\textsuperscript{24} The stepping stone model where business angel financing is followed on by VC financing rarely applies in reality (Hellmann, 2017).

In the case of venture capital, co-investment refers to the situation where the limited partners invest directly in a company that is backed by the VC fund, in which they participate. There are obvious advantages for the limited partners, such as lower fees and carried interest payments, and, in recent years, co-investments have been growing in popularity. Some limited partners generally ask for co-investment opportunities or even

\textsuperscript{22} See, for instance, Hayton et al. (2008), Gray (2015), PACEC (2012), PACEC (2013) and NZVIF (2014).

\textsuperscript{23} Nevertheless, research undertaken by Murray & Dimov (2004) and Dimov & Murray (2006) suggest that some of the largest and most established venture capital funds, particularly in the US, historically made the most seed investments, albeit within the context of portfolios comprising mainly later-stage investments.

\textsuperscript{24} Hellmann et al. (2015) collected data from the Venture Capital Programme (VCP) in British Columbia, Canada. The regulatory filings under the VCP allowed obtaining systematic and detailed data on business angel as well as venture capital investments. According to Hellmann (2017), British Columbia’s venture eco-system is relatively similar to that in the European Union’s ‘second tier’ clusters (e.g. Munich, Paris, Milan, as opposed to the ‘first tier’ such as Silicon Valley, Massachusetts, London). British Columbia is a part of this second tier; i.e., not perfect but good, with strong economy but weak venture capital markets, where the greatest talent prefers to migrate to Silicon Valley. What is specific to British Columbia is the tax credits made available to business angels and venture capitalists that may affect the results. However, the UK Enterprise Investment Scheme (EIS) works in a similar fashion, thus the impact does not appear to be significant.
co-investment rights. However, co-investment is not an identical process to fund investing and is a sophisticated investment strategy that is actually difficult to execute.

To be specific, this study looks at the situation where the government enters into an asymmetric relationship with a partner organisation of qualified investors in order to bring their complementary capabilities together. There is already significant experience of public co-investment funds that partner with business angels and business angel networks. However, the focus of the study is co-investment with VC funds that, when lacking financial resources, partner with governments that are not well positioned to evaluate opportunities and to build businesses, and do not have the industry specific network.

For the purpose of this discussion, co-investment funds additionally have to meet the following criteria:

- Public money is invested directly into a company that is also financed by the partner organisation;
- Public body as an investor either:
  - Is also a limited partner of the VC fund (this only applies to VC funds as governments cannot be members of a business angel network); see Figure 3 in Section 2.2.2, or
  - Has entered in an agreement with the partner organisation and invest in parallel (see Figure 4 in Section 2.2.2), but without being a limited partner or member;
- Co-investment fund enters into the agreement with the partnering organisation before the first co-investment is done.

Beyond providing private funding, a partnering organisation usually also provides specialized support, such as strategic advice, marketing and networking.

Co-investment with venture capitalists

While there are many well documented cases of public co-investment with business angels, there is very little, if any, written on government co-investments with venture capitalists (in the sense of this study). Overall, the market space for co-investments is very limited, public support might cause crowding out, co-investments require a lot of technical experience on the public side, and – unless co-investment schemes allow ‘automatic’ access to public funding, the VCs are not really interested in it. Further possible reasons for the scarcity of VC co-investment schemes include:

- Such schemes rely on a critical mass of experienced VC firms for a co-investment programme to partner with. This only exists in relatively established VC markets. If this condition is met, the public entity needs to have experience as an investor in funds as well as a direct investor. In several situations that were analysed in the context of this study, the co-investment scheme targeted (or was at least open to) venture capital, however, opportunities apparently did not materialise.
- Cases where VC funds are in need of public co-investments might be rare and could also raise the question of a potential ‘crowding out’ situation.
- Venture capital requires a network of institutional investors, strong technology deal-flow etc.

The many different set-ups, economic environments, maturity of VC and business angel markets, and the lack of data make comparisons very difficult. Often named and, therefore, interviewed, but excluded from this study are:

- The German High-Tech Gründerfonds (HTGF) is a venture capital investment firm operating in the realm of public–private partnerships. Investors include the Federal Ministry for Economic Affairs and Energy, the KfW Banking Group owned by the federal government, and a number of German industrial groups. Because of the private sector investors, the HTGF is often referred to as ‘co-investment fund’. However, according to
the definition of co-investment adopted for the study’s purposes it does not fall into this category. In fact, in the first round (HTGF is an early stage seed investor) companies should not even have an external investor (Frankenberg, 2017).

- The German Coparion provides public venture capital to start-ups and young growth companies. Coparion’s capital is provided by the European Recovery Programme (ERP) fund (managed by Federal Ministry for Economic Affairs and Energy) as well as by the KFW Banking Group. Coparion acts as a co-investment fund, teaming up with lead investors from the private sector and investing in innovative start-ups and young technology companies on matching terms. Coparion was launched in March 2016 and only has a young portfolio of seven companies. Moreover, in practice, Coparion is taking a more active role, acting like a normal venture capital fund and not following or relying on a private lead investors (Stein, 2017). In addition, as there is no framework agreement with pre-screened co-investment partners, Coparion falls outside the scope of this study.

- The Lithuanian Invega co-investment fund (managed by UAB Kofinansavimai, a subsidiary of UAB Investicijų ir verslo garantijos) is the VC instrument of the Ministry of Economy. This instrument is designed in order to develop the national venture capital market and to increase capital availability for new Lithuanian companies that have limited access to business financing offered by banks. The co-investment fund is about to be launched and therefore no lessons can be drawn from it yet (Bartkute, 2017).

The case studies considered to be relevant for this study were Invitalia (IT), Neotec / INNVIERTE (ES) and the ERP-EIF Growth Co-Investment Facility (DE)\(^\text{25}\) - they are discussed in detail in the Case Studies section (Section 5):

- **Invitalia Ventures** was launched in 2016 and, therefore, no conclusions can be drawn at this point in time. Despite potentially having access to a sizeable network of venture capitalists and corporations, there is no rigorous due diligence to prequalify potential co-investment partners. As a result, little can be delegated and Invitalia Ventures need to be highly involved in the due diligence and the investment decision. Therefore, it is essentially operating like a private sector VC fund and at comparable costs. Moreover, Invitalia is – compared to other co-investment approaches – more constrained by its internal resources (skilled and experienced investment professionals) and as a result may be less able to increase scale.

- As mentioned by an interviewee, and maybe unfairly, **Neotec** was found to be disappointing. Neotec’s design appeared to be sound, but the concept may have been too ambitious for this stage of the development of the Spanish VC market. Another explanation for the limited success put forward by an interviewee was Neotec’s lengthy approval process required for the investment decision. Therefore, and despite the strong relationships as limited partner of the VC funds, delegation of the decision making may not have been strong enough to be found attractive by the VC funds.

- The **ERP-EIF Growth Co-Investment Facility (GCIF)** was launched in 2016; therefore, also in this case no conclusions can be drawn at this point in time. Other public schemes approach co-investment on a deal-by-deal basis, evaluating individual proposals and occasionally even doing a specific due diligence. This implies considerable effort and results in long delays until the investment decision is made. In the case of the GCIF the longest delay is caused by the one-off framework agreement. Once the criteria are met, there is no separate EIF approval or due diligence required with respect to individual investments. The facility can be flexibly accessed by the partnering VC firms. Therefore, the GCIF does not result in huge administrative overheads (see Figure 1).

Figure 1 presents the co-investment fund interaction structure and how chosen co-investment instruments are designed in terms of the strength of relationship with the private sector investors vs. delegation of the decision making.

---

\(^{25}\) Excluded from the scope of the study are all situations where the government is co-investing with limited partners in funds. The study looks at situations where the government is co-investing with VC funds in portfolio companies (for instance, that is what Neotec is doing, but INNVIERTE is not – See Section 5).
How co-investment funds interact with the private sector investors depends on the strength of the relationship between these parties. In turn, the strength of the relationship is an important factor in determining to what degree responsibility for screening, due diligence and investment decisions can be delegated to the private investors as co-investment partners (See ANNEX 3 for detailed elaboration).

**Figure 1 Co-investment fund interaction structure (VC case studies)**

![Co-investment fund interaction structure](image)

*Source: Authors’ elaboration based on case studies*

Essentially, the stronger the relationship between a public body and private parties, the more it can delegate to the VC funds, the less bureaucratic oversight is needed, and the more co-investments can be done and they can be done more quickly. The downside is that the relationship depends on trust and trust is neither scalable nor it cannot be built up quickly. Where there is a weak relationship (as in the case of Invitalia), the public body needs to do its own due diligence which limits the number of deals that can be done and how quickly they can be done. The associated bureaucratic effort and resulting delays are likely to make these schemes unattractive for VC funds.

**Co-investment with business angel co-investment funds**

Gray (2015) identified a number of public co-investment funds, the majority relating to business angel schemes, and compiled 13 case studies. This summary is based on reports by Hayton et al. (2008) and Gray (2015), and building on Gray (2017). Well documented examples for successful co-investment funds focusing on business angel investment include the New Zealand Seed Co-investment Fund and Scottish Co-investment Fund (SCOF) (Wilson, 2015).

---

26 In the United Kingdom: Scottish Co Fund I-III, Scottish Seed Fund, Scottish Venture Fund, UK Business Angel Co Fund, London CoInvestment Fund, Northern Ireland Co Fund. International funds: NZ Angel Fund (New Zealand), European Angels Fund (EU), Angels Quebec Capital (Canada), Oregon Angel Fund (USA), OhioTech Fund (USA), DG Enterprise pan European Angel Fund (EU, proposed), SEEDS (Singapore), Technopartner Co-Investment (Netherlands), Compete Co-Investment (Portugal), World Bank MENA region co fund (proposed), Swedish regional co-investment fund, High-Tech Gründerfonds (Germany), Ingenium Funds (Italy), Angel Source (France), Pre-Seed Fund Capitalization Programme Ohio (USA), Commercial Acceleration Loan Fund Ohio (USA), Yozma Fund (Israel), Cradle Fund Sdn Bhd (Malaysia), Moscow City Seed Fund (Russia), World Bank Lebanon CoFund.

27 In his comparative review of co-investment funds Gray (2015) also mentions Yozma, a programme set-up by the Israeli government in 1993 to create the infrastructure for a domestic VC market. Since inception the Yozma Group has managed more than $220m in three funds. The first fund Yozma I has been widely credited for Israel becoming the ‘most successful case of the export of Silicon Valley-style venture capital practice’ (Kenney et al., 2004). Yozma I falls outside the scope of co-investing as defined for this study: notably, its focus is investments in VC funds. There is no co-investing alongside partnering organisations in companies. Yozma I actually is a fund-of-funds (FoFs); that it is mentioned as a ‘co-investment fund’ is due to the fact that Yozma is investing as a limited partner along-side other private sector limited partners in VC funds. While Yozma I had a window for direct investments and Yozma II and Yozma III were investing directly in companies, these were not co-investments along-side VC funds. Nevertheless, the Yozma experience holds important lessons relevant for this study (see ANNEX 4 for details).
Whereas business angel investing is able to take root even in less developed markets, venture capital requires a more developed ecosystem comprising, for instance, a network of institutional investors with the resources and skills to invest in alternative assets, technological innovators and entrepreneurs. Thus, in few economies are all pre-conditions for successful VC investing actually met, nor can they be easily created.

As pointed out by one interviewee (Garcia, 2017), depending on the stage, European leverage is more or less important. In the seed and early stage financing area – where business angels take a strong role – a pan-European approach is less important, whereas for later stage investments, an international orientation becomes highly important, arguably favouring venture capital. According to Amati (2017), co-investment with business angels can work ‘in any market in Europe’. Particularly in the very early stages, business angels are more active than venture capitalist. On the one hand, in many regions the deal-flow is insufficient to support specialised VC funds of a meaningful size for institutional investors, rendering fundraising in these regions a futile exercise. On the other hand, however, while co-investment with business angels, it is possible to raise money on a project-per-project basis and build portfolios of, say, 20 good quality investments spread over industry sectors and investment stages.

Some co-investment funds like the Scottish Co-Investment Fund and the New Zealand Seed Co-investment Fund are viewed as the ‘gold standard’ for successful support of the business angel markets. Figure 2 presents Co-investment fund interaction structure with business angels.

Figure 2 Co-investment fund interaction structure (BA cases)

The less developed the business angel market is, the more pro-active the co-investment fund managers have to be in order to ‘drag’ the private sector in. For instance, the North Ireland Co-Investment Fund is operating in a less developed business angel market and is taking an active role in sourcing deals, conducting due diligence and making investment decisions. In contrast, the Scottish market is more developed and the Scottish Co-Investment Fund taking a more passive role alongside the private sector with the high level of delegation of decision making.

An existing body of evidence reveals that BA co-investment schemes are attaining their key objectives. However, they need to be designed taking local specific

---

27 This is debatable. For instance, the European Angels Fund, that since 2012 aims to improve access to risk finance by innovative ICT firms by encouraging cross-border investments within the EU by business angels. The intention is to create syndicates of business angels from multiple countries in order to support the development of a single market for European innovative start-ups. However, the majority of business angel networks indeed operate nationally. See http://www.eif.org/what_we_do/equity/eaf/.
features into account. Take the example of Scotland, which has a high number of skilled and active business angels, whereas countries like Romania and Bulgaria are completely different. Even in the UK and despite having the same culture, education, and tax law, there are different models of co-investment funds for Wales, London, Scotland, and North Ireland (Gray, 2017).

2.2.2. Governance structure

As described in Section 2.2.1, there are two main models of co-investment fund governance structure from the perspective of a public entity: 1) the public body is a limited partner of the VC fund, or 2) has entered in an agreement with the partner organisation and invests in parallel but without being a limited partner or fund member.

Co-investment as limited partners (as depicted in Figure 3) is essentially in line with the private sector modus operandi as followed by many institutional investors. Figure 3 represents, for instance, the ERP-EIF case: EIF is investing into funds managed by the same VC firm as limited partner. Consequently, EIF knows these firms very well and the firms would also like to win EIF as investor in future funds. So there is already a strong relationship and EIF can delegate the decision-making to the fund managers. In addition to this relationship, there is another formal agreement specifically related to co-investments.

Figure 3 Public body as one of VC fund’s limited partners

Investing via a parallel fund (as described in Figure 4 below) is a variation that is followed by several governments worldwide. Here, public money is not invested in the fund itself and consequently there is, compared to the previous situation, less alignment of interests between the government and the fund’s limited partners.
The common denominator between the two structures (Figure 3 and Figure 4) is that there needs to be a formal relationship between the public body and the co-investment fund. This formal relationship is strongest in situations where the public body is one of the VC fund’s LPs. However, this requires there to be a public body that invests as a fund-of-funds (FoFs) in VC funds. The apparent focus on the ‘latter scenario’ (Figure 4) comes from the fact that there are very few public bodies that are operating as FoFs.\(^{29}\)

Ultimately, in the first case (Figure 3), there is a very strong alignment of interests and therefore ERP-EIF can delegate the decision-making process. In the second case (Figure 4), there is just an agreement that gives a scope for misunderstandings and misappropriation and, therefore, the public body SCOF needs to be more vigilant.\(^{30}\) In the case of Invitalia (also Figure 4) not even a due diligence is done on the partnering VC firms. Consequently, the relationship is so weak that Invitalia essentially operates like an ordinary VC fund with the same costs.

2.2.3. Benefits

Co-investment brings together complementary capabilities of VC funds and governments. On the one hand, co-investments can support venture capital funds. By providing VC funds with financial resources that they might be missing, governments use co-investment funds to accelerate the development of VC markets.\(^{31}\) In that respect, co-investment can be seen as a way to increase a fund’s capital under management and therefore, its likelihood to deliver a high performance, facilitating the firm establishment of teams and the subsequent development of a larger fund. In the survey performed on co-investment amongst 80 GPs worldwide by Preqin in 2014, 75% of fund managers saw the construction of a stronger relationship with limited partners as an important benefit of co-investment, and 45% of responders mentioned the improvement in chances of successful fundraising as an important benefit (Duong, 2014).\(^{32}\)

---

29 A few examples include: the French BPI, the Finnish FII and the Danish Vaeksfonden

30 SCOF is not investing directly in the various funds as LP (due to a regulatory constraint for BA funds). Therefore, it needs to do a specific due diligence on the partnering BA/VC organisations as well as it has to look into the investment cases.

31 The latter are seen as being more effective investors than individual business angels.

32 These results are in line with the feedback received from European industry practitioners.
On the other hand, through co-investment, governments obtain from VC funds those skills and resources that they are lacking. Very often governments do not have financial market know-how or experience in conducting a due diligence and taking investment decisions. They rarely even have enough skilled resources to do so, nor do they have the industry specific network.\footnote{In an ideal market with complete information and friction-free exchange of goods there is no need for intermediation. However, where these assumptions do not hold, such as in private equity markets, financial intermediaries can have valid reasons to exist. Here, there are substantial costs associated with searching, evaluation, structuring and transacting investments and related risks that can be shared between parties that pool their capital. Intermediaries may also have superior information on markets that require special knowledge. Gennaioli et al. (2012) discussed a model where investors delegate portfolio management to professionals based not only on performance, but also on trust. If investors put trust in fund managers, they perceive the risk of the investment to be reduced. Investors would still prefer delegation to taking risk on their own, even if the managers underperform the market net of fees. In theory, as Fang et al. (2012) point out, private equity appears to be ‘a textbook case where the benefits from financial intermediation would be substantial’.}

By co-investing, public entities can leverage private money and fund more innovative companies in specific areas or sectors as a result, and therefore, can fulfil policy objectives. Co-investment can help support riskier or underperforming companies of a strategic focus. The government co-investing in later rounds can also be used to support portfolio companies that are underperforming or that are in danger of failing and would otherwise be written off by the fund managers.

From the viewpoint of portfolio companies, public co-investment offers significant advantages as well: more capital is provided under less onerous conditions, e.g. with less due diligence and quicker. To some degree, entrepreneurs may also feel better protected as the write-off of a company backed by public money is likely to lead to questions, e.g., by the court of auditors, and thus will be avoided by the fund managers. Beyond providing private funding, the partnering organisation usually also provides specialised support to companies, such as strategic advice, marketing and networking.

**Co-investments do not come for free, but are usually cheaper than fund investments and direct investments.** Co-investments are thought to come with obvious advantages for the limited partners, such as lower fees than those seen in the usual fund arrangements. The majority of fund managers charge little or no fees to access co-investment opportunities and claim no carried interest but only transaction fees without set-off. Although at first glance it appears to be highly attractive not to pay fees or carried interest on co-investments, such cost savings are to some degree offset by the limited partner’s internal costs. In order to properly pursue co-investments, limited partners need a dedicated team and are, therefore, likely to incur significant expenses.\footnote{The perception, however, that co-investments always come without fees is wrong. To be able to take this ‘no fee, no carried interest’ route, the limited partner usually needs to have a good relationship with the fund manager and/or be able to offer expertise in a particular field. Simplistically, in about one quarter of cases, fund managers charge 1% management fees on co-invested capital and receive 10% carried interest. In a similar number of cases, managers charge no fees but receive the standard carried interest, i.e. typically 20% on the fund commitment (Braun, 2017).\footnote{As far as higher level of funds’ fees is concerned - the first major academic study was conducted by Fang et al. (2012), albeit focusing on direct investments more than on co-investments, estimated that a fund’s compensation structure, made up of management fees plus carried interest, implies a cumulative investment cost of 5 to 7 percentage points per year.} As far as higher level of funds’ fees is concerned - the first major academic study was conducted by Fang et al. (2012), albeit focusing on direct investments more than on co-investments, estimated that a fund’s compensation structure, made up of management fees plus carried interest, implies a cumulative investment cost of 5 to 7 percentage points per year.}

Moreover, it is widely believed that co-investment returns are higher than fund returns for less risk. For instance, a survey conducted by Preqin (2015) found that co-investments outperformed fund investments for 80% of investors. So far, there are very few academic studies on this subject, as it is even more difficult to get access to data than in private equity. None of the usual private equity research providers, such as InvestEurope, analyse co-investment performance. Therefore, a general problem with publications on co-investments is that a lot of the evidence is anecdotal or based on a small sample. The two most important papers on co-investment, but not public co-investment, Fang et al. (2012) and Braun et al. (2016), do not back up the outperformance claim touted in the industry.

2.2.4. **Bottlenecks**

As mentioned before, public co-investment funds do not have the same capability or capacity as a private fund manager to maximise financial return. **Public co-investment funds have to match diverging objectives** – as they are cooperating with private
sector investors they need to fulfil commercial objectives, but at the same time they should meet policy objectives. Governments, however, are limited in the way they can influence co-investment funds – in particular, as the successful co-investment funds are those that are market driven. In order to bridge these, not always aligned objectives, co-investment funds usually neither aim for maximising financial returns, nor for avoiding investment risk.

Related to this is the dilemma between crowding-out and demonstrating success. On one hand, successful investments are indicative of a positive impact of the intervention. Financial return is therefore a proxy that captures the achievement of high level objectives. On the other hand, the public co-investment fund following a return-oriented approach is likely to drive down, or even eliminate private sector investments. Moreover, through demonstrating the commercial viability of VC and business angel investing as an asset class, public players have the possibility of achieving evergreen status, in reality (as sustainably high returns are usually elusive\(^{35}\)) eventually making them an additional beneficiary of the government’s intervention.

Moreover, the issue arises whether only smaller, less successful funds co-invest with public entities. Braun et al. (2016) found that private equity firms that managed to raise multiple funds are less likely to offer co-investments. Such firms find it easier to attract investors to their funds and therefore do not need extra resources that co-investments offer.\(^{36}\)

Other bottlenecks mainly relate to:

- Absence of a critical mass of suitable deals / lack of investment readiness,
- Lack of experienced co-investors (business angels) in the country,
- Not established VC market,
- Lack of co-investing VC funds,
- Lack of trusting relationships established between co-investment fund and VC fund,
- Lack of managers at the co-investment fund (case of Invitalia, where the model of co-investment is not scalable).

Finally, co-investment, particularly when combined with other instruments like guarantees, has the potential to gradually weaken the limited partnership model until there is a tipping point, where the model collapses as the alignment of interest become unbalanced and incentives are eliminated (see ANNEX 2 for further discussion of the potential issues regarding the alignment of interests).

2.2.5. Key lessons learnt

As a result of the cross-analysis of case studies (see Section 5) and literature review, several distinctive key lessons learnt could be identified:

- Co-investment funds partnering with business angels are likely to have a positive impact in the seed and early stage phase as well as in underdeveloped markets for SME financing, while co-investment with venture capitalists requires an already established VC market;
- In the seed and early stage financing area – where business angels take a strong role – a Pan-European approach is less important, whereas for later stage investments an international orientation becomes highly important, favouring venture capital;

\(^{35}\) A return requirement for the co-investment fund to potentially become ‘evergreen’ translates into a KPI of an implied IRR of around 5%, needed to cover capital losses, operating costs, and the devaluation of capital caused by inflation.

\(^{36}\) According to these researchers, the different findings are partially explained because results by Fang et al. (2012) were heavily weighted towards investment years when returns on co-investments in the much larger sample of Braun et al. (2016) were poor. Finally, their results support that limited partners with prior experience of co-investing, tend to earn higher returns in venture capital.
The VC co-investment funds analysed in this study mainly aim to boost winners and are, therefore, more suitable for later stages. For this reason, VC co-investments are likely to end up continuing to concentrate funding on existing ‘hot spots’ of innovation and venture funding in Europe;

VC funds-of-funds are well placed to also manage a co-investment fund, as they can leverage the due diligence and the relationships with the VC funds they have invested in;

Key Performance Indicators (KPIs) are rarely defined and systematically tracked. This system has to be put in place at the inception of the co-investment fund to be effective.

Co-investment with a low level of delegation of the decision-making process to VC funds implies that the public co-investment fund needs a higher number of skilled professionals with direct investment experience to source and review the deals, resulting in higher management costs, and lower potential for scalability of the instrument.

### 2.3. Blending

#### 2.3.1. Defining blended instruments

For the purpose of the study, **blending (or blended instrument) is defined as the combination of grants with one, or several of those mentioned below:**

- **Loans:** a part of the funding is a subsidy, while another portion has to be repaid with interest;
- **Soft loans:** loans with interest rates lower than the market rate and/or subjected to other favourable conditions;
- **Guarantees:** in this case the providing institution commits to paying the loans contracted by the applicant in case the latter is not able to do so;
- **Equity:** in this case the subsidy is provided in exchange for a portion of the company shares. Therefore, the providing institution becomes shareholder.

**Blended instruments also include:**

- **Loans convertible to grants:** in this case the funding consists of a loan that can be converted into a grant, and that therefore does not have to be repaid, under specific circumstances, such as the technical failure of the project;
- **Partially repayable loans:** it consists of a loan, a share of which does not have to be reimbursed.

Following the definition of blending adopted in the study, ‘hybrid financing instruments’ combining features of both debt and equity, into a single financing vehicle, as defined by (OECD, 2013), are out of scope of the study. The CEBF - EFSI Investment Platform is also out of scope, as it is a mix of public and private funding that are not blended in a single instrument (see ANNEX 5 for a more detailed analysis of the instrument).

In European Commission documents37, blending is always defined as a combination of grants with 1) guarantees, 2) loans or 3) equity. It should be noted, however, that WEF uses a broader definition of blending as ‘the strategic use of development finance and philanthropic funds to mobilise private capital flows to emerging and frontier markets’38.

---

In general, blending instruments address sub-optimal investment situations - they are used for projects that have a positive economic rate of return (ERR), but that are not attractive to financiers without a grant element. When considering the motivations of using blending to finance innovation, blended finance is related to the “technology death-risk area”, which is a zone that does not attract investors due to high costs and uncertainty (see Figure 5). In this area, public support can assist in financing and increasing the bankability of projects by reducing risks and associated interest rate costs.\textsuperscript{39} More specifically, blending can be used to attract additional financing for important investments in innovation by reducing exposure to risk, increasing capital leverage, and enhancing the sustainability of financing schemes.

![Figure 5 Technology cycle and financial needs](source: (Nunez Ferrer et al., 2011))

The analysis of blending that is being carried in the study is based on a literature review, in-depth interviews and the cross analysis of interesting cases, which are presented below.\textsuperscript{40} As a matter of fact, blending mechanisms are not very common at Member State level - blending schemes were only encountered in Spain, the Netherlands, Austria and Norway.\textsuperscript{41}

Apart from innovation, blending is already extensively used in the development and environmental realms. Examples include:

- Combination of grants with loans: LAIF: Latin America Investment Facility\textsuperscript{42}; Young Innovative Companies funding (YIC)\textsuperscript{43};

\textsuperscript{39} In fact, innovation produces an intangible asset, such as patents or brands, which cannot be used as collateral to obtain external funding (Bravo-Biosca, undated). Moreover, returns on innovation are highly uncertain, and it is very difficult to quantify the probability of success and failure, so that expected return to the investment cannot be estimated.

\textsuperscript{40} An extensive analysis of the cases is provided in Section 5.

\textsuperscript{41} In Norway a concept of blending is used, though not a single and identifiable instrument were found.

\textsuperscript{42} The Latin America Investment Facility (LAIF) was officially launched during the EU-LAC Summit in May 2010. The Facility is an innovative financial mechanism that combines grants (non-refundable financial contributions from the European Union) with other resources such as loans from Development Finance Institutions in order to leverage additional financing for development and increase the impact of EU aid.

\textsuperscript{43} Tekes, the Finnish Funding Agency for Innovation, provides funding for young, innovative companies up to EUR 1.25 m, of which a maximum of EUR 500,000 may be funded as a grant, and EUR 700,000 as a loan. Tekes funds 75 percent of the eligible project costs in at least three phases. The funding for the first phase is a EUR 250,000 grant; typically for the period of 6-12 months. The funding is granted for business development.
Combination of grants with equity: Danish Climate Investment Fund ("DCIF" or "KIF") \(^{44}\); Africa Investment Facility, managed by DG DEVCO \(^{45}\).

Table 4 presents an overview of the blending instruments for innovation encountered in the European countries.

**Table 4 Overview of European blending case studies**

<table>
<thead>
<tr>
<th>Case study</th>
<th>Innovation Credit - IK</th>
<th>Early Phase Financing – VFF</th>
<th>Grants and loans/guarantees mix - GL</th>
<th>Partially Reimbursable Loans – PRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing institution</td>
<td>Netherlands Enterprise Agency – RVO</td>
<td>Austrian Research Promotion Agency – FFG</td>
<td>Centre for the Development of Industrial Technology – CDTI</td>
<td></td>
</tr>
<tr>
<td>Type of investors</td>
<td>Institutional</td>
<td>Institutional</td>
<td>Institutional</td>
<td></td>
</tr>
<tr>
<td>Governance</td>
<td>Team of internal and external advisors evaluating applications and monitoring projects</td>
<td>Team of internal advisors</td>
<td>Team of internal advisors</td>
<td></td>
</tr>
<tr>
<td>Type of funding</td>
<td>Grant + loan</td>
<td>Loan convertible to grant in case of failure</td>
<td>Grants + soft loans or guarantees</td>
<td>Loan convertible to grant in case of failure</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>Mostly SMEs</td>
<td>Early Stage Start-ups</td>
<td>Mostly SMEs</td>
<td>Mostly SMEs</td>
</tr>
<tr>
<td>Size of funding</td>
<td>Financing up to 75% of project, out of which 25 - 45% is a grant (depending on the size of the company). Funding goes from 150,000 to 10 m EUR</td>
<td>Loan equal to 35% (medium companies) or 45% (small companies) of the cost of the research if between EUR 110,000 and EUR 350,000.</td>
<td>50% of total financing. Big companies receive 19% in grant and 31% in loan, medium companies grant and loan 25% 25% 28% 22% small company grant and loan. Start-ups - total funding up to 70%: 31% grants and 19% loan + 20% of additional loan financing.</td>
<td>Up to 85% of the project funding, out of which up to 30% does not have to be reimbursed in case of failure. The average funding is 1.5 m EUR and there is no ceiling</td>
</tr>
<tr>
<td>Terms of funding</td>
<td>The project is divided into milestones and the grant is paid in 1/3 of the loan is provided at the beginning of the project, and after that the 50% of grants and loans are provided upon signing the contract, 30% of grants and loans</td>
<td>The project is divided into milestones and the grant is paid in 1/3 of the loan is provided at the beginning of the project, and after that the 50% of grants and loans are provided upon signing the contract, 30% of grants and loans</td>
<td>At the signature of the project, 25% of the funding is provided.</td>
<td></td>
</tr>
</tbody>
</table>

\(^{44}\) The Danish Climate Investment Fund (KIF) offers risk capital and advice for climate investments in developing countries and emerging markets in Asia, Africa, Latin America and parts of Europe. KIF is managed by the Investment Fund for Developing Countries (IFU), which has participated in more than 1,200 investments in more than 100 countries in cooperation with Danish trade and industry.

\(^{45}\) AfIF provides its support through: Investment grants, Technical assistance, Risk capital and other risk sharing instruments. The final beneficiaries of the Facility will be the partner countries, either directly or indirectly through their central, regional and local administrations or public or semi-public institutions. Other final beneficiaries can be the private sector and in particular households and SMEs for categories of operations dedicated to the private sector development.
The study analysis focuses on four selected instruments: Dutch Innovation Credit (IK) and Early Phase Financing instrument (VFF), Spanish Partially Reimbursable Loan (PRL), and Austrian non-repayable grants mixed with loans or guarantees (GL).

- **Innovation Credit**, operational since 2008, is a financial instrument for innovation that is a combination of a grant and a loan, managed by the Netherlands Enterprise Agency (RVO). In a nutshell, IK consists of a grant that has to be repaid by the beneficiary under certain conditions. More specifically, when a company is assigned the grant, two phases are distinguished: the high-risk development phase, in which the product is conceived, and the commercialisation phase, in which the product is launched on the market. If the development fails, then innovation credit acts as a grant and the repayment of the loan is waived. On the other hand, if the company is successful, then the loan has to be repaid. In this respect, IK can be considered also a soft loan, as the interest rate is 4-7% for technological projects, and 7-10% for clinical projects. RVO provides up to 75% as financing, out of which 25-45% is a grant depending on the size of the company. In fact, the size of the grant is 25% for large companies, 35% for mid-size, and 45% for SMEs.

- If the company is granted funding, it has to provide a plan with milestones. The development phase takes 4-5 years in average, thereby the period is divided into milestones and the grant is paid in portions.

- **Early Phase Financing (VFF)**, operational since mid-2014, also managed by RVO. The scheme consists of a minimum loan of EUR 50,000 and a maximum of EUR 350,000 with a fixed interest rate of 5% plus Euribor46. 20% of the loan has to be given back three years after the start of the project, and the rest of the loan has to be repaid within 5-year period. Therefore, the total scheme lasts 8 years. If the project is not successful, the loan can be converted to a grant. That is why the scheme is defined as a loan convertible to grant. Conversely to IK, there are no milestones for obtaining financing. In fact, in VFF 1/3 of the loan is provided at the beginning of the project, and after that the company can apply for the other 2/3.

- A third case study is the Partially Reimbursable Loan (PRL) managed by the Spanish Centre for the Development of Industrial Technology (CDTI). The scheme, which has existed with different characteristics since the late seventies, has been conceived following extensive discussions with the World Bank, especially regarding the choice of loans instead of grants, the latter being the preferred way of funding research at that time. The financial support consists of a partially reimbursable loan that can cover up to 85% of the project, out of which up to 30% does not have to be reimbursed. If the company is not able to repay the loan during the course of the

---


<table>
<thead>
<tr>
<th>Repayment</th>
<th>Starts 3 years after the project ends.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to pay back up to 10 years</td>
<td>20% of the loan has to be given back three years after the start of the project and has to be fully repaid during a 5 year period</td>
</tr>
<tr>
<td></td>
<td>Repayment starts three years after the end of the project, is due within 5 years from the end of the project.</td>
</tr>
<tr>
<td></td>
<td>The payment of the loan starts 2 years after the end of the project.</td>
</tr>
<tr>
<td></td>
<td>The company pays back the loan over 8 years.</td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration on the basis of case studies*
project, the CDTI asks for additional collateral. Each case is tackled individually in an attempt to reach a deal, recovering from 50 to 100% of the debt. Special projects of particular interest are granted an exemption from the guarantees and are requested to pay only 25% of the loan back, provided they score 7/10 on the technological evaluation exercise. The interest rate is fixed according to the Euribor, which is currently 0%. The interest rate is linked to Euribor at the moment the contract is signed and it remains fixed for the entire duration of the project.

- A final case can be seen in the funding schemes of the Austrian Research Promotion Agency (FFG), dubbed as GL, which provides non-repayable grants mixed with soft loans or with guarantees for bank loans. More specifically the grant is combined with a soft loan with a fixed interest rate (0.75%), or a guarantee for bank loans plus a subsidy for the interest rate (currently 2%) provided that the company is credit worthy and the loan exceeds EUR 500,000. In some cases, the board of the FFG can also decide to convert the loan into grant, in full - in case of technical failure, partially - if commercialisation of the project’s results were only partly possible, or if the project’s results were technically outdated. On the other hand, if the project has been successful and the attempts to commercialise the results were insufficient, the loan cannot be converted into grant. This scheme is very similar to IK, the main difference being that in the latter, guarantees are not involved.

**All of the schemes provide at least a portion of funding in advance or during the project implementation.** In the case of PRL, 25% of funding is provided in advance and the other payments are issued after the costs of research are incurred and demonstrated. Moreover, none of the schemes considered are sector focused: only IK has a separate budget for technical development and clinical projects.

Similarly, half of the schemes examined are stage focussed. In fact, in case of VFF the main beneficiaries of the scheme are innovative start-ups with an idea that is early stage, and that have to carry out a particular proof of concept to convince future investors. Considering PRL, the scheme focuses on early stage research and ends at the first prototype of the project. On the other hand, the interviewees responsible for IK and GL reported that there is no focus on a particular innovation stage of the project.

Considering the application process, in the case of IK, VFF and FFG, **it is necessary to provide a business plan and a financial plan.** On the other hand, in PRL it is enough to provide a description of the research activities to be carried out.

Very interestingly, in VFF, an important condition for receiving funding is a matching letter from a prospective investor who will finance the rest of the early stage process based on a set of validation requirements. The investment involved has to be at least the same amount that is received from the government. The investor has to be new (no capital invested in this company yet) and has to have the knowledge, network and experience to assess the business case and guide the company during the commercialisation process. Moreover, the investor should not have an interest as a customer, as a supplier or being in a personal relationship (family, partner) with the applicant. In theory, the presence of the investor commitment is important, as it is a signal of the viability of a project. However, in practice, such commitments are not made as investors often go back on their promises and cannot be forced to invest.

Furthermore, the **monitoring of beneficiaries is an important activity** for all the schemes involved: there is always a team involved in regularly checking the progress of the project, in providing advice to the beneficiaries, and sometimes in visiting the project site (as in the IK case). Apart from VFF, the other schemes articulate the project and the related funding in milestones and monitor the projects at different stages during the project life cycle.

It is very interesting to notice that in all of the analysed cases the **schemes are managed internally**, that is by national innovation agencies. With respect to loan element, blending schemes require additional resources and competences for monitoring the execution of the project and for assessing if the project has been successful, and thereby if the money received has to be repaid. The close monitoring of the project also increases somehow the administrative burden for the beneficiaries of the project, as they
have to provide a lot of data and report on their activity at different stages.

Regarding the conditions of participation, the applicant must at least provide a description of the research project (for PRL) and, most of the times, a financial and business plan (IK, VFF and FFG) depicting the status of the company and its future commercialisation plans. An internal team of advisors, which has to determine if a research proposal is innovative and feasible, assess the application. In the case of IK also, an external team of advisors hired for this purpose provides an opinion on the admissibility of the research proposal. In the case of VFF, it is also required to provide a matching letter from a prospective investor, who is willing to finance the rest of the early stage research process based on a set of validation requirements.

The lifecycle of blending instruments is shown in Table 5.

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>APPROVAL</th>
<th>MONITORING</th>
<th>EVALUATION AND REPAYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• First step is an eligibility test, then project and business plan and financial stability are assessed.</td>
<td>• After it is approved, part of the payment is received and the execution of the project can begin.</td>
<td>• The project is divided into milestones and funding is provided when milestones are reached.</td>
<td>• After the end of the project the repayment starts in the case of success.</td>
</tr>
<tr>
<td>• Assessment takes up to 12 weeks and is carried out by a team of advisors, experts in the field.</td>
<td>• A team of advisors is assigned to follow the company for the duration of the project and to provide also advice on the execution of the project idea.</td>
<td>• In the case of PRL, 25% of funding is provided in advance and the other payments are issued after the costs of research are incurred.</td>
<td>• In the case of failure the funding is considered as a grant or the loan is converted into a grant.</td>
</tr>
<tr>
<td>• In PRL only the project idea is checked and not the financial situation of the company.</td>
<td></td>
<td>• The only exception is VFF, in which 1/3 of the funding is provided at the beginning.</td>
<td>• The company can also opt to delay the payment or to pay in several installments.</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration on the basis of the analysed case studies

2.3.2. Governance structure

As stated above, in all cases the instruments are managed internally by the innovation agency, and never by an intermediary. Moreover, in the case of all the instruments considered, there is clearly a significant involvement of resources on the side of the managing institutions:

- Taking into account the IK case, there is no dedicated management board for the scheme. However, there is a dedicated team at RVO managing the instrument that is half made up by professionals with a technical background, and the other half by professionals with financial background and experience in innovation and technology. Due to limited in-house resources, a team of about twenty external advisors is also involved in the evaluation of the applications. The decision period can last up to 8 weeks.

- Regarding VFF, there is a team of advisors, both with technical and financial backgrounds. The VFF advisory committee is involved in assessing applications for SME entrepreneurs and innovative enterprises. Applications are reviewed in the order of submission. Just as in the case of IK, the decision period can last up to 13 weeks.

- Considering the PRL case, there is no dedicated team managing the scheme. Instead different departments from the institution are involved in the different stages of the project. For instance, the promotion directorate intervenes during the advisory stage (before the application), while financial and technical directorates are involved in the...
the evaluation process. Likewise, once the project is approved, the secretary general intervenes to sign the contract. Then the directorate of monitoring (around 50 employees) enters into action to monitor the project.

- In the case of FFG, there is a team that assess applications, and an internal team managing the repayment of the loan. Internal experts receive information from companies, as well as monitor project implementation through maintaining a regular direct and regular contact with companies, especially close to the repayment date. Occasionally, in those cases where the team receives a request to postpone the repayment of the loan, the team goes to visit the company and gathers more information.

2.3.3. Benefits

The main benefits of blending for a public entity include: 1) a greater flexibility of the instrument, 2) a higher sustainability of the instrument (due to the revolving effect), 3) a lower moral hazard, as researchers are more engaged in the success of the project, 4) leveraging of other public and private funding opportunities, 5) and the possibility to closely monitor the beneficiaries of the funding with respect to regular grants, allowing you to assess the status of the project completion and its chances of success.

Blending instruments allow for an increase in flexibility of the instrument, as the amount of money supplied can be tailored to the real needs of the project and, as a result, the implementation of the project can be accelerated. The transfer of knowledge is also increased, especially when blending the instrument includes a form of technical assistance.

Blending could also mitigate moral hazard: the authority providing grants cannot perfectly monitor the activities of the inventor after the grant has been approved. As a result, the inventor could be tempted to carry out riskier projects or to avoid putting the required effort in the research activity. In this case, the fact that a part of the money provided has to be repaid mitigates the moral hazard and the opportunistic behaviour for the receiver. Thereby, when compared to traditional grants, blending instruments maximise the impact of the innovation funding programmes.

The higher sustainability of the instrument is a result of a revolving effect of repayments. By combining grants with loans, public entity increases an overall amount of funding available, and therefore can support more companies. With the exception of VFF the level of repayments was over 60%, reaching 97% in some cases:

- IK received every year about 400 quick scan applications, 100 formal applications, out of which, 35-40 are approved. Although half of the projects are shut down before the end, the return on investment is 60% including the interest rate.
- The impact assessment of VFF estimates that 20-40% of the companies will repay the bill.
- Regarding the results of PRL, the % of paid back loans is 93%, including the interest rate. Considering its take up, the scheme in 2016 has funded 1,366 firms for a total of 961 projects;
- Finally, about 1,400 projects were funded last year by FFG while the level of paid back loans reached 97%;

Concerning leveraging other public and private funding opportunities, the assignment of the funding is a clear signal for the viability of the project for investors. In addition, blending reduces the risk involved in funding innovation for investors, as an instrument covers part of the risk. In fact, some companies apply to schemes first, and if they are approved they go to other investors bringing the approval as a proof of viability of the project. The only scheme for which the leverage effect has been revealed by the interviewee is innovation credit: in 2016 the grant amount approved reached 54 m EUR, with a total value of project funding reaching 136 m EUR. Therefore, it is safe to say that the multiplier effect is around 2.5.

As far as impact evaluation is concerned, the only instrument for which there is a formal impact evaluation is IK. In fact, an external impact evaluation has been commissioned by
the Ministry of Economic Affairs to Aarts de Jong Wilms & Goudriaan Public Economics (APE) (De Jong P., Gielen M., and van Praag M., 2013). The evaluation revealed that companies receiving the IK differ from unsuccessful companies as they spend more on R&D, apply more to patents, and are more often funded with venture capital. Moreover, considering the net effect of the scheme, the assignment of an IK results in a 68% increase in R&D wages: in monetary units this means that 1 EUR of IK payment yields 1.22 EUR of additional R&D wages, and 1.82 EUR in extra R&D spending.

2.3.4. Bottlenecks

Across the analysed cases, the most important bottlenecks include the following:

- It is difficult to find qualified advisors. The teams managing blending schemes are composed of high level professionals with technical and financial backgrounds, but it is difficult to find qualified advisors.
- It is sometimes difficult to define what is the early stage of a project: there are no clear boundaries. Applicants sometimes apply even though they are not sure if they really are in an early stage;
- There is a lot administrative and monitoring work involved in all of the schemes:
  - FFG employs a team of 40 people, 15 experts in technology and 10-12 experts on the market side. All the experts are responsible for monitoring the project together with the financial experts at the agency;
  - VFF sustains high running costs (EUR 740,000 for 2017) because there are 80 applications a year. If the tool were a fund of funds, the applications would have likely been 4 or 5 per year;
  - Regarding IK, the costs of managing the instrument are very high (3.6 m EUR for 2017), as a large number of advisors have to monitor the on-going projects and manage the project portfolio, while other advisors have to evaluate the proposals;
  - A high cost of monitoring is also reported by PRL, as there is the need to assess and monitor companies in financial terms, establishing guarantees or financial conditions.
- Soft loans are not as attractive as they used to be in the past, as interest rates in Europe are very low.

2.3.5. Key lessons learnt

The cross-analysis of cases provides the following lessons learnt:

- Concerning scalability and transferability, there is no particular reason why the schemes should not be adopted by other countries and/or at European level (source: all the schemes considered);
- Blending schemes do not really crowd out other possible financing sources: in fact, commercial banks can use the assignment of a blending scheme as a signal for the viability of a project. Furthermore, their resources are complementary to the ones already provided to the applicant firm (source: all schemes considered);
- For the institution managing the scheme, it is very important to keep the instrument flexible and to adapt to all the deviations from the project plan that the company goes through (IK - Kruiderink, 2017);
- During the development phase, it is very important to closely monitor the projects in order to distinguish the successful from the unsuccessful ones, stopping the unsuccessful projects halfway in order to contain losses (IK - Kruiderink, 2017);
- Monitoring is very challenging also due to the fact that the team working on the scheme has limited resources and is quite small. The bank sector has a more sophisticated scheme, however the focus on the monitoring system should be increased (GL - Dlesk, 2017);
- Companies are more keen to receive grants rather than loans (Ubierna, 2017);
A fund of funds structure could be better than a blending scheme because the person managing the fund would also help the company in becoming a successful start-up. Therefore, it would be important to not only provide funding but also some consultancy and advice (IK - Kruiderink, 2017);

One of the key success factors is that there are no sectorial limitations. All of the relevant actors know the institutions providing the scheme so they can refer to them when they cannot fund start-ups for whatever reason (IK - Kruiderink, 2017);

The letter from the investor is not a strong enough commitment, as investors often go back on their words very quickly. Therefore, the chances of an investor coming into the project are slim (IK- Kruiderink, 2017);

There is a funding gap in the market for scale-ups. A lot of companies are able to finish the development phase and they need additional funding to go beyond the first year of commercialisation (IK - Kruiderink, 2017);

Not having milestones for finance is a problem because after much of the payment has been issued, there is nothing that can be done if the project stops (IK - Kruiderink, 2017 and VFF - Ubierna, 2017);

When the funding is too high and/or the funding conditions are too beneficial, the risk is basically transferred from the innovator to the funding agency (GL - Dlesk, 2017).

### 2.4. Royalty-based financing

The concept of royalty-based financing is correlated with various terms of which definitions are not always clear and transparent. The term is often used in exchange with the term ‘revenue-based financing’ and ‘performance-based financing’, or classified together with the latter under the umbrella of ‘quasi-equity’. Regardless of the term, for the purpose of the study, the concept of royalty-based financing refers to the financial instruments that are correlated with the future cash-flow of the company.

#### 2.4.1. Definition

For the purpose of the study, *royalty-based financing is defined as an investment vehicle where money is lent from an investor to an investee against its future revenue streams*. A growing business receiving the royalty-based growth capital is committed to paying back a percentage of the future revenues (not profits, so royalties are added to the expenses of running a business), usually monthly, until the royal cap is repaid.

According to some sources, royalty-based financing is classified as a form of quasi-equity financing (Epstein D., 2013 and Isaacs A., 2016) where the investments are usually based on the company’s future cash flow growth. Quasi-equity, including royalty-based financing, differs from a loan in the sense that it is dependent on how the company performs in the years after the investment. This implies that the availability of data is extremely important in order to minimise the risk that is possible when investing in a company. The lenders need to use projected cash flow statistics of the company they are investing in, because they base the structure of the quasi-equity investment upon what the future cash flow stream is going to be. As the risk associated to this kind of investment lays in between the senior debt, characterised by a lower level of risk, and common equity, with a higher level of risk, hence, the use of the term: quasi-equity (Fi-compass, 2015).\(^4\)

Another term that can be related to quasi-equity, and thus to royalty financing, is ‘venture debt’, understood by (Durufle et al., 2017 after Hochberg et al., 2014) as a loan for companies that also raise funds from venture capital investors. These companies have a ‘(...) negative cash flow and few collateral assets’, therefore lenders rely partially on a due diligence performed by VCs. In this case, banks or VC funds require ‘additional upside in the form of equity or warrants’. The loan is expected to be paid back when 1) company

---

\(^4\) See ANNEX 5 for an example of quasi-equity instrument for innovation: InnovFin MidCap Growth Facility
starts generating positive cash flow, 2) on the exit – when company is sold, or when 3) company raises new equity.

In royalty-based financing, the initial capital plus an additional interest has to be repaid by the company until the pre-established amount is paid back (so called royalty cap), with repayments only starting when a company generates positive cash flow. Investors obtain returns as soon as the investees reach an agreed level of revenue. A ceiling (cap) placed on the possible return implies that if a company does exceptionally well in the future years there will be a payment cap that does not allow the investor to receive anything beyond the established amount, regardless of how well the business preforms48.

Royalty-based funding has been often, and mostly, applied in the private sector, in particular in the pharmaceutical, oil and gas industries. Some of the examples include: Royalty Pharma in US49, LifeCycle Pharma50 in Denmark and Aeterna Zentaris51 in Canada and Germany, for the pharmaceutical sector, or the American BP Prudhoe Bay Royalty Trust52 for the oil industry. For instance, Royalty Pharma, operating in the biopharmaceutical industry since 1996, has created a ‘rapidly growing company through the acquisition of revenue producing intellectual property – principally, royalty interests in marketed and late stage development biopharmaceutical products’ (Royalty Pharma, website). The business model of Royalty Pharma does not rely on discovering, developing or marketing products. Instead, the company solely provides liquidity to royalty owners (research institutions, inventors and biotechnology & pharmaceutical companies) and ‘assumes the future risks and rewards of ownership’53.

For research institutions, royalty-based financing represents a common financial mechanism that enables them to acquire funding necessary to develop and commercialise a new, disruptive technology. Universities usually licence intellectual property to a large, established company that develops the technology into a marketable product. The typical scheme implies that the firm makes an up-front payment for the license and commits to making further royalty payments as a percentage of product sales (revenue).

In recent years, however, universities pursue ‘riskier paths for technology transfer through the formation of start-ups or licenses with young, unproven firms’ (McDougall and Powers, 2005).

Regarding an example of royalty-based financing for innovation from the public sector, the Business Development Bank of Canada (BDC) exploits, amongst other financial instruments, royalty-based financing in order to support businesses and boost the success of entrepreneurs. BDC finances, under certain conditions, SMEs that are able to demonstrate a competitive advantage with innovative ideas while having a positive cash flow. They have to have a strong management team, profitable business model and excellent financial control. The repayment is based on cash flow rather than depreciating company assets and is tied to the revenue stream as a percentage of sales revenues (Nicol, 2014).

2.4.2. Benefits and challenges

The royalty-based financing represents benefits, both, for the investing entity and for the beneficiary. In its concept, it is considered as a wiser way of supporting innovative projects, as it focuses on their success and does not hamper their development in the initial phase.

Regarding companies, the royalty-based financing system is particularly appealing for start-ups in the technology and service sectors that are likely to achieve high profit

49 http://www.royaltypharma.com
50 http://www.veloxis.com
51 http://www.aezsinc.com
52 http://www.reuters.com/finance/stocks/companyProfile?symbol=BPT
53 https://www.royaltypharma.com/
margins in the future, but need a high level of investment at the beginning of the project (Yejee Lee, 2014). In particular, this instrument presents the following benefits for companies (Revenue Capital Association, 2014):

- No ownership dilution;
- No personal liability;
- Variable, flexible payments;
- Limited payback amounts (capped);
- No conflict over valuation of the company.

Concerning investors, since an investor lends the company a certain amount of funds instead of purchasing an equity interest in a company, there is no need for the investor and the company to agree on the company’s value at the time of the investment. In theory, this reduces the burden related to the decision-making process (though investor needs to analyse company’s situation in detail and keep an eye on cash-flow projections) (Yejee Lee, 2014).

At the same time, the incentives for both parties are focused on increasing revenues. Investors can obtain returns as soon as the investees reach an agreed level (according to certain thresholds) of revenue, while the company does not have to pay the excessive costs of repayment in the development phase of the project. The risk of default is mitigated by the flexibility of the payments that are not fixed on a strict schedule (Yejee Lee, 2014).

On the other hand, royalty financing presents some challenges. As the example of InnovFin MidCap Growth Facility, a quasi-equity instrument that includes a royalty-based element, shows that an administration of quasi-equity loans requires from a public entity substantial financial and human resources (see ANNEX 5 for details).

Furthermore, an investor (or a lender) benefits when a company is doing well, but also bears certain risks when a company doesn´t generate positive cash flow. The risk is only partially mitigated by warrants and guarantees. However, the paybacks are usually slow since they are not provided until a certain revenue threshold is reached. Moreover, since a market for royalty-based financing does not exist, once the investment is made, investors have very limited options for liquidity (Yejee Lee, 2014).

Finally, regarding beneficiaries, they can suffer from the fact that royalty-based investors / lenders are usually not committed to future company growth and they do not provide follow-on funds to investees. High reporting requirements during the repayment of the loan can also add to the administrative burden of the companies (Yejee Lee, 2014).

2.4.3. Key lessons learnt

Royalty-based financing is an instrument that is especially suitable for innovative SMEs and Midcaps rather than start-ups, from the perspective of the public institution. As financing institutions participate both in the upside and downside of the company, the assessment of the future performance of the company becomes particularly important, augmenting the focus on the eligibility criteria, and on the evaluation and monitoring process. Furthermore, an interviewee (Stoykov, 2017a) stressed following key lessons learnt:

- The instrument cannot be overly complicated, it should be quick and commercially minded;
- The instrument should be run in close collaboration with the market to gain advice and knowledge – financed companies should be required to bring private investors;
- Financed companies should demonstrate a well-established corporate governance structure and reporting standards;
This sort of instrument requires close monitoring and evaluation of projects with a substantial team in place, however, the focus on monitoring increases the administrative burden for the companies – both aspects should be leveraged.

2.5. Revolving nature of funds

Financial instruments, whether equity, or debt-based, or mix of both, can be revolving in nature, meaning the revenues come back to the instrument. The possibility of using the same funds several times through various revolving cycles contributes to the impact and sustainability of the instruments.

2.5.1. Definition

A Revolving fund is a feature of the financial instrument that allows the funding of a continuous cycle of operations exploiting the revenues generated. ‘Once adequately capitalised, the revolving fund requires no additional money and comprises a ready and continuous source of funds’ (Carrasco et. al., 1983). The instrument does not imply that all the capital is recovered from project. However, once the capital is recovered, even if partially so, it is reinvested for new operations.

For the purpose of the study, the OECD definition will be applied. According to OECD a revolving fund is ‘(...) a fund in which the income delivered from its operations is available to finance the fund’s continuing operations without fiscal year limitations’ (OECD, 2016).

Funds that are revolving in nature are thought to be particularly suitable for long-term payback projects often associated with the innovative framework. Innovative projects in their early stages may require a considerable amount of time to be implemented and as a result, they need more time to start repayments. Revolving funds are able to support projects characterised by long-term repayments and higher risks, as they receive an inflow of repayments from a differentiated portfolio of projects (van Vliet, 2013).

Due to this, they have been widely applied lately in the area of environmental projects, which typically show a high degree of risk and returns in the long term (for instance, the American Clean Water State Revolving Fund54, the Revolving Funds for City energy Efficiency Projects in San Antonio (Gates, 2015), the Green Revolving Fund by Harvard55 or the Thai Energy Efficiency Revolving Fund in Thailand56). In Europe, the Joint European Support for Sustainable Investment in City Areas (JESSICA)57 is a prominent example of the revolving funding model to finance projects. The JESSICA initiative has the objective of ensuring sustainable urban development and regeneration through the use of financial instruments – revolving Urban Development Funds (UDFs) investing in public-private partnerships and other projects for sustainable urban development (Mazars, 2013). The Urban Development Fund supports projects using a range of financial instruments (equity, loans, guarantees). The returns from investments are fed back into UDFs and further reinvested.

The Revolving nature of funds can be applied to loans, equity, guarantees or hybrid funds (as in the case of Urban Development Funds). In other words, instruments other than grants can be revolving in nature, and as a result, more sustainable than grant.

For instance, the JEREMIE initiative (Joint European Resources for Micro to Medium Enterprises) offers EU Member States, the opportunity to use part of their EU Structural Funds to finance SMEs by means of equity, loans or guarantees, through a revolving Holding Fund acting as an umbrella fund that receives repayments from the financial intermediaries for further investments in the SME sector. Hence, in this case, the final

---

54 https://www.epa.gov/cwsrf
55 https://green.harvard.edu/programmes/green-revolving-fund
56 http://iepd.iipnetwork.org/policy/energy-efficiency-revolving-fund-eerf
57 JESSICA is a technical assistance initiative of the European Commission developed jointly with the European Investment bank and in collaboration with the Council of Europe Development Bank.
beneficiaries (SMEs) are not targeted directly. Instead, JEREMIE targets financial intermediaries that provide SMEs with loans and equity participation. According to EIF, this makes SME support via EU Structural Funds more sustainable as compared to using the pure grant approach (EIF, 2012).

Perhaps the most prominent example in Europe of the revolving nature of instruments for innovation is a blended instrument: Innovation Credit (NL), as presented in the box below. The instrument is partially revolving with, on average, a revolving effect of around 60% - hence, the instrument is not self-sustaining. The partially revolving feature of the instrument is the result of the friction between the innovative nature of the targeted projects and the sustainability of the instrument. The Innovation Credit finances projects with a high level of risk, though some projects fail to repay the money (see full Case study 4).

**Partially Revolving Fund for Innovation – Dutch Innovation Credit**

- Managing institution: RVO – Netherlands Enterprise Agency
- Geographical scope: Netherlands
- Main beneficiaries: Innovative SMEs
- Size of the fund: in EUR 60 m for clinical and 40 m EUR for technical projects
- Amount of funding: up to EUR 5 m per project (up to 75% in loans and in grants up to 25% for large companies, 35% for mid-size, and 45% for SMEs)
- Structure:
  - At the end of the development phase the final amount of credit is determined and ratified by an audit report, and a repayment schedule is established
  - Notice that if a project technically fails, the firm does not need to repay the innovation loan
  - Revolving level: 60%
- Governance of the revolving funds: The funds do not go back to the agency but to the Ministry of Economic Affairs that contributes additional money to the fund each year.
- Evaluation of the scheme: Evaluation by the government every 5 year. As result of the evaluation, the government can decide to stop the scheme.
- Key lessons learnt (Kruiderink B., 2017 and Jong et al., 2013):
  - It is impossible to have a 100% revolving effect of funds.
  - The focus on the revolving effect influences the choice of projects funded – there is a temptation to finance projects that guarantee the repayment of a loan, thus highly risky projects or projects that require a very long time to start repayment are not funded.
  - Extensive effort and resources are needed to evaluate and monitor projects on a regular basis to safeguard the repayment of a loan.

The governance of the revolving funds can also vary, mainly depending on a type of financing applied. For instance, the fund may be overseen by a management committee, a dedicated manager, or by staff from a relevant office, such as the finance, facility or sustainability office. In the case of the previously mentioned Green Revolving Funds, the most common leadership model is the management committee. Stakeholder groups who are involved with, or affected by the fund, should normally be represented on this committee to maintain buy-in and contribute to their expertise (Indvik et al, 2013). In the case of Innovation Credit’s revolving fund, the Dutch Netherlands Enterprise Agency manages the instrument while the Ministry of Economic Affairs decides on the revolving effect of the scheme and the amount of funding.

Finally, the factors affecting the operation of revolving funds include: ‘(...) the interest rates (for lending and/or borrowing), levels of premiums; administrative expenses;'

---

payments/repayments and failure to make them; inflation and the liabilities’ (UN-Habitat, 2006), as well as the reimbursement level of funds.\textsuperscript{50}

2.5.2. Benefits and bottlenecks

Revolving funds play an important role in supporting high risk innovative projects with long-term payback perspectives that normally face barriers to access finance otherwise. Revolving funds, similarly to other financial instruments, are considered particularly advantageous because of the multiplier effect\textsuperscript{60} they generate (EC SWD, 2012). Even if, as it is often the case, the fund is not 100% revolving, it finances innovative projects that sometimes turn out to be successful and, therefore, it recovers some part of the capital to be re-invested. The impact/multiplier effect, in the case of revolving funds, is strengthened by the accumulation of interests generated and dividends paid (EC SWD, 2012).

The revolving character of the instrument, i.e. repayment and re-use of funds, increases efficiency and sustainability of public funds in the long term (Widuto, 2016). The requirement to repay can stimulate better performance and quality of investment projects. This represents a gain in efficiency with respect to grants, as the allocation of grants is typically threatened by moral hazard (Murshed, 1994). By not expecting any returns, the issuer of grant is applying less effort in incentivising the recipients and in overseeing the projects in order to discourage moral hazard. The fact that the revolving funds need to be repaid promotes better quality, better planning and a greater financial discipline of projects (EC SWD, 2012).

In general, as suggested by (Bertoldi and Rezessy, 2010), revolving funds are also less dependent on external investors and, if operated effectively, they can contribute to a permanent financing structure, which is separate from political influence. Indeed, the more capital is recovered from each investment round, the more resources for further investments are available. This decreases, or even cancels, the need for external financing of the fund. Instead of being refuelled with public money, the revolving fund can become a self-sustained instrument. When this is the case (even if it does not happen frequently), the political influence is clearly weakened until the point of complete independence of the fund from political power.

The typical disadvantage of a revolving fund is that they require substantial upfront investment and might be expensive to administer, as the experience from the energy efficiency area shows (Bertoldi and Rezessy, 2010). According to (Kruijerink B., 2017) they require trained personnel to be effective and they need significant human resources to control and administer the repayment and disbursement of funds.

In addition, in order to obtain a valuable revolving effect, sufficient financial instrument resources need to reach the final recipients in due time. This means that both the management of the fund and the cycle of repayments should allow the fund to be able to provide projects with the adequate financial support in due time for their development. (European Court of Auditors, 2015).

2.5.3. Key lessons learnt

The analysis of the literature and cases provides the following key lessons concerning the revolving nature of instruments:

- A revolving nature of fund is a feature of an instrument that requires appropriate trained resources and organisational structure. However, and more importantly, it requires an appropriate monitoring system to be set up front in order for it to be effective.

\textsuperscript{50} See section 3.4 for details.

\textsuperscript{60} The multiplier effect is, for any given project or project portfolio, the ratio between public and private funding raised (numerator) versus the funding paid - money injected into the fund - (denominator) (EC SWD, 2012).
While supporting riskier innovations, it is unrealistic to expect a revolving fund to be fully sustainable without the additional financial injection needed. It is safe to assume that any innovation supporting financial instrument will be only partially revolving.

Moreover, too strong of a focus on the revolving effect of the fund adversely influences the choice of projects funded, resulting in the trading off of support for the more-risky disruptive innovations for the support of more commercially appealing projects that guarantee higher repayment rates.

In order to keep the revolving fund self-sufficient and sustainable, appropriate measures need to address these factors (UN-Habitat, 2006). The experience from European guarantee and loan funds, applied in the rural development area in the period 2000-2013, shows that there was no leverage and revolving effect in the case of many regional funds mainly due to: 1) the delays in the implementation of the revolving fund, 2) the lack of adequate provision to encourage the achievement of the expected benefits in the legal framework and 3) the lack of appropriate monitoring systems to track whether the instruments had achieved their objectives effectively (ECA, 2015).

2.6. Claw-back provisions

The claw back provisions, or similar contractual obligations, are commonly applied in the European programmes, including Horizon 2020, with the aim of safeguarding the proper allocation of granted financial resources. For instance, the European Regional Development Fund (ERDF), which allocates resources amongst European regions in order to enhance innovation and research, applies claw-back provisions (CPI, 2012). Nevertheless, the strictness of the clauses represents an interesting point for further analysis.

2.6.1. Definition

Under the claw-back provision, the fund can take back the money already given out under specific circumstances that are established as a clause in the contract. The claw-back provisions offer the advantage of permitting the recovery of a part of the funds if certain requirements are not met. This represents a control mechanism for public bodies over the use of dedicated funds and encourages beneficiaries to use the funds in a more stringent manner.

With respect to innovation, the provision can be also designed to ensure that the efforts of the beneficiaries remain focused on the agreed objectives and that the support contributes to a specific beneficiary or geographical location. For instance, the Callaghan Innovation Fund (AU) uses a claw-back provision to ensure that the R&D grant contributes to the innovative company within the borders of the country (Garry, 2013).

Certain clauses can include an additional penalty. In such cases, if the company fails to respect the conditions, the entire amount of a financial aid has to be returned plus an additional payment settled in the conditions. Let’s use the example of the two state subsidy programmes: the claw-back provision applied in Colorado for the ‘Colorado FIRST and Existing Industry Customized Training grants’ and the one used by Connecticut. The first one requires the companies to reimburse the full amount of the subsidy if they fail to meet their job creation and wage commitments. In Connecticut, however, a stricter condition imposes geographical limitations. In particular, ‘(...) if a company receiving financial aid from the state’s department of economic development, development authority, or Connecticut Innovations, Inc. relocates outside the state within ten years or during the term of the aid, whichever is longer, the company must repay the full value of the subsidy plus a 5% penalty’.

In the area of innovation, the above mentioned Callaghan Innovation Fund (NZ) is an example of the institution applying a strict claw-back provision for R&D grant. Companies may be required to return some or all grant funding, during or following a grant agreement if: 1) they `(...` breach any grant agreement, misappropriate funding, provide incorrect information to Callaghan Innovation, or claim ineligible expenditure`; 2) they `enter into a contract or arrangement (including change of ownership) that materially reduces the current or future planned research and development activity in New Zealand`; or 3) `(...) the grant fund is unspent and for which contractual liabilities have not yet been incurred` (Garry, 2013). The second clause was applied in case of a Gameloft’s grant - the government of New Zealand is currently pursuing to claw back USD 3m (about EUR 270m) given to Gameloft as the company did not continue its R&D activities in the country after obtaining an innovation grant (RNZ, 2016).

In terms of governance, the public entity, or usually the governmental agency in charge of the financing scheme, establishes the claw back provisions. The agency is responsible for monitoring if the clauses are respected and it intervenes if they are not.

2.6.2. Benefits and bottlenecks

One of the main benefits of claw-back provisions is that they are a control mechanism for public entities - claw-back provisions ensure that financial resources are used efficiently (in a way that was claimed by beneficiaries), at the same time ensuring effectiveness of the instrument (by imposing certain policy objectives). These provisions represent a disincentive for moral hazard. Strict conditions imposed on beneficiaries make them keener not to deviate from the agreements once the financial support is provided.

When a claw-back provision is applied to a financial instrument, a trade-off exists that has to be taken into account. On the one hand, the more severe the clauses are, the easier it is to tackle the imperfect information existing in the market. On the other hand, the provisions can be seen as a threat from the point of view of the beneficiaries, if the conditions are very strict. This might result in a disincentive for the companies to apply for funding. For instance, in the case of the claw-back provisions applied to the grants issued by the ERDF, the risk of claw-back is seen to be increasing to the point where it is becoming too high of a risk for many organisations to apply for ERDF (CPI, 2012). In certain situations, the risk can be further augmented by the external context. In case of claw-back provisions in ERDF grants, the threat of retrospectively applied changes in rules, is pointed out as making it more difficult for the companies to ensure compliance and increasing the riskiness of acquiring funding (CPI, 2012).

2.6.3. Key lessons learnt

The main key lessons learnt drawn from the analysis regarding claw-back provisions include:

- Claw-back provisions should be, and are, a standard clause used in grant agreements, but should not be stringent to the level of discouraging the potential beneficiaries to apply.
- While they are an effective tool to deter the beneficiaries from misusing the resources, they can play an important role in making sure that the support for innovation contributes to the local ecosystem – ensuring that the company does not move its operations after receiving a grant.
3. INTEGRATED ANALYSIS

On the basis of the analysis of the database of instruments gathered during the course of the study, it is safe to draw a conclusion that co-investment is a relatively frequent financial instrument, while the use of blending instruments for innovation (mix of grants with other types of instruments) is still rare and takes mainly a form of loans convertible to grants in case of failure, soft loans or partially reimbursable loans (for instance: Innovation Credit (NL), FGG (AT) or BpiFrance Reimbursable Advancement). The use of royalty-based financing by public entities in order to support innovation is much more rare. Moreover, the instruments that have been analysed are relatively young - most of the co-investment instruments were funded after 2005, while most of the blending instruments were funded after 2008.

3.1. Overview of the key aspects of instruments

Based on the detailed analysis in the previous chapters, some key aspects of the financial instruments within the scope of the study were identified. The table below illustrates the features of financial instruments, such as the type of related form of financing (equity, loans, grant, guarantees or a mix of them all) and the revolving nature of instruments. The model also refers to the level of risk of projects financed vs. the level of return generated by the instruments as compared to loans, and the role that the public institution plays in selecting projects. Co-investment, blending and royalty-based financing are core types of financial instruments. The revolving nature of the instrument is treated here as one of the characteristics of the financial instruments. Claw-back provisions are treated as additional contractual obligations.

Table 6 Overview of new financial instruments

<table>
<thead>
<tr>
<th>Name</th>
<th>Features of financial instruments</th>
<th>Level of risk / Return</th>
<th>Role of public institution in selecting projects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equity</td>
<td>Loan</td>
<td>Grant</td>
</tr>
<tr>
<td>Co-investment</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blending</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Royalty-based financing</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Claw-back</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Source: Authors´ elaboration

The core type of financing is marked in bold X. For instance: the concept of co-investment is always connected to equity financing, a concept of blending has a grant at its core while mixing it with one of the other forms of financing (either loan, or equity, or guarantee). As far as royalty-based financing is concerned, while understood in a broader sense of quasi-equity instruments, it combines debt with some features of equity, though without ownership rights. Furthermore, any of the instruments can be revolving in nature by definition, if the revenues are re-invested.

Regarding co-investments, they are characterised by high levels of risk but also high levels of return in comparison to loans. The role of the public body in this case is low as the General Partner decides which projects to finance under the initial setup general conditions. Moreover, the very design of the instrument assumes a combination of public and private investments.
In the case of blending, projects are characterised by a medium level of risk and a low to medium level of return, depending on the mix of instruments. For instance, a combination of a grant with a loan will generate lower returns than a loan on its own, but a combination of a grant and equity can generate higher returns than a loan. The role of the governing body in selecting projects is usually high – practice shows that blending instruments within the context of the study are usually managed by the public innovation agencies. In addition, the grant element requires strong engagement with the public body. Blending involves mostly public sources of financing, with the exception of the situation when obtaining a co-investment from private investors is a prerequisite for financing.

The royalty-based financing is usually characterised by a higher level of risk than loans, as the royalties are fixed and are dependent on positive revenue streams. In turn, the expected return on investment is higher than in the case of loans. The role of the governing body is usually medium (when instruments are managed by the intermediary, such as a bank) or high (when they are managed by a governmental agency).

3.2. Benefits and bottlenecks of new financial instruments

The in-depth analysis in the previous section shows that the financial instruments bring diverse benefits but also challenges for the public institution (see ANNEX 6 for detailed summary of challenges and benefits of specific types of instruments). Regardless of the difference, the new innovative financial instruments demonstrate the following shared benefits:

- **Greater sustainability of instruments** - obtained by the use of revenue generating instruments and reinvestment of the revenues back into the instrument (in case of their revolving feature),
- **Greater effectiveness of public funding** - through attracting additional private funding, a more diverse use of instruments and the reuse of funds allowing an increased number of companies to be financed,
- **More efficient use of public resources** – due to a market-based approach to investing (co-investment), reduced moral hazard (blending), a more informed decision-making process and better monitoring of the proper use of resources,
- **Better quality and performance of projects** – obtained by limited market interference (co-investment), stricter pre-evaluation and monitoring of projects based on performance indicators, or by a requirement to repay money that stimulates better performance and the quality of investment projects.

Nevertheless, public and managing institutions are also faced with challenges while implementing the innovative financial instruments as they require:

- **Trained professionals** with a very specific set of skills,
- **An effective performance monitoring and evaluation system** for projects and instruments, and
- **Significant human and financial resources** to monitor project performance and their spending, as well as to administer the repayment of loans to funds.

The last two are especially true in the case of blending and royalty-based financing (see ANNEX 6 for details).

It is worth highlighting that one of the main features of new financial instruments in the area of public policy is that they should not be strictly revenue/profit oriented, or at least not to the same extent as private financial instruments as they leverage profit-driven vs. policy-driven investments. They should, therefore, leverage ‘reasonable returns’ while generating ‘an optimal impact on society’ (Mazars, 2013). That leads to accepting multiplier effects below usual levels (EC, 2012)\(^6\), and to an additional challenge of

---

\(^6\) See section Annex for further explanation of how a performance of new financial instruments is measured.
meeting conflicting objectives, in particular in the case of co-investment and the revolving feature of instruments. For instance, co-investment, being a very market-driven instrument, tends to focus on projects that maximise the return on investments for investors. Thus, managing institutions are quick to disregard policy objectives, which a public entity can only promote softly through additional incentives. As far as the revolving nature of the fund is concerned, a focus on a revolving effect may lead to a trade off between the riskiness of projects funded and their level of innovation.

### 3.3. Governance structure and resource management

An interesting difference between co-investments and blended instruments lies in the governance structure of these instruments. While in both cases the team with the right skill-set, such as specific market and sectorial knowledge to be able to assess and pick innovative projects, are a prerequisite for an instrument to be successful, the governance system that is adopted is different.

In the case of co-investments, public entities usually recognise that they do not have enough resources, skills or sufficient access to the local network to be able to manage the fund successfully. Therefore, in most of the cases, they put an emphasis on the selection of the right GP and give them the freedom to select projects in line with pre-set policy objectives. In reality, the possibilities to promote policy objectives with respect to co-investments are rather limited - incentives can take the form of additional performance fees for meeting the objectives, such as specific number of companies funded in specific number of countries. In that case, the public entity participates in the Advisory Committee, although they do not have a direct influence on the investment decisions. This, in turn, safeguards the commercially minded and market nature of the instrument, with equity professionals making the investment decisions. This also implies that the public entity does not need to deploy extensive internal resources to manage the fund.

Blending, on the contrary, is managed internally, by the public innovation agencies that take care of the selection process of the companies funded, as well as their monitoring and evaluation. This, in turn, implies the need to set up a substantial organisational structure and the need to attract skilled professionals – a resource that is scarce and, therefore, well remunerated. Thus, this is one of the major challenges for the institutions managing blending instruments. As a result, the importance of internal training schemes to build a sufficient pool of professionals is stressed.

### 3.4. Measuring the performance of new financial instruments

The new financial instruments require an effective monitoring and evaluation system set in place in advance in order to successfully meet objectives. The monitoring usually implies the use of Key Performance Indicators (KPIs) that measure an instrument’s progress towards achieving the policy goals set by public institutions. Though KPIs should be stated as an objective of the programme and should be tracked systematically, the results of the interviews suggest that the monitoring measures and evaluation procedures are rarely embedded in the initial design of the instruments. In reality, however, more often than not, KPIs are just defined ex-post in the context of reviews in order to demonstrate the success of programmes. This is especially the case with the co-investment instruments. For instance, the upcoming Lithuanian Co-investment scheme managed by INVEGA, did not envisage any evaluation procedures at all. Similarly, while setting up CEBF no evaluation framework was set in place (at the time of the interview).

Moreover, the systematic data collection appears to be difficult to encourage. According to Gray (2015) in co-investments `data collection is consistently reported to be difficult and more expensive than expected, due to the data not being seen to be a priority for the companies or the partner investors`.

The situation appears to be different for blending and royalty-based instruments on the basis of the limited sample of interviews performed. This might be mainly attributed to the fact that instruments that have a loan element in their design require constant monitoring.
of the performance of projects. On top of that, they are managed by the innovation agencies that are required to report their performance to the respective ministries. For instance, in the case of Innovation Credit, monitoring takes the form of periodic visits to the companies to assess the progress of projects and to anticipate any possible problems in advance. As a result, the repayment rates of loans are very high (around 95% for successful projects).

The table below presents the list of KPIs that are usually used to monitor instruments. KPIs are divided into two groups: 1) those that measure the **efficiency** of the instruments in terms of returns and value for money, and 2) those that measure the **effectiveness** of the instruments in the provision of funds and in the provision of policy objectives.

**Table 7 Summary of the criteria used to assess the performance of instruments**

<table>
<thead>
<tr>
<th>Key Indicator</th>
<th>Performance</th>
<th>Measure description</th>
<th>Co-investments</th>
<th>Blending</th>
<th>Royalty - based financing</th>
<th>Revolving funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on investment</td>
<td>Measuring efficiency</td>
<td>Multiples and Internal Rates of Return (IRRs) on privately invested capital</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest rate on a loan</td>
<td></td>
<td>% of interest rate compared to market rates</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Level of paid back loans / level of unpaid loans</td>
<td></td>
<td>% of paid back loans annual % of loans unpaid</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Time to pay back loan</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Cost of running the fund</td>
<td></td>
<td>% of management fee (yearly / over the period of fund)</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Total size of funds allocated</td>
<td></td>
<td>Amount of money funded</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Number of companies funded</td>
<td></td>
<td>Or deals granted</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Average size of funding</td>
<td></td>
<td>Granted to a company</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Leverage effect / Follow-on funds raised</td>
<td>Measuring effectiveness</td>
<td>Ratio of further funding attracted / Ratio public to private funding</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Revolving / multiplier effect</td>
<td></td>
<td>Ratio of re-invested payments of capital or interest vs. initial size of the fund</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Disbursement rate of funds</td>
<td></td>
<td>% of the distribution of the funds to final recipients</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Risk level of projects funded</td>
<td></td>
<td>Project risk score</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Successful exits (IPOs, M&amp;A)</td>
<td></td>
<td>By number &amp; transaction value</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Size of fund at the end of funding period</td>
<td></td>
<td>Value</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Number of jobs created</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

**Source: Authors’ elaboration**

Besides operational KPIs, such as return on investment or average size of funding, the instruments in the sphere of the public sector focus on the **leverage effect of funding** - a financial measurement of the ratio between the total amount of investments/funding...
attracted and the level of initial public investment (EC, 2015). In the case of co-investment, a leverage effect depends on the amount of funding co-invested by private investors (VC or BA). In case of the other instruments, a leverage effect would be measured by the amount of the attracted follow up investments.

The leverage effect should be distinguished from the **multiplier / revolving factor** which is used in case of the revolving nature of funds. A multiplier effect is defined as a % of reutilisation of the initial allocation of money used to set up an instrument (EC, 2015). ‘An additional multiplier effect is achieved during the lifetime of the innovative financial instrument, if repayments of capital or interest and proceeds of an investment can be reused for the instrument. Such a revolving character can considerably increase the reach of instruments’ (EC, 2011).

The evidence shows that those effects are not easy to estimate, nor track, nor easy achievable. The effects will vary greatly between instruments. Nevertheless, the financial instruments are thought to generate higher leverage effects than grants (EC SWD, 2012). For instance, the *Investment Plan for Europe* envisages 15 x leverage effect of the European Fund for Strategic Investments (EC, 2014) due to the leverage effect of guarantees. The EU blending facilities in development policy have a leverage effect ranging from 7 to 33, depending on the local needs and characteristics, and the type of projects undertaken (Deve, 2012). In cohesion policy, early evaluations revealed that each euro of soft loans leveraged EUR 4.5 of private investment (EC SWD, 2012).

Moreover, public instruments leverage profit vs. policy driven objectives. Therefore, long-term KPIs should include indicators that measure the impact of the instruments on the overall economy, such as the number of jobs created. Though, such an indicator is applied to some extent\(^3\) in co-investing (e.g.: Scottish Co-Investment Fund, the Northern Ireland Co-Investment Fun) as well as blending (e.g. Innovation Credit), it seems that more suitable, and easier to measure proxy for job creation would be the number of successful companies created.

---

\(^3\)For instance, the New Zealand Seed Co-investment Fund had no KPI’s on jobs at all and in the UK the Business Angel Co-investment Fund initially had specific KPI’s in relation to the number of jobs created, but they were dropped
4. FINAL CONSIDERATIONS AND RECOMMENDATIONS

An analysis of different types of financial instruments within the scope of the study reveals that although some instruments are more established than others and have different functions, there is evidence that such instruments achieve their key objectives under certain conditions that will be further discussed in this section. Table 8 contains the integrated summary of the key lessons learnt from how the different instruments work.

Essentially, VC co-investment funds are more suitable for later stages of financing, if they aim to boost ‘winners’ rather than increase the number of deals made, and in countries where the VC market is already established. However, co-investing with BA is more suitable for seed and early stage financing and also in underdeveloped markets. As far as meeting the policy objective of supporting riskier investments is concerned, it seems that co-investments with BA and blending instruments is more appropriate than co-investments with VCs, as the latter tend to concentrate on supporting high growth, promising companies. In particular, flexible blending instruments are well fitted to finance investments characterised by higher risk. Blending instruments not only increase the impact of grants and the number of companies financed, but they also attract additional funding from other sources.

Moreover, royalty-based financing is a particularly flexible instrument from the perspective of the financed beneficiaries, as it releases companies from the burden of repayments before reaching a certain level of revenues. It seems, however, that flexibility is occupied by the substantial monitoring effort on the side of public body (as in the case of blending and royalty-based financing).

As far as the current state-of-play regarding financial instruments at EU level is concerned, some instruments are already applied on European level, for instance: InnovFin Midcap Growth Facility, transposed into the European Growth Finance Facility, is based on an idea of quasi-equity / royalty-based financing.

Concerning co-investments, the European Investment Co-Investment Facility together with the German Federal Ministry of Economic Affairs and Energy (BMWi) and the European Recovery Programme in 201664 providing qualified fund managers with co-investment pockets in the range of between EUR 20m and EUR 60m. The GCIF concept was a result of market feedback received by EIF, i.e., that nobody wanted to co-invest and, therefore, there was a dependency on the big US players. In addition, EIF conducted a market survey amongst fund managers that invested under the ERP fund-of-funds65. The survey identified a larger ticket gap in the range EUR 20m to EUR 40m.66 Therefore, the GCIF with its unique model aims to address the market gap of robust EU growth investment infrastructure, as EIF’s traditional fund-of-funds model could only have a limited impact in this situation. The GCIF was also meant to support VC funds that either have insufficient resources or are constrained from further investing. By providing an additional pocket of money, the GCIF helps them 1) to avoid dilution, and 2) allows them to obtain or maintain a seat on a board (see Case study 5.3). The solution is currently applied in Germany but can be replicated in other countries, provided that there is a market gap, a sufficient existing deal flow in the country and that local conditions are taken into consideration. VC co-investment funds critically depend on competent VCs, thus, there is no possibility of a short-cut in the case that there is no established VC industry.

Moreover, there is a tendency of copying something that has worked in a certain environment and under specific circumstances, and then applying it to different conditions. However, just because an instrument worked in one country does not mean it will work in another.67

---

64 See http://www.eif.org/what_we_do/resources/ERP_EIF_Co-investment_Growth_Facility/index.htm
65 A EUR 3.2bn fund-of-funds investing in VC funds focusing mainly on German-based, high-tech companies in early development stage, managed by EIF on behalf of the German BMWi and ERP.
66 In the case of blending, some interviewees admitted that they see a lack of follow-on investments after the initial development phase for project is finished.
67 For instance, the Israeli Yozma scheme was mentioned by two interviewees as the template based on which their scheme was designed, but praxis shows that they applied critical thinking taking from Yozma what they found valuable and ignored
Table 8 Summary of key lessons learnt

<table>
<thead>
<tr>
<th>Co-investment</th>
<th>Blending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-investment funds partnering with BA are likely to have a positive impact in the seed and early stage phases as well as in underdeveloped markets for SME financing;</td>
<td>For the institution managing the scheme it is crucial to keep the instrument flexible and to adapt to all the deviations from the project plan the company goes through;</td>
</tr>
<tr>
<td>Co-investment with venture capitalists requires an already established VC market;</td>
<td>During the development phase it is very important to monitor closely the projects in order to distinguish the successful from the unsuccessful ones, stopping the unsuccessful projects as soon as possible in order to contain losses. However, monitoring requires a substantial team with sectorial knowledge;</td>
</tr>
<tr>
<td>In the seed and early stage financing area – pan-European approach is less important; for later stage investments an international orientation becomes highly important, favouring VC;</td>
<td>It is vital to provide not only funding but also some consultancy and advice for start-ups;</td>
</tr>
<tr>
<td>VC co-investment funds aiming to boost winners are more suitable for later stages, and are likely to continue to concentrate funding on existing ‘hot spots’ of innovation and VC funding in Europe68;</td>
<td>Blending instruments should not be sector-specific;</td>
</tr>
<tr>
<td>VC funds-of-funds are well placed to manage also a co-investment fund, as they can leverage the due diligence and the relationships with the VC funds they have invested in;</td>
<td>Well-established relations with the financial ecosystem are crucial, as finance institutions can redirect companies to the scheme;</td>
</tr>
<tr>
<td>Co-investment with a low level of delegation of the decision-making process to VC funds implies that the public co-investment fund needs a higher number of skilled professionals with direct investment experience to source and review the deals, resulting in higher management costs and a lower potential for scalability of the instrument.</td>
<td>Blending schemes do not crowd out other financing sources – other institutions consider obtaining blending financing as a signal for the viability of a project and treat it as complementary source of financing;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Royalty-based financing</th>
<th>Revolving nature of funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing institution participates both in the upside and downside, thus, the focus should be on the eligibility criteria, evaluation and monitoring;</td>
<td>It requires appropriate trained resources and an organisational structure;</td>
</tr>
<tr>
<td>The instrument cannot be overly complicated, it should be quick and market-based;</td>
<td>It requires the appropriate monitoring system established upfront in order to be effective;</td>
</tr>
<tr>
<td>The instrument should be run in close collaboration with the market to gain advice and knowledge - Companies should be required to bring private investors to gain advice and knowledge;</td>
<td>An innovation supporting financial instrument can only be partially revolving.</td>
</tr>
<tr>
<td>Financed companies should demonstrate well-established corporate governance structures and</td>
<td></td>
</tr>
</tbody>
</table>

what would have inhibited the free-flow of money (Yozma scheme worked for a short while, but in the form it was successful, it is not followed by the Israeli government anymore).

68 The EIF-ERP approach explicitly aimed to boost winners, Invitilia was more aiming to increase the number of deals.
While taking into consideration the existing landscape of VCs and BAs, as well as the current initiatives of the EIF, it seems that there is no need for additional co-investment facilities strictly dedicated to innovative SMEs. There is potential, however, to enrich the concept of the SME instrument through the introduction of blending instruments:

- In Phase 2 of the SME instrument, it is advisable to introduce grants convertible to loans with an additional requirement of safeguarding initial co-financing from accredited investors/ lenders. More specifically, Phase 2 entails the development of a new product, process or service as well as a business innovation plan incorporating a detailed commercialisation strategy and a financing plan aimed at attracting private investors. In this regard, the blending scheme could entail an initial grant to develop the innovation, which could be converted to a soft loan after the commercialisation of the product. The commitment of an investor could be taken into account in the case of failure, e.g. safeguarding that the company does not move its operations after receiving a grant.

- Regarding Phase 1 of the SME Instrument, it consists in a proof of concept and feasibility, therefore the funding required is limited and the commercialisation of the product is further down the road. A grant is therefore more advisable.

- As far as Phase 3 of the SME Instrument is concerned, the focus is on commercialisation of the innovation developed. In that respect, the interviewed representatives of national innovation agencies mentioned that there is a gap in funding for innovative companies that spans from the initial development phase into the commercialisation phase. Therefore, innovation support in Phase 3 could take the form of a soft loan to support commercialisation. Here, the requirement of receiving co-financing from accredited investors would be of particular importance as, in that phase, the guidance and mentorship of experienced professionals is valuable for the success of innovative projects.

Concerning the scalability and transferability of blended instruments, stakeholders managing blended instruments stated that they do not see obstacles to the adoption of the similar instruments at European level. However, it was stressed that those types of instruments require trained professionals and a substantial effort regarding the on-going monitoring and evaluation of projects.

Regarding the blending mechanisms of the grant convertible to loans, it could follow the NL, CDTI and FGG example. Companies could be awarded grants combined with a loan element: 1) non-refundable grant element with 2) a convertible grant / loan element. A convertible grant element is understood either as ‘grant convertible to loan in the case of success’ or ‘loan convertible to grant in the case of failure’. Although both of the latter elements entail basically the same, it seems that a concept of ‘loan convertible to grant in the case of failure’ promotes a positive approach to a project’s success. The convertible element means that in some cases a loan can be converted into grant, in full - in the case of technical failure, or partial failure - if commercialisation of the project’s results was only partly possible. In other words, if the development of the project fails, a loan would act as a grant and the repayment of the loan is waived. On the other hand, if the company is successful in the commercialisation phase, then the loan has to be repaid.

It is questionable, whether the repayment of the grant in the case of success should be tied to future positive revenue streams. For instance, in the case of the FGG blended instrument, if a project has been successful and the attempts to commercialise the results were insufficient, the loan could not be converted into grant. In the development phase,
companies are usually granted a minimal period of 2-3 years before starting repayments, therefore, using resources for investment only. If the repayment is tied to future positive cash-flow, the application of additional warrants / collaterals would minimise moral hazard.

Concerning the requirement of safeguarding a certain level of initial co-financing from accredited investors as a part of blended instrument´s requirements, the term `accredited investors´ is understood as financing institutions that underwent the EIF´s due-diligence process, as EIF has expertise in the selection and evaluation of relevant intermediaries. In that respect, `accredited investors´ entails InnovFin financial intermediaries (banks, other lenders and VC funds registered as InnovFin financial intermediaries under either the SME loan guarantee scheme (InnovFin SMEG) or the venture capital scheme (InnovFin VC)), intermediaries of other EU-level financial instruments, facilities being invested in or guaranteed by the EIF under any of its mandates, including EFSI and intermediaries of a financial instrument implementing an ESI Funds programme. Moreover, accredited investors could include national promotional or regional innovation agencies, or an intermediary of other EU-level.

By using the requirement of initial co-financing from accredited investors, the EC would delegate some burden of the due-diligence of projects to already approved and trusted intermediaries. Those intermediaries could also take over (partially) the effort of the ongoing monitoring of the project progress. Thus, that would help, to some extent, address the need for trained and sufficient human resources to manage the projects.

In any case, while establishing any of the instruments at European level, certain conditions (summarised below) should be taken into consideration.

**Instruments should be managed by market professionals**

European institutions very often do not have enough market knowledge and enough skilled professionals to manage new financial instruments. In the case of co-investments with business angels or VCs, the best approach is to let financial professionals manage the fund and select projects. In the case of other instruments, that are mainly managed by public agencies, they imply the need to either attract highly skilled professionals to the agencies, hire them as external consultants, or train and retain talent inside the organisation. In any case, the right skills require the correct remuneration.

**Use private investors to bring knowledge and advice**

In many cases, interviewees stressed that the role of private investors is not limited merely to leveraging private capital. More importantly, they provide market knowledge, advice and support to innovative companies increasing their chances of success in the market.

**Instruments should be designed taking local market differences into account**

Interviewees emphasise that the different levels of development of the supply side within Member States needs to be taken into account when designing a public co-investment scheme. In many cases, schemes are designed based on their apparent success in other markets, but without doing a proper assessment of local conditions, historical context, and whether an approach is suitable for the needs or stage of the local market development. The (OECD 2011) observed that while `venture capital tends to attract the bulk of the attention from policy makers, the primary source of external seed and early-stage equity financing in many countries is angel financing not venture capital´. More specifically, in the case of venture capital, co-investments require an established VC market of critical size.

Venture capital is only a solution for a limited fraction of start-ups, i.e., those with high growth potential, in combination with their intention and willingness to eventually sell the business. A high percentage of company founders, however, want to create a family business and do not want to exit.
**Instruments should be market-driven but without crowding-out**

While it is clear that financial instruments should be commercially oriented and market-driven, they should not distort the market by 1) providing too much funding, 2) under too beneficial conditions. In addition, one can argue that too stringent KPIs or too much focus on KPIs might lead to a situation where focusing on performance, leads to focusing on high-growth investments only or a high number of deals, leading to the crowding-out of private investors.

Finally, there should be a clear differentiation established between SME financing (that is indeed needed more in Europe) and VC financing. VC funds should be investing in ‘elite’ companies, but by definition few such exist and more public money will be harmful.

**Provide follow-up funding mechanism**

What becomes apparent is that the existing new financial instrument solutions are rarely designed in a way that provides support to an innovative project through the lifecycle of projects. Interviewees stressed the need for follow-up funding in the different stages of the company development, yet, the instruments (whether co-investing or blending) were rarely connected to each other, even while managed by the same institution. The effective, interconnected system of redirecting the companies from one form of financing to the other throughout the project lifecycle should be created.

**Keep the instrument flexible**

Financial instruments should envisage some level of flexibility – on the one hand, they should be designed taking into account the differences in the local markets – the size of the market, its stage of development, the size of funding needed or that is feasible. On the other hand, instruments should be flexible in adapting to changes in the project plan and company’s needs and performance.

Moreover, it is important to note that, in the highly evolving market space, strictly ‘designed co-investment schemes’ cannot adapt quickly enough to the changing environment and changing needs. Therefore, more flexibility should be given to public instruments to address newly emerging needs, to experiment and learn from experience.

**A monitoring and evaluation system should be embedded in the instrument**

Practice shows that the easily measurable KPIs together with a data gathering system should be embedded in the design of the instrument from the start. That also implies that the evaluation system should be established upfront on the basis of those KPIs. The KPIs should be designed wisely, leveraging market vs. policy objectives – focussing on the efficiency or effectiveness of the instruments solely might lead to the situation in which financing institutions favour ‘safe’ investments. For instance, too strong a focus on the revolving effect of funds might lead to a lack of support for highly risky, disruptive innovations.

Concerning the ex-post evaluation, the European Commission could consider design the data gathering activity in order to facilitate the implementation of counterfactual impact evaluation methodologies. The applicant should also be contractually obligated to provide all the necessary data for the ex-post evaluation as well as to participate in the evaluation exercises. The information should be managed by one entity at European level and should be used to help designing the new financial instruments in their initial phase.
5. CASE STUDIES

This Section presents 7 detailed case studies on relevant financial instruments identified at national level:

1) CASE STUDY on CO-INVESTMENT – INVITALIA (IT)
2) CASE STUDY on CO-INVESTMENT – CDTI PROGRAMMES: NEOtec & INNVERTIE (ES)
3) CASE STUDY on CO-INVESTMENT - ERP-EIF CO-INVESTMENT GROWTH FACILITY (DE)
4) CASE STUDY on BLENDING – INNOVATION CREDIT (NL)
5) CASE STUDY on BLENDING – PARTIALLY REIMBOURSABLE LOAN (ES)
6) CASE STUDY on BLENDING – FGG (AT)
7) CASE STUDY on BLENDING – VFF (NL)

5.1. CASE STUDY on CO-INVESTMENT – INVITALIA (IT)

Overview of the national context

The Italian Government sees a market failure on two levels:

- The total amount of smart risk capital for innovation of less than EUR 200 m invested in Italian venture capital is very low compared to other European countries, notably France, Germany, and the United Kingdom. The government only intervenes in deep market failure, and Italy perceives itself as being amongst the last European countries regarding VC funding made available to innovative start-ups.

- The average funding round size is 30-40% less than the average in the other EU countries.

The Invitalia Ventures fund was created to address these issues and Europe’s apparent inability to create giant technology leaders.

The main bottleneck with regards to funding mechanisms is the total amount of VC capital in the Italian market - there are less than 10 active VC firms in Italy, one of which is Invitalia Ventures. More players translate into more capital available, therefore the VC funds operating in Italy need additional support. The scarcity of experienced VC firms could be overcome by attracting international players, e.g., engaging leading VCs internationally and encouraging them to open a branch in Italy.

The Fondo Italiano Investimenti managed by the Cassa Depositi e Prestiti provided EUR 120 m to new VC funds operating in Italy over the last three years. It is the only fund-of-funds providing funding to Italian venture capital. Despite its intervention, there is still a perceived market gap caused by investors believing that VC investments are more risky than usual. Co-investment mitigates this risk, as Invitalia Ventures’s partners feel reassured due to its presence.

Overview of the instrument

Fully controlled by Invitalia S.p.A. (National Agency for Development, 100% owned by the Italian Ministry of Economy), Invitalia Ventures manages a EUR 100 m (target fund size) Italia Venture I Fund to actively co-invest with national and international VC firms in order to promote the Italian VC industry and innovative start-ups. Invitalia Ventures is a classic SGR asset management company under regulation of the Banca d’Italia and the Alternative Investment Fund Manager Directive.

---

69 See http://www.invitaliaventures.it/
70 Società di gestione del risparmio
Management structure of the instrument

Italia Venture I Fund started in 2015 and received its first commitment from the Sustainable Growth Fund, operating through the Ministry of Economic Development. It received a further 50% of its commitments from Cisco Investments, Fondazione di Sardegna and Metec (Industrial group Ginatta). Italia Venture I Fund has the typical 5-year investment period followed by a 5 year disinvestment period. Management fees are 2% of the total commitment with 10% carried interest to reward investment performance. The fund invests in all innovation sectors, providing up to 50% of series A financing in the range of EUR 500,000 to EUR 1 m. Investments have to be ambitious, targeting, for instance, R&D output from university, technology to change industries and markets, or to solve large problems of humanity. The priorities of Invitalia Ventures are:

- Increasing the number of venture deals made (targeting 12 co-investment deals per annum);
- Attracting international smart capital to Italy;
- Intervening in general VC market failure.

Invitalia Ventures’s approach is argued to be broadly based on experiences with Israel’s successful co-investment scheme Yozma. However, the interviewee called its structure ‘unique’ and ‘original’ (Mizzi, 2017). Invitalia Ventures intervenes at the bottom, i.e. not investing as a fund-of-funds but to provide funding alongside its co-investment network, thus following a market-led and ‘non-helicopter money’ approach. Regulation stipulates that 50% of the capital needs to be provided by private investors. For this reason, Invitalia Venture has built a network of around 150 co-investing VC funds and mid and large corporates. Approximately half of them are Italian partnering organisations (Figure 6).

![Figure 6 Invitalia Ventures - structure](image)

Source: Authors’ elaboration

A formal application is needed in order to become a partner of Invitalia Ventures’s investor network. The application needs to provide general information on the partner. Beyond some checks on small boutiques and not well-known brands, there is no due diligence, particularly when partners are perceived to be market leaders from the corporate and VC world. After signature, however, there is no binding commitment. Partners exchange with

71 See (Erlich, undated) and Annex 4 on Yozma case

72 See [http://www.invitaliaventures.it/site/ventures/en/home/network.html](http://www.invitaliaventures.it/site/ventures/en/home/network.html): ‘To join our network, please have a look at our open call, download our application form and send it to info@invitaliaventures.it’
Invitalia Ventures provides information on deal-flow and cooperate on setting up funding rounds. Invitalia Ventures provides no incentives at all; everything is done according to market terms and conditions.

**Decision-making**

Invitalia Ventures is described as operating like a regular VC fund. While it receives proposals from its partner network, there is also a deal flow directly going to the fund. After screening, Invitalia Ventures proposes opportunities to its partners, and arranges funding rounds. It is doing its own due diligence, but the due diligence process is easier when proposals come from its partners.

Investment skills and speed of investment decisions are critical success factors. The Invitalia Ventures team comes from the private sector, with a private sector mindset and tries to operate as close to the market VC modus operandi as possible.

Invitalia Venture currently has a team of nine, comprising a chief executive officer, business analysts for the evaluation of proposals, two people responsible for compliance and corporate affairs and the rest are in the investment team. Investment decisions are taken independently by the team. They do `not receive any kind of push´ (Mizzi, 2017). The investment committee has nine members. It is an advisory body, mandatory by fund regulations, but non-binding in deal approvals. The board of directors has five members, with one representing the Ministry and two independent directors.

Investment decisions are made very quickly, as information on the targeted start-up is provided by the partnering investor well in advance. On average, three months are needed before closing the deal (1 month for due diligence, 1 month for documentation and investment committee approval and 1 month for board of director approval). This is faster than the usual private investor decision in Italy.

The co-investment approach allows Invitalia Ventures to move and engage with many partners in the market.

**Main results and benefits**

Invitalia Ventures sees a significant number of `outstanding´ opportunities in the Italian venture space. More than 1000 projects were evaluated in 2016, of which 11 companies were funded that otherwise would not have been able to attract sufficient capital. Invitalia Ventures provides a clear leverage effect on private funding. In 2016, EUR 8m were invested in a total funding round size of EUR 25m. Without the fund’s presence, these rounds would not have taken place. Moreover, Invitalia Ventures attracted three industrial partners (AXA Strategic Ventures, Enel Green Power, Victoria Bike) that never before had invested in Italian start-ups as new investors in this space. Finally, Italia Venture I Fund is the first fund in Italy with commitments from a US tech giant, Cisco. This is a sign of increased international interest. Through Invitalia Ventures’s intervention, an additional EUR 25m early stage funding (more series A than seed) went to Italian venture capital in 2016.

The potential for crowding out is viewed as remote. The need to produce innovation and finding the necessary resources leads to a `team spirit in the market´ (Mizzi, 2017). Effectively, Invitalia Ventures operates more like a networking fund in line with the typical VC syndication approach to investing. Here, the co-investment is a kind of risk mitigation without competition, working for the benefit of all. Larger funding rounds are a strategic choice to make the start-up successful. In this space the competition is international and syndication is needed to provide capacity to compete"73.

---

73 The term syndication is broadly used to refer to situations where different venture capitalists invest in a given project at different times (see Brander et al., 2002).
Main bottlenecks

Despite having access to a sizeable network of venture capitalists and corporations there is no rigorous due diligence to prequalify potential co-investment partners. As a result, little can be delegated and Invitalia Ventures needs to be highly involved in the due diligence and the investment decision process. Therefore, it is essentially operating like a private sector VC fund and at a comparable cost level.

Key Lessons Learnt

According to Invitalia Ventures, their cap, that does not allow investing more than EUR 2m into a single start-up, does not allow them to provide sufficient backing to emerging winners.

In fact, different funding mechanisms for different cycles require the creation of a more later-stage oriented Italia Venture II fund to back winners (EUR 200m to EUR 300m fund size, funding rounds in the range of EUR 10m to EUR 30m/EUR 40m). Series B and C investing would require seasoned management from large corporates with industry and market knowledge.

The interviewee felt that public intervention in the VC market at this point in time is too much focused on the fund-of-funds mechanism. This should be complemented by providing direct investment in order to be faster and more efficient. An approach, as followed by Invitalia Ventures, maybe usefully applied to other countries, particularly Southern Europe, to produce innovation and improve productivity.

Conclusions

While Invitalia Ventures is still in its initial phase, it sees itself as being already recognised as a cornerstone member in the Italian VC ecosystem. There appears to be a more regular and quicker decision making process now with Invitalia Ventures interacting on a daily basis with its partner network. Italy certainly needs more co-investors, but Invitalia Ventures is viewed, in the words of its CEO (Mizzi, 2017), as `giant step ahead`. 
5.2. **CASE STUDY on CO-INVESTMENT – CDTI PROGRAMMES: NEOTEC & INNVERTIE (ES)**

**Overview of the national context**

The Spanish market for venture capital faces a number of opportunities and challenges. Spain is a major EU economy but policy makers consider its VC market to be disproportionately underdeveloped despite opportunities for investment in advanced technologies. There is a good level of basic research but translating it into a product and service that reaches the market remains difficult. In addition, there is little private investment in young technology companies, making their growth and internationalisation difficult. Private sector investors in VC funds are rare, which creates a high dependency on public funding. Moreover, the Spanish VC ecosystem is immature, not robust enough and still unable to sustain itself. There are too few success stories that would put Spain on the map of international investors. On top of that, there is a lack of late stage funds (Innvertie, 2017).

**Overview of the instruments**

The Spanish CDTI\(^4\) is the promoter of two co-investment schemes that are relevant for the study and provides lessons for the future design of such programmes:

- **The Neotec programme** that ran between 2006 and 2012 and was launched in cooperation with CDTI, the European Investment Fund and several other private investors, mainly Spanish blue chip companies;
- **The INNVIERTIE programme**, launched by CDTI in 2012, with the aim of stimulating investment in Spanish technological and innovative companies.

Neotec was a high-tech and innovation vehicle, which included a fund-of-fund Neotec Capital Riesgo and a co-investment facility. Neotec Capital Riesgo’s first closing was in February 2006 at EUR 175m, and final closing in June 2006 at EUR 183m, to which the EIF committed EUR 50m.\(^5\)

INNVIERTIE aims to promote business innovation by supporting VC investment in technology-based or innovative companies. It is part of the Spanish Strategy for Science and Technology and Innovation 2013-2020, approved by the Agreement of the Council of Ministers on the 1st of February 2013. The programme is implemented through the INNVIERTIE Economía Sostenible, S.A. S.C.R. (supervised by the National Securities Market Commission). CDTI, as a promoter of the INNVIERTIE programme, is the sole shareholder of the VC firm. Particularly, it mobilised over EUR 90m of seed capital to finance technology companies. Of this amount, EUR 38.5m were provided by INNVIERTIE with the rest coming from other investors, predominantly private.

For the purpose of this study, the Neotec programme is considered to be more relevant, as it foresaw co-investment alongside VC funds.

**NEOTEC**

Neotec was operating as a fund-of-funds and aimed to commit to no less than 15 VC funds managed by qualified Spain-based management teams. Although it focused on technology funds, Neotec could also become a limited partner in generalist funds that invest in companies developing commercial applications of new technology or that deploy technology supports. Importantly, Neotec was supposed to co-invest directly in technological SMEs in parallel with previously selected private equity and VC funds (‘Parallel Technology Resources Action’) (Figure 7). No more than 25% of Neotec’s total resources were foreseen for this type of activity.

---

\(^4\) Centro para el Desarrollo Tecnológico Industrial, part of the Spanish Ministry of Science and Innovation

\(^5\) See [http://www.eif.org/what_we_do/resources/neotec/](http://www.eif.org/what_we_do/resources/neotec/)
All funds, except those that Neotec entered into under the ‘Young Funds Start-up Programme’ had to comply with the ‘market economy investor principle’, i.e. at least 50% of a fund’s limited partners had to be operating under normal market conditions. A pressure to quickly go for deals was reduced through a minimum programme investment period of five years with a maximum 20% deployment per annum (unless otherwise agreed by the advisory committee of investors) and the possibility of extending this period to up to 10 years.

**Management structure of the instrument**

Neotec is noteworthy, as the structure basically tackled different policy objectives through two different approaches. Through the fund-of-funds programme, the Neotec designers expected a promotion of the Spanish VC market. However, it was understood that the pond for specialised technology-oriented VC funds remains very shallow in this region and that imposing many constraints on the fund managers would have created too much risk for their investors. Moreover, it was assumed that more generalist and later stage oriented private equity funds, as well as foreign funds, may have found investing in selected Spanish technology-oriented portfolio companies as an interesting opportunity. Neotec was designed to help overcome the deal-flow problem inherent in the targeted sectors and to allow a more diversified portfolio for the vehicle.

EIF provided its selection, structuring and management experience to Neotec and advised the investment committee that made independent decisions. Note that the public sector was not involved in the selection of the portfolio companies for co-investment with the ‘Parallel Technology Resources Action’, as this task was entirely the responsibility of the VC fund managers. The independent technology committee with CDTI’s participation, only conducted the eligibility check to ensure that the investments comply with the technology criterion, but they did not carry out a qualitative assessment of the technology component.

The technology committee comprised three members – one appointed by CDTI and two independent members – who had, at short notice, to conclude whether the proposed investment fitted into the Neotec technology and innovation definition and whether the technology risk assessment had been carried out properly by the VC fund managers.

---

76 Interestingly, EIF falls into this category for INNVIERTE as it is not considered to be public financing (see Garcia, 2017).
Theoretically, Neotec had been giving a clear incentive for VC fund managers to channel CDTI direct investments into good deals.

**Main results and benefits**

At the end of the programme, Neotec had supported 14 VC funds, only slightly falling short of the set objective of supporting 15 VC funds. However, the programme resulted in only four co-investments, none of which were carried out by a foreign VC fund. That led to some interviewees to consider Neotec as being `not a big success’.

**Bottlenecks**

Despite its sound design, the Neotec concept may have been too ambitious for the stage of the development of the Spanish market, and expectations apparently were scaled back when launching a prospective INNVIERTE programme.

One of the barriers mentioned by the interviewee was Neotec’s lengthy approval process required for the investment decision. Therefore, and despite the strong relationships as a limited partner of the VC funds, the delegation of decision making may not have been strong enough to be found attractive by the VC funds (the VC funds were faced with too much bureaucracy and the process involving the investment committee was too long and cumbersome).

**Key lessons learnt**

The design and expected results of the financial instrument should be adjusted to the realities of the national financial ecosystem market, in particular, the stage of development of the market.

**INNVIERTE**

INNVIERTE is essentially a follow-up of Neotec but there are important differences. Currently 100% of its capital comes from CDTI, and the programme is managed by CDTI only. INNVIERTE is investing in VC funds as a limited partner only, and therefore INNVIERTE does not fall into category of co-investment in the understanding of the study. It does not co-invest alongside private funds, like Neotec did. The reason for this shift in strategy is the lack of a critical mass of VC firms operating in the Spanish market, implying a focus on promoting new fund management teams. The support of innovative companies is thought to result from this strengthening of the VC ecosystem.

Currently, the INNVIERTE programme fosters the entry of private capital into Spanish technological firms under market conditions in order to support their technological activities, to provide them with management skills and market knowledge, and foster their internationalisation.

**Management structure of the instrument**

INNVIERTE is taking minority positions in VC funds, pari passu with private sector limited partners. The majority of a VC fund’s commitments need to come from private sector investors. INNVIERTE foresees co-investments, but only with corporate venture arms (examples: Iberdrola, Repsol New Energy Ventures, Aqualogy Soluciones y Tecnologias del Agu (AGBAR)). One of its objectives is to attract international investors, either directly into VC funds, or by accompanying investment rounds in companies. The co-investment facility

---

77 This assessment may be overly critical. Neotec co-invested with Adara Venture Partners in AlienVault, a developer of commercial and open source solutions to manage cyber-attacks. AlienVault was founded in 2007 in Madrid and the involvement of Adara Venture Partners is likely to have contributed to the internationalization of the company by attracting famous US venture capitalists such as Kleiner Perkins, Trident Capital, and Caufield and Byers. See also http://www.unquote.com/unquote/news/80638/spain-adara-and-neotec-back-alienvault
aims to promote growth and to create leading companies in their respective sector. 90% of INNVIERTE’s resources go to funds’ commitments.

For this purpose, the CDTI launched several calls to identify co-investment partners and as a result to enter into a framework agreement. The agreement foresees that a co-investment partner regularly (typically every four months) discusses with CDTI opportunities related to Spanish technology companies. The investment band is between EUR 500,000 to EUR 3m. A follow-on financing agreement is possible, but only up to EUR 3m.

In some cases, the CDTI identifies opportunities itself and proposes them to the partnering corporates. Nevertheless, the responsibility for selection remains with the co-investment partner. The CDTI shares expenses, but the due diligence is done by the co-investment partner. Financing can be provided quickly, as there is an intensive contact with the co-investing partners. As INNVIERTE relies mainly on the analysis put forward, it takes just between one to two months until the investment decision.

**Main results and benefits**

Since 2012, INNVIERTE committed to 14 VC funds and seed funds and entered into three co-investment agreements (Iberdrola in mid-2016 (finished already), Repsol New Energy Ventures and AGBAR in June 2017). By the end of 2016, nine co-investments were carried out and at end of the respective investment period (4 year duration) in total 16 companies are expected to have been backed. Every EUR 75 provided by INNVIERTE is leveraged with EUR 100 by the co-investing partner.

Garcia, (2017) saw clear additional benefits to the co-investment programme: it has led to significant investment of corporates in new companies, which did not happen before. For example, the CDTI presence was considered to be an important factor for convincing Repsol’s board of directors to launch a corporate VC programme.

**Bottlenecks**

Several bottlenecks were identified by CDTI in the process. The Spanish VC ecosystem is growing but it is still immature. Therefore it is difficult to attract new private money to these types of investments. Private LPs are still rare in Spain, therefore there is still a need for public funding.

Moreover, fundraising processes are extremely long and VC Managers need to devote too much time to raising money.

**Key lessons learnt**

Investing in technology-based businesses requires highly specialised managers that have experience, knowledge of the market and of the problems associated with technological projects.

Overall, there is a need for late stage funds that provide follow up investments for the funded companies to further support them in scaling up.

**Conclusions**

INNVIERTE is still in the operational phase, so final conclusions cannot be drawn yet.
5.3. CASE STUDY on CO-INVESTMENT - ERP-EIF CO-INVESTMENT GROWTH FACILITY (DE)

Overview of the national context

At the time when the ERP-EIF Co-investment Growth Facility (GCIF) was created there were still very few growth investors in Europe. Examples of those established since then include: EQT Ventures, Rocket Co-Investment Fund\textsuperscript{80}, Atomico (EUR 760m) and Index Ventures. All of these can be considered to be ‘plain vanilla’ VC funds. Moreover, at this time there was no infrastructure in place to leverage opportunities. Only foreign investors (mainly US-based) provided money to this part of the eco-system. Still at the time of writing, only few Europeans like Atomico’s Niklas Zennström have the know-how and an experience to, say, list a company on the Nasdaq. From a policy perspective, the lack of a robust EU growth investment infrastructure is a risk. Therefore, the GCIF with its unique model is addressing this market risk as EIF’s traditional fund-of-funds model could only have a limited impact in this situation.

The GCIF concept was a result of a market feedback received by EIF, i.e., that nobody wanted to co-invest and, therefore, there was a dependency on big US players. In addition, EIF conducted a market survey amongst fund managers that invested under the ERP fund-of-funds\textsuperscript{82}. They identified a larger ticket gap in the range EUR 20m to EUR 40m. The GCIF was also meant to support VC funds that either have insufficient resources or are constrained from further investing. By providing an additional pocket of money, the GCIF helps them 1) to avoid dilution, and 2) allows them to obtain or maintain a seat on a board.

Overview of the instrument

The German Growth Co-Investment Facility is a EUR 500m facility managed by the European Investment Fund on behalf of the German BMWi and the European Recovery Programme (EIF, 2016). The GCIF funds come from the BMWi on behalf of the ERP (EUR 330m) and from the EIF (EUR 170m). The facility was launched in March 2016 with an investment period until the 31st of December 2021. The facility provides qualified fund managers with co-investment pockets in the range of between EUR 20m and EUR 60m.

As two thirds of resources are provided by the German government, thus, state aid regulation relevant, for each funding round there needs to be a minimal level of private investment. Therefore, in addition to the industry-standard investor reporting (International Private Equity and Venture Capital Investor Reporting Guidelines\textsuperscript{83}), each co-investment requires specific reporting, outlining the capital structure of the company and funding round.

Management structure of the instrument

The GCIF’s design is based on experience with various other EIF managed schemes, such as Neotec, Istanbul Venture Capital Initiative, Mezzanine Facility for Growth and business angel schemes. Rather than EIF’s sidecar-type co-investments of the early 2000s that had as a primary purpose to support VC funds experiencing liquidity problems, the GCIF aims to boost the performance of emerging winners in a VC fund’s portfolio. There are two main beneficiaries of the scheme that are of an equal importance: (1) the VC firms (in order to build an infrastructure of high-quality partners) and (2) the companies for which a speed in which the funding made available is a strong benefit.

The GCIF operates as a money provider that leverages private players. Unlike other public schemes, such as Coparion and Invitalia, EIF does not take deal-by-deal decisions on

\footnote{Co-investing with Rocket’s EUR 1bn listed vehicle; for every EUR 1 invested by the listed fund, additional EUR 4 co-invested}

\footnote{The most basic version of the financial instrument}

\footnote{A EUR 3.2bn fund-of-funds investing in VC funds focusing mainly on German-based, high-tech companies in early development stage, managed by EIF on behalf of the German BMWi and ERP.}

\footnote{See https://www.avcal.com.au/documents/item/439}
direct investments. Instead, the GCIF builds on the EIF’s strength and experience in assessing the proposals of VC firms and funds. EIF partners with a selected group of firms, with who it has built an on-going and successful relationship. The EIF’s experience as LP and the trust established with partners mitigates risks related to an adverse selection.

Therefore, co-investment capital is provided to reputable VC fund managers who (EIF, 2016):

- Are active in Germany and invest in SMEs and Mid-Caps based in Germany;
- Have an established EIF relationship;
- Can demonstrate an excellent track record;
- Have investment opportunities in their existing portfolio with the potential to meet the investment criteria set for a growth stage portfolio company.

The co-investment partnership between the GCIF and the VC firms is formalised in a framework agreement (Figure 8).

**Figure 8 ERP – EIF Co-investment Growth Facility Structure**

![Diagram](image)

*Source: Authors’ elaboration*

The GCIF targets innovative SMEs and Mid-Caps in their expansion and internationalisation phase investing in, both, new and existing portfolio companies of a fund manager’s main funds. The framework agreement stipulates that at least three companies will be co-invested in under the facility. The GCIF provides incentives to the VC firms: the fund managers receive 0.1% on capital invested and 10% carried interest on the co-investment. However, these terms cannot be more favourable than those for the fund’s commitment.

**Decision-making**

The VC firms source the deals, do their due diligence, and co-invest (1:1 matching in order to assure alignment of interest); they can draw from the GCIF when the following criteria are met (EIF, 2016):

- New or existing portfolio company of one of the VC firm’s main funds;
- Alternatively:
- Company with run-rate revenues of more than EUR 5m and expected continued rapid growth\(^8\), or,
- Company active in drug development - financing of clinical phase II trials without the need to show revenues.

- Investment round of more than EUR 10m;
- Valuation representing an up-round of more than 10% as compared to the last post-money valuation, set by a third party investor leading or co-leading the round to provide arm's length valuation (not applicable to co-investments in new portfolio companies);
- Expected at least double return and a realistic exit window within the next 12-36 months;
- Company should be a German SME or Mid-Cap (according to definition of the European Commission).

The GCIF cannot be called for down rounds where investors purchase stock at a lower valuation than the preceding round. Moreover, at least 30% of the round has to be ‘new’ independent private money\(^8\), in order to assure the validity of the price. For illustration, in the case of a EUR 20m round, EUR 6m needs to be ‘new’ money, not coming from public sector investors, EUR 4m from private sources including existing investors, and EUR 10m from the GCIF.

In addition to the selection of a trusted VC firm as a partner, the above criteria aim to avoid adverse selection. The last two criteria are rather soft in the sense that they cannot be enforced and are more based on judgment and trust. However, at the same time the criteria are to be strictly enforced; the GCIF is not managed ‘by exception’. The approach is based on the approach followed by experienced market players\(^8\).

Within the ERP team of six investment professionals, only one individual on average is dealing with the co-investments. With the framework agreement in place, the commitment can be effective just as in the case of normal fund transactions: it takes only between 5 to 10 business days before the money is wired to the company.

**Main results and benefits**

GCIF’s concept was validated through the framework agreement with Holtzbrinck Ventures, one of the leading independent European early stage investors. This agreement resulted in three co-investments within the last six months. For example, the GCIF allowed Holtzbrinck Ventures to support Flixbus’s expansion in cooperation with global growth equity firms General Atlantic and Silver Lake Partners\(^8\). Four additional framework agreements with other VC firms are to be signed soon. EIF expects to engage in 150 co-investments under the GCIF within its five-year investment period.

In contrast to other schemes, KPIs do not include reporting on the number of deals and partners. There is no pressure to go for volume - the focus is rather on quality, i.e. to be more successful with fewer good transactions. This objective is achieved through building a partnership with good VC firms that have sufficiently deep pockets allowing them to take at least a 30% share in follow-on deals.

Compared to the usual early stage investments, the co-investment portfolio under the GCIF is expected to provide better returns for less risk. The portfolio companies are more mature, with strong run-rate revenues. At the same time, under the GCIF, lower management fees are paid and less carried interest is charged. This raises the question whether this scheme crowds out private investors? This does not appear to be likely:

---

\(^8\) The revenue run-rate is the annualized revenue of a company, by extrapolating the current revenue over a year. If a company were to make EUR 1m in its first month of operation then its revenue run rate would be EUR 12m.

\(^8\) Money from investors that were not present before.

\(^8\) Greycroft and e.ventures

\(^8\) Mobility provider offering daily intercity bus service all over Europe.
• Under the GCIF, public money is invested through private channels. The VC fund managers decide whether to draw from the co-investment facility;

• The main fund and its LPs, always have priority. GCIF is used when the private sector does not invest, otherwise it is automatically scaled down;

• Co-investment is not exclusive to EIF. Other LPs can co-invest too, though rarely do so.

Due to its structure – there is always a minimum private third-party investment of the same size – the GCIF achieves at least 50% leverage. In the co-investments undertaken so far, a ratio of 1:3 (public vs. private funding) was observed.

Main bottlenecks

Other public schemes approach co-investment on a deal-by-deal basis, evaluating individual proposals and occasionally even doing a specific due diligence. This implies considerable effort and results in long delays until the investment decision is made.

This bottleneck is overcome by GCIF’s approach, but it depends on suitable/trusted/experienced VC firms with which EIF has maintained a relationship previously.

Key Lessons Learnt

In the case of the GCIF, the longest delay is caused by the one-off framework agreement. Once the criteria defined above are met, there is no separate EIF approval or due diligence required with respect to individual investments. The facility can be flexibly accessed by the partnering VC firms. Therefore, the GCIF does not result in the huge administrative overheads.

Conclusions

The GCIF was launched in 2016. Therefore, also in this case, no conclusions can be drawn at this point in time.
5.4. CASE STUDY on BLENDING – INNOVATION CREDIT (NL)

Overview of the national context

The Netherlands has a long tradition of public innovation credits. In particular, the instrument analysed was preceded by the Technical Development Credit (TOK) and the Technical Development Projects regulation (TDP), running from 1954 to 2003. More recently, in 2006 came the Challenger Credit (Uitdagerskrediet - UK), which was replaced in 2008 by the Innovation Credit (Innovatiekrediet - IK).

Overview of the instrument

Innovation Credit, operational since 2008, is a financial instrument for innovation that is a hybrid between a grant and loan. In a nutshell, IK is a grant that has to be repaid by the beneficiary under certain conditions. More specifically, when a company is assigned the grant, two phases are distinguished: 1) the high-risk development phase, in which the product is conceived and 2) the commercialisation phase, in which the product is launched on the market.

If the development fails, then Innovation Credit acts as a grant and the repayment of the loan is waived. However, if the company succeeds with the product, then the loan has to be repaid. In this respect, IK can be also considered as a soft loan, i.e. a loan with favourable conditions.

IK is based on its predecessor, called Challenger Credit. It ran for 1.5 years, and consisted of a loan for innovative and fast-growing companies. IK is also partially based on a previous instrument from 1995-2003, called Technical Development Credit. At international level there aren’t many similar examples. In fact, one of the unique features of IK is the provision of direct loans to companies, while the other instruments provide companies with guarantees for bank loans. This leads to an inherent risk factor in IK.

Management of the scheme

The instrument is governed by the Ministry of Economic Affairs and is implemented/managed by the Dutch Netherlands Enterprise Agency (RVO). The Ministry of Economic Affairs decides on the revolving effect of the scheme and the amount of funding. On the other hand, the Ministry of Finance checks the amount of funding coming in and out. Apart from managing the scheme, RVO also provides advice to companies.

Objectives of the instrument

An important motivation behind IK is to strengthen the knowledge economy in the Netherlands and to contribute to sustainable economic growth, an objective which is increasingly dependent on high-quality technical expertise and innovations, especially in knowledge-intensive, innovative sectors such as life science. In that respect, start-ups play an important role, because they can focus on relevant aspects of product development. Also, start-ups are flexible, so they can respond quickly to unexpected changes that are inextricably linked to innovation. More specifically, the main reason for adopting the scheme is to reduce the risk involved in funding innovation in the view of increasing innovation output in the Netherlands. As the risk for other investors to fund the complete development project is too high, especially in the case of clinical projects, RVO covers part of the risk. Other objectives include an increasing sustainability of the policy instrument and leveraging other funding opportunities.

According to the interviewee, there is a conflict of objectives between the aim of supporting more risky innovation and the need for the Ministry of Economic Affairs to ensure that a high portion of the funding is revolving (i.e. 60%). As a result, some proposals that can produce very important innovations but that have a high level of risk, and thus, the possibility of repaying the loan is so low that the funding is not granted.

Over the course of the programme, the objectives of the IK remained unchanged. However, the dedicated line of budget for clinical projects was created in 2010 due to the
fact that those projects are of a high risk, and thereby could not be supported under the existing Innovation Credit.

**Roadmap for applications**

The Innovation Credit roadmap can be broken down into six steps:

1) Get oriented: at first applicants need to enter the Quick Scan to briefly explain the project plan. Then, on the basis of the Quick Scan, a consultant informs the applicant about the funding opportunities;

2) Apply: the size of the applicant company, revealed by means of the SME test, determines what percentage of credit can be obtained. Applications can be made over the course of the year. An applicant should provide a business plan, a project plan and a financing plan, and, preferably, a feasibility study, market research or annual results of the company;

3) Get acquainted: after application is completed, a direct contact between the applicant and RVO starts. The project advisor provides information on the scheme, as well as on the application process;

4) Decide: within 8 weeks the applicant receives a letter with the final decision: approval of the grant, conditional approval or rejection. This period can be extended to a further 8 weeks;

5) Implement: in case of approval, the applicant receives a quarterly payment. After each agreed reporting period (usually 6 to 12 months) the applicant provides a progress report. Major changes to the project require an amendment to the contract;

6) Redeem: 13 weeks after the end of the project, a final report and a financial report are issued. Then the repayment starts. Most applicants opt for a repayment scheme on a quarterly basis.

**Terms of funding**

Regarding terms of funding, companies can apply at any time, by providing a business plan and a financial plan for project. An internal team of advisors assesses the application: if approved, an external advisory board gives an opinion, and an application is rejected or accepted. RVO provides up to 75% as financing, out of which 25 - 45% is a grant. The size of the grant is 25% for large companies, 35% for mid-size, and 45% for SMEs. Projects funded must have the following characteristics:

- Be technologically innovative;
- Provide an excellent business perspective;
- Make a positive contribution to the Dutch economy;
- To be implemented in the Netherlands, Bonaire, St. Eustatius and Saba;
- Involve at least EUR 150,000 in value (maximum EUR 10m);
- Be in the stage of proven technical feasibility and marketing;
- To be completed within 5 years.

The interest rate, roughly linked to the risk level of the projects, is 4-7% for technological projects, and 7-10% for clinical projects. The interest rate is higher for start-ups without positive cash flow.

**Implementation of the scheme**

If funding is granted, a company has to produce a plan with milestones. The development phase takes 4-5 years on average, thereby the period is divided in milestones and the grant is paid in portions. The progress of the company/project is monitored closely, and if all goes as planned, the grant is paid and the company has to repay the grant. If there is a failure, due to technical problems and/or to a loss of marketability of the product, then the company can apply for a waiver of the payment obligation.
The main beneficiaries of the instrument are companies active in the Netherlands, both SMEs and large firms, though most applicants are SMEs. Regarding the development stage of the companies, applicants are mostly projects in the technical development stage, entering the market in 4-5 years, both start-ups (50%) and existing companies starting a new project/product. More specifically, start-ups are defined as young companies that have not entered the market yet and that are developing their product, and are therefore in an early stage. Usually, these start-ups have already obtained a first round of funding, and IK can fund up to 45% of the development cost as part of the total funding.

The scheme has no sectorial focus but two separate budgets: one for technical development projects and a separate budget for clinical projects that have a higher risk. The instrument has no end date planned. It is evaluated every 5 years and the Ministry of Economic Affairs decides every time whether to continue the programme. The first evaluation provided positive results, and the next evaluation is scheduled in 2018.

The total budget of the scheme for 2017 is about EUR 60m: EUR 20m for clinical and EUR 40m for technical projects. Currently, there are EUR 250m of outstanding loans. The average size of a loan is EUR1.5m: EUR 1.8m for clinical projects, and EUR 1.4 for technical ones.

**Main results and benefits**

Concerning the result of the scheme, an evaluation is performed by an external party every 5 years, while internal evaluations take place every 3-6 months.

According to the interviewee, the results objectives of the scheme have been fully achieved. KPIs collected include the number of companies funded, size of fund at the end of funding period, the leverage-multiplier effect, risk rating of projects funded at every milestone and the number of failures. More specifically, the results are as follows:

- Every year there are about 400 quick scan applications and 100 formal applications, out of which 35-40 are approved;
- Return on investment is 60% including interest rate;
- Time to pay back a loan is up to 10 years (4-6 years on average)
- Amount of approved grants amounted to EUR 54m in 2016, with a total value of projects funded reaching EUR 136m.
- Therefore, the multiplier is about 2.5.88

An external evaluation of the Challenger Credit and Innovation Credit commissioned by the Ministry of Economic Affairs to Aarts de Jong Wilms & Goudriaan Public Economics (APE) (De Jong P., Gielen M., and van Praag M., 2013) revealed that companies receiving the IK spend more on R&D, apply for more patents, have higher budgets and production capacity, demonstrate larger growth in terms of FTE89, and attract more venture capital funding and are financed less by grants, as compared to the companies unsuccessful in receiving the IK. Moreover, companies receiving IK are also more likely to receive other forms of funding; this effect may be attributed to receiving the grant, but also to the entrepreneurial qualities of the successful companies.

Regarding the administrative burden of the application procedure, the estimated value of time spent on an application is over EUR 8,000 and the value of the compliance with the reporting obligations after receiving the IK is estimated at EUR 5,500. Almost half of the applicants expressed an opinion that the application process is too cumbersome, and 40% believe that it is more stressful than applying for private money.

Considering the total cost of IK project management for RVO, defined as the sum of the time value spent on the application for an enterprise and the implementation costs by the

---

88 Some other examples of KPIs are depicted in the appendix
89 Equivalent employees working full-time. More specifically, one FTE is equivalent to one employee working full-time
RVO, it amounts to EUR 17,500 for a single application. Adding the cost of management and reporting the total cost of IK management, the sum reaches EUR 34,200.

Regarding the quantitative effects of the IK scheme, they have been assessed by means of an econometric estimation of the impact of IK on the R&D payroll. The analysis makes use of two models: one in which the score of the application is not included in the estimation, that estimates the gross effect of IK (that does not take into account selectivity); and a second model in which the score is included, that can be thereby used to assess the net effect of IK (corrected for selectivity and unobserved heterogeneity). Concerning the gross effect of an IK assignment, the estimation provides a range of results going from 0.82 to 0.70: this means that companies with a grant have respectively 127% and 101% more R&D wages than companies experiencing a rejection. On the other hand, the net effect of IK on R&D wage (\(\log\)) is 0.52. This means that the assignment of an IK results in 68% increase in R&D wages. The net effect can be translated into monetary units, showing that 1 EUR of IK payment yields EUR 1.22 of additional R&D wages.\(^90\)

As far as main benefits are concerned, the interviewee reports that the IK helps companies to complete funding for their project, and it is advantageous, both, for the beneficiary (that maintains the entire property of the project/product as there is no equity involved), and for the investors (that receive a clear signal of the viability of the project). In fact, some companies apply to RVO first and, if approved, they reach out to other investors using the IK as a proof of viability of the project. Moreover, there is no risk of adverse selection of investment opportunities as the IK complements private funding.

Furthermore, the scheme is more sustainable than a typical grant instrument: 1) a large portion of the funding comes back (with interests) and 2) projects are closely monitored during their development so the chances of success are higher.

Examples of successful projects include:

- Innovative method for recycling PET\(^91\) products conceived by the start-up Ioniqa Technologies based in Eindhoven\(^94\);
- BiosanaPharma developing biosimilars of expensive drugs for which patent has expired\(^93\);
- 3D metal printer for the production of aircrafts\(^94\);
- Innovative tools for heart specialists - the Hemodynamic Cardiac Profiler (HCP) of Hemologic BV\(^95\);
- Organs-on-a-chip technology that makes laboratory animals unnecessary\(^96\): the OrganoPlate®, an advanced 3D-culture plate, can be used to cultivate small pieces of human tissue or organs to better identify the effects of (new) drugs.

**Bottlenecks**

One of the issues related to the IK is that a lot of companies need additional funding to go beyond the development phase and survive first year of commercialisation. Thereby, a lot of companies ask to postpone the repayment of the loan and, as a result, RVO has to arrange and adapt the repayment schedule.

\(^90\) This is a proxy for number of researchers employed and thereby for R&D activity

\(^91\) Polyethylene Terephthalate (PET) is a thermoplastic polymer used to produce synthetic fibers


\(^95\) [http://www.rvo.nl/actueel/praktijkverhalen/innovatief-gereedschap-voor-hartspecialisten](http://www.rvo.nl/actueel/praktijkverhalen/innovatief-gereedschap-voor-hartspecialisten)

Another bottleneck is related to the difficulty of finding qualified advisors / consultants to manage the scheme. Currently the RVO team managing the scheme is composed of 50% of professionals with a technical background, and 50% of professionals with a financial background that have an experience in financing innovation and technology. A large number of advisors have to monitor the on-going projects and manage the project portfolio, while other advisors have to evaluate the proposals. However, it is difficult to attract and retain the right talent. As a result of the need of large number of advisors, and relatively high cost of their salaries, the costs of managing the instrument are very high, amounting to approximately EUR 3.6m in 2016.

**Lessons learnt**

For the institution managing the scheme, it is very important to keep the instrument flexible and to adapt it to all deviations from the project plan that the company goes through. In this respect, during the development phase it is very important to closely monitor projects in order to distinguish those that are successful from those that are not, stopping the unsuccessful projects halfway in order to limit losses.

Concerning scalability and transferability, an interviewee did not state any particular reason why the scheme should not be adopted by other countries and/or at European level.

**Conclusions**

According to the interviewee and the documentation available, IK has reached its main objectives, such as increasing R&D and innovation in the Netherlands, establishing a sustainable policy instrument and leveraging other funding opportunities. In 2016, the grant amount approved reached EUR 54m, with a total value of project funding reaching EUR 136 m.

The top obstacle and barrier for the instrument is the cost of its management (amounting to EUR 3.6 m in 2016) as the governance structure requires a large number of advisors to monitor the project portfolio, while other advisors have to evaluate the proposals.

Regarding the benefits of the instrument, clearly the scheme is more sustainable than a typical grant instrument, because a large portion of the funding is repaid. Furthermore, the companies during the development phase are monitored, so the chances of success are higher, and finally there is no risk of adverse selection of investment opportunities as the IK complements private funding.

Concerning scalability and transferability, an interviewee did not state any particular reason why the scheme should not be adopted by other countries and/or at European level.

Finally concerning the future steps, the funding for clinical development projects will probably be increased as, for instance, this year the number of applications was so high that all the available funding has already been assigned.
5.5. **CASE STUDY on BLENDING – PARTIALLY REIMBOURSABLE LOAN (ES)**

**Overview of the national context**

According to the Spanish Institute of Statistics, the innovation activities of Spanish businesses are still suffering the effects of the crisis. In fact, expenditure on innovation was reduced by 18% between 2010 and 2013, and the number of innovative companies dropped by almost 40%. These figures establish a scenario marked by the reduction of R&D activities in many companies due to the lack of funding and market demand for their products. In this respect, the support of CDTI has been pivotal in allowing companies to maintain their investment in R&D during the financial crisis.

**Overview of the instrument**

The Partially Reimbursable Loan (PRL) scheme is managed by the Spanish Centre for the Development of Industrial Technology (CDTI). The scheme, which has existed with different characteristics since the late seventies, was conceived following extensive discussions with the World Bank, particularly the feature of the scheme concerning the choice of loans instead of grants, which were the preferred way to fund research at that time.

The financial support consists of a partially reimbursable loan that can cover up to 85% of the project, out of which up to 30% does not have to be reimbursed. If the company is not able to repay the loan later on down the line, then the CDTI asks for collateral. Each case is tackled individually in an attempt to reach a deal, effectively recovering from 50 to 100% of the debt. Projects of special interest receive an exemption from providing guarantees and are asked for only 25% of the loan, provided they achieve 7/10 on the technological evaluation exercise. The interest rate is fixed at the Euribor rate, which is currently 0%. The interest rate is linked to Euribor at the moment of the signature of the contract and it remains fixed throughout the duration of the project.

**Management of the scheme**

There is no specific team managing the scheme, but there are different apartments at the institution that participate at the different stages of the project. For instance, the promotion directorate intervenes during the advisory part (before the application), while the evaluation part involves the financial and technical directorates. Once the project is approved, the General Secretary intervenes to sign the contract. Then, the directorate responsible for monitoring (around 50 employees) enters into action. In fact, the CDTI system has been developed for 40 years, since its creation, to create a consolidated and experienced organisation.

**Objectives of the instrument**

The objectives of the instrument are to clearly overcome suboptimal investments in research, increase the sustainability of the policy instrument (due to the loans/revolving effect), boost the leverage of private funding, as clearly the instrument pushes more private money to R&D, and to allow access to new markets and foreign funding, as a lot of the projects that are supported are international collaborations.

**Terms of funding**

Companies can apply at any time and do not have to present a business plan nor a financial plan, as the scheme only funds some activities of the company, namely R&D. The

---

97 [http://www.ine.es/prodyser/pubweb/anuario16/anu16_1Stecno.pdf](http://www.ine.es/prodyser/pubweb/anuario16/anu16_1Stecno.pdf)
companies only have to submit a research plan, and the minimum loan is 175 thousand EUR. At the signature of the project, 25% of the loan is paid. Further on down the line, the money is paid against results and costs of the project. After the project ends, there are two years without a need for repayment. Following this period, the company pays back the loan over 8 years. Therefore, the scheme lasts 10 years overall. The CDTI advisors visit most of the projects about every 2-3 years. There are three milestones over a period of 10 years when the technical and financial parts are monitored. If there are problems in carrying out a project, the milestones can be re-arranged. In cases where the project does not succeed, the first 25% of the loan is turned into a grant. Once the application is issued, the financial evaluation and the technical evaluation pipelines run simultaneously. If the CDTI deems that the project is too big for the company or if the activities proposed are not R&D, or are not feasible, then the CDTI can remodel the project. The scheme focuses on early stage research and ends at the first prototype of the project. The beneficiaries of the scheme are companies of any size, however, 60% of the projects are carried out by SMEs. On the other hand, the share of the budget accruing to SMEs is 50%. There is no sectorial focus, but obviously advisors taking care of the evaluation of proposals and projects are specialised according to the sector of the project/firm.

Main results and benefits

The scheme has funded 1,366 firms (961 projects) in 2016, with a total budget of EUR 460 m and an average financing of EUR 1.5 m, with a percentage of paid back loans equal to 93% including the interest rate. Concerning the benefits of the scheme, the interviewees reported the following:

- The CDTI aids are financially very attractive (include a non-refundable part and a 0 interest rate refundable part – currently –), more attractive than a bank loan or other sources of external financing;
- The CDTI aid covers a large amount of the proposed budget, up to 85% of the project’s budget;
- The repayment obligation is not immediate, there is a grace period of, typically, two years and the CDTI is flexible and can recognise the work plan if the difficulties and delays are justified;
- There is a preliminary advisory service that helps companies to focus the projects before the preparation of the full proposal. It’s a service that is very much appreciated by less experienced companies;
- The evaluation system helps projects to improve, thanks to the contribution of the qualified and professional technical staff at the CDTI, something that participating companies value in general;
- The possibility of developing R&D projects in collaboration with other companies that provide complementary knowledge and skills is very interesting for many organisations, because it allows them to develop more ambitious projects than if they were to go it alone;
- The obligation to return the repayable part helps companies to become financially disciplined, something that is positive for them.
- Regarding the impact and results of the scheme, the level of paid back loans is 93%, including the interest rate. Data on the return on investment (in terms of employment creation), time to pay back loan, leverage/multiplier effect, disbursement rate of funds and rate of failures will be integrated when available.

Bottlenecks

The bottlenecks reported by the interviewees include the following:

- The CDTI scheme is based, to a large extent, on the company’s financial analysis, which limits the support provided to younger companies which have a lack or limited financial records to analyse in order to give an aid. This has created a trend to concentrate the support on solvent companies or at least companies that can afford
the CDTI loan (usually medium and big companies) in order to minimise the risk of the operations;

- As the CDTI offers loans sometimes, it has requested guarantees from companies if the financial analysis concludes that there are default risks. The CDTI do this so that they can maintain a reasonable level of defaults and avoid de-capitalisation of their organisation. Due the financial and economic crisis, the rate of companies which the CDTI requests guarantees from has increased. Therefore, the Centre has launched a system to reduce the number of guarantees requested from SMEs with good projects;
- The scheme involves a management system that implies a heavy administrative burden for some companies. Therefore, those companies that are more experienced in R&D, may consider that this administrative work is not compensated by the financial aid they receive, since the non-financial support is not that highly valued. This issue is extremely relevant in low interest rate scenarios where the financial support provided is less attractive.

**Success factors**

The success factors reported by the interviewees include the following:

- The CDTI’s blended aid scheme installs financial discipline amongst the recipient companies, something that does not happen with companies that receive direct subsidies that do not imply any financial obligations;
- The CDTI’s support scheme is based on the analysis of the technical feasibility and technical quality of the project, and also on the monitoring of its execution in order to ensure it is carried out effectively. This evaluation and monitoring scheme is, in fact, very valuable non-financial support that helps companies to carry out their R&D projects, especially for companies that lack experience in R&D;
- The CDTI's blended aid scheme means a source of funding for the CDTI (returns from supported companies) that allows the CDTI to leverage the State Budget Allocations received and multiplies the power of public aid. It creates a virtuous circle of funding and refunding;
- The financial autonomy of the CDTI allows more flexibility granting aids than other administrative bodies.

**Lessons learnt**

The lessons learnt reported by the interviewees include the following:

- It is extremely important to find the right balance between sufficient financially attractive instruments and some obligations imposed on the company, such as financial guarantees and reporting requirements, so companies continue to have interest in this kind of support;
- The traditional CDTI blended scheme makes it difficult to provide support for start-ups and young technological companies, as has been previously mentioned. Therefore, the CDTI decided to design a specific support tool based only on subsidies (not loans) and with a greater weight on the technical and business project evaluation: the NEOTEC Grants programme, on offer since 2015;
- Not all companies have the same R&D capacity, the same vision and working habits. The CDTI understand that, in order to make it easier for more to take advantage of their aid scheme, a key issue is to strengthen cooperation on R&D projects amongst large or medium-sized companies (that act as leaders) and small companies that collaborate with the leader. Usually the leading companies bring business vision, financial muscle and resources of all kinds that fit very well with the small partners’ new ideas and greater agility, so the benefit is mutual;
- The financial autonomy of the CDTI gives it flexibility, something that is appreciated by companies, but that also sometimes forces the CDTI to request financial guarantees that could drive companies to reject the financial support awarded. The CDTI understood that reaching a balance on this point is a key issue, and that they need to try to avoid requesting guarantees or try to request the minimum amount necessary;
Blending schemes do not really crowd out other possible financing sources: in fact, commercial banks can use the assignment of a blending scheme as a signal of the viability of a project. Furthermore, their resources are complementary to the ones already provided to the applicant firm.

**Conclusions**

According to the interviewees, the support of the CDTI has been pivotal in allowing companies to maintain their investment in R&D by covering the funding gaps due to financial constraints in time of crisis. More specifically, it seems clear that the budget allocated to policies to support R&D can have an anti-cyclical effect on the economy, allowing, when financial barriers are more relevant, companies find a way to finance their innovative projects. Thus, it seems logical to conclude that in times of financial constraints, the CDTI should assume even more if it is responsible for supporting the innovative Spanish companies and designing action plans that are adapted to the circumstances of the environment.
5.6. CASE STUDY on BLENDING – FGG (AT)

Overview of the national context

The Austrian Federal Government has set itself the goal of bringing Austria into the group of European innovation leaders. The necessary steps were laid down in the "Strategy of the Federal Government for Research, Technology and Innovation - The Road to the Innovation Leader" (subsequently FTI strategy). The FTI strategy pursues a comprehensive approach ranging from education to the science system to the potential for innovation in the Austrian economy. All effective instruments should be combined and contribute decisively to an increase in the economic performance, prosperity and quality of life of Austria as a knowledge society. In the case of market failures, research, development and innovation are invested in too little in competitive markets, because the results are uncertain and cannot be directly and exclusively exploited by their authors. Therefore, the innovation support is intended to remedy this market failure and reduce its negative impact on economic development.

Overview of the instrument

The funding scheme of the Austrian Research Promotion Agency (FFG) provides non-repayable grants mixed with loans or guarantees for bank loans. The scheme has existed since 2004. Before this, there were many agencies that merged with the Austrian funding agency and that ran similar kinds of scheme since the beginning of the 1970s. Approximately 1,400 projects were funded in 2016 accounting for a total budget of EUR 400 m. Roughly 50% of the budget goes to SMEs, and projects at any stage of development can be proposed. The projects are so different in scope that it is difficult to give an idea of an average size.

There is no minimum amount of money funded, and the FFG covers only a part of the project, the company therefore has to propose a project with a proper budget. Companies can propose single firm projects but sometimes (in the minority of the cases) projects involve a consortium. More specifically, the funding is a combination of a non-refundable grant and a soft loan with a fixed interest rate (currently 0.75%) or a guarantee for a bank loan plus a subsidy for the interest rate (currently 2%), with the condition that the amount on loan exceeds half a million EUR and that the company has a high credit worthiness. The mixture of grants and loans is variable: in fact, the proportion of the grant is related to the size of the company (small firm –higher grant).

The repayment of loans is due in a lump sum, 3 years after completion of project. Loans can be transformed into grants in the event of the technical failure of the project. In some cases, the FFG board can also decide to convert loans into grants, fully in case of technical failure, partially if the commercialisation of project results was only partly possible or if the project results were technically outdated.

If the project has been successful and the attempts to commercialise the results were insufficient, the loan cannot be converted. The repayment can be diluted into several instalments in case of cash-flow problems (more on that below). The mixture of grants and loans is variable and is related to the size of the company, meaning that smaller firms will receive a higher grant. In the standard funding scheme, companies receive 50% of total financing, out of which big companies receive 19% grant and 31% loan, medium companies 25% grant and 25% loan, small companies 28% grant and 22% loan (Figure 9).

On the other hand, in the special funding scheme, start-ups get 31% grants and 19% loan as well as 20% of additional loan financing. Therefore, total funding goes up to represent 70% of the project.
Regarding the payment scheme for grants and loans, 50% of grants and loans are provided upon signing the contract, after the fulfilment of any conditions imposed in the contract. 30% of grants and loans are provided after reaching 50% of total project costs (showed in report). Finally, 20% of grants and loans is provided after submission of the final report and cost statement, and after project approval through an audit at the company site and an internal review. The repayment of the loan is due within five years after the end of the programme for start-ups and market starters, and within five years after the end of the project for all the other companies. At the end of the project, the internal team decides on the modalities of loan repayment, while only the board of the agency can decide to convert the loan into a grant.

Regarding the internal team decision at the end of the project, the criteria used include: the progress of the project, the commercialisation and the financial situation of the company. The internal team can opt for an extension of the loan, an extension with an increase in the interest rate, a dilution of the repayment in different instalments, or a rejection of the request. Regarding the board decision at the end of the project, in case of technical failure, the loan is fully converted to a grant. In case of partial failure, the possible commercialization of projects results, or if the projects results are technically outdated, the loan is partially converted to a grant. Finally, if the project is technically successful and there is not a sufficient attempt to commercialise the results, then the conversion of the loan to grant is rejected.

Management of the scheme

There is an internal Advisory Board deciding on the application, monitoring the beneficiary and managing the repayment of the loan. The internal experts get the info from the company and get in contact in order to monitor them. There is direct and regular contact, especially close to the repayment date. Occasionally, in cases where repayments are postponed, the team goes to visit the company and gathers more information. The team consists of about 40 people, including 15 experts in technology and 10-12 experts on the market side who are responsible to monitoring the project together with the financial experts of the agency. The internal team is set up and supported by the Management Board of FFG, which has the last word on the assignment of the loan and on the conversion of the loan to grant.
Objectives of the instrument

The subsidies implemented on the basis of this scheme are intended to provide effective impetus for the stimulation of research and development, especially in the case of medium-sized industrial companies, in the fields of research and innovation policy. The subsidised projects are intended to make a significant contribution to the intensification of industrial research and experimental development and the exploitation, dissemination and optimisation of research and development results. Particular attention is paid to the feasibility of the research projects in the direction of technological development, market relevance and the economic importance of SMEs. In addition to a few large, international companies, the industrial structure of Austria also has a broad range of successful medium-sized industrial companies, which contribute a great deal to the foundation of research and development. This also applies to the fact that, due to information asymmetries, innovation risks and relevant external effects, too little is invested in research, development and innovation.

The medium-sized structure of Austrian industry requires measures to strengthen the innovative power of this important group of companies and to anchor research and development in the company in the long term. Larger companies should increasingly play their role as innovators and invest more in the early stages of research. A themed access in the context of individual projects would offer opportunities for future and niche themes and thus keep the innovation system open as a whole. More specifically, a blended scheme is adopted to increase the sustainability of the policy instrument, as loans are repaid by the large majority of companies and interest revenues are gained every six months.

Moreover, the blended scheme lowers the moral hazard related to funding innovation and increases risk diversification, as large companies always pay back what they receive, while on the other hand, many start-ups cannot pay back and fail. Some other specific objectives include increasing the monitoring of beneficiaries and leveraging of other funding sources. FFG tries to combine the funding of other agencies when possible, and in any case if a company has been funded by FFG then it is a good signal for other investors.

It should be highlighted that innovation support is only allowed if it has an incentive effect, in order to remain within the boundaries of European aid control legislation (i.e. if it triggers additional activities by the beneficiary that would not be undertaken without the support). The existence of an incentive effect is to be excluded, in particular, if the work on the project to be sponsored began before a grant application was received. This does not mean that the potential beneficiary should not have already carried out feasibility studies or comparable preparatory work that is not covered by the funding request.

Roadmap for the application

The application process consists of the following steps:

1) Submission of the application via eCall and reception of a confirmation letter
2) Receipt of the application at the FFG;
3) First examination by internal experts (8-10 weeks) and if necessary, a request of additional information to the applicant;
4) Board meeting deciding on the funding;
5) In case of acceptance, the applicant receives a funding contract stating: contract partner, project cost, granted funding, funding period, general conditions, additional requirements, signature.

Terms of funding

The applicant has to submit a written application to the FFG, using the latest forms provided in the system called eCall. The funding request must include at least:

- Name of the applicant;
• In the case of the applicant companies, the company number and the size of the company and, if necessary, the status of the company, including all of the necessary documents;
• Description of the project, indicating the start and completion date;
• Location of the project;
• Cost of the project;
• Type of funding (e.g. subsidy) and the amount of public funding needed for the project.

Furthermore, the request for assistance must contain a declaration that:
• A proper management structure is in place;
• A proper implementation of the supported project is to be expected, in particular on the basis of the present technical, economic and organisational conditions;
• There is no legal reason for exclusion and no other grounds for exclusion.

Regarding the scoring system, there are four main criteria:
• Technical quality: novelty and innovation, R&D risk, practical value, results, and ecological soundness;
• Feasibility: technical and financial feasibility, quality of management and company organisation;
• Commercial exploitation: market potential (position in the market with respect to the competitors), market experience, and capability to commercialise R&D;
• Relevance to the programme: additionality on project level, additionality on company level (gaining of know-how and R&D dynamics), macroeconomic effects, and social aspects.

The evaluation results of the four areas are not added, but rather span an evaluation area in which the project is positioned, i.e., sufficient positive values must be achieved in all evaluation categories. Details on the evaluation and decision-making criteria are carried out and published in the respective tender or instrument guidelines. Depending on the project category, the evaluation of subsidy requests is based on partly different assessment criteria and decision-making criteria. In order to obtain a complete picture of the project in the company context, research can also be carried out on the spot.

Funding proposals that have met the formal and substantive requirements are professionally assessed and evaluated by the Advisory Board for Basic Programmes, which takes the technical decisions. The FFG Management Board is responsible for setting up the Advisory Board and for taking the final decision about the conversion of the loan into a grant. A code of practice must be enacted for the Advisory Board, which must at least regulate the number and composition of the members, the nomination and appointment of the individual people, the exercise of the right to vote and the duration of the appointment. In addition to the professional qualification, a balanced gender distribution must be taken into account when filling the Advisory Board.

**Implementation of the scheme**

The contract process consists of the following steps:

1. Acceptance of the contract by returning a signed copy to the applicant;
2. Transfer of the 1st instalment (50% of the granted funds and loan);
3. Start of the project;
4. Intermediate report after 50% of the project costs are incurred;
5. Internal examination of the intermediate report and cost statement;
6. Transfer of the 2nd instalment (30% of the granted funds and loan);
7. Within 3 months of the project end: technical final report and cost statement;
8. Technical final audit;
9. On site audit to ascertain the legal use of the funding;
10. Closing and transfer of the final instalment or reclaim of funding.

Main results and benefits

According to the interviewee, the objectives of the scheme have been achieved, even though hard data on outcomes and impacts of the scheme are limited. In fact, an evaluation of the impact of the scheme has not been carried out so far. The KPIs that have been collected include the number of companies funded (1400 so far), the interest rate on loan, the % of paid back loans (97% including interests), the time taken to pay back loans, the number of companies funded, the size of fund at the end of funding period, the number of failures, the funds lost (EUR 8.9 m, i.e. 2.2% in 2016) due to non-payment and conversions.

Regarding the benefits of the scheme, according to the interviewee, the scheme offers the advantage of diversifying the risk, getting budget back and monitoring the recipient more strictly. Moreover, the scheme increases the research, technology and innovation intensity at country level, and strengthens competences in industrial research and the international position regarding from a technological standpoint. On the other hand, the company receiving funding from the blended instrument can finance a higher share of the project, repays a lower interest rate and has more liquidity.

Bottlenecks

Regarding the bottlenecks of the scheme, it is often difficult to find qualified advisors and the costs of managing the instrument are very high (2-5% of the budget). A large number of advisors have to monitor the ongoing projects and manage the project portfolio, while other advisors have to evaluate the proposals. In fact, there is a lot administrative and monitoring work, especially when companies have to repay the scheme. More specifically, the team consists of 40 people, including 15 experts in technology and 10-12 experts on the market side, who are responsible for monitoring the project together with the financial experts at the agency.

A final bottleneck can be seen in the fact that the funding is so high that basically the risk is transferred to the funding agency.

Lessons learnt

Concerning the main success factors, beneficiaries have the advantage that from the general programme, they receive up to 70% of financing volume. On the other hand, other institutions give only grants of 30-40% and the companies, especially start-ups, are not able to finance the projects.

Moreover, the scheme doesn’t ask for guarantees or collaterals, and the interest rate is very low at the moment.

Regarding scalability and transferability, there is no reason why the scheme should not be adopted by other countries and/or at European level. In fact, the Austrian beneficiaries are very satisfied with the scheme, therefore it would be natural to try to expand it at EU level.

It is also crucial to highlight that for the institution managing the scheme, it is very important to keep the instrument flexible and to adapt to all the deviations from the project plan the company goes through.
Moreover, management costs, with respect to traditional funding mechanisms, are high and monitoring tasks are very challenging, because the team is quite small. Taking this into account, the focus on the monitoring system should increase, adopting a similar system that is used in the banking sector, with a more sophisticated monitoring scheme.

Finally, there is no risk of crowding out private sector investors in the case of the provision of loans and equity. The private funding is complementary. In fact, the companies use the approval of FFG to get other funding, as it serves as proof of the viability of the project.

**Conclusions**

The scheme has been operational since 2004 and, according to the interviewee, has played a significant role in supporting research and innovation in Austria. More specifically, the scheme seems quite successful considering the number of companies funded (1400), the high % of paid back loans (97% including interests), and the very low amount of funds lost due to non-payment and conversions (EUR 8.9 m, i.e. 2.2% in 2016).
5.7. CASE STUDY on BLENDING – VFF (NL)

Overview of the national context

The Netherlands has a long tradition of public innovation credits. In particular, traditional instruments include the Technical Development Credit (TOK) and the Technical Development Projects regulation (TDP), running from 1954 to 2003. More recently in 2006, came the Challenger Credit (Uitdagerskrediet - UK), which was replaced in 2008 by the Innovation Credit (Innovatiekrediet - IK), and in 2014 by Early Phase Financing (Vroegefasefinanciering - VFF).

Overview of the instrument

The Early Phase Financing (VFF) funding scheme, operational since mid-2014, consists of a minimum loan of EUR 50,000 and a maximum of EUR 350,000 with a fixed interest rate of 4.93% plus Euribor. 20% of the loan has to be given back three years after the start of the project and has to be repaid fully during a 5-year period. Therefore, the total scheme lasts 8 years, and if the project is not successful the loan can be converted to a grant. That is why the scheme is defined as a loan convertible to grant. Different from IK, there are no milestones for financing. In fact, in VFF, 1/3 of the loan is provided at the beginning, and after that the company can apply for the other 2/3. The payment cannot be stopped if the milestones are not reached.

Like IK, VFF is based on Challenger Credit, which ran for 1.5 years, and consisted of a loan for innovative and fast-growing companies. It is also based on a previous instrument running from 1995-2003, called Technical Development Credit. One of the unique features of VFF is the provision of direct loans to companies, while other instruments in the international arena provide companies with guarantees for bank loans. This leads to an inherent risk factor.

A crucial element of VFF is that it supports the innovative companies from the idea conception to the start of product development, helping them to create and verify commercial concepts, identify the appropriate market and develop the appropriate IPs. This phase is called the early stage for innovative start-ups and renewal phase for the existing companies. Therefore, both start-ups and established companies take advantage of the Early Stage Financing. VFF focuses on three target groups: SMEs, innovative enterprises (≤ 5 years), academic / HBO (higher professional education) and innovative enterprises, whose economic activities arising directly and immediately from research in a university, a college, or a university hospital.

Concerning the rationale for the instrument, before VFF early-stage activities were often not included in R&D subsidised activities, as the latter were already considered in the commercial phase. In addition, some subsidy programmes that offered (partial) support for early phase projects in the Netherlands had expired. Analysis and market signals from individual entrepreneurs, financial sector and intermediary organisations confirmed an increasing need for early phase financing. This need was enhanced during the economic crisis with private investors who invested in this kind of ventures up to a few years, preferring to steer clear of these risky activities. Furthermore, investments in this phase are currently just too far from the market, because the development and marketing of the product is still very uncertain. Therefore, to bridge the valley of death there is the need for an early stage instrument involving business angels and supporting businesses in having greater access to private capital.

Management of the scheme

The Ministry of Economy has developed the Early Stage Financing (VFF) to help companies in the early stage of renewal. The Netherlands Enterprise Agency (RVO.nl) and Netherlands Organisation for Scientific Research (NWO) domain Applied and Technical Sciences (TTW) enter this scheme. RVO.nl is responsible for the scheme implementation regarding the SME and innovative enterprises. TTW executes the scheme for academic innovative enterprises. The Ministry of Economic Affairs decides on the revolving effect of the scheme and the amount of funding. On the other hand, the Ministry of Finance checks
the amount of funding coming in and out. A pivotal role is played by a team of advisors both with technical and financial backgrounds. The advisory committee is involved in assessing applications for SME entrepreneurs and innovative enterprises, and the assessment of the applications is made in order of receipt during a period of up to 13 weeks.

Objectives of the instrument

VFF aims to stimulate innovation in Netherlands, leverage private funding, diversify risks, increase sustainability of the policy instrument, and lower moral hazard related to funding innovation due to the fact that companies winning a lot of grants are less keen to move into commercialisation. An important general aim is also to launch innovative products and ideas that can help to solve social problems and increase prosperity. On the other hand, VFF does not aim to closely monitor beneficiaries, as the managing team wants to reduce the administrative burden.

Roadmap for the application

The VFF application roadmap is very similar to the process followed with Innovation Credit:

- Get oriented: at first applicants need to enter the Quick Scan to briefly explain the project plan. Then, on the basis of the Quick Scan a consultant informs the applicant about the funding opportunities;
- Apply: after having assessed the size of the applicant company, which determines what percentage of credit can be obtained, applications can be made over the course of the year. An applicant should provide a business plan and a financing plan;
- Get acquainted: after the application is completed, a direct contact between the applicant and RVO starts. The project advisor provides information on the scheme, as well as on the application process;
- Decide: within 13 weeks the applicant receives a letter with the final decision: approval of the grant, conditional approval or rejection;
- Implement: in the case of approval, the applicant receives 1/3 of the payment at the beginning of the project. Afterwards, the applicant can apply for the remaining 2/3;
- Redeem: after 5 years the repayment starts. Most applicants opt for a repayment scheme in several instalments.

When considering applying for VFF, it is recommended to first use the QuickScan Early Stage Financing tool, explaining the project plan briefly. On this basis, one of the RVO consultants will carry out an initial assessment of the chances of a successful application and will provide valuable feedback.

Terms of funding

The scheme is open to every company that meets the start-up criteria. Furthermore, the information that has to be provided is pretty limited: a business plan and a financial plan. Moreover, there are no sectorial limitations, and all the relevant actors know the VFF so they refer to it when they cannot fund start-ups for whatever reason.

The application process consists in providing a business plan and a financial plan, along with a letter from the investor willing to match the funding awarded by RVO. Concerning the application process, at first there is an interview with the advisors from RVO, and then the prospective entrepreneurs pitch their plan before the advisory committee. During the project, normally lasting two years, the advisors visit the company very often. After the project is over, the company has to provide financial data every year. It is interesting to notice that IK and VFF can be used in sequence.

An important condition for receiving funding is a matching letter from a prospective investor who will finance the rest of your early stage process based on a set of validation requirements. The investment involved has to be at least the same amount that is
received from the government. The investor has to be new (no capital invested in this company as of yet) and has to have the knowledge, network and experience to assess the business case and guide the company during the commercialisation process. Moreover, the investor should not have an interest as a customer, as a supplier or be in a personal relationship (family, partner) with the applicant, and should provide proof of financial solidity.

The commitment and the future investor involvement are crucial. If the early phase plan has been completed and the "proof of concept" has been successfully demonstrated, the prospective investor finances the next phase: development through to the final product and marketing. Therefore, the commitment of the investor is a strong signal that the loan can be paid back and that the project is viable.

Apart from the presence of an external investor, other terms of funding for an innovative start-up include:

- The application is in the early phase trajectory and the company should not have received any subsidy for the product to be developed. The early phase trajectory should be completed within two years.
- Being enrolled at the Chamber of Commerce for up to 5 years at the time of funding
- Having at least 10% of operating costs consisting of expenses for research and development, for at least one of the three years for support.
- Prove that the products (or services or processes) to be developed are technologically new. This can be done through market research showing a substantial improvement of existing products and services in the industry, or by an assessment of an external expert.

On the other hand, an SME receives funding for the renewal phase if (apart from the presence of an external investor):

- The research to be funded concerns the acquiring, combining, shaping and using existing scientific, technological, business and other relevant knowledge and skills to plan, arrangement or design new, altered or improved products, processes or services;
- The renewal phase was not started at the date of application, and can be completed within two years;
- The company does not have alternative resources to carry out the research.

The SME is considered to be `small` and receives a loan equal to 45% of the cost of the research if it has fewer than 50 employees, if the annual turnover or annual balance sheet does not exceed EUR 10 m, and if the cost of research is between EUR 110,000 and EUR 350,000. On the other hand, the SME is considered to be `medium` and receives a loan equal to 35% of the cost of the research, if it has fewer than 250 employees, if the annual turnover is up to EUR 50 m or the balance sheet does not exceed EUR 43 m, and if the cost of research is between EUR 142,000 and EUR 350,000.

The advisory committee can reject the funding request on the following grounds:

- If it is probable that the applicant may obtain the funding for which the application has been submitted from others;
- If it is insufficiently likely that, on the basis of the early phase plan, the future investor is willing or able to finance the applicant;
- If the anticipated cost of the early phase is higher than EUR 350,000 or lower than EUR 50,000;
- If there is insufficient confidence that the applicant will be able to complete the early phase from the technical point of view, and therefore it is unlikely that the applicant will be able to obtain financing for the phase after the early phase project by future investors;
- If there is insufficient confidence that the innovative starter may repay the money loan.
Implementation of the scheme

The main beneficiaries of the scheme are innovative start-ups, SMEs and innovative academic starters, with an idea that is in its early stages, and that have to carry out a particular proof of concept to convince future investors. Therefore, the development of a commercially viable prototype is out of scope. Different to IK, in VFF there is no sectorial focus and no separate budgets. A lot of projects are, in fact, ICT and life science based. Moreover, VFF is concentrated on early stage financing, and has the unique feature of the requirement to provide a matching letter from an investor. The duration of the scheme is 5 years, the average size of the scheme is EUR 350,000, and the total budget was EUR 7 m in 2015, EUR 5 m in 2016, EUR 7 m in 2017. Almost all the budget from previous years has been used.

Main results and benefits

As for the impact and results of VFF, it is too soon to have an idea because companies are only now starting to repay the loans. However, a mid-term review is foreseen for next year, and the impact assessment of the scheme estimates that 20-40% of the companies will repay the bill. Some information about the number/rate of failures and the number of companies funded is available in the appendix.

Examples of successful projects include:

- Electronic Patch to Cure Diabetic Foot[^98]: Plasma Cure is developing an electronic patch to cure chronic foot ulcers in diabetics. This patch not only saves a lot of suffering, but also a lot of money. Leveraging the Early Stage Financing (VFF), the company is carrying out the first required safety investigation;

- Treatment of Spinal Cord Injury[^99]: Neuro Plast BV found a method to treat spinal cord injury patients with clean, endogenous stem cells, in order to reduce the chance of rejection. With the assistance of the Early Stage Funding and support of the National Entrepreneurial Netherlands (RVO.nl), Neuro Plast managed to get the product into the spotlight;

- Electronic health record tool for recruiting patients for clinical trials[^100]: CTcue developed a tool that physicians and hospitals quickly and efficiently find suitable subjects for clinical trials. This patient-trial matching tool was very interesting, but funding proved to be difficult. The Early Stage Financing (VFF) came to the rescue, so that in 1.5 year time the tool went from an innovative idea to an internationally coveted product.

Bottlenecks

One of the bottlenecks identified in the case of the VFF is the fact that the letter from the investor is not a strong enough commitment, as investors often go back on their words very quickly. Therefore, the chances of the investor becoming implicated in the project are slim.

Also, not establishing milestones as a basis on which to award the finance is a problem. This is because, after the second payment has been made, (2/3) of the money has been paid and there is nothing that can be done if the project stops.

Moreover, it is very difficult to define what the early stage of a project is: there are no clear boundaries meaning that applicants sometimes apply even though they are not sure if they really are in an early stage.

[^100]: http://www.rvo.nl/actueel/praktijkverhalen/van-innovatief-idee-tot-internationaal-begeerd-product
Similar to IK, the team responsible for the VFF scheme confirms the high cost of running the scheme (EUR 740,000 for 2017) because there are 80 applications a year. If the tool were a fund of funds, the applications would have likely been 4 or 5 per year.

Just as in the IK case the team responsible for the VFF case also reported a clear funding gap in the market for scale-ups.

**Lessons learnt**

The team managing the VFF instrument highlighted that a fund of funds structure would be better, because in this case the person managing the fund would also help the company to become a successful start-up. Therefore, it would be interesting to not only provide funding but also some consultancy and advice services.

A fund of funds would be also more effective because the RVO would be only one of the contributors.

Concerning recommendations to the European Commission regarding the adoption of blended instruments alongside existing financial instruments, the interviewee pointed out the need to listen to the applicant’s point of view as well as the views of the relevant organisations, such as the regional development funds.

**Conclusions**

The scheme has been in operation since mid-2014, therefore it is too early to provide an assessment of the extent to which the initial objectives have been met and what the impact has been. According to the person in charge of the scheme, 20-40% of the companies are expected to repay the bill, so the scheme is expected to be quite successful.
ANNEXES

ANNEX 1 Measuring success of co-investment

In the design of co-investment schemes, the most difficult part relates to getting policy makers to articulate objectives and priorities clearly. This step is vital as it influences structure, operation, assessment of whether the scheme is successful or not, and performance measurement. A proper definition clarifies the expectations of all parties involved, i.e., co-investment fund’s management team, government, partnering organisations and entrepreneurs.

The objectives below have been set out in the context of, and ranked according to, the perceived importance of the beneficiaries. Not doing so can result in conflicting KPIs and would generate confusion. Gray (2015) suggests primary and secondary beneficiaries of a co-investment fund. He views potential and existing entrepreneurs as primary beneficiaries. The enabling players – mainly VC funds, business angels, and business angel networks – are seen as secondary beneficiaries of co-investment funds.

1. Policy objectives

While public co-investment funds provide funding to companies, their typical primary objective is to alter the behaviour, capacity and capability of potential and existing private investors in such a way that they will help support the economic development objectives. The various interviews and evaluation findings suggest a number of objectives on various levels and for various beneficiaries.

High-level objectives

Though governments tend to have a range of high-level objectives, those relevant for this discussion include:

- Stimulating economic development and growth;
- Stimulating innovation and supporting the development of a national market for innovation financing.

There are constraints to achieving these objectives, such as:

- Keeping fiscal risk at a set minimum level;
- Concentrating public support in priority areas, e.g., only where a market failure is perceived.

Intervention objectives

The government intervenes in the investment market as part of a policy mix to achieve these high-level objectives. That implies a refinement of the objectives set before:

- Closing an identified equity gap, notably related to the early stage investment in innovative companies and regional development;
- Creating a market for private investment in innovative early-stage technology-based firms, where previously there was none;
- Demonstrating to potential investors that returns could be made by investing in early stages, therefore stimulating the growth of investments in this area.
- Formalising, organising and legitimising nascent cultures for investing in innovative early-stage technology-based firms;
- Providing an integrated, consistent and cohesive approach to small business funding;
- Improving access to finance for SMEs;
- Improving access to finance for innovative technological firms;
• Improving access to finance for SME’s in targeted regions;
• Increasing the scale of, and enhance the development of, networks for early-stage investment;
• Improving the quality of investment by accelerating the development of greater professional capacity and capability in the market for intermediation between investors and SMEs;
• Increasing the depth in the specialist skills needed to assess and manage early-stage technology-based investment;
• Altering the behaviour, capacity and capability of potential and existing private investors;
• Demonstrating the commercial viability of the VC and business angel asset class.

In this case, there are also some constraints to achieving these objectives, such as:

• Saving costs of public investment programmes;
• Achieving a better leverage for public money by closer cooperation with the investment industry;
• Providing public funding to targeted beneficiaries while avoiding crowding-out and not displacing existing investment activity.

Co-investment fund objectives

Governments use co-investment funds to accelerate the development of VC markets, the business angel community and business angel groups. The main bottlenecks the public co-investment fund has to address are its limited resources to source deals and conduct due diligence, and the scarcity of skilled lead investors. Typical objectives set for co-investment funds include:

• Creating success stories for early-stage technology-based investment that attract further investment;
• Generating a minimum financial return to keep co-investment funds evergreen;
• Generating a minimum financial return to demonstrate the success to potential investors;
• Developing networks of venture capitalists and business angel groups that engage in early-stage technology-based investment.
• Increasing the number of co-investing partners by attracting new business angels who have not invested before;
• Increasing the diversity of co-investing partners;
• Improving standards for due diligence and the selection of deals.
• Providing greater liquidity and share risk with qualified and properly incentivised investors.

Co-investment funds are typically constrained by:

• They can only partner with intermediaries that are in line with eligibility and exclusion criteria;
• Public co-investment funds have to invest usually on equal terms with the private investors (pari passu)\textsuperscript{101};

\textsuperscript{101} Asymmetric funding schemes that allocate a higher proportion of the returns to the private sector investors and a greater part of the losses to the public sector investors exist but remain an exception for co-investments (see Gray, 2015).
The costs of the co-investment fund operation need to be covered;

- They cannot aim to avoid the risk of investments or to maximise financial return for the sponsors and investors in the co-investment fund;
- There are policy limitations related to the investment size the co-investment fund can provide, the legal share it can take, and the availability of follow-on funding (also restricting the financial performance the co-investment fund can achieve).

The policy objectives set by the co-investment fund’s sponsors can be in conflict with those of private investors. The government as a sponsor is mainly interested in the successful implementation of its policies, whereas private investors prioritise financial returns. In order to bridge these, not always aligned, objectives, co-investment funds usually neither aim for maximising financial returns nor for avoiding investment risk.

Co-investing partner objectives

The investment going to the companies targeted as secondary beneficiaries is a by-product of supporting venture capitalist and business angels. Few policy-oriented objectives can focus on intermediaries that are beneficiaries, as well. Therefore, the objectives have to be largely aligned between the public co-investment fund and these private investors:

- Increasing the number of deals in innovative early-stage technology-based firms;
- Increasing the quality of early-stage technology-based investments;
- Decreasing the risk of innovative companies failing;
- Increasing the probability of success for innovative companies.

Co-investment partners are typically constrained by the fact that:

- They can only benefit from public co-investments for investee companies that are in line with eligibility and exclusion criteria.

Investee companies

The success of investors depends on picking good companies to invest in. Entrepreneurs as primary beneficiaries should build a successful business, but it does not stop there. It is expected that good companies create more secure and high quality employment in innovative industries.

2. Key performance indicators

Key performance indicators define set of quantifiable measures used to gauge or compare performance in terms of meeting objectives. KPIs are needed to measure a public programme’s progress towards achieving the goals set by policymakers. They also depend on the beneficiaries, for instance:

- SMEs as beneficiaries imply KPIs relating to the level of funding going to SMEs, job creation and the number of deals made.
- Business angels as beneficiaries imply KPIs such as number of partners and their quality.

Typical KPIs for co-investment funds are listed in the Table below. It is important to note that the definition of KPIs tends to be an afterthought, if done at all. Governments are often reluctant to commit themselves to objectives. Particularly, in the situations where objectives are conflicting, when the outcome of the programme is rather uncertain and where the priorities of policy makers tend to change over time.
<table>
<thead>
<tr>
<th>Key Performance Indicators for co-investment</th>
<th>Importance (examples)</th>
<th>Measured (examples)</th>
<th>Actionable by (examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companies founded</td>
<td>Support entrepreneurs</td>
<td>Number in relation to time interval, time to receive funding</td>
<td>Ease access to funding, quality of fund manager selection process</td>
</tr>
<tr>
<td>Number of business angel partners</td>
<td>Support emerging business angel market</td>
<td>Number in relation to time interval</td>
<td>Ease access to funding, quality of business angel selection process</td>
</tr>
<tr>
<td>Quality of business angel partners</td>
<td>Support emerging business angel market</td>
<td>Number of deals screened, number of deals done as lead investor</td>
<td>Quality of selection process; technical support to business angels</td>
</tr>
<tr>
<td>Number of co-investment agreements with VC funds</td>
<td>Selection of high quality investments</td>
<td>Number in relation to time interval, time to fund closing</td>
<td>Terms and conditions of framework agreement, quality of fund manager selection process</td>
</tr>
<tr>
<td>Quality of partnering VC funds</td>
<td>Selection of high quality investments</td>
<td>Assessment of VC firm, presence of foreign limited partners</td>
<td>Quality of fund manager selection process</td>
</tr>
<tr>
<td>Leverage effect</td>
<td>Optimize use of public funding, sustainability of venture industry, confirmation of success</td>
<td>Ratio of public and private funding</td>
<td>Quality of selection process, terms and conditions</td>
</tr>
<tr>
<td>Attracting foreign funding</td>
<td>Optimize use of public funding, sustainability of venture industry, confirmation of success</td>
<td>Ratio of domestic private funding and foreign private funding</td>
<td>Quality of selection process, terms and conditions</td>
</tr>
<tr>
<td>Total amounts invested</td>
<td>Effectiveness of public programme</td>
<td>Total public funding made available, total private funding made available to targeted areas</td>
<td>Terms and conditions, funding process</td>
</tr>
<tr>
<td>Average deal sizes</td>
<td>Impact of public funding</td>
<td>Average public funding made available per deal, average total private funding made available to targeted areas</td>
<td>Terms and conditions</td>
</tr>
<tr>
<td>Number of jobs created</td>
<td>Support community</td>
<td>Number in relation to time interval, benchmarking to economy</td>
<td>Ex-ante design of programme</td>
</tr>
<tr>
<td>Number of jobs supported</td>
<td>Support community</td>
<td>Number of jobs in supported companies at given time</td>
<td>Quality of selection process, follow-on financing being made available</td>
</tr>
<tr>
<td>Quality of jobs supported</td>
<td>Support community, improve quality of employment</td>
<td>Salary values</td>
<td>Quality of selection process, follow-on financing being made available</td>
</tr>
<tr>
<td>Number of patents filed</td>
<td>Stimulate technological innovation</td>
<td>Number in relation to time interval</td>
<td>Quality of selection process, sectors targeted</td>
</tr>
<tr>
<td>Follow-on funding provided</td>
<td>Support entrepreneurs and community, back winners</td>
<td>Amount being made available in relation to time interval</td>
<td>Quality of selection process</td>
</tr>
<tr>
<td>Number of failed companies</td>
<td>Support entrepreneurs and community, effectivens of public support, reputation of venture industry, reputation of public programme</td>
<td>Number in relation to time interval</td>
<td>Quality of selection process, follow-on funding made available</td>
</tr>
<tr>
<td>Follow-on funds raised</td>
<td>Sustainability of venture industry</td>
<td>Ratio of successful fund raising / abandoned fund raising</td>
<td>Quality of selection process, alignment of interest with private sector limited partners</td>
</tr>
<tr>
<td>Successful exits (IPOs, M&amp;A) by number</td>
<td>Create further investor interest, attract private sector investors, confirm success</td>
<td>Number in relation to time interval</td>
<td>Quality of fund manager selection process</td>
</tr>
<tr>
<td>Successful exits (IPOs, M&amp;A) by transaction value</td>
<td>Create further investor interest, attract private sector investors, confirm success</td>
<td>Total transaction value in relation to time interval</td>
<td>Quality of fund manager selection process</td>
</tr>
<tr>
<td>Return on investment</td>
<td>Attract private sector investors</td>
<td>Multiples and IRRs on privately invested capital, various benchmarks (public markets, private equity markets)</td>
<td>Quality of selection process, terms and conditions</td>
</tr>
</tbody>
</table>
**Compiling and monitoring KPIs**

The effort to compile and monitor KPIs is significant. It is a fair assumption that KPIs are only tracked systematically if they really were an objective of the programme. More often than not, KPIs are just defined ex-post in the context of reviews in order to demonstrate the success of programmes according to some criteria.

Systems are to be put in place at the stage of the design of the co-investment fund to systematically collect the data. However, interviews conducted during the course of this study suggest that this is still rarely done and confirm the observations made by Gray (2015) that "data collection is consistently reported to be difficult and more expensive than expected, due to the data not being seen to be a priority for the companies or the partner investors".

**Actions to meet KPIs**

KPIs need to be linked to actionable steps to achieve the set objectives:

- In the case of co-investment funds, the risk of crowding out is mitigated by limits, such as a limitation not to invest more than 50% alongside private investors;
- The quality of the co-investing partners can be influenced through selection (due diligence) and monitoring. Many co-investment funds are also providing technical assistance and training to business angels. A high quality of partners leads to lower levels of intervention needed and thus to lower costs for the public co-investment fund;
- In the case of involving foreign investors, the number of foreign VC funds investing and the amount of funding provided can give an indication regarding the quality of the deals done. The involvement of foreign venture capitalists was a central idea underlying the Israeli Yozma programme mentioned by several interviewees (See ANNEX 4 for details).

**Conceptual issues**

One significant issue is that many KPIs, such as job creation or Gross Value Added, are of no relevance to private sector investors. However, economic development, and in particular job creation, lie at the heart of public sector intervention. Consequently, co-investment funds are supposed to track the number and the salary levels of new jobs created in the SME beneficiaries. For example, Hayton et al. (2008) tracked the impact of the Scottish Co-Investment Fund on employment creation. Furthermore, the Northern Ireland Co-Investment Fund uses job creation as one of its KPIs.

According to Gray (2015), there is, however, some variance as to the extent to which job creation is specifically measured and assessed, reflecting their wider objectives, notably related to skills improvement. In fact, SMEs often find employing additional people to be difficult and that the job creation KPI is of little relevance for them. As one interviewee pointed out, if the objective is to create companies with many employees, it will likely result in low-wage employment and will not create jobs in the creative and high technology industries. Therefore, for instance, the New Zealand Seed Co-investment Fund had no KPI’s related to job creation at all. The Business Angel Co-Investment Fund (UK) initially had specific KPI’s in relation to the number of jobs created, but these have been dropped (Gray, 2015). A more suitable proxy to assess job creation potential could be tracking the number of successful companies created, as they are likely to create employment.

Some co-investment funds have specific targets for the number and value of investments made within a defined period. Many of the KPIs established for public sector co-investment funds, such as: the amount of money to be invested, the number of deals done or the maximisation of the amounts invested in one company, are likely to lead to a crowding out of the private sector, as it is difficult to find suitable deals where so much money can be put to work.
Similarly, defining priority sectors based on political considerations does not make sense. Based on his experience in advising the World Bank, Gray (2017) mentioned the case of Jamaica, where inducing business angels to invest in technology companies (e.g., mobile communication, environmental technology) is unlikely to lead to positive results, as there is no history of this type of investment in the country. Instead, it is important to focus on investing in people and not worry about what they are investing in.
ANNEX 2 Potential issues while designing VC Co-investment scheme

Below, the potential issues that could negatively affect a public VC co-investment scheme are discussed.

Potential weakening of the VC model

There is an optimal span of a venture capitalist’s portfolio, and limiting the size of the funds raised initially can improve a fund manager’s ability to deal with entrepreneurial agency problems, as Inderst et al. demonstrated in various papers.102 These researchers found that a commitment to ‘shallow pockets’ is an optimal strategy when there is a high failure rate and high rewards, as opposed to portfolio companies with high probabilities of success. By staging their investment in several rounds, venture capitalists retain the right to deny follow-on financing to particular portfolio companies in favour of other, more promising ones. As a result, entrepreneurs are put into competition with each other in the fund’s portfolio for the limited ‘informed’ capital at the refinancing stage. Restricting financing may provide more powerful incentives, since even small changes in performance may be crucial in determining whether refinancing is obtained (Sahlman, 1990).103 Without constraints on financing, fund managers cannot credibly threaten to withhold further funding. Therefore, the ‘shallow pockets’ give the fund managers more bargaining power, as entrepreneurs are forced to compete for refinancing. Additional resources for co-investments may have an adverse effect on early stage funds as they neutralise this strategy.

Insufficient deal flow and too many resources

For a VC fund, its size needs to be in line with its investment strategy. For instance, Silicon Valley firms are well known for restricting fund sizes to keep them in line with a high quality deal-flow. Generally, limited partners are concerned if firms increase the size of successor funds too quickly as it raises questions as to whether this has an adverse impact on the quality of deal selection and whether the number of fund managers is sufficient for sourcing attractive deals, doing due diligence and monitoring the portfolio companies. Significantly increasing staff size can raise concerns as to whether the firm’s management and internal systems are able to deal with the necessary organisational changes. Limited partners and their experience in selecting fund managers keep fund growth in check, whereas too much public money for co-investments has the potential to counter-act this control mechanism.

Straining relationships between parties involved

Preqin in 2014 surveyed views on co-investments (Duong, 2014). The survey covered 80 general partners worldwide and, for this reason, may not be fully representative for European venture capital. However, with 75% of fund managers seeing the building of a stronger relationship with limited partners as an important benefit and 45% of respondents highlighting the improvement in chances of successful fundraising, the results are in line with the feedback received from European industry practitioners. Importantly, 33% of fund managers fear the negative impact of co-investments on relationships with limited partners that are not offered co-investment rights, and another 7% are concerned that co-investing limited partners have more control over the fund’s portfolio companies.

i. Other limited partners

Co-investments may be a source of conflict of interests with the fund’s other limited partners (Gartenwarter & Weidig, 2005). On the one hand, fund managers may be

---

102 Inderst & Muenich (2003) and Inderst et al. (2007)

103 ‘The most important mechanism for controlling the venture is staging the infusion of capital. (...) Capital is a scarce and expensive resource for individual ventures. (...) The credible threat to abandon a venture, even when the firm might be economically viable, is the key to the relationship between the entrepreneur and the venture capitalist. (...) The seemingly irrational act of shutting down an economically viable entity is rational when viewed from the perspective of the venture capitalist confronted with allocating time and capital among various projects’, quoted from Inderst et al. (2007). Limited partnership agreements usually contain covenants that reduce the ability to raise further funds. This renders the commitment to ‘shallow pockets’ more credible.
inclined to spend more time on particular portfolio companies if they receive additional management fees, carried interest, or if the co-investing limited partner is of 'strategic importance' to them. Here, they may overweigh selected limited partners in the choice of the best investments (Da Rin & Phalippou, 2016). On the other hand, if no fees are paid for the co-investments, the other limited partners are effectively cross-subsidising this activity, as pointed out by one interviewee.

This is particularly problematic in situations where co-investments significantly outperform the fund’s other portfolio companies, as the non-co-investing limited partners will feel disadvantaged and are unlikely to back the next fund raised by the private equity firm.

**ii. Fund managers**

Fund managers and other non-co-investing limited partners may limit their upside. Therefore, established teams with an investment strategy supporting a stronger deal flow tend to simply raise larger funds and not pursue co-investments further.

For fund managers, co-investments can also come at a risk. If disputes on an investment arise, it can affect the relationship with the limited partners and negatively affect future fundraising. A fund manager may not be able to simultaneously strengthen the relationship while sticking to the investment strategy.

**iii. Portfolio companies**

From the viewpoint of portfolio companies, public co-investments offers significant advantages: more capital is provided under less onerous conditions (with less due diligence and quicker). To some degree, entrepreneurs may also feel better protected as the write-off of a company backed by public money is likely to be questioned, for instance by the court of auditors, and thus will be avoided by the fund managers.

In addition, rather than trying to pick winners, there is a risk that public co-investments will cosset losers. A major part of the VC model is based on the swift stopping of under-performing investments. Therefore, a lower number of write-offs could indicate poorer incentive structures.

**iv. Government**

As far as governments are concerned the situation is problematic where co-investments significantly underperform fund investments. It raises the question of the adverse selection of co-investments or of the fund managers.

It is a fair assumption that the private equity firm has a preference for non-governmental investors, as they are more likely to back future funds and to help the firm to build up their reputation. To maintain their relationship with the other limited partners, fund managers may seek to use public co-investments for the ‘lemons’ in their portfolio, either in order to reduce the portfolio allocation to underperforming companies or to avoid their write-off and the resulting losses.

There is a wide consensus that limited partners should focus solely on committing to the very best funds. This cannot be compensated by funds offering co-investments. In this context, one interviewee called a government entity as the ‘co-investor of last resort’ suggesting that there can also be an adverse selection of fund managers in the case of public co-investments.

**Crowding out**

Co-investments are usually classified between a direct investment and a normal partnership due to their risk and reward profile. Some public co-investment schemes provide only follow-on financing after the VC fund had already invested in previous rounds, and, thus, invest in more mature and less risky deals. One interviewee argued that there is a gap in the provision of follow-on funding, which would be consistent with the findings made by Preqin (2012), i.e., that limited partners only co-invest with funds that meet
certain size requirements. However, there remains a potential for crowding out private sector investors. Should a fund have a position left in a round of financing, they may be better off by getting in other experienced VC or strategic investors rather than private sector investors.
### ANNEX 3 Co-investment fund interaction structure

#### Table 9 Strength of relationship between co-investment fund and private investors

<table>
<thead>
<tr>
<th>Strength of relationship</th>
<th>Stake in a VC fund plus co-investment agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>Probably the strongest possible relationship is the case where a co-investment fund is also a limited partner in the VC fund it is co-investing with. In this case, the partnership is not only based on an intensive due diligence on the fund management team up-front, but on an on-going relationship between the VC firm and one of its institutional investors. As governments cannot be member of a business angel network, entering into such a relationship is only possible in the case of co-investing with VC funds.</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Co-investment agreement with strong due diligence on private sector investor</td>
</tr>
<tr>
<td></td>
<td>Private sector investors, such as business angel networks, VC funds, and corporate investors, apply to become partners of the co-investment fund, with partnership status being granted following a formal appraisal process. According to Gray (2015), all of the co-investment funds in his sample carry out extensive due diligence of the partnering organisations prior to doing an investment with them.</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>Co-investment agreement with limited due diligence on private sector investor</td>
</tr>
<tr>
<td></td>
<td>Other co-investment funds take a rather light-touch approach to the appraisal of their partnering organisations that does not go much beyond confirming the investor’s compliance with the scheme’s requirements. The relationship is usually formalised through an agreement that can, for instance, identify the areas of interest and how information on deal flow will be exchanged. This, however, implies that the co-investment fund will need to do an in-depth due diligence on every deal proposed by the partner.</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration

#### Table 10 Levels of delegation of the decision making in co-investments

<table>
<thead>
<tr>
<th>Delegation of decision making</th>
<th>Due diligence and investment decision making by private sector investor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>In cases where there is a strong partnership based on trust (e.g., after in-depth due diligence or because there is a long-standing and on-going relationship) decision making can be fully delegated to the partnering organisation while after agreeing investment eligibility guidelines, deal sourcing and investments’ due diligence. In this configuration, the public co-investment fund follows the lead of its private sector partners that is given an allocation of capital that can be drawn down as needed.</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Due diligence by private sector investor, investment decision subject to public co-investment fund review</td>
</tr>
<tr>
<td></td>
<td>In any case, the co-investment fund’s team needs to confirm that the</td>
</tr>
</tbody>
</table>
proposed deal is eligible. It is possible that the co-investment fund reserves the right to decline a deal even if the eligibility criteria are met\footnote{For example in the case of the Scottish Co-Investment Fund - see Hayton et al. (2008)}. As Gray (2015) pointed out, the level of due diligence conducted on individual deals by the co-investment fund also reflects the level of development of the local business angel markets. For instance, the UK Business Angel Co-investment Fund carries out an extensive review of the due diligence done by the partnering business angels, but it is not initiating its own one.

<table>
<thead>
<tr>
<th>Low</th>
<th>Due diligence and investment decision driven by public co-investment fund</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Many regions have an underdeveloped market with too few adequately skilled lead business angel partners. Consequently, in such circumstances the co-investment fund takes a much stronger involvement and even guides the due diligence on deals proposed. Here, the public co-investment fund can be seen as acting more like a lead investor, as opposed to taking the usual passive approach of following the private sector (Gray, 2015). Until more business angels have developed the necessary skills, the co-investment funds needs to provide additional resources, increasing the running costs of the public intervention and resulting in slower decision making.</td>
</tr>
</tbody>
</table>

\textit{Source: Authors’ elaboration}
ANNEX 4 Yozma Fund

Overview of an instrument

Yozma is said to have effectively created the Israeli venture capital market in 1993 through the formation of its first venture fund, Yozma I. At that time, Yozma received USD 100m (about EUR 90 m) of public funding to attract private funds of over USD 150m (about EUR 135 m). It invested USD 8m (about EUR 7 m) in each of the 10 funds that were all required to raise another USD 10 m to USD (about EUR 9 m) 12m (about EUR 11 m) from ‘a significant foreign partner,’ presumably an overseas venture capital firm. Yozma I also retained USD 20m for direct investments. Between 1992 and 1997, the 10 VC funds supported by Yozma I raised more than USD 200 m (about EUR 180 m). Yozma I’s key objective was to bring foreign venture capitalists’ investment expertise and network of contacts to Israel.

Structure

Yozma was the creation of the Chief Scientist of the Infrastructure Ministry at the time, Yigal Ehrlich. He explained that the structuring of the Yozma I scheme was the result of several months of discussions with experts from the budget division and other divisions in the Ministry of Finance, industry experts, investors, American companies and bankers. These ideas were integrated into a policy in what (Ehrlich, 2015) described as ‘a trial and error process’.

An important feature of Yozma I was that its structure preserved intense performance incentives on the upside. It provided a buy-out option for private sector management participants, thereby rewarding high investment performance. The return that the government could enjoy from these funds was capped, with the remainder flowing to the private investors. Effectively, the private investors had a call option on Yozma I’s investment at cost, plus (i) a nominal interest rate and (ii) seven percent of the future profits from portfolio company investments in which the fund was then invested. Importantly, Yozma I provided no guarantee against losses, and, unlike other programmes, private investors and the fund’s managers bore their share of the downside risk. Gilson, (2003) finds that this incentive structure compares favourably to other programmes. Yozma is interesting because its structure served to leverage the returns and, as a consequence, increased the investors’ incentive to carefully monitor the portfolio companies.

Involvement of foreign investors and decision making process

Yozma I’s key feature was the involvement of overseas venture capitalist. In fact, Israeli financiers were actively discouraged from participating in the programme. Yozma I did not get involved in selecting the portfolio companies but left this task exclusively to the fund managers who bore the investment’s risk and return. While investments in funds were passive, the fund’s managers and other investors were highly incentivised. Gilson (2003) identified interposing a highly incentivised intermediary between passive investors and the portfolio company as a critical aspect of the Yozma’s structure.

Main results

According to Gilson (2003), Yozma I was plainly influenced by the US experience and, compared to programmes elsewhere in the world. It came ‘closer to getting the incentive structure right’. Its performance was consistent with its highly incentivised investment structure. The programme helped create ten private VC firms and is credited for jump-starting a vibrant VC market in Israel. The main features of the programme include the alignment of interests and involvement of foreign investors, which helped to create ‘knowledge spill-overs’ that built on international best practices while mitigating political influence on investment selection. These features have made this structure, in the eyes of many industry observers, a blue print for government intervention in the VC market.
Applying the Yozma’s experience

The success of Yozma attracted a lot of attention and several countries tried to replicate the structure. The one that appears to have got the closest in its efforts was the Chilean CORFU (Corporación de Fomento de la Producción). CORFU was established in 2001 and aimed to provide an incentive for the development of VC funding in Chile.

Like Yozma I, CORFU acted as a limited partner in the privately managed funds. It provided a subsidy to fund investors, including fund managers, through capping its return on its investment. The programme backed eligible VC funds through instruments that – while being denominated as ‘loans’ – functionally are preferred equity with a cap on return. It, too, leveraged the private investors’ and the general partner’s equity stakes in the fund. Other features of CORFU’s structure were particularly interesting as they compensated for the general partner’s missing track record in Chile’s nascent market. In under-developed VC markets, fund managers need to gain a reputation for their investment acumen first. Generally, the reputation the fund managers put at stake and the structure of the incentives, are sufficient enough to assure investment performance.

CORFU addressed these issues in two ways. Firstly, it had features that, as Gilson (2003) interpreted them, are substitutes for the operation of a reputation market amongst venture capitalists. The typical general partner in the US usually contributes only around 1% of a venture capital fund’s total commitments. CORFU required that the fund managers invest at least 15% of their own total assets in the managed fund. This did not mean that the fund managers had to be rich, but they needed to put more ‘skin into the game’ to ensure that these usually new fund managers have a direct share of the downside. Secondly, the programme sought to ensure a greater monitoring of the fund manager’s performance through the private sector investors. Monitoring of the fund manager was encouraged through requiring the presence of large investors. Each fund had to either have at least five unrelated investors, each holding a minimum of 10%, or at least one institutional investor holding a minimum of 20% of the fund’s equity.

In the case of the Chilean CORFU example scheme, the policy makers drew the right conclusions from the successful Israeli programme. CORFU seemed to have got the structure right and was predicted to succeed, but according to Avnimelech & Teubal (2006) it failed mainly due to the lack of deal flow.

There are other cases were governments are said to adopted some principles from Yozma, e.g., Australia, Taiwan, Czech Republic, South Africa, New Zealand, Denmark, Korea, Croatia, Russia, Singapore. According to Yigal Ehrlich, he was involved in several of these attempts, but his recommendations were usually not fully taken on board. For most policy makers, the simplicity (and the importance of simplicity) of Yozma is not clear, because in a way it is in conflict with government thinking.

Lessons learned

While Yozma has created a lot of attention, the reasons for its success have been subject to little, if any, critical review. In many discussions, a feature from Yozma is cherry-picked, for instance:

- ‘Yozma is an automatic matching scheme by the government’: Many venture capitalists point to the fact that in the case of Yozma, the government was not involved in the selection of the VC funds and argue for a general automatic matching of private with public money. What is overlooked, however, is that only those VC funds that attracted a critical mass of foreign investors benefitted from Yozma I. Without this check, against lobbying and political interference, an automatic matching scheme is likely to lead to a proliferation of weak funds and ultimately to an under-performing VC market.

- ‘Yozma is an upside leverage’: There is an impression that an upside leverage (provided by the call option on Yozma’s investment at cost) was key. However, an upside leverage is unable to compensate fully for a systematic under-performance of some VC markets and, therefore, cannot be used as a remedy over a longer term. In any case, most policy makers view allowing private sector investor (particularly foreign
ones) to benefit additionally through this mechanism from government funding as unacceptable.

- It is quite telling that despite Yozma I’s success, the Israeli government has not created another vehicle with a similar design. In fact, experiences suggest that this approach depends critically on a combination of conditions:
  - One major factor was that Yozma got the timing right. The scheme coincided with the long worldwide technology boom and ended well before the dot-com bubble burst. It is difficult to judge the impact of these favourable conditions, but it must have been considerable.
  - Lerner (2009) suggested that, in addition to the financial incentives, it was important that Yozma adopted a legal structure for the VC funds that foreign investors would be comfortable with. This may have been a factor in the mid-1990s, but by now international private equity market practices and legal structures are much better known and commonly accepted. Going forward, this condition is unlikely to have an impact.
  - At the time of launching Yozma I, Israel already had a significant innovative and entrepreneurship capacity. The VC funds, therefore, were able to tap into a robust and high quality deal-flow, a condition that often (see for instance CORFU) is absent.
  - The involvement of experienced foreign investors as a trusted party to select promising VC funds is an interesting policy avenue as it may have removed the perception of the government intervening and stimulating adverse selection. But in many cases, such a programme may be harder to implement – for instance, in the European setting, making the presence of ‘foreign investors’ a condition is impossible to implement in practice.

Finally, the fact that this government programme had a built-in ‘get in’ and ‘get out’ was viewed as a key factor to its success. Senor & Singer (2009) highlighted that it was ‘rare for a government programme to actually disappear once it had served its initial purpose, rather than continue indefinitely’. One could argue that Yozma I was conceptually close to an ‘incentive prize’. Effectively, the Israeli government created a challenge for solving the problem of how to bring foreign VC investments and know-how to Israel. Foreign investors received additional compensation in form of the upside leverage for identifying a good VC fund, whereas the VC fund managers were rewarded by matching the Yozma funding for having succeeded in finding a critical mass of experienced investors. The limited and fixed size of the programme made it temporary and thus, by design, assured that only the most convincing proposals made it.

This was also only possible as there were (unlike in Europe with its range of national, regional and European level schemes aiming to provide support in all forms to venture capital and business angels) no competing governmental programmes operating in Israel that could have provided alternative funding to fund managers that did not make it under Yozma. While in the European Union, grants and grant-like mechanisms are the preferred approach to provide venture funding, Yozma I’s success could be taken as evidence that public schemes to support the VC industry should be structured closer to the idea of an incentive prize.
### InnovFin Mid Cap Growth Finance / European Growth Finance Facility - an example of a quasi-equity instrument

InnovFin Mid Cap Growth Finance programme, recently replaced by the European Growth Finance Facility programme, is a quasi-equity debt instrument of the EIB. Within the instrument, the EIB can safeguard from 1% to 10% in stock options (without ownership rights), that are sold back to company at the exit. The percentage depends on the valuation of the project. The bigger the future valuation of the project, the smaller the percentage.

- **Type of instrument:** Quasi-equity debt
- **Start year:** 2015
- **Geographical coverage:** EU
- **Policy objective:** To provide a significant support to high-risk innovative projects. It aims to address the market gap that affects about 2,500 European companies of medium size, where the financing need is between EUR 10 m to EUR 17 m (Rees, 2017).
- **Sector:** Innovation
- **Beneficiaries:** SMEs or MidCaps with maximum 3,000 employees
- **Co-investment:** EIB finances maximum 50% of eligible R&D project costs, co-investment with third-party sources or own resources
- **Size of funding:** EUR 7.5m to EUR 50m (under InnovFin Mid Cap Growth Finance) under European Growth Finance Facility: EUR 7.5m to EUR 25m (under European Growth Finance Facility)
- **Repayment period:** Usually 5 to 7 years
- **Portfolio:** 27 Venture Debt / Quasi Equity operations for a total of EUR 424m; over 1,500 financing requests reviewed; 50 financed. In 2016, the EIB closed 19 quasi-equity operations for a total of EUR 290m with the target for 2017 around EUR 800m or EUR 1bn (Stoykov, 2017b).
- **Eligibility criteria for Midcaps:** Sustainable capital structure, raised equity in the past, stable and experienced management team, professional corporate governance and code of conduct, sustainable business model, business plan and strategy providing credible growth perspectives.
- **Governance structure:** Scheme managed internally, run by a team of risk, legal, technical and monitoring experts with more than 120 people in total. 23 people are working in the front office (Stoykov, 2017b).
- **Key benefits:** Commercially minded instrument with closed within 2 weeks
- **Bottlenecks:**
  - In central Europe, companies are unable to generate R&D costs reaching the minimal level of funding (EUR 7.5m) due to smaller companies and market still in the development phase
  - High reporting requirements for companies and high evaluation efforts for institutions
  - Midcaps are a very active asset class often with changes of ownership - high legal costs because of changes of ownership and restructuring (10 - 20% of the fund is put aside for legal costs.
- **Key lesson learnt:**
  - High Implementation effort: The development of the instrument was a complex process. In addition to the new documentation and contracts that had to be created, a team of experts guided by Mr. Hirsto Stoykov (Head of Growth Capital & Innovation Finance) changed the relations between different directorates within the Bank.
  - The minimal size of the granted funding needs to be adjusted to the market conditions
Initiatives that bring together several sources of funding, public and private, to address the same policy objective under EFSI (Munisteri F., 2014)
for the benefit of the stakeholders.

- Investors remuneration structure: Initial return of 2% for all investors - all investors are remunerated at the inflation rate before the incentives kick in. Then, all investors are remunerated to their classes of shares, and then according to a classic structure of a carried interest.

- Access to investment opportunities: Due diligence done by the fund managers, on a deal by deal basis

- Key performance indicators:
  - Return on investment: net IRR 8-11%
  - Targets on a number of projects and number of countries covered and there is a performance fee/incentive fee built
  - Requirement to look at the leverage effect of the fund (the way it is defined under EFSI)
  - The multiplier effect of the EC funding: 1 to 4.

- Key lessons learnt / recommendations:
  - The EC does not have a sufficient number of people that understand finance sufficiently enough to manage such types of instruments
  - It’s difficult to leverage commercial interest vs. political interests – special construction of the incentives is needed to safeguard political objectives, while at the same time allowing a fund to operate on a market basis (Krzyzanowska, 2017)
### Table 11 Benefits of innovative financial instruments and their features

<table>
<thead>
<tr>
<th>Benefits and challenges</th>
<th>Co-investment</th>
<th>Blended instruments</th>
<th>Royalty-based financing</th>
<th>Revolving</th>
<th>Claw-back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater sustainability</td>
<td>Through generating returns</td>
<td>Limited role of grants and greater use of revenue generating instruments such as loans</td>
<td>Through generating returns</td>
<td>Through reinvestment of the benefits in the fund</td>
<td>Ensures that money targets the right beneficiaries</td>
</tr>
<tr>
<td>Greater effectiveness of public funding</td>
<td>Leverage effect - By attracting private money, governments can increase the size of the fund and as a result the number of companies funded. Attracts private money to riskier projects through the engagement of public funds</td>
<td>More diverse set of instruments to meet the different needs of the companies Increases grant impact through a combination with revenue generating types of financing Increases the number of companies funded</td>
<td>Alignment of incentives between funder and beneficiary Participation in project upsides and downsides allows focus on more risky projects but with greater success potential</td>
<td>Diversification of the risk by managing projects with different pay back schedules and different risk profiles Multiplier effect due to the reuse of funds - higher amount of companies can be funded</td>
<td></td>
</tr>
<tr>
<td>Focus on more efficient use of public resources</td>
<td>Focus on return on investment. Brings ‘smart’ private money and professional, market-based approach to investing</td>
<td>Reduces moral hazard connected to grants</td>
<td>More informed decision making process minimises the risk of investment - as the loan paid back is dependent on future revenue streams, detailed projected cash flow statistics of the company are made</td>
<td>Focus on the repayment of funds for obtaining revolving effect is an incentive for better quality investments, better planning and greater financial discipline</td>
<td>Promotes the efficient use of resources in line with the claimed objectives</td>
</tr>
<tr>
<td>Better quality and performance of projects</td>
<td>Better access to non-financial information on co-investments through professionals that, in turn, are better positioned to monitor the portfolio of companies and select the right</td>
<td>The requirement to repay the money stimulates better performance and quality of investment projects Strict pre-evaluation and monitoring of projects based on performance indicators</td>
<td>Focus on promoting positive project’s results Allows company to focus resources on project development rather than repayment maximising a project’s success The risk of project default is</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
projects

Limited market interference since investments are selected by the private sector

mitigated by the flexibility of the payments that are not fixed to a strict schedule

Source: Authors’ elaboration

Table 12 Challenges of new financial instruments

<table>
<thead>
<tr>
<th>Need of higher human and financial resources</th>
<th>Co-investment</th>
<th>Blended instruments</th>
<th>Royalty-based financing</th>
<th>Revolving</th>
<th>Claw-back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depending on the set up of the fund – requires high management costs and additional incentive fees to meet policy objectives</td>
<td>Require significant human resources to monitor project performance and spending, and administer the payback of funds</td>
<td>Require significant human resources to monitor project performance</td>
<td>Require resources to administer the payback and disbursement of funds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Need for trained professionals | Only finance professionals can manage the fund and select projects effectively | Requires a well-trained internal team – it is challenging to attract finance professionals to public administration | Requires well-trained internal team | Requires specific expertise of the personnel to be effective |

| Conflicting objectives | Focus on high-return projects that would get funding otherwise - market-oriented instrument where it is hard to impose policy objectives | Requires systematic and effective monitoring of project performance | Focus on the revolving effect leads to a trade-off between the riskiness of projects funded and their innovation level | Requires a balance between efficiency and effectiveness – too stringent provisions may restrain beneficiaries from applying |

| Need for an effective monitoring and evaluation system | Requires systematic and effective monitoring of project performance | Requires systematic and effective monitoring of project performance | Requires effective monitoring and evaluation system of the instrument performance |

Source: Authors’ elaboration
# ANNEX 7 List of performed scoping and in-depth interviews

<table>
<thead>
<tr>
<th>Scope</th>
<th>Name</th>
<th>Surname</th>
<th>Position</th>
<th>Institution</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoping interviews</td>
<td>Luigi</td>
<td>Amati</td>
<td>CEO</td>
<td>META Group</td>
<td>IT</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Silje</td>
<td>Aspholm</td>
<td>Director of Innovation Politics and analysis</td>
<td>Innovation Norway</td>
<td>NO</td>
</tr>
<tr>
<td>Revolving funds</td>
<td>Rachel</td>
<td>Lancy Beaumont</td>
<td>Deputy Head of Unit</td>
<td>European Commission, DG REGIO</td>
<td>BE</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Reiner</td>
<td>Braun</td>
<td>Professor</td>
<td>Technical University Munich</td>
<td>DE</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Marco</td>
<td>Da Rin</td>
<td>Professor</td>
<td>Tilburg University</td>
<td>DE</td>
</tr>
<tr>
<td>Revolving funds</td>
<td>Jean-Luc</td>
<td>Eggen</td>
<td>Advisor</td>
<td>Netherlands Enterprise Agency (RVO)</td>
<td>NL</td>
</tr>
<tr>
<td>Blended instruments</td>
<td>Luigi</td>
<td>San Jose Garcia</td>
<td>Head of the Department of Analysis and Investments</td>
<td>Centre for the Development of Industrial Technology (CDTI)</td>
<td>ES</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Thomas</td>
<td>Hellmann</td>
<td>Professor</td>
<td>Said Business School, Oxford</td>
<td>UK</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Anna</td>
<td>Krzyzanowska</td>
<td>Head of Unit, Broadband</td>
<td>European Commission, DG CNECT</td>
<td>EU</td>
</tr>
<tr>
<td>General</td>
<td>Laure</td>
<td>Reinhart</td>
<td>Director of Partnerships</td>
<td>BPIFrance, TAFTIE chair</td>
<td>FR</td>
</tr>
<tr>
<td>Royalty-based financing</td>
<td>Hristo</td>
<td>Stoykov</td>
<td>Head of Growth Capital &amp; Innovation Finance</td>
<td>European Investment Bank</td>
<td>LU</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Bjoern</td>
<td>Tremmerie</td>
<td>Head of Venture Capital and Impact Investing</td>
<td>European Investment Fund</td>
<td>DE</td>
</tr>
<tr>
<td>Blended instruments/General</td>
<td>Marco</td>
<td>Zappalorto</td>
<td>Head of European Development</td>
<td>Nesta</td>
<td>UK</td>
</tr>
<tr>
<td>In-depth interviews</td>
<td>Ausma</td>
<td>Bartkute</td>
<td>Acting Head of the Project Management Division</td>
<td>INVEGA</td>
<td>LT</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Gerald</td>
<td>Dlesk</td>
<td>General Programme’s SME Package</td>
<td>Austrian Research Promotion Agency (FFG)</td>
<td>AT</td>
</tr>
<tr>
<td>Blended instruments</td>
<td>Rein</td>
<td>van Erp</td>
<td>Innovation Fund of Funds</td>
<td>Netherlands Enterprise Agency (RVO)</td>
<td>NL</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Alexander von Frankenber</td>
<td>Managing Director</td>
<td>High-Tech Grunder fonds</td>
<td>DE</td>
<td></td>
</tr>
<tr>
<td>Co-investments</td>
<td>Luis Enrique</td>
<td>Garcia</td>
<td>Head of the Department of Analysis and Investments - INVERTIE Programme</td>
<td>Centre for the Development of Industrial Technology (CDTI)</td>
<td>ES</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Nelson</td>
<td>Gray</td>
<td>Advisory Board / Business Angel investor</td>
<td>Scottish Co-investment Fund / Angel Co-fund UK</td>
<td>SCOT</td>
</tr>
<tr>
<td>Blended instruments</td>
<td>Heidi</td>
<td>van Hooff-Sprangers</td>
<td>Early Stage Financing (VFF) instrument / Innovation Credit Facility</td>
<td>Netherlands Enterprise Agency (RVO)</td>
<td>NL</td>
</tr>
<tr>
<td>Revolving funds / Blended instruments</td>
<td>Bas</td>
<td>Kruidenier</td>
<td></td>
<td>Netherlands Enterprise Agency (RVO)</td>
<td>NL</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Salvo</td>
<td>Mizzi</td>
<td>CEO</td>
<td>Invitalia</td>
<td>IT</td>
</tr>
<tr>
<td>Co-investments</td>
<td>Christian</td>
<td>Stein</td>
<td>Manager</td>
<td>Coparion Co-Investment Fund</td>
<td>DE</td>
</tr>
<tr>
<td>Blended instruments</td>
<td>Andres</td>
<td>Ubierna Gorricho</td>
<td>Partially Reimbursable Loan</td>
<td>Centre for the Development of Industrial Technology (CDTI)</td>
<td>ES</td>
</tr>
</tbody>
</table>
## ANNEX 8 Long list of financial instruments

<table>
<thead>
<tr>
<th>No</th>
<th>Type of Instrument</th>
<th>Subtype</th>
<th>Innovation Relevant</th>
<th>Name of the Instrument</th>
<th>Country</th>
<th>Geographic al Scope</th>
<th>Managing Institution</th>
<th>Main beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blended instrument</td>
<td>loan convertible to grant with soft loan</td>
<td>yes</td>
<td>Innovation Credit (VFF)</td>
<td>NL</td>
<td>National</td>
<td>Netherlands Enterprise Agency (RVO)</td>
<td>SMEs</td>
</tr>
<tr>
<td>2</td>
<td>Blended instrument</td>
<td>grant with loan</td>
<td>yes</td>
<td>Young Innovative Companies funding (YIC)</td>
<td>FL</td>
<td>National</td>
<td>Tekes (The Finnish Funding Agency for Innovation)</td>
<td>Start-ups</td>
</tr>
<tr>
<td>3</td>
<td>Blended instrument</td>
<td>loan convertible to grant</td>
<td>yes</td>
<td>General Programme SME Package</td>
<td>AT</td>
<td>National</td>
<td>Austrian Research Promotion Agency (FFG)</td>
<td>SMEs</td>
</tr>
<tr>
<td>4</td>
<td>Blended instrument</td>
<td>grant with loan</td>
<td>yes</td>
<td>Aide au Développement de l’Innovation (ADI)</td>
<td>FR</td>
<td>National</td>
<td>BPI France</td>
<td>SMEs</td>
</tr>
<tr>
<td>5</td>
<td>Blended instrument</td>
<td>grant with loan</td>
<td>yes</td>
<td>Grid-connected solar PV—Hydro Hybrid Demonstration Project</td>
<td>PH</td>
<td>National</td>
<td>International Finance Corporation (IFC)</td>
<td>Grid-connected PV plant projects</td>
</tr>
<tr>
<td>6</td>
<td>Blended instrument</td>
<td>grant with soft loan</td>
<td>yes</td>
<td>Loan Fund Innovation Support(Fundusz Pozyczkowy Wsparcia Innowacji)</td>
<td>PL</td>
<td>National</td>
<td>Polish Agency for Enterprise Development (PARP)</td>
<td>Start-ups</td>
</tr>
<tr>
<td>7</td>
<td>Co-investment</td>
<td>grant with soft loan</td>
<td>yes</td>
<td>Innvierte Venture Capital Co-investment Funds</td>
<td>ES</td>
<td>National</td>
<td>Centre for the Development of Industrial Technology (CDTI)</td>
<td>Technological or innovative companies</td>
</tr>
<tr>
<td>8</td>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>Neotec Venture Capital</td>
<td>ES</td>
<td>National</td>
<td>Centre for the Development of Industrial Technology (CDTI)</td>
<td>Technological SMEs</td>
</tr>
<tr>
<td>9</td>
<td>Co-investment</td>
<td>equity and loans</td>
<td>yes</td>
<td>Connecting Europe Facility (CEF) Broadband Fund</td>
<td>EU</td>
<td>EU</td>
<td>European Investment Bank (EIB)</td>
<td>Broadband infrastructure</td>
</tr>
<tr>
<td>10</td>
<td>Co-investment</td>
<td>VC and BA</td>
<td>yes</td>
<td>London Co-investment Fund</td>
<td>UK</td>
<td>Local</td>
<td>Funding London and Capital Enterprise</td>
<td>Start-ups</td>
</tr>
<tr>
<td>11</td>
<td>Co-investment</td>
<td>VC and BA</td>
<td>yes</td>
<td>InnovFin SME Venture Capital</td>
<td>EU</td>
<td>EU</td>
<td>European Investment Bank (EIB)</td>
<td>Start-ups</td>
</tr>
<tr>
<td>12</td>
<td>Co-investment</td>
<td>BA</td>
<td>yes</td>
<td>UK Angel Cofund</td>
<td>UK</td>
<td>National</td>
<td>British Business Bank</td>
<td>SMEs</td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC and BA</td>
<td>yes</td>
<td>New Zealand Seed Co-investment Fund / The New Zealand Venture Investment Fund (NZVIF)</td>
<td>NZ</td>
<td>National</td>
<td>Private Board of Directors</td>
<td>Start-ups and SMEs</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>-----------</td>
<td>-----</td>
<td>--------------------------------------------------------------------------------</td>
<td>----</td>
<td>---------</td>
<td>---------------------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>BA</td>
<td>yes</td>
<td>European Angels Fund (EAF)</td>
<td>EU</td>
<td></td>
<td>European Investment Fund (EIF)</td>
<td>SMEs</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>Coparion</td>
<td>DE</td>
<td>National</td>
<td>Bankengruppe</td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>equity, loans, guarantees</td>
<td>yes</td>
<td>Clean Energy Finance Corporation (CEFC)</td>
<td>AU</td>
<td>National</td>
<td>Each fund has an investor Supervisory Board and the programme has an independent advisory board, Innovation Australia.</td>
<td>Companies</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>The Australian Government’s Innovation Investment Follow-on Fund (IIF)</td>
<td>AU</td>
<td>National</td>
<td>Jointly administered by Innovation Australia (assisted by AusIndustry) and the Australian Taxation Office.</td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>High-tech Grunder Fond</td>
<td>DE</td>
<td>National</td>
<td>Federal Ministry of Economics and Technology together with six industrial partners and the KfW banking group.</td>
<td>SMEs</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>ERP-EIF Co-investment Growth Facility</td>
<td>DE</td>
<td>National</td>
<td>KfW Bankengruppe</td>
<td>SMEs and Mid-Caps</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>BA</td>
<td>yes</td>
<td>Smart CapThe Estonian Development Fund (Eesti Arengufond)</td>
<td>AT</td>
<td>National</td>
<td>Estonian Development Fund / State Ministry of Employment and the Economy together with Tekes.</td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>The Digital Ambition Fund (FSN-PME)</td>
<td>EE</td>
<td>National</td>
<td>Venture Capital Hungary Plc.</td>
<td>Innovative SMEs</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>Vigo</td>
<td>FL</td>
<td>National</td>
<td></td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>The Digital Ambition Fund (FSN-PME)</td>
<td>FR</td>
<td>National</td>
<td>CDC Entreprises (Bpifrance)</td>
<td>Innovative SMEs</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>Hiventures</td>
<td>HU</td>
<td>National</td>
<td></td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-investment</td>
<td>VC</td>
<td>yes</td>
<td>Venture Capital</td>
<td>HU</td>
<td>National</td>
<td></td>
<td>Innovative SMEs</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programme</td>
<td>VC and BA yes</td>
<td>Investment</td>
<td>National</td>
<td>European Investment Fund (EIF)</td>
<td>Start-ups and SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>---------------</td>
<td>------------</td>
<td>----------</td>
<td>-------------------------------</td>
<td>--------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 Co-investment</td>
<td>Baltic Innovation Fund</td>
<td>LT</td>
<td>National</td>
<td>Empresa Nacional de Innovación, SGE, SA (ENISA)</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Co-investment</td>
<td>Spain Start-up Co-Investment Fund</td>
<td>ES</td>
<td>National</td>
<td>Zernike Ventures</td>
<td>Start-ups and SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 Co-investment</td>
<td>Ingenium Funds</td>
<td>IT, SL, PO</td>
<td>International</td>
<td>Zernike Meta Ventures</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 Co-investment</td>
<td>UK Research Partnership Investment Fund (UK RPIF)</td>
<td>UK</td>
<td>National</td>
<td>Higher Education Funding Council for England (HEFCE)</td>
<td>Universities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 Co-investment</td>
<td>Italia Ventures Fund</td>
<td>IT</td>
<td>National</td>
<td>UAB Kofinansavimias, INVEGA</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34 Co-investment</td>
<td>Scottish Co-investment Fund I</td>
<td>LT</td>
<td>National</td>
<td>Scottish Investment Bank</td>
<td>SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 Co-investment</td>
<td>Scottish Venture Fund</td>
<td>SCOT</td>
<td>National</td>
<td>Scottish Investment Bank</td>
<td>Start-ups and SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 Co-investment</td>
<td>Northern Ireland Co-Investment Fund</td>
<td>IE</td>
<td>National</td>
<td>Clarendon Fund Managers Ltd</td>
<td>SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37 Co-investment</td>
<td>Technopartner Co-Investment</td>
<td>NL</td>
<td>National</td>
<td>Netherlands Enterprise Agency (RVO)</td>
<td>Start-ups and SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38 Co-investment</td>
<td>COMPETE Co-Investment</td>
<td>PT</td>
<td>National</td>
<td>COMPETE Management Authority</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39 Co-investment</td>
<td>Angel Source</td>
<td>FR</td>
<td>National</td>
<td>iSource</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 Co-investment</td>
<td>Swedish regional co-investment fund</td>
<td>SE</td>
<td>National</td>
<td>Tillväxtverket (Swedish Agency for Economic and Regional Growth)</td>
<td>Start-ups and SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 Co-investment</td>
<td>Vaeksfonden (Danish Growth Fund)</td>
<td>DK</td>
<td>National</td>
<td>Vaeksfonden (Danish Growth Fund)</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 Co-investment</td>
<td>JEREMIE Languedoc-Roussillon</td>
<td>FR</td>
<td>National</td>
<td>Soridec</td>
<td>Innovative SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43 Co-investment</td>
<td>JEREMIE Co-Investment Fund</td>
<td>SK</td>
<td>National</td>
<td>Limerock Fund Manager</td>
<td>SMEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44 Co-investment</td>
<td>Oregon Angel Fund Pre-Seed Fund Capitalization Program Ohio</td>
<td>US</td>
<td>National</td>
<td>Ohio Development Services Agency</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 Co-investment</td>
<td>Commercial Acceleration Loan Fund Ohio</td>
<td>US</td>
<td>National</td>
<td>Ohio Development Services Agency</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46 Co-investment</td>
<td>Angels Quebec Capital</td>
<td>CA</td>
<td>National</td>
<td>Angels Quebec Capital</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47 Co-investment</td>
<td>Spring SEEDS Capital</td>
<td>SG</td>
<td>National</td>
<td>Spring SEEDS Capital</td>
<td>Start-ups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Type of Financing</td>
<td>VC and BA</td>
<td>Equity, Loans, Guarantees</td>
<td>Fund Name</td>
<td>Country</td>
<td>Sector</td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>--------------------------</td>
<td>-----------</td>
<td>---------</td>
<td>--------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Co-investment</td>
<td>yes</td>
<td>Moscow City Seed Fund</td>
<td>RU</td>
<td>National</td>
<td>VTB Capital Asset Management</td>
<td>Large-scale projects with the following technologies: geothermal, solar energy, wind energy, energy saving, energy storage, biomass.</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Royalty-based financing</td>
<td>yes</td>
<td>Amsterdam Climate and Energy Fund (AKEF)</td>
<td>NL</td>
<td>Local</td>
<td>Municipality of Amsterdam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Royalty-based financing</td>
<td>yes</td>
<td>InnovFin Mid Cap Growth Facility / European Growth Finance Facility</td>
<td>EU</td>
<td>Regional</td>
<td>European Investment Bank (EIB)</td>
<td>Midcaps</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Royalty-based financing</td>
<td>no</td>
<td>REV Royalty Fund</td>
<td>CA</td>
<td>Internation</td>
<td>Accilent Capital Management Inc.</td>
<td>Publicly listed or private entities located in Canada</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Revolving fund</td>
<td>yes</td>
<td>The Innovation Investment Fund (IIF)</td>
<td>AU</td>
<td>National</td>
<td>Australian Government Department of Industry</td>
<td>Start-ups</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Revolving fund</td>
<td>yes</td>
<td>Joint European Support for Sustainable Investment in City Areas (JESSICA) Funds</td>
<td>EU</td>
<td>EU</td>
<td>EC - DG REGIO Urban development projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Revolving fund</td>
<td>yes</td>
<td>The Billion Dollar Green Challenge (The Challenge) Green Revolving Fund</td>
<td>US</td>
<td>National</td>
<td>Sustainable Endowments Institute in collaboration with 16 partner organizations</td>
<td>Universities and colleges</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Revolving fund</td>
<td>yes</td>
<td>The US State Revolving Fund: Clean Water State Revolving Fund</td>
<td>US</td>
<td>Local</td>
<td>Harvard University</td>
<td>Infrastructure projects (Public, Private, no-profit)</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Revolving fund</td>
<td>yes</td>
<td>The US State Revolving Fund: Clean Water State Revolving Fund</td>
<td>US</td>
<td>Local</td>
<td>United States Environmental Protection Agency</td>
<td>Infrastructure projects (Public, Private, no-profit)</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Revolving fund</td>
<td>yes</td>
<td>Revolving Funds for City energy Efficiency Projects in San Antonio</td>
<td>US</td>
<td>Local</td>
<td>City of San Antonio’s Office of Sustainability</td>
<td>Medium-sized energy conservation projects or energy saving projects</td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Revolving fund</td>
<td>yes</td>
<td>Thai Energy Efficiency Revolving fund</td>
<td>TH</td>
<td>National</td>
<td>Government of Thailand</td>
<td>European Energy Efficiency Fund</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Revolving fund</td>
<td>yes</td>
<td>European Energy Efficiency Revolving fund</td>
<td>EU</td>
<td>EU</td>
<td>European Energy Efficiency Fund</td>
<td>Local and regional authorities as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Claw-back</td>
<td>subordinated loan</td>
<td>type</td>
<td>Royalty Funding of Business Development Bank Of Canada</td>
<td>CA</td>
<td>National</td>
<td>Government of Canada</td>
<td>SMEs</td>
</tr>
<tr>
<td>---</td>
<td>-----------</td>
<td>-------------------</td>
<td>------</td>
<td>------------------------------------------------------</td>
<td>----</td>
<td>----------</td>
<td>----------------------</td>
<td>------</td>
</tr>
<tr>
<td>64</td>
<td>Claw-back</td>
<td>yes</td>
<td></td>
<td>Royalty Funding of Business Development Bank Of Canada</td>
<td>CA</td>
<td>National</td>
<td>Government of Canada</td>
<td>SMEs</td>
</tr>
<tr>
<td>65</td>
<td>Claw-back</td>
<td>N/A</td>
<td>no</td>
<td>Clow-back Provisions in Medicaid</td>
<td>US</td>
<td>National</td>
<td>US government</td>
<td>Federal States</td>
</tr>
<tr>
<td>66</td>
<td>Claw-back</td>
<td>grant</td>
<td>yes</td>
<td>New Zealand Callaghan Innovation Grant</td>
<td>NZ</td>
<td>National</td>
<td>Callaghan Innovation</td>
<td>Start-ups</td>
</tr>
<tr>
<td>67</td>
<td>Claw-back</td>
<td>N/A</td>
<td>no</td>
<td>Provision applied to financial assistance</td>
<td>US</td>
<td>Local</td>
<td>State's department of economic development, development authority, or Connecticut Innovations</td>
<td>Companies</td>
</tr>
</tbody>
</table>
ANNEX 9 Appendix to Case Study on Innovation Credit

Figure 10 Applications to IK (2008-2011)

Table 13 Overview of the Innovation Credit

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications</td>
<td>122</td>
<td>79</td>
</tr>
<tr>
<td>Requested loan</td>
<td>EUR 194 m</td>
<td>EUR 133 m</td>
</tr>
<tr>
<td>Allocations</td>
<td>36</td>
<td>39</td>
</tr>
<tr>
<td>Rejections</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td>Total amount granted</td>
<td>EUR 52.9 m</td>
<td>EUR 47.5 m</td>
</tr>
<tr>
<td>Average amount allocated</td>
<td>EUR 1.47 m</td>
<td>EUR 1.22 m</td>
</tr>
<tr>
<td>Projects of less than EUR 1 m</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland, Annual Report on IK, 2013

Table 14 Grounds for rejection (IK)

<table>
<thead>
<tr>
<th>Rejection Reasons</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rejections</td>
<td>18</td>
<td>22</td>
<td>34</td>
</tr>
<tr>
<td>Funding not been shown</td>
<td>16</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>No confidence in economic and/or technical success</td>
<td>16</td>
<td>17</td>
<td>28</td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland, Annual Report on IK, 2013
<table>
<thead>
<tr>
<th>Reason</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic feasibility not shown</td>
<td>8</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>Technical feasibility not shown</td>
<td>9</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Project does not meet the definition</td>
<td>6</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Other reasons</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland, Annual Report on IK, 2013

### Table 15 Applications over time (IK)

<table>
<thead>
<tr>
<th>Number of applications and annual results</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>New applications</td>
<td>74</td>
<td>79</td>
<td>122</td>
</tr>
<tr>
<td>Clinical</td>
<td>12</td>
<td>18</td>
<td>28</td>
</tr>
<tr>
<td>Technical</td>
<td>62</td>
<td>61</td>
<td>94</td>
</tr>
<tr>
<td>Increase Request</td>
<td>5</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Clinical</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Technical</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total handled applications</td>
<td>72</td>
<td>82</td>
<td>107</td>
</tr>
<tr>
<td>Clinical</td>
<td>17</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>Technical</td>
<td>55</td>
<td>63</td>
<td>80</td>
</tr>
<tr>
<td>Approved</td>
<td>30</td>
<td>39</td>
<td>36</td>
</tr>
<tr>
<td>Clinical</td>
<td>10</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Technical</td>
<td>20</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Rejections</td>
<td>18</td>
<td>22</td>
<td>34</td>
</tr>
<tr>
<td>Clinical</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Technical</td>
<td>15</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>24</td>
<td>21</td>
<td>37</td>
</tr>
<tr>
<td>Clinical</td>
<td>4</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Technical</td>
<td>20</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>Applications pending at year end</td>
<td>13</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>Clinical</td>
<td>3</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Technical</td>
<td>12</td>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland, Annual Report on IK, 2013
### Table 16 Development Phase (IK)

<table>
<thead>
<tr>
<th>Project credit</th>
<th>Number of projects under management on January 1</th>
<th>Increase in year</th>
<th>Waived in years</th>
<th>Fully redeemed in year</th>
<th>Projects under management on December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33</td>
<td>24</td>
<td>4</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>31</td>
<td>2</td>
<td>7</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>31</td>
<td>2</td>
<td>13</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>13</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
<td>90</td>
</tr>
<tr>
<td><strong>Cumulative from 2008</strong></td>
<td>74</td>
<td>121</td>
<td>9</td>
<td>24</td>
<td>90</td>
</tr>
</tbody>
</table>

*Source: Agentschap Nederland, Annual Report on IK, 2013*

### Table 17 Commercial Phase (IK)

<table>
<thead>
<tr>
<th>Project Portfolio in committed credit</th>
<th>Number of projects under management on January 1</th>
<th>Increase in year</th>
<th>Fully redeemed in year</th>
<th>Projects under management on December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td><strong>Cumulative from 2008</strong></td>
<td>8</td>
<td>22</td>
<td>3</td>
<td>19</td>
</tr>
</tbody>
</table>

*Source: Agentschap Nederland, Annual Report on IK 2013*
ANNEX 10 Appendix to Case Study on Early Phase Financing (VFF)

Table 18 Overview of Funding Requests (VFF)

<table>
<thead>
<tr>
<th>REQUESTS</th>
<th>Q1 2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL</td>
<td>OLD</td>
<td>NEW</td>
</tr>
<tr>
<td>Assigned</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Rejected</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Not treated</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Withdrawn</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Under treatment</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>No file</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland

Table 19 Quickscans (VFF)

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2016</th>
<th>2015</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted</td>
<td>60</td>
<td>191</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Starter</td>
<td>51</td>
<td>179</td>
<td>117</td>
<td>90%</td>
</tr>
<tr>
<td>SME</td>
<td>9</td>
<td>12</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Positive Advise</td>
<td>13</td>
<td>80</td>
<td>48</td>
<td>37%</td>
</tr>
<tr>
<td>Positive Advise MKB</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Negative Advise</td>
<td>44</td>
<td>108</td>
<td>82</td>
<td>63%</td>
</tr>
<tr>
<td>Number of Applications</td>
<td>57</td>
<td>21</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland
<table>
<thead>
<tr>
<th>Applicant</th>
<th>Province</th>
<th>Sector</th>
<th>Funding (EUR)</th>
<th>Cumulative (EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amarna Stem cells B.V.</td>
<td>Limburg</td>
<td>Life Sciences &amp; Health</td>
<td>350,000</td>
<td>350,000</td>
</tr>
<tr>
<td>Eyesiu Medicines B.V.</td>
<td>Zuid Holland</td>
<td>Life Sciences &amp; Health</td>
<td>350,000</td>
<td>700,000</td>
</tr>
<tr>
<td>GiffDiff B.V.</td>
<td>Zuid Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>293,910</td>
<td>993,910</td>
</tr>
<tr>
<td>CiteFlow B.V.</td>
<td>Zuid Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>75,000</td>
<td>1,068,910</td>
</tr>
<tr>
<td>ViaFactor B.V.</td>
<td>Brabant</td>
<td>HS &amp; Materials / ICT</td>
<td>335,000</td>
<td>1,403,910</td>
</tr>
<tr>
<td>Innovative Stone Technologies</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>325,000</td>
<td>1,728,910</td>
</tr>
<tr>
<td>RemainBrain B.V.</td>
<td>Zuid Holland</td>
<td>Life Sciences &amp; Health</td>
<td>135,000</td>
<td>1,863,910</td>
</tr>
<tr>
<td>Ctcue</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>189,926</td>
<td>2,053,836</td>
</tr>
<tr>
<td>EZ2</td>
<td>Zeeland</td>
<td>HS &amp; Materials / ICT</td>
<td>150,000</td>
<td>2,203,836</td>
</tr>
<tr>
<td>AdoptiQ</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>350,000</td>
<td>2,553,836</td>
</tr>
<tr>
<td>Succint</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>210,000</td>
<td>2,763,836</td>
</tr>
<tr>
<td>The Sleep Company BV</td>
<td>Brabant</td>
<td>Life Sciences &amp; Health</td>
<td>309,950</td>
<td>3,073,786</td>
</tr>
<tr>
<td>Field Reporter</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>197,880</td>
<td>3,271,666</td>
</tr>
<tr>
<td>Savve B.V.</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>328,400</td>
<td>3,600,066</td>
</tr>
<tr>
<td>3DUniversum BV</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>350,000</td>
<td>3,950,066</td>
</tr>
<tr>
<td>PlasmaCure</td>
<td>Brabant</td>
<td>Life Sciences &amp; Health</td>
<td>300,000</td>
<td>4,250,066</td>
</tr>
<tr>
<td>Podo Industries Holding BV</td>
<td>Brabant</td>
<td>Creative Industry</td>
<td>120,000</td>
<td>4,370,066</td>
</tr>
<tr>
<td>Wind Tales</td>
<td>Limburg</td>
<td>HS &amp; Materials / ICT</td>
<td>349,000</td>
<td>4,719,066</td>
</tr>
<tr>
<td>Zoho Studio BV</td>
<td>Zuid Holland</td>
<td>Creative Industry</td>
<td>350,000</td>
<td>5,069,066</td>
</tr>
</tbody>
</table>

*Source: Agentschap Nederland*
### Table 21 Funding Assigned in 2016 (VFF)

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Province</th>
<th>Sector</th>
<th>Funding (EUR)</th>
<th>Cumulative (EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meliora Medical B.V.</td>
<td>Brabant</td>
<td>LSH</td>
<td>349,593</td>
<td>349,593</td>
</tr>
<tr>
<td>Biovolt BV</td>
<td>Noord Holland</td>
<td>LSH</td>
<td>350,000</td>
<td>699,593</td>
</tr>
<tr>
<td>FlorAccess</td>
<td>Utrecht</td>
<td>HSM</td>
<td>250,000</td>
<td>949,593</td>
</tr>
<tr>
<td>Intelligence Mobility Monitoring BV</td>
<td>Limburg</td>
<td>HSM</td>
<td>344,700</td>
<td>1,294,293</td>
</tr>
<tr>
<td>Tide Microfluidics</td>
<td>Overijssel</td>
<td>HSM</td>
<td>335,000</td>
<td>1,629,293</td>
</tr>
<tr>
<td>Cytocypher B.V.</td>
<td>Gelderland</td>
<td>LSH</td>
<td>300,000</td>
<td>1,929,293</td>
</tr>
<tr>
<td>Mito Medical Products B.V.</td>
<td>Limburg</td>
<td>LSH</td>
<td>350,000</td>
<td>2,279,293</td>
</tr>
<tr>
<td>Test Inspire</td>
<td>Gelderland</td>
<td>HSM</td>
<td>170,000</td>
<td>2,449,293</td>
</tr>
<tr>
<td>InOn B.V.</td>
<td>Drenthe</td>
<td>HSM</td>
<td>90,000</td>
<td>2,539,293</td>
</tr>
<tr>
<td>Quva Kitchen Products B.V.</td>
<td>Noord Holland</td>
<td>HSM</td>
<td>150,000</td>
<td>2,689,293</td>
</tr>
<tr>
<td>Noviocell B.V.</td>
<td>Utrecht</td>
<td>LSH</td>
<td>349,000</td>
<td>3,038,293</td>
</tr>
<tr>
<td>Scoozy BV</td>
<td>Utrecht</td>
<td>HSM</td>
<td>348,190</td>
<td>3,386,483</td>
</tr>
<tr>
<td>Dimanex BV</td>
<td>Utrecht</td>
<td>HSM</td>
<td>346,000</td>
<td>3,732,483</td>
</tr>
<tr>
<td>LeydenJar Technologies B.V. Hoodhunt</td>
<td>Zuid Holland</td>
<td>HSM</td>
<td>300,000</td>
<td>4,032,483</td>
</tr>
<tr>
<td>Noord Holland</td>
<td>HSM</td>
<td></td>
<td>304,100</td>
<td>4,336,583</td>
</tr>
<tr>
<td>Equestic Holding B.V.</td>
<td>Gelderland</td>
<td>HSM</td>
<td>157,520</td>
<td>4,494,103</td>
</tr>
<tr>
<td>Aidence B.V.</td>
<td>Noord Holland</td>
<td>HSM</td>
<td>334,080</td>
<td>4,828,183</td>
</tr>
<tr>
<td>Buproxy BV</td>
<td>Gelderland</td>
<td>HSM</td>
<td>348,380</td>
<td>5,176,563</td>
</tr>
<tr>
<td>Northend Systems B.V</td>
<td>Noord Holland</td>
<td>HSM</td>
<td>125,000</td>
<td>5,301,563</td>
</tr>
<tr>
<td>Cati B.V.</td>
<td>Brabant</td>
<td>HSM</td>
<td>344,242</td>
<td>5,645,805</td>
</tr>
<tr>
<td>Vacis B.V.</td>
<td>Zuid Holland</td>
<td>LSH</td>
<td>350,000</td>
<td>5,995,805</td>
</tr>
<tr>
<td>StyleCompass BV</td>
<td>Noord Brabant</td>
<td>HSM</td>
<td>349,000</td>
<td>6,344,805</td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland

### Table 22 Reasons for rejection in 2016 (VFF)

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Ac</th>
<th>Appeal</th>
<th>2nd app.</th>
<th>Definitio n</th>
<th>Article 3.16.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArenaRed ec BV</td>
<td>YES</td>
<td></td>
<td></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>DiManEX</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>d,e</td>
<td></td>
</tr>
<tr>
<td>Be-Rex BV</td>
<td>YES</td>
<td></td>
<td></td>
<td>d,e</td>
<td></td>
</tr>
<tr>
<td>Buproxy BV</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>d,e</td>
<td></td>
</tr>
<tr>
<td>E-Heli BV</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Sensius BV</td>
<td>YES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>StyleScript BV</td>
<td>Withdrawn</td>
<td>YES</td>
<td>a,b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amarna Ophthalmology BV</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>a,b,d,e</td>
<td></td>
</tr>
<tr>
<td>Protinhi BV</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>d,e</td>
<td></td>
</tr>
<tr>
<td>Antibodychain International</td>
<td>YES</td>
<td>Inadmissible</td>
<td>a</td>
<td></td>
<td>A</td>
</tr>
</tbody>
</table>
AC means that the advisory committee has examined the proposal. 2nd APP means that a second application has been filed. Notice also that the VFF scheme has 5 reasons mentioned in article 3.16.19 of the Regeling Nationale EZ-Subsidies:

- If it is probable that the applicant may obtain the funding for which the application has been submitted to others;
- If it is insufficiently likely that, on the basis of the early phase plan, the future investor is willing or able to finance the applicant;
- If the anticipated cost of the early phase is higher than EUR 350,000 or lower than EUR 50,000;
- If there is insufficient confidence that the applicant will be able to complete the early phase from the technical point of view, and therefore, it is unlikely that the applicant will be able to obtain financing for the phase after the early phase project by future investors;
- If there is insufficient confidence that the innovative starter may repay the money loan.

### Table 23 Funding Assigned in 2017 (VFF)

<table>
<thead>
<tr>
<th>Name</th>
<th>Province</th>
<th>Sector</th>
<th>Funding (EUR)</th>
<th>Cumulative (EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Naval</td>
<td>Zuid Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>231,000</td>
<td>231,000</td>
</tr>
<tr>
<td>EcoCircuits BV</td>
<td>Brabant</td>
<td>HS &amp; Materials / ICT</td>
<td>348,500</td>
<td>579,500</td>
</tr>
<tr>
<td>NOWI Energy BV</td>
<td>Zuid Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>344,754</td>
<td>924,254</td>
</tr>
<tr>
<td>Deltaprot BV</td>
<td>Noord Holland</td>
<td>HS &amp; Materials / ICT</td>
<td>312,180</td>
<td>1,236,434</td>
</tr>
</tbody>
</table>

*Source: Agentschap Nederland*
### Table 24 Reasons for rejection in 2017 (VFF)

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Ac</th>
<th>Appeal</th>
<th>2nd app.</th>
<th>Definition</th>
<th>Article 3.16.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine Men</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td></td>
<td>B,d,e</td>
</tr>
<tr>
<td>Trade Your Trip</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>Re-examine</td>
<td>A,e</td>
</tr>
<tr>
<td>NovioPonics B.V.</td>
<td>YES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Findest B.V.</td>
<td>YES</td>
<td></td>
<td></td>
<td>Re-examine</td>
<td>D,e</td>
</tr>
</tbody>
</table>

Source: Agentschap Nederland
ANNEX 11 Appendix to Case Study on blending under FFG

Table 25 – Basic Loans Programmes (in million EUR)

<table>
<thead>
<tr>
<th>Year</th>
<th>Loan received</th>
<th>Non-payment</th>
<th>Conversions</th>
<th>Total Loss</th>
<th>In %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>378,4</td>
<td>8,1</td>
<td>2,4</td>
<td>10,5</td>
<td>2.7%</td>
</tr>
<tr>
<td>2015</td>
<td>383,9</td>
<td>8,8</td>
<td>3,4</td>
<td>12,2</td>
<td>3.2%</td>
</tr>
<tr>
<td>2016</td>
<td>408,4</td>
<td>4,3</td>
<td>4,6</td>
<td>8,9</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

Source: Austrian Research Promotion Agency (FFG)

Table 26 – Statistics on Loss of Loans (FFG)

Source: Austrian Research Promotion Agency (FFG)
REFERENCES


Bertoldi Paolo and Rezessy Silvia (2010). 'Financing Energy Efficiency: forging the link between financing and project implementation', European Commission, Directorate General JRC (Joint Research Centre), Institute of Energy, Renewable Energy Unit


Bpifrance – TAFTIE (2016). 'Enhancing operational cooperation with EIB/EIF and the EC: RDI risk sharing schemes and EU instruments', Expert session #3, Strasbourg 22 September

Bpifrance – TAFTIE (2016). 'How to better connect SMEs already supported in RDI phases to EU supported later stages debt financing', 22 September


Callaghan Innovation. ‘R&D and Grants’. Available at: https://www.callaghaninnovation.govt.nz/grants


Centro para el Desarrollo Tecnológico Industrial (CDTI) (2017). ‘Investee or co-invested ECR’, 16 March

Centro para el Desarrollo Tecnológico Industrial (CDTI) (2017). ‘What is Neotec Venture Capital’, 16 March

Centro para el Desarrollo Tecnológico Industrial (CDTI) (Undated). ‘VC Funding Programmes at national level. Innnrierte’


Deve, (2012). ‘Blending Grants and loans in the Light of the New DCI’


Dlesk G. (2016). ‘Financing close-to-market innovation projects’, FGG (Austria)/ RVO.nl (Netherlands) TAFTIE Academy Networking Workshop, FGG Funding Schemes


Dutch Ministry of Economic Affairs (RVO) (undated b). ‘3D Metal printer for aircraft’. Available at: [link to webpage] [accessed 16 May 2017]

Dutch Ministry of Economic Affairs (RVO) (undated c). ‘Innovative tools for heart specialists’ Available at: [link to webpage] [accessed 16 May 2017]

Dutch Ministry of Economic Affairs (RVO) (undated d). ‘Organs-on-a-chip technology makes unnecessary laboratory animals’. Available at: [link to webpage] [accessed 16 May 2017]


Erlich, Y. (undated). ‘The Yozma Programme – Policy & Success Factors’, Tel Aviv, Israel. Available at: [link to webpage]


Eurodad (2013). ‘A dangerous blend? The EU’s agenda to ‘blend’ public development finance with private finance’, Brussels

European Court of Auditors (ECA) (2015). ‘Are financial instruments a successful and promising tool in the rural development area?’ Publication office of the European Union, Luxembourg


European Commission (2011g). ‘A Budget for Europe 2020: the current system of funding, the challenges ahead, the results of stakeholders consultation and different options on the main horizontal and sectoral issues’, SEC(2011) 868 final, Brussels


European Investment Bank (2010). ‘Evaluation of the Activities under the Risk-Sharing Financial Facility (RSFF)’, Luxembourg


European Investment Bank. ‘What InnovFin products are available and who can benefit from them?’. Available at: http://www.eib.org/products/blending/innovfin/products/index.htm

European Investment Fund (2012). ‘JEREMIE. A new way of using EU structural funds to promote SME access to finance via Holding Funds’, Luxembourg


Fi-Compass (2015). ‘The European Maritime and Fisheries Fund (EMFF)’

Fi-Compass (2015a). ‘A sustainable way of achieving EU economic and social objectives’


Fi-Compass. ‘Recent developments with ESIF financial instruments’. Available at: https://www.fi-compass.eu/news/2016/06/recent-developments-esif-financial-instruments


Gracia Serrano J. (2016). ‘The implementation of non-grant RDI financing with ESIF, Bpifrance’ TAFTIE, Strasbourg 22 September


Harvard University Sustainability. ‘Green Revolving Fund’. Available at https://green.harvard.edu/programmes/green-revolving-fund


Innovation Norway (undated). ‘State baked Seed Capital, Pre-Seed pilots and Seal of Excellence. Norwegian implementation’

InnovFin (2016). ‘Supporting Innovation Taftie Academy’, Strasbourg 22 September


NESTA (2015). ‘Finance for Impact: the case for transforming public finance to better support evidence, outcomes, engagement and innovation’

NESTA, ‘Nesta’s vision for the European Innovation Council’

Nicol, S. (2014). ‘Helping to create and develop Canadian businesses through financing venture capital and consulting services, with a focus on accelerating entrepreneurs success’, Business Development Bank of Canada. Available at: https://prezi.com/fvpmpq5nk0sb/business-development-bank-of-canada/


OECD (2015 a). ‘Blended Finance: Vol. 1 A Primer for Development Finance and Philanthropic Funders’


OECD (2015 c). ‘New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments’


Rogers S. (2016). ‘EC expectation on non-grant financing/EIC’, EC DG_RTLD, Strasbourg 22 September


Silchenko V. (2015). ‘How to raise capital but preserve your equity: Royalty Based Crowdfunding’, The Huffington Post, February 1


Taftie (2016). Expert session 2, Capital for Innovation, Paris 21 April


The International Finance Corporation (2013). ‘IFC blended finance’


URB Energy. ‘The Estonian revolving fund scheme for energy efficient refurbishment in housing’. Available at: http://www.urbenergy.eu/105.0.html?&l=1


Ward R. (undated). ‘Funding Your Business’, Enterprise Ireland


World Bank (1999). ‘Revolving Funds: Lessons Learned in Turkey’


United States Environmental Protection Agency (EPA). ‘Clean Water State Revolving Fund’. Available at: https://www.epa.gov/cwsrf


**Interviews**


Gray, N. (2017) *Interview with Nelson Gray on various co-investment funds*. 22. February, 18:00 to 19:30


Kruiderink B. (2017). Interview with Bas Kruiderink. RVO. 16. March, 14:00 to 15:00


Stein, C. (2017) Scoping interview with Christian Stein, Coparion. 22. February, 14:00 to 14:45

Stoykov H. (2017 a). Interview with Hirsto Stoykov, EIB. 20 March, 14:00 to 15:00


Ubierna Gorricho, A. (2017) Interview with Andres Ubierna Gorricho. CDTI. 30. March, 17:00


How to obtain EU publications

**Free publications:**
- one copy: via EU Bookshop (http://bookshop.europa.eu);
- more than one copy or posters/maps:
  from the European Union’s representations (http://ec.europa.eu/represent_en.htm);
  from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
  by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

**Priced publications:**
The study explores best practices and assesses the potential of using new financial instruments for filling the gap in EU innovation financing with a particular focus on VC co-investment, blended instruments, royalty-based financing and additional features, and clauses of financial instruments. The study is structured around three main objectives: 1) defining and mapping the relevant new financial instruments; 2) assessing their potential to support innovative SMEs by providing follow-on funding, and to get more break-through, disruptive innovations to market; 3) formulating policy recommendations focusing on the recommendation of the most valid avenue to consider at the European level, together with a description of key success factors, challenges and future steps. As part of the final report, the study delivers a detailed analysis of seven national innovative instruments in Europe.