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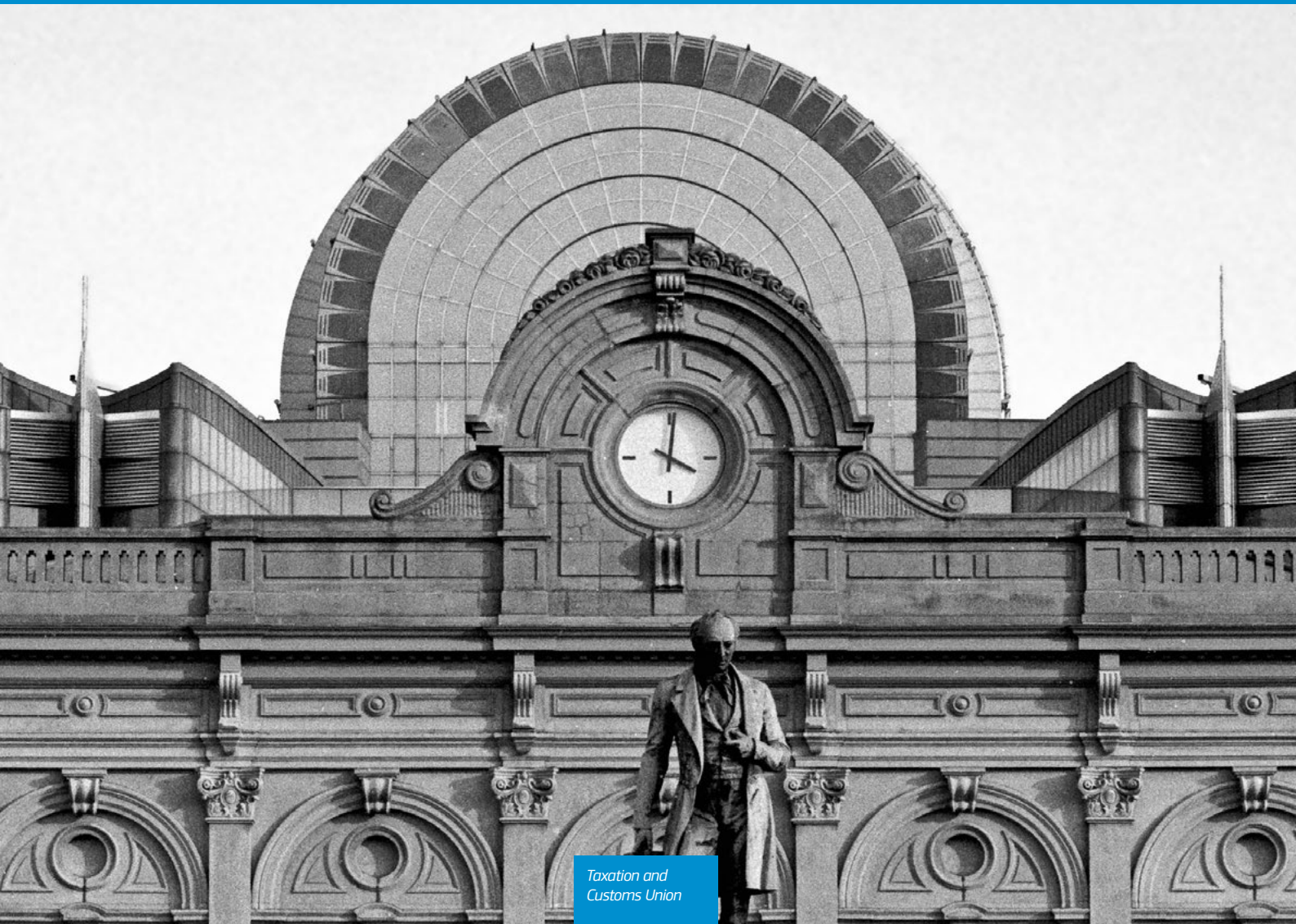
Effectiveness of tax incentives for venture capital and business angels to foster the investment of SMEs and start-ups

Final Report



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Effectiveness of tax incentives for venture capital and business angels to foster the investment of SMEs and start-ups

Final Report

TAXUD/2015/DE/330

FWC No. TAXUD/2015/CC/131

PricewaterhouseCoopers LLP (PwC): Project Leader

Institute for Advanced Studies (IHS): Consortium Leader

In consortium with:

CASE
CPB
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Preface

This report has been prepared for the project "Effectiveness of tax incentives for venture capital and business angels to foster the investment of SMEs and start-ups", Specific Contract No. TAXUD/2015/DE/330 implementing the Framework Service Contract No. TAXUD/2015/CC/131 for the provision of economic analysis in the area of taxation.

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Summary for policymakers

Overview

The Capital Markets Union project (CMU) aims to strengthen the single market by deepening the integration of investment across the European Union. Improved access to finance is a key component of this project, in particular for start-ups, small- and medium-sized enterprises (SMEs), and young companies with innovative growth plans.

Historically, European SMEs have been primarily dependent on bank finance. In the wake of the financial crisis, this source of funding has been restricted by refinancing capacity, risk appetite and capital adequacy of the banking sector. This has forced young, growing and innovative businesses to seek finance from different sources, such as venture capital and business angels.

This study investigates the part that tax incentives for venture capital and business angels can play in fostering investment, with the intention of promoting the diffusion of best practice across Member States. In doing so, this study recognises that tax incentives form part of a broader set of policy tools and that it is important to consider the broader policy mix when analysing tax incentives.

Key findings

- **This type of investment is important for European SMEs.** Venture capital and business angel investment has been shown to generate a number of positive macroeconomic effects, such as job creation and productivity gains. The financial crisis resulted in restrictions in the availability of bank finance, a historically significant source of finance for European small-and-medium sized enterprises (SMEs). Indeed, equity financing accounted for, on average, just 4%, 6% and 8% of micro, small and medium business total financing respectively over 2009-2014 (European Commission, 2015b).
- **A wide range of factors drive this type of investment.** There are a number of characteristics specific to venture capital and business angel investment that result in inherent difficulties in driving venture capital and business angel investment (e.g. typically higher risk nature and imperfect information). In addition, venture capital and business angel investment activity can be driven or blocked by a number of determinants at the macro-level (e.g. strength of IPO markets, government policy (including taxation) and the macroeconomic and business environment).
- **Taxation plays a role for in supporting or blocking this type of investment.** Taxes on income generated during the holding period are less relevant in the context of venture capital and business angel investments in start-ups as they are unlikely to make dividend distributions. However, the tax treatment of capital gains or losses realised on disposal of an investment will influence the risk appetite and decision making process of a prospective investor. For instance, tax relief for capital gains or the provision of loss relief on a more favourable basis than the baseline tax system could support the derisking of investments in young, growing and innovative businesses.
- **Tax incentives are part of broader set of policy tools for supporting young, growing and innovative businesses.** Government initiatives can be financed through the revenue or expenditure side of the budget. Empirical evidence on the impact of both tax incentives and other forms of policy intervention (e.g. grants) is mixed. However, there is evidence that both forms of policy intervention

(individually and in combination) can be effective if appropriately designed and tailored to context.

- **Good practice has been identified across a number of aspects of tax incentive design.** The study identifies 18 desirable features in the design of venture capital and business angel tax incentives. These are grouped according to scope, qualifying criteria, administration, stability and generosity (see **Table 1**).
- **Tax incentives are used to support this type of investment across the EU-28 and selected OECD countries.** The study observed 46 tax incentives designed to promote venture capital and business angel investment in the sample of 36 countries.[1] Tax incentives were implemented by 19 of the 36 countries. In terms of the EU-28, there is a marked contrast between EU-15 and other Member States in the prevalence of tax incentives. This can be explained through differences in the level of venture capital and business angel investment activity and differences in preferences for the use of targeted tax incentives.
- **The tax incentives were benchmarked to support policy dialogue on good practice.** The benchmarking component of this study ranked all tax incentives observed in the country sample according to good practice in their design in order to inform policy discussion on best practice. The highest ranked scheme is United Kingdom's Seed Enterprise Investment Scheme. SEIS provides individuals making investments in young companies with an upfront tax credit, a capital gains tax deferral for reinvestment, a capital gains tax exemption for chargeable gains realised on disposal and loss relief on more favourable terms than the baseline tax system for capital losses realised on disposal. The scheme's ranking was driven by high scores across scope, qualifying criteria and administration. SEIS uses a combination of age, size and specific sector exclusions to target entrepreneurial firms. It restricts the participation of related parties, but has introduced allowances for business angels. It targets newly issued ordinary share capital, imposing a maximum investment value attracting tax relief and a minimum holding period. In terms of administration, SEIS is administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs.

Policy implications

1. **Addressing investor risk aversion:** Tax incentive schemes should contribute to lowering the risk (upside and downside) of investments in SMEs and start-ups, such as by offering upfront tax credits or loss relief on a more favourable basis than afforded by the baseline tax system.
2. **The problem of 'picking winners':** Tax incentive design should recognise that governments rarely, if ever, have the necessary resources and information to successfully target support to specific firms, sectors or technologies. Instead, tax incentive design should target entrepreneurial firms based on a number of criteria, such as age and size (financial and headcount).
3. **Achieving quantity of quality investment:** Tax incentive design should utilise qualifying criteria that promote investment quality, such as performance-related tax relief, in combination with features that promote uptake.
4. **Stability and awareness:** The uptake of tax incentives could be improved through a combination of increased stability in their design features over time and

[1] Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

awareness-raising among target investors.

5. **Systematic monitoring and evaluation:** There is a widespread absence of transparent and systematic monitoring by governments of the fiscal costs and economic impacts generated by tax incentives. Systematic monitoring and evaluation of tax incentives can support their design and reform, as well as promoting the attainment of value for money.

Conditions of transferability

The study highlights that prior to implementing tax incentive schemes in new contexts, or reforming existing schemes in line with good practices elsewhere, attention should be paid to the following considerations:

1. **Design requirements:** It is important to ensure that design features are adapted to fit the needs of the local context (legal, institutional, economic, political or otherwise).
2. **Administrative requirements:** Any necessary changes to existing policies, procedures and systems should be designed and tested in advance of implementation.
3. **Capacity building and training:** Changes in administrative processes should be accompanied with support to those responsible for administering the tax incentive scheme in the implementing authority.
4. **Prior announcement and ongoing communication:** The introduction of new tax incentives requires a communications strategy to raise awareness and promote uptake.
5. **Monitoring and evaluation frameworks:** New tax incentives must be properly monitored and assessed, to ensure that the incremental fiscal cost of the scheme is justified by the broader economic and social effects generated.

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List of abbreviations

AMEX	American Stock Exchange
BA	Business angel
CMU	Capital Markets Union
DG TAXUD	Directorate General Tax and Customs Union
EC	European Commission
ECB	European Central Bank
EU	European Union
GDP	Gross domestic product
IPO	Initial public offering
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
OECD	Organisation for Economic Cooperation and Development
R&D	Research and development
SAFE	Survey on access to finance
SME	Small and medium-sized enterprise
UK	United Kingdom
US	United States
VC	Venture capital
VCT	Venture Capital Trust

Executive summary

Introduction

The Capital Markets Union project (CMU) aims to strengthen the single market by deepening the integration of investment across the European Union. Improved access to finance is a key component of this project, in particular for start-ups, SMEs, and young companies with innovative growth plans.

Historically, European SMEs have been primarily dependent on bank finance. In the wake of the financial crisis, this source of funding has been restricted by refinancing capacity, risk appetite and capital adequacy of the banking sector. This has forced young, growing and innovative businesses to seek finance from different sources, such as venture capital (VC) and business angels (BA).

This study investigates the part that tax incentives for can play in fostering VC and BA investment, with the intention of promoting best practice across Member States.

Such tax incentives have become an increasingly important part of the investment and innovation policy mix in the EU and beyond. They typically offer investors some combination of up-front tax benefit, relief on income generated over the life of the investment, and relief on gains realised upon disposal of the investment. However, the specifics of how these schemes operate, and who can access them, vary considerably from country to country.

Consequently, the aim of the study is to:

- analyse and assess possible design features of tax incentives schemes, in light of the wider empirical and theoretical literature;
- evaluate existing tax incentive schemes; and
- make policy recommendations for future practice.

The research contained in this report has drawn on the empirical and theoretical literature on taxation and investment, descriptions (and, where available, assessments) of existing tax incentive schemes, dialogue with public officials from Member States, and interviews with representatives of the Business Angel and Venture Capital communities.

Why is VC and BA investment desirable?

A number of studies have identified positive macroeconomic outcomes associated with VC and BA investment in young and innovative firms. VC and BA financing lead to economic benefits such as economic growth and job creation through a number of transmission channels, as illustrated in **Figure 1** below.

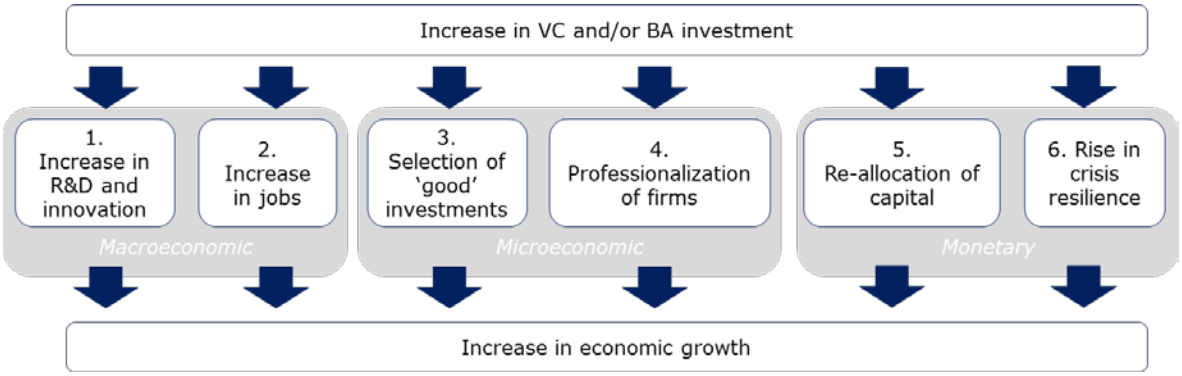
The decline in bank lending triggered by the financial crisis disproportionately affected small and young enterprises. Historically, European SMEs have favoured bank finance,

with equity financing accounting for, on average, just 4%, 6% and 8% of micro, small and medium business total financing respectively over 2009-2014 (European Commission, 2015b).

As a result of this, SMEs are turning to alternative sources of finance, such as VC and BA. However, these alternatives are substantially underdeveloped in the EU compared to the US. Notably, the US has a particularly strong venture capital ecosystem, with $79.3bn of investments in the US in 2015,[2] compared to only €5.3bn in the entirety of the EU, with significant concentrations of investment activity in the United Kingdom.[3]

The challenges in securing adequate financing faced by many typically higher risk SMEs in the EU, coupled with the positive macroeconomic outcomes associated with VC and BA investment, creates a compelling economic rationale as to why VC and BA investment is desirable.

Figure 1: Channels through which VC and BA financing increase economic growth



Source: PwC analysis

What are the drivers of and obstacles to VC and BA investment?

VC and BA investment activity is influenced by a number of factors. These determinants may be conducive or detrimental to stimulating VC and BA investment, depending on their nature. Of the few studies that examine the determinants of VC, fewer still consider the impact of specific taxation policies.

Characteristics of VC and BA investments that deter investors include; the typically higher risk nature of these types of investment; information asymmetries where one party has greater information than the other, causing imbalance; and moral hazard where there may be a risk that a party has not entered into the contract in good faith.

Jeng and Wells (2000) provide a comprehensive analysis of the determinants of VC for 21 countries. They found that government policy can be an important determinant in driving VC investment.

[2] Data from the American National Venture Capital Association http://nvca.org/research/venture-monitor/).
[3] Data from Invest Europe (https://www.investeurope.eu/research/activity-data/annual-activity-statistics).

In addition, VC and BA investment activity can be driven or blocked by a number of determinants at the macro-level. These include the strength of IPO markets, financial markets and the appetites of institutional investors, labour market rigidities, government policy (including taxation) and the macroeconomic and business environment.

How does the tax system influence VC and BA investment?

In practical terms, an investor should take account of any taxes and incentives applicable across the investment lifecycle when making the initial investment decision.

Members of the VC and BA investor community stressed the importance of incentivising downside, as well as upside, investment risk. The provision of loss relief has been linked with encouraging greater risk-taking among investors, which influences the initial investment decision.

Taxes on income generated during the holding period are less relevant in the context of VC and BA investments in start-ups, which may not generate any income in the earlier stages. However, income taxation may also affect entrepreneurial activity via differences in tax rates on corporate versus wage income. This, in turn, may affect the demand for VC and BA investment.

Higher capital gains tax (CGT) rates may have a negative impact on the quantity and quality of investment, though the evidence on the extent and significance of this impact is mixed. A number of representatives from the VC and BA investor community have stressed that their main focus in investing in SMEs and start-ups is to grow the company in question to a capital event. Therefore, the CGT treatment of an investment will influence the risk appetite and decision making process of a prospective investor. For instance, tax relief for capital gains or the provision of loss relief on a more favourable basis than the baseline tax system could support the derisking of investments in young, growing and innovative businesses.

Whilst there is little agreement on specific quantitative predictions and estimates, there is a general consensus that taxation rates across countries significantly influence key decisions regarding foreign direct investment (FDI). From a different perspective, the EC's Report of Expert Group on removing tax obstacles to cross-border Venture Capital investments, identified the potential compliance costs generated by a lack of cohesion between Member States' tax systems as a key obstacle to cross-border VC and BA investment in the EU.

Through discussion with policymakers, it was emphasised that tax incentives form part of a broader set of policy tools. Government support can be delivered through the revenue or expenditure side of the budget. It is important to recognise consider the broader policy mix when analysing

Should VC and BA investment be incentivised through the tax system?

The use of the tax system, such as through

targeted tax incentives, to incentivise VC and BA investment is just one component of the portfolio of responses available to policy makers. Many countries provide support through the expenditure side of the budget, in the form of direct grants and government-backed VC funds.

Tax incentives reduce the effective marginal cost of investing in smaller companies. As a result, in theory more investors should be willing to supply more capital to smaller companies through venture capital funds and/or as business angels benefitting from tax incentives, and at lower expected before-tax rates of return.

While empirical evidence on the impact of both tax incentives and grants is mixed, there is evidence that both forms of policy intervention (individually and in combination) can be effective if appropriately designed and tailored to context.

Through discussion with policymakers on the effectiveness of tax incentives, it became clear that in many cases it is simply too soon to observe effects. This was a result of the recent implementation of tax incentives combined with the characteristically long holding periods of investments of this nature.

Desirable features of VC and BA tax incentives

A range of features that should be considered in the design and operation of VC and BA tax incentive schemes have been identified. These cover the scope of the tax relief provided, the eligibility criteria for the scheme, the administration of the incentive, the stability of the incentive scheme, and its overall generosity to the investor. **Table 1** places these features on a spectrum of good practice.

Table 1: Summary of desirable design features of VC and BA tax incentive schemes

Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
Scope	Upfront relief on amount invested	**Upfront relief granted to eligible investors**	**N/A**	**Absence of upfront relief**
	Relief on returns (investment income/ capital gains)	**Offer relief on capital gains**	**Offer tax relief on investment returns without distinguishing between investment income or capital gains**	**No tax relief on investment returns**
	Loss relief	**Loss relief granted to eligible investors on**	**Loss relief allowed as per the baseline**	**Withdrawal of loss relief**

Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
		more favourable terms than the baseline tax system	**tax system**	
Qualifying criteria	Business age targeting	**Partial targeting on the basis of business age**	**N/A**	**No targeting on the basis of business age**
	Business size targeting	**Partial targeting on the basis of business size**	**N/A**	**No targeting on the basis of business size**
	Business sector targeting	**Restrictions to prevent capital preservation schemes (e.g. excluding certain sectors but with provisions for businesses that operate across sectors)**	**Do not target on the basis of business sector**	**Targeting on the basis of business sector**
	Investor targeting	**Target both business angel and venture capital investors within one scheme or across multiple schemes**	**N/A**	**Target either business angel or venture capital investors within one scheme or across multiple schemes**
	Related parties targeting	**Restrict participation of related parties. However, in the case of schemes specifically targeting natural persons, an allowance is introduced for**	**N/A**	**Restrict participation of related parties. However, in the case of schemes specifically targeting natural persons, an allowance has not been introduced for**

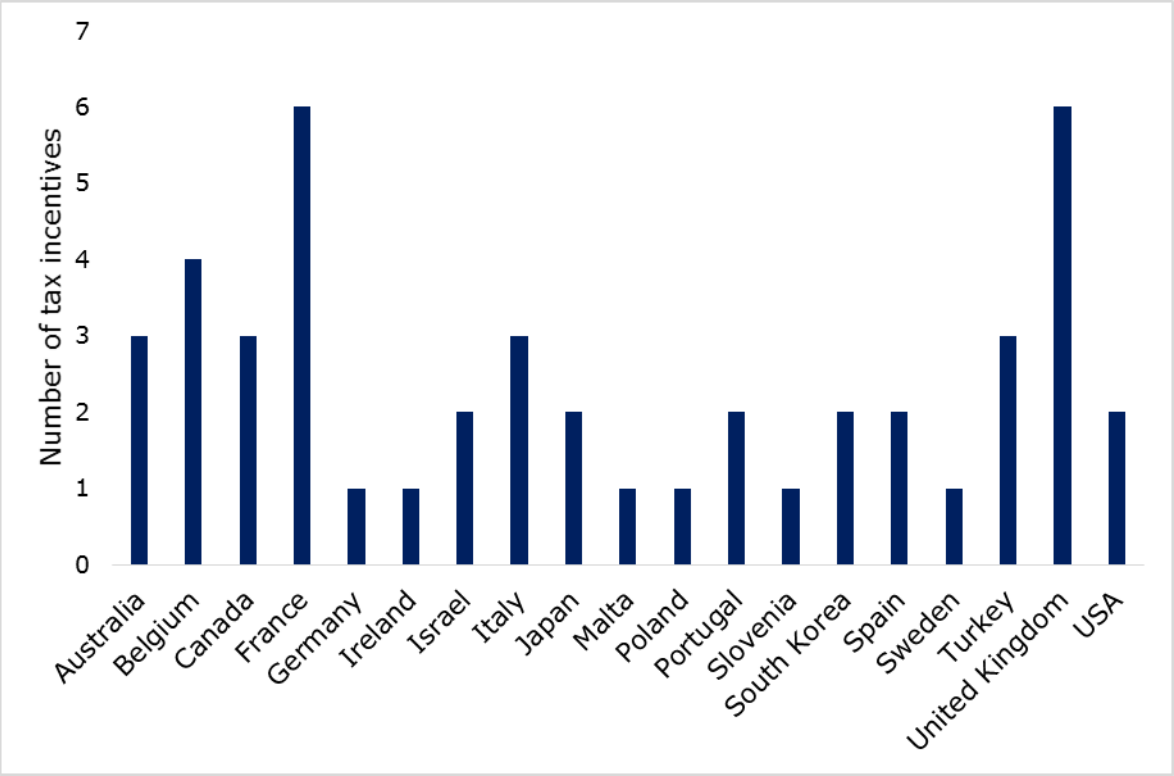
Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
		business angels		**business angels**
	Cross-border investments targeting	**Permit the participation of cross-border investors**	**N/A**	**Restrict to national investors**
	Debt vs. equity targeting	**Target equity investment**	**Make no distinction between debt and equity investment**	**Target debt investment**
	New investment targeting	**Restrict eligibility to new investments (e.g. newly issued share capital)**	**N/A**	**Allow existing investments to qualify for tax relief**
	Investment size limits	**Impose upper or upper and lower limits on investment size attracting tax relief**	**N/A**	**No limits or just a lower limit on investment size**
	Investment duration	**Impose minimum holding periods**	**N/A**	**No required holding period or impose maximum holding periods**
Administration	Discretion	**Administered on a non-discretionary basis**	**N/A**	**Administered on a discretionary basis**
	Fiscal cost monitoring	**Transparent annual monitoring of fiscal costs**	**Undisclosed regular monitoring of fiscal costs**	**Irregular, non-existent or opaque monitoring of fiscal costs**
	Impact monitoring	**Transparent annual monitoring of economic impacts**	**Undisclosed regular monitoring of economic impacts**	**Irregular, non-existent or opaque monitoring of economic**

Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
				impacts
Generosity	Generosity	**Uncertain**	**N/A**	**Over-subsidising**
Stability	Stability	**Fixed design features with prior announcement of design changes**	**N/A**	**Frequent and/or unannounced changes to design features**

What tax incentives are currently available for VC and BA investment?

We analysed VC and BA tax incentive schemes (where they existed) across the EU-28, and in eight additional countries. 19 of the 36 countries examined implement tax incentives targeted to VC and BA investors in start-ups and SMEs, operating a total of 46 different schemes between them.

Figure 2: Popularity of tax incentives



Source: PwC analysis

In terms of the EU-28, there is a marked contrast between EU-15 and other Member States in the prevalence of tax incentives. Nine of the EU-15 Member States operate tax incentives compared to just three (Malta, Poland and Slovenia) of the remaining

13 Member States. This difference can be explained from two perspectives. Firstly, the latter group, in general, choose to incentivise investment activity through the baseline tax system, such as through distributed profits taxes (e.g. Estonia) or low tax rates (e.g. Bulgaria). Secondly, in general Member States in this group have smaller, less developed venture capital markets than the EU-15. Assuming that venture capital drives the demand for tax incentives, the low levels of VC investment in these countries could explain the widespread absence of tax incentives. Of course, causality could run the other way, with tax incentives driving demand for VC, which could explain the low levels of VC investment observed in the second group of Member States.

The various choices taken by governments in the design and implementation of tax incentives to promote business angel and venture capital investment can be grouped into three main categories; 1) scope, 2) qualifying criteria and 3) administration.

Tax credits in respect of the amount invested are the most popular form of incentive, followed by tax exemptions on the returns (current or capital) generated by the investment. However, it should be noted that it is common for schemes utilise multiple forms of incentive, with 13 doing so.

All of the schemes in the country sample use combinations of qualifying criteria, of varying complexity, to target particular businesses, investors, investments and holding periods.

By virtue of utilising qualifying criteria, all of the schemes in the country sample were found to be administered on a non-discretionary basis. However, there was a general lack of transparent monitoring of fiscal costs and economic impacts. Furthermore, there was a widespread lack of readily accessible guidance from implementing authorities on the design and operation of tax incentives.

Benchmarking and good practice cases

The 46 tax incentive schemes observed by the study have been benchmarked according to the principles of good practice set out in **Table 1** to provide a basis for informing policy discussion on good practice.

The highest ranked tax incentives was the United Kingdom's Seed Enterprise Investment Scheme (SEIS). SEIS provides individuals making investments in young companies with an upfront tax credit, a capital gains tax deferral for reinvestment, a capital gains tax exemption for chargeable gains realised on disposal and loss relief on more favourable terms than the baseline tax system for capital losses realised on disposal. The scheme's ranking was driven by high scores across scope, qualifying criteria and administration. SEIS uses a combination of age, size and specific sector exclusions to target entrepreneurial firms. It restricts the participation of related parties, but has introduced allowances for business angels. It targets newly issued ordinary share capital, imposing a maximum investment value attracting tax relief and a minimum holding period. In terms of administration, SEIS is administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs.

The benchmarking results, controlling for novelty and diversity of approaches, were then used as a basis for highlighting good practice in the design of specific tax incentives.

The top five tax incentive schemes and the schemes highlighted in good practice cases are listed in **Table 2** below.

Table 2: Top five tax incentives and good practice cases

Benchmarking results		
Rank	**Scheme**	**Country**
1	Seed Enterprise Investment Scheme	UK
2	Enterprise Investment scheme	UK
3	"Madelin" tax reductions	FR
4	Social Investment Tax Relief	UK
5	Venture Capital Trust	UK
5	"INVEST - Venture Capital Grant"	DE
Good practice cases		
Scheme		**Country**
"INVEST - Venture Capital Grant"		DE
Employment and Investment Incentive Scheme		IE
Tax treatment of crowdfunding loans		BE
"Madelin" tax reductions		FR
Angel Tax System		JP
Venture Capital Trust		UK
Social Investment Tax Relief		UK
Venture Capital Limited Partnership program		AU
Tax shelter for investments in start-ups		BE
Business Angel Scheme		TR

Policy implications

Our benchmarking exercise revealed multiple opportunities for improving the design and operation of tax incentive schemes:

1. **Addressing investor risk aversion**: Policy interventions aiming to stimulate VC and BA investment should try to address investor risk aversion. Policy makers should ensure that the features of a tax incentive contribute to derisking investments in SMEs and start-ups, such as by offering upfront tax credits or loss

The United Kingdom's EIS incentive and Japan's Angel Tax System are among the only schemes to offer loss relief on a more favourable basis.

relief on a more favourable basis than afforded by the baseline tax system.

2. **The problem of picking winners:** Tax incentive design should recognise the challenges of 'picking winners' by targeting entrepreneurial firms based on high-level criteria only, such as age and size. It may be desirable to limit the involvement of certain sectors (e.g. finance and real estate) to avoid deadweight costs associated with incentivising capital preservation. However, the exclusions should not be overly restrictive so as to prohibit the participation of innovative businesses that may sit at the intersection of sectors, such as Fintech.

3. **Achieving quantity of quality investment:** Investment quality can be achieved through a number of ways. Tax relief on future returns on investment will mean a greater focus on success by investors. The tax incentive should utilise qualifying criteria that limit the extent to which the scheme can be used for pure tax avoidance purposes, such as related party restrictions. Alternatively, schemes could utilise qualifying criteria that screen out unqualified investors, such as business experience criteria. They could also use performance-related tax relief to create incentives for the generation of knowledge spillovers.

   Irregular, unannounced and/or poorly consulted changes to tax incentives limit the extent to which investors can price in the impact of the incentive on their investment with any degree of reliability. Members of the VC and BA investor community claimed that this may deter investors from using tax incentive schemes.

4. **Stability and awareness:** The uptake of tax incentives could be improved through a combination of increased stability in design features over time and awareness-raising. Anecdotal evidence suggests that a lack of stability may deter the uptake of tax incentives. In addition to stability, awareness among target investors is another key concept that influences the uptake of tax incentive schemes.

5. **Systematic monitoring and evaluation:** There is a widespread absence of transparent and systematic monitoring by governments of the fiscal costs and economic impacts generated by tax incentives. Systematic monitoring and evaluation of tax incentives can support their design and reform, as well as promoting the attainment of value for money.

Conditions of transferability

Prior to implementing tax incentive schemes in new contexts, or reforming existing schemes in line with good practices elsewhere, attention must be paid to the following considerations:

1. **Design requirements:** International "best practices" should be scrutinised carefully for elements corresponding to specific domestic policy objectives, local market failures, or investor preferences. It is important to ensure that design features are adapted to fit the needs of the local context (legal, institutional, economic, political or otherwise).

2. **Administrative requirements:** New tax incentive schemes generate new administrative requirements. Any necessary changes to existing policies, procedures and systems should be designed and tested in advance of implementation.

3. **Capacity building and training:** Changes in administrative processes should be accompanied with support to those responsible for administering the tax incentive scheme in the implementing authority.

Public officials highlighted that capacity building was crucial in helping revenue authorities 'do more with less'.

4. **Prior announcement and ongoing communication:** The introduction of new tax incentives requires a communications strategy. This will ensure that existing and prospective investors are aware of the scope and nature of changes to the tax system, which should support greater levels of uptake of incentives.

Consultation is a necessary part of the reform process but should be proportionate to the scale of change. Consultation many not always be desirable, particularly where reform is designed to combat the abuse of tax incentives.

5. **Monitoring and evaluation frameworks:** New tax incentives must be properly monitored and assessed to ensure that the incremental fiscal cost of the scheme is justified by the broader economic and social effects generated.

1. Objectives and approach

Section summary

- The intention to study the impact of tax incentives for BA and VC investment was stated in the 2015 CMU Action Plan. This was driven by the results of the Green Paper Consultation during the development of the CMU Action Plan.
- The aim of this study is to evaluate the effectiveness of existing tax incentives for VC and BA in fostering investment in SMEs and start-ups. The study will also aim to provide best practice recommendations for the design of tax incentives for VC and BA.
- The study addresses these aims by seeking to provide answers to a number of overarching research questions.
- The scope of the study has been set to avoid potential for duplication of effort between the EC's recent studies on R&D and SME tax incentives, namely "SME taxation in Europe – An empirical study of applied corporate income taxation for SMEs compared to large enterprises", and "A Study on R&D tax incentives".
- The study's research strategy is structured around four interrelated work streams; 1) literature review, 2) data collection in the EU-28 and eight OECD countries, 3) benchmarking and 4) engagement with a working group of capital market and tax policy experts.
- It is important to recognise that there are a number of challenges to studying the effectiveness of tax incentives of this nature. Data availability, difficulties inherent in assessing impact and access to up to date tax legislation/revenue authority manuals have created limitations of scope.

1.1 Background

Improving access to financing, in particular for start-ups, SMEs, and young companies with innovative growth plans, is one of the main areas that the CMU seeks to address. The CMU is a new frontier of Europe's single market and its creation is a key element of the Investment Plan [COM(2014) 0903 final of 26.11.2014] launched in November 2014. The 2015 CMU Action Plan [COM(2015) 468 final of 30.09.2015] announces that the Commission will study tax incentives for venture capital and business angels to see how these can foster investment into SMEs and start-ups, and promote best practice across member states.

The intention to study the impact of tax incentives for BA and VC investment was driven by the results of the Green Paper Consultation during the development of the CMU Action Plan. Several respondents underlined that an increasing number of Member States are already encouraging venture capital and business angel investment through tax incentives. They recommended sharing the experience of successful schemes. At the same time, some respondents highlighted that differences in tax incentives among Member States should be reduced as much as possible. Many

respondents also encouraged the European Commission to support tax incentives that would contribute to achieving the goals of the CMU, in particular as regards investment into SMEs and long-term projects.[4]

Historically, European SMEs have been primarily dependent on bank finance. In the wake of the financial crisis, this source of funding has been restricted by refinancing capacity, risk appetite and capital adequacy of the banking sector. This has forced young, growing and innovative businesses to seek finance from different sources. Generally speaking, these businesses are too small in scale to benefit from public equity issuances and, instead, look to alternative sources of funding such as marketplace lending, crowdfunding, VC funds and BAs (i.e. individual investors who provide both capital and advice to start-ups and young companies). However, these alternatives are substantially underdeveloped in the EU compared to the US. Notably, the US has a particularly strong venture capital ecosystem, with $79.3bn of investments in the US in 2015,[5] compared to only €5.3bn in the entirety of the EU, with significant concentrations of investment activity in the United Kingdom.[6]

In order to ensure adequate financing of young, growing and innovative businesses, both in terms of volume and structure of funding available, many stakeholders argue that taxation should foster long-term investment in enterprises with higher risk and reward profiles. Indeed, an increasing number of Member States are already encouraging VC and BA investment through directly targeted tax incentives as a means of increasing the supply of early stage VC.

However, there is little evidence on the impact of these forms of intervention. Some research has shown positive impacts in terms of additionality and some has shown significant downside risks generated by poor targeting of investors and target companies, and a lack of coherence with the baseline tax system. Monitoring and evaluation is thus extremely important to ensure such schemes create good value for public money. Systematic measurement, not just of investment activity, but also of the results of that investment activity is essential.

1.2 Objectives and research questions

The aim of the study is to:

- analyse and assess possible design features of tax incentives schemes, in light of the wider empirical and theoretical literature;
- evaluate existing tax incentive schemes; and
- make policy recommendations for future practice.

Although the aim of the study is focused on the role of taxation, it is important to recognise that tax incentives are a single component of a broader portfolio of policy

[4] COMMISSION STAFF WORKING DOCUMENT Feedback Statement on the Green Paper "Building a Capital Markets Union", SWD(2015) 184 final, 30.9.2015.
[5] Data from the American National Venture Capital Association http://nvca.org/research/venture-monitor/).
[6] Data from Invest Europe (https://www.investeurope.eu/research/activity-data/annual-activity-statistics).

interventions that can be used to stimulate BA and VC investment in SMEs and start-ups. Alternative approaches, such as subsidies and grants, can be seen as substitutes or compliments to tax incentives. However, the remit of the study is to analyse the effectiveness of tax incentives in isolation, rather than providing an assessment relative to other forms of policy intervention.

In order to achieve these aims, a series of overarching research questions have been addressed:

- **Why is VC and BA investment desirable?** Before undertaking an analysis of the factors driving VC and BA investment levels, and how taxation can influence these choices, it is important to understand the role that VC and BA investment plays in the economy as a whole, and thus why increasing levels of VC and BA investment is important. It is vital that any incentives to increase VC and BA activity work in such a way that they preserve these desirable characteristics. For example, if productivity spillovers to the wider economy are a key component of what makes VC and BA investment valuable, then it is important that incentives adequately target the quality as well as the quantity of VC and BA investment.
- **What are the drivers of and obstacles to VC and BA investment?** The increasing trend towards incentivising VC and BA investment implies that such investment is underprovided under normal market conditions. Understanding why this is the case, and if possible the scale of the problem, should help us to target tax incentives accordingly. Ideally, tax incentives should be designed in such a way as to enhance drivers of investment, while also helping to reduce or remove obstacles.
- **How does the tax system influence VC and BA investment?** Understanding how VC and BA investments interact with the tax system over the lifecycle of a given investment, and how investment decisions are influenced by taxation, helps to provide a baseline understanding of both the possibilities for incentivisation and potential pitfalls.
- **Should VC and BA investment be incentivised through the tax system?** This study will explore assessments of the impact of tax incentives, as well as potential criticisms (such as deadweight cost, distortion, and crowding out effects).
- **What tax incentives are currently available for VC and BA investment?** Empirical evaluation of tax incentive schemes in the EU, as well as other member countries of the Organisation for Economic Co-operation and Development (OECD), will provide policymakers insight into the breadth of existing tax incentives, and the design choices available. This study will prepare a cross-country mapping of the tax incentives available in the country sample and will benchmark these against principles of good practice in their design and administration. Given that building CMU is a priority of the European

Commission, this study will also pay particular attention to cross-border aspects of these incentives in the data collection and benchmarking components (see **Section 1.4** for more detail).

- **What are the desirable design features of VC and BA tax incentives?** Through a combination of literature review, independent theoretical analysis, and appraisal of existing tax incentive schemes, this study will outline the various design choices available to policymakers, and offer suggestions about potential best practices.
- **How do existing tax incentives for VC and BA investment perform against best practice?** Tax incentives currently available, will be assessed against the best practices emerging from the analysis of desirable design features, in order to benchmark existing schemes.

1.3 Scope

Tax incentives targeted towards investment in young, growing and innovative businesses have become an increasingly common element of the general innovation and funding policy mix. However, there is a broad spectrum of tax incentives targeted towards different growth and innovation drivers in the SME sector. This study has adopted a number of parameters to focus the analysis presented in this report and avoid potential for duplication of effort between the EC's recent studies on R&D and SME tax incentives, namely "SME taxation in Europe – An empirical study of applied corporate income taxation for SMEs compared to large enterprises",[7] and "A Study on R&D tax incentives".[8] The parameters are as follows:

- **Recipient of relief**: Only those tax incentives that are received by the investor and/or an intermediary, such as a professionally managed VC fund, will be considered. Although capital allocation within young and innovative businesses is subject to market failures (e.g. free riding on the generation of intellectual property), this has been explored in the EC's 2014 report *A Study on R&D tax incentives*. As such, this study will focus on the role of tax incentives that seek to correct market failures in the allocation of capital across firms. However, it is important to recognise that both sets of market failures can interact to create obstacles for the formation and growth of young, innovative companies. Innovation and industrial policy should take an integrated approach to addressing both sets of market failures.
- **Nature of investment**: Only those tax incentives relating to externally-sourced debt or equity investments will be analysed. While own capital is an important source of capital for SMEs, its provision is not subject to the same market failures (e.g. information asymmetries) and is often not as instrumental

[7] http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8377

[8] http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_52.pdf

in the SME growth cycle as external finance. As such, it is not the focus of this study.

- **Research and development**: Tax incentives related to investments in businesses engaging in qualifying R&D activity will be considered by this study only where the above parameters have been met.

Common examples of reliefs that satisfy these criteria include:

- up-front tax benefit for the investor on the amount invested in a qualifying company;
- tax benefit on the income received and return from the qualifying investment (dividends, capital gains) and treatment of losses;
- tax benefit on the sale or disposal of the assets held in the qualifying companies (capital gains, inheritance or gift taxes); and
- other forms of new or pilot tax schemes adopted or under development which aim to facilitate financing to young and growing innovative companies.

1.4 Research strategy

This study addresses these objectives and research questions through a four key tasks. The four tasks are as follows:

- **Task One: Literature review and analysis.** The first part of the study reviews the existing literature on VC and BA investment (**Section 2**) and explores the potential interactions between VC and BA investment and the tax system in general (**Section 3**), before evaluating the various design choices available to policymakers when introducing tax incentives specifically targeted towards VC and BA investment (**Section 4**). This analysis will result in a framework for analysing and appraising tax incentive schemes designed to incentivise VC and BA investment, covering features such as the scope of the incentive, how well targeted it is, and how well administered it is.
- **Task Two: Data collection.** The second part of the study collects information on tax incentives for VC and BA investment in the EU-28, the US, Canada, Japan, South Korea, Turkey, Australia, Switzerland and Israel. The data collected allows for an analysis of the rationale and functioning of specific tax incentives within the tax systems in question, and against the broader backdrop of access to finance issues. It provides the basis for the benchmarking exercise in Task Three, and where possible it provides information to understand the impact of tax incentives on the size and development of national venture capital markets, facilitating comparison with countries where such tax incentives do not exist, and understanding of the in-country impact of their introduction. Note that, although these country fiches are presented separately to the output of Task One, they are actually

developed through an iterative process – so where research has identified novel VC and BA incentive schemes in the selected countries, this study has, where possible, expanded the analytical framework to address the relevant features of these incentives.

Immediately following the data collection process, draft country fiches underwent a two-stage review and validation process. Firstly, draft country fiches have been sent to national tax experts from the PricewaterhouseCoopers global network to be reviewed for completeness and accuracy. Following this, representatives of the Member States were invited to comment on the content of the draft country fiches. Comments received from the representatives of Member States were addressed at the discretion of the authors of this report. The outcomes of the Member State review process is documented in the relevant sections of **Appendix 1**. It is understood that comments by the Member States on the questionnaires constitute neither an official validation nor the Member State's endorsement of their content or the content of the report. The country fiches of the eight OECD countries have not undergone review by representatives of their respective governments.

- **Task Three: Benchmarking.** Using the framework developed from the literature review and independent analysis conducted in Task One, the tax incentive schemes identified during Task Two are evaluated and ranked. Benchmarking of this data is conducted in a context-sensitive fashion, with a nuanced understanding of how different design features may best address country-specific issues – for example, a particular design may be best suited to help compensate for a particular shortcoming in access to finance, or a particularly disadvantaged subset of young, growing and innovative companies.

  Drawing on the benchmarking results, good practice fiches have been developed to provide an in-depth overview of good practice in the design and operation of tax incentives.

- **Task Four: Chair and animate two working group meetings.** These meetings provide an opportunity to reality-test the results of the other Tasks, in front of an audience comprised of tax policy and capital markets experts drawn from the Member States. Furthermore, they provide a vital role in refining and disseminating the best practice recommendations derived from the benchmarking exercise.

In addition, and to the extent possible within the time constraints of this study, a number of interviews with representatives of the Business Angel and Venture Capital communities have been conducted. The intention of this was to supplement the data collection being undertaken in Task Two.

1.5 Research challenges and solutions

Any study into the effectiveness of tax incentives on the quantity and quality of VC and BA investment into young, growing and innovative businesses faces a number of challenges.

The available data and literature on the impact of tax incentives on VC and BA investment is extremely limited: In part, this is because such policies are relatively novel, and until recently have been limited to a relatively small number of countries, which means that both theoretical interest and empirical data have been minimal. Such data and analysis as does exist for individual schemes is generally not directly comparable with studies conducted in different jurisdictions, and there are no international studies focusing specifically on the question of tax incentive design on VC and BA investment – although there are international studies examining determinants of venture capital investment more broadly, such as Romain and van Pottelsberghe (2004) and Da Rin *et al*. (2006). Problems of data availability are even more acute with regard to business angel activity, in comparison with venture capital activity; as the OECD notes in its publication, *Financing SMEs and Entrepreneurs 2016*, "*even when programmes have annual filing conditions for investors and businesses in order to be eligible for government support, data on who benefits from tax incentives for angel investors, the companies they invest in, and on their characteristics and performance, are not always systematically collected and studied*" (OECD, 2016).

To address this problem, this study draws on the broader literature around drivers of VC and BA activity; the broader literature on tax, investment, and tax incentives; and analysis based on first principles of the consequences of different policy decisions. In order to develop an analytical framework for the benchmarking of different design features, this study has had to use a combination of independent analysis of likely impacts on the basis of first principles (inferring, for example, that a relief on capital gains on disposal of investment gives investors a greater incentive to ensure that the company receiving the investment is successful than a tax credit that can be claimed upfront upon investment), and through consideration of wider literature that intersects with this study's research questions. For example, where minimal literature exists on the impact of targeting tax incentives towards particular kinds of young, growing and innovative company, this study has considered wider literature about the potential growth in the size and productivity of different types of early stage enterprise, using this information to reflect on if and how incentives are appropriately targeted.

In addition, to broadening the scope of the literature review, key findings from the primary research components of this study have been included to highlight or contrast with issues raised in the literature. These findings have been taken from the interviews with representatives of the Business Angel and Venture Capital communities (Task Two) and the meetings of the working group (Task Four). In order to maintain the distinction between empirical and anecdotal evidence, the key findings from primary research will be presented in boxes.

Assessments of the real-world impact of these tax incentives is complicated by the presence of multiple confounding variables and treatments: Ideally, policy evaluation should be conducted by allocating the 'treatment' (in this case, the introduction of tax incentives with a particular design construction) to a random sample of companies, investors, or even jurisdictions (depending on the level at which effects are of interest), and comparing the impact on the relevant dependent variables (such as investment raised by a company, amounts invested by the investor, or productivity growth across the economy as a whole) with the results from an untreated control group.

To date, no such experimental construct has been attempted with regard to VC and BA incentives, and there are sound political and administrative reasons for believing such an experiment to be unlikely. In lieu of such a study, a number of alternative research methods have been employed, including statistical techniques intended to approximate the experimental construct (such as panel data approach adopted by Cowling *et al*.'s 2008 study of the UK's EIS and VCT schemes, matching companies receiving tax incentivised funding with those that did not and comparing performance), to surveys of investors and investees (such as Ipsos MORI's 2016 study on behalf of HMRC), to more descriptive studies that compare the performance of companies receiving tax-privileged investment to the baseline population (such as Hellman *et al*.'s 2010 evaluation of the Venture Capital Program in British Columbia).

All such approaches have methodological limitations and policymakers must make a number of assumptions if they are to translate these findings into clear policy recommendations. Panel data studies assume that entities are not dissimilar in any relevant way that is not captured by the variables used for matching, which given data limitations is an assumption with limited credibility. Purely descriptive comparisons fare even worse in this regard, as no effort is made to control for differences between companies other than whether or not they benefit from the tax incentive. Survey data on investor and investee decisions is inherently subjective, requiring interview subjects to speculate as to what would have happened in the absence of an incentive, and is likely to overstate the importance of the incentive (as both investors and investees are likely to favour the continuation and expansion of schemes that benefit them at a cost to the wider taxpayer population).[9]

This study acknowledges that there remains a good deal of uncertainty over the magnitude and even existence of any impact of tax incentives upon VC and BA investment (see, for example, the results of Cowling *et al*.'s 2008 evaluation of the UK's EIS and VCT schemes). The lack of available data, and the difficulty of detecting any causal effect of tax incentives on both the quantity and quality of VC and BA investment, limits the strength of this study's conclusions. Nevertheless, anecdotal evidence from tax experts working in this area, and surveys of investors such as the 2016 study conducted by Ipsos MORI's Social Research Institute on behalf of HMRC

[9] The inherent subjectivity of survey data has been recognised in the inclusion of key findings from the primary research components of this study in the literature review. Anecdotal evidence has been presented in such a manner as to allow the reader to make the distinction from empirical evidence.

seem to confirm that tax incentives do have a significant impact on investment decisions. This hypothesis will be further tested through interviews with VC and BA investors and the meetings of the working group, the results of which will be interspersed throughout the literature review.

As regards the impact of particular design features of tax incentive schemes, data and literature is even more restricted. Consequently, the assessment of the impact of these measures draws on a wider range of literature and independent analysis (as discussed above), and the benchmarking assessment aggregates qualitative rankings of individual design features, rather than attempting to quantify their relative impact on quantity and quality of VC and BA investment. This approach – based upon principles of best practice, in lieu of internationally comparable data and analysis of the impact of different design features on VC and BA investment – was adopted in the EC's 2014 study on R&D tax incentives, where similar problems regarding the coverage of the literature, confounding variables, and multiple treatments were encountered.

In the country fiches, this study presents information (where it is available) that maps the introduction of tax incentives to the development of VC and BA investment over time, remaining clear that no causal inference can be drawn. Indeed, this study recognises the possibility that causality could run in the opposite direction (i.e. the deepening of VC and BA markets in a particular country could lead to calls for privileged tax treatment of these investments, rather than vice versa).

Access to up-to-date tax legislation and/or revenue authority manuals is uneven: This presents a significant challenge for mapping the tax incentives offered by the countries sampled as part of the data collection exercise. Priority has been given to government sources, but in the interests of coverage, institutional and private sector sources will also be used wherever necessary.

1.6 Structure of this report

The remainder of this report is structured as follows:

- **Section 2** will present a review of the literature on the characteristics and determinants of VC and BA investment.
- **Section 3** will present a review of the literature on the relationship between BA and VC investment and the tax system.
- **Section 4** will present a review of the literature on the design features of tax incentives for VC and BA investment in SMEs.
- **Section 5** will contain the results of the data collection on tax incentives in EU-28 and selected OECD countries.
- **Section 6** will present the benchmarking methodology and results.

- **Section 7** will outline the conclusions of the study, including policy implications.
- **Annex 1** will briefly discuss the tax advantages of debt compared to equity financing.
- **Annex 2** will outline, in more detail, the empirical evidence on the impact of venture capital financing on the economy.
- **Annex 3**: will contain a high level overview of alternative approaches to measuring generosity using the B-Index methodology.
- **Annex 4** will contain an overview of the robustness of the benchmarking results
- **Annex 5** will contain the results of the benchmarking component of this study.
- **Appendix 1** will contain country fiches for the country sample.
- **Appendix 2** will contain good practice fiches.

2. Framing VC and BA investment in SMEs

Section Summary

- A number of studies have identified positive macroeconomic outcomes associated with VC and BA investment in young and innovative firms. VC and BA investment has been empirically shown to have positive impacts on innovation and productivity.
- The decline in bank lending, a key source of SME finance, triggered by the financial crisis disproportionately affected small and young enterprises. As a result of this, SMEs are turning to alternative sources of finance, such as VC and BA.
- The challenges in securing adequate financing faced by many SMEs, coupled with the positive macroeconomic outcomes associated with VC and BA investment, creates a compelling economic rationale as to why VC and BA investment is desirable.
- VC and BA investment activity is influenced by a number of factors. These determinants may be conducive or detrimental to stimulating VC and BA investment, depending on their nature. Of the studies that examine the determinants of VC, few consider the impact of specific taxation policies.
- There are a number of characteristics specific to VC and BA investment and market failures that result in inherent difficulties in driving VC and BA investment. These include the typically higher risk nature of these types of investment, information asymmetries, moral hazard, and positive externalities to society not captured in private decisions.
- In addition, VC and BA investment activity can be driven or blocked by a number of determinants at the macro-level. These include the strength of IPO markets, financial markets and the appetites of institutional investors, labour market rigidities, government policy (including taxation) and the macroeconomic and business environment.

For the purposes of this review, the definition of VC used is that provided in the EC's Venture Capital Tax Expert Group report, "Removing obstacles to cross-border investments by venture capital funds" (2010):

"Investment in unquoted companies by venture capital firms who, acting as principals, manage individual, institutional or in-house money. In Europe, the main financing stages included in venture capital are: early-stage, covering seed and start-up, and expansion. Strictly defined, venture capital is a subset of private equity… Offsetting the high risk the investor takes is the expectation of higher than average return on the investment."[10]

[10] The EU Regulation on European Venture Capital Funds (EuVECA) offers a regulatory definition of venture capital funds. Only funds that invest at least 70% of their assets in unlisted companies employing fewer than 250 persons and having an annual turnover not exceeding €50 million or an annual balance sheet total not exceeding €43 million can qualify as European venture capital funds. It should be noted that in July the Commission proposed to enlarge the definition of venture capital funds by increasing the range of companies that these funds can invest in, thus unlocking more market-based investments to SMEs. More specifically, the Commission proposed to include among qualifying investee companies all unlisted undertakings which employ up to 499 persons and SMEs listed on an SME Growth Market (as defined in the Markets in Financial Instrument Directive - MiFID II). The proposal also permits follow-on investments in qualifying portfolio undertakings, namely undertakings that do not meet the definition criteria but met them at the time of the first investment by the qualifying venture capital fund in those undertakings. On 30 May

Similarly, a BA is defined in the EC's report (2010) as:

"A knowledgeable private individual, usually with business experience, who directly invests part of his or her personal assets in new and growing unquoted businesses. Besides capital, business angels provide business management experience for the entrepreneur."

These two definitions distinguish between VC and BA by virtue of the fact that VC is provided by firms, while BA are individuals who invest their money and time into young business. However, it is common in the literature to see BA defined as 'informal' VC (see e.g. Aernhoudt, 2005).

VC firms may also be publically financed, for instance in industries where governments are seeking to encourage innovation (see e.g. Brander *et al.*, 2015). Unless explicitly said, this study considers public and privately funded VC together.

Using these definitions, this section will first explore the defining characteristics of VC and BA investment. It will then discuss the key determinants of VC and BA investment before closing with a discussion of the importance of this type of investment and how policy makers can look to promote it.

2.1 Defining Characteristics of VC and BA investment

Based on the definitions above, a number of characteristics of VC and BA investment can be identified. To structure the discussion these are classified into three groups. First, the role of VC and BA investment in SME financing will be considered. Secondly, different stages of the investment process are considered. Thirdly, the fact that VC and BA investment bears high uncertainty, i.e. the high growth potential comes with high risk, is discussed. Finally, the important characteristic of asymmetry between the entrepreneur and investor will then be examined.

2.1.1 Role of VC and BA investment in SME financing

It is in the interests of governments to incentivise investment in SMEs. These enterprises play an essential role in the European economy, employing 90 million people and accounting for over 99% of enterprises (European Commission, 2015a) in the non-financial business sector in 2014. The CMU project seeks to improve access to finance for SMEs – for whom access to traditional bank finance has reduced since the financial crisis. As a result, alternative sources of finance are becoming increasingly important. Alternative financing refers to financing from external, non-bank sources, such as VC and BA.

However, VC or BA investment may not be appropriate or viable for all SMEs. 93% of Europe's SME population in 2014 were micro enterprises[11] (European Commission, 2015a). This suggests that the vast majority of SMEs are unlikely to have the same growth trajectory of 'gazelle' firms. These enterprises are likely to continue to rely on traditional sources of finance, such as bank loans and overdrafts. Consequently, equity financing accounts for a relatively small proportion of total SME financing, averaging just 4%, 6% and 8% of micro, small and medium business total financing respectively over 2009-2014 (European Commission, 2015b).

2017 the European Parliament and Council of the EU reached political agreement to open up EuVECA to fund managers of all sizes and to allow the Commission proposed greater range of companies to benefit from EuVECA investment. The agreed text now follows ordinary legislative procedure before the final endorsements by the European Parliament and the Council of the EU.

[11] Classified as companies employing less than 10 people.

Analysis by Invest Europe (2016) looking at the number of companies invested in in 2015 shows that the majority (in absolute terms) of VC investments were at the start-up phase (1,812), compared to 431 and 644 for seed and later-stage investments respectively. 98.7% of VC investments were in SMEs,[12] including 68.8% in firms with fewer than 20 full-time equivalent staff. Investments were most common in the life sciences, computer and consumer electronics, and communications sectors. In comparison, Strategy& analysis (2015) shows that R&D spending is most prevalent in the computing and electronics, and healthcare industries, with software and Internet just behind auto in fourth place. This suggests VC funding is most prevalent in industries where R&D expenditure and efforts to innovate are greatest.

The Invest Europe analysis also showed that in 2015, cross-border VC investments within the EC totalled €994m in comparison to €2,499m domestic investments within EC countries. The UK and France led the way in terms of the quantity of investment in VC. Data on cross-border BA investment is less abundant, although there is evidence of cross-border BA syndicate activity[13].

Seed and early-stage financing appeared to weather the financial crisis better than later-stage financing (OECD, 2015). In line with this, Block and Sandner (2009) find that firms in later phases of the venture cycle are more likely to be negatively affected by weak IPO markets than firms seeking initial funding. Looking at VC investments in US Internet firms, and using a regression analysis, they find that the financial crisis is associated with a 20% decrease in the average amount of funds raised per funding round.

However, evidence for the UK is contrary, suggesting that in both the dot-com bubble and the financial crisis seed and early stage funding were particularly hard hit. In the two-year period 2007-2009, the number of companies receiving VC finance decreased by 38%, while the total amount invested fell by 37%. Total investment in seed and first round companies decreased by 58%, with 52% fewer companies backed (Pierrakis, 2010).

The financial crisis had a threefold impact on the VC market: exit opportunities were reduced, fundraising activities shrunk and invested capital stagnated (OECD, 2009). The OECD (2015) draws on investment data from national or regional VC associations according to the location of the enterprise. The data shows that VC investments were higher in 2014 compared to 2007 in only a few countries (including the US, South Korea and Hungary). In Europe, VC investment in SMEs has fallen since 2008. Firms with between 20 and 99 employees have seen the largest decline. Block, De Vries and Sandner (2010) also show that the crisis is associated with a decrease in the number of initial funding rounds, as well as the amount of funds raised in later funding rounds.

The available data on BA activity is sparse in comparison to VC, largely because of the difficulty in identifying private, individual investors in unquoted companies. A study on BA activity in the UK during the financial crisis seeks to overcome data scarcity by tracking more visible elements of the market (i.e. investments channels through 'portals' such as networks or syndicate groups). This shows that in comparison to debt finance and VC, the level of BA activity in the UK has been maintained since the crisis (Mason and Harrison, 2015). Although the EC collects some data relating to BA activity, it is not available for all countries.

[12] Defined in this instance as firms with fewer than 250 full-time equivalent staff.
[13] For examples see crossborderangels.com

Note that, despite this study's focus on BA and VC forms of equity investment, bank overdrafts and loans remain the largest source of finance for SMEs. As such, it is important to understand the extent to which gaps in traditional debt financing availability can be remedied by greater levels of VC and BA investment. Equity capital is important for high-growth, innovative start-ups and SMEs, but not necessarily an appropriate form of financing for all enterprises. Van der Schans (2012), for example, shows that in the UK, only 1-2% of SMEs looking for external finance seek equity finance. This is consistent with firm-level responses to the ECB-European Commission SME survey on access to finance (SAFE) in 2016 showing that only 2% of SMEs used equity financing, whereas 18% used bank loans.

In this context, it is worth noting the emergence of 'venture debt', which broadly covers debt financing provided to VC-backed companies. It is estimated that the European venture debt market has invested nearly £1 billion into VC-backed businesses since the late 1990s (BVCA, 2010). The research notes that as VC investments dropped following the crisis, venture debt played an important role where investors needed to remain with companies in the period leading up to exits. Data relating to investments made by three of Europe's largest venture debt providers shows that during and immediately after the crisis, the amount of venture debt invested almost tripled (to around £137m in the UK and £105m in Europe). By 2009 investment had returned to much lower levels (to around £19m in the UK and £26m in Europe). Though the remainder of this literature review focusses broadly on VC and BA, the role of venture debt in the venture ecosystem could be considered in future research.[14]

Finally, there is a widely-held view that the European VC and BA market lags the US market and as such requires some level of intervention, specifically it is roughly a quarter of the size (see for example PwC, 2016). Axelson and Martinovic (2012) argue to the contrary that there is no difference in the likelihood or profitability of IPOs between European and US deals from the same year. However, they note that 'serial entrepreneurs' are less common in Europe. In Europe, serial entrepreneurs account for 15% of deals, compared to 35% in the US. The authors conclude that this variance accounts for the difference in performance between the two markets. This follows from earlier findings from Gompers *et al*. (2010) that the existence of a pool of serial entrepreneurs is important for the success of a VC industry.

2.1.2 Timings and stages of VC and BA investment

The process of investing into young and unquoted firms by either VC firms or wealthy individuals can take place at several points in time. While there are somewhat varying definitions used by different venture capital associations, it is possible to group the different stages of the firm development into five broad categories.[15] **Figure 1** depicts how the lifecycle of an investment project can generally be broken down into five stages (based on European Commission, 2015) and how aspects of the tax system are relevant at different stages:

- **Pre-seed**: Companies researching, assessing or developing an initial idea or concept before reaching the formal start up process. Companies at this stage typically incur low level of outgoings, and receive no income. Investment likely to come from own resources. There is minimal scope for interaction with tax system, aside from loss relief.

[14] For a short discussion of the tax advantages of debt versus equity financing see Annex 1.
[15] See OECD (2015) for a comparison of different definitions of the VC stages.

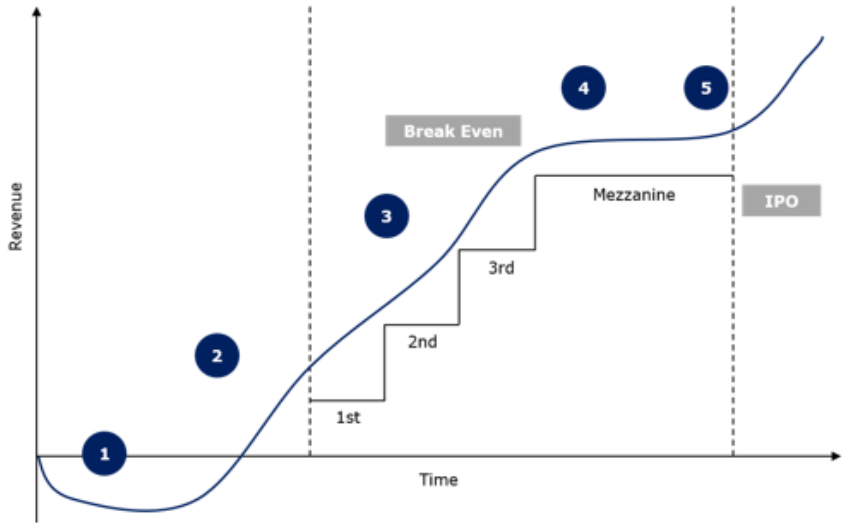
- **Seed**: Companies that have already formally been set up but are at a very early stage in development. Companies at this stage typically incur an increasing level of outgoings, and receive no income, though they may receive investment (from own resources or external funders). There is minimal scope for interaction with tax system, aside from loss relief, and potentially also payroll taxes. Sale of equity stakes could give rise to capital gains implications for investors.

- **Early stage**: Companies that may have developed a product or service but have not yet achieved breakeven (or are still in the process of refining their product/offering). Companies at this stage typically incur a higher level of outgoings. They may also begin to generate income, if not profit. They may receive investment (from own resources or external funders). There is some scope for interaction with tax system, including applicable indirect taxes, payroll taxes, and loss relief. Some jurisdictions offer small companies simplified tax systems based on turnover rather than profit. Sale of equity stakes could give rise to capital gains implications for investors.

- **Later stage**: Growing companies in production that may still be pre-breakeven. Companies at this stage may be liable for personal or corporate income taxes on profits, as well as indirect and payroll taxes. Sale of equity stakes could give rise to capital gains implications for investors.

- **Expansion (scale-ups)**: Companies with the scope to scale up and internationalise their activities. Companies at this stage may be liable for personal or corporate income taxes on profits, as well as indirect and payroll taxes. Sale of equity stakes could give rise to capital gains implications for investors.

Figure 3: Investment stages of start-ups and SMEs and the tax system



Investment stage	1) Pre-seed	2) Seed	3) Early stage	4) Later stage	5) Expansion
Relevant aspects of tax system	• Loss relief	• Loss relief • Payroll taxes • Capital gains taxes	• Profit taxes • Simplified business taxes • Loss relief • Payroll taxes • Capital gains taxes • Indirect taxes	• Profit taxes • Payroll taxes • Capital gains taxes • Indirect taxes	• Profit taxes • Payroll taxes • Capital gains taxes • Indirect taxes

Source: Adapted from European Commission/CSES

The stages in **Figure 3** highlight that the timing of the investment growth cycle determines to a large extent several important characteristics of the VC or BA investment. *Ceteris paribus*, the earlier in the growth cycle the investment takes place, the higher the risk is, as the less information on product, business plans and performance is available to the investor. Hence, the anticipated rate of return in the event of success needs to be higher to attract sufficient investment. Furthermore, the earlier in the growth cycle the investment is, the more important is the additional dimension of business advice provided by the venture capitalist or business angels. From our research we have been unable to find a clear evidence base to suggest that VC and BA funding are more prevalent at certain stages respectively. Some authors consider BA funding to precede VC funding in the early phases (see for example Benjamin and Margulis, 2001), whereas others find VC and BA to be closer substitutes (see for example Hellman *et al.,* 2015).

Another relevant aspect of the stages shown in **Figure 3** is the fact that both VC and BA are normally temporary investments and that successful projects end in an IPO or other form of exit.[16] Therefore, the exit strategy of the investor is also of importance, which in turn can be affected by the tax treatment of capital gains. Both a trade sale and an IPO are taxable events, but preferences tend to be driven by the vendor's circumstances and the intent of the purchaser instead of tax implications.

[16] Data on European private equity divestments shows that the number divestments by way of an IPO exit route are relatively low compared to other forms such as trade sales. (Invest Europe, 2015).

2.1.3 Uncertainty and high growth potential

The second key characteristic of VC and BA investment is uncertainty. Given the fact that the investment takes place in unquoted companies and typically at an early stage of firms' development processes, the return on the investment is typically less certain than for other forms of investment. An emphasis on research and development, or other innovative aspects of their business models, can make evaluation of their risk profile difficult for both investors and lenders. Young innovative enterprises are particularly affected by these problems as they often lack collateral or a record of revenue generation. Limited information and limited scale contribute to the general lack of liquidity in such investments, and the ability of investors to exit from any investment they might make.

To compensate for the higher risk, an above usual rate of return for a successful project is required by investors. This search for extraordinary projects is reflected by the more likely occurrence of VC and BA investment into high growth firms (HGF). For example, Gornall and Strebulaev (2015) review the economic impact of VC and find that, while most of the VC-backed companies fail, the outstanding performance of the successful projects results in a clearly positive contribution of VC to job creation and economic growth.

One source of uncertainty is the fact that the investment typically takes place in young enterprises that are below their optimal size, and may be developing innovative products that are not guaranteed to succeed either commercially or technologically. This means that the potential investors are likely to have limited information about both the firm and the entrepreneur. If the entrepreneur has repeatedly started new businesses (referred to as 'serial entrepreneurs') they may be better able to demonstrate their capabilities to potential investors and therefore attract more capital.[17]

2.1.4 Asymmetry between investor and entrepreneur

Over and above the uncertainty about the technical feasibility and commercial viability of new products and services, additional investor risk arises from the information asymmetries between investors and entrepreneurs. The VC firms or BAs investing their money into a new start-up enterprise do not normally possess the same level of information about the potential of the business idea in comparison to the entrepreneur. Small-scale and innovative business models means that reliable third-party information on smaller firms is rarely available. Developing this knowledge can be costly and may lead to investment based on incomplete information, an inefficient allocation of capital. This screening process is particularly important in light of the high uncertainty surrounding VC or BA investment, and often used as an argument against direct VC investment by public bodies.[18]

The second information asymmetry of importance lies in the fact that the success of the firm needs sufficient effort from the entrepreneur. This cannot be easily or cheaply observed by the investor, which creates an opportunity for the entrepreneur to provide less effort once they have obtained funding. Under the plausible assumption that the best efforts to run the business come at a cost for the

[17] See Wright *et al*. (1997) for a discussion about serial entrepreneurs and also Gompers *et al*. (2010) for a more recent discussion about the impact of serial entrepreneurship on the success of VC investment.
[18] See for example Lerner (2012) who names the failure to follow the market by policy makers as one of the pitfalls of government intervention to spur innovation.

entrepreneur, this results in a moral hazard problem.[19] Furthermore the entrepreneur may rely on business advice from the VC or BA investor, which may also be non-observable. Hence, the moral hazard problem may be two-sided.[20] This is discussed in further detail in **Section 2.2**.

2.1.5 Private and public funding into VC

Analysis by Invest Europe (2016) found in 2015 that 31% of VC funds came from government agencies. Brander *et al.* (2015) highlight how governments may finance VC investments in industries where they are seeking to encourage innovation, filling gaps that may exist in private VC markets. The OECD (1997) outline the channels through which governments can contribute to VC funding; specifically:

- Equity investments in SMEs
- Government loans to SMEs
- Hybrid VC funds, which the private sector also contributes to
- Direct financing of, or loans to, private VC firms

The debate around the complementarity/substitutability between private and public VC is discussed in greater detail in **Section 4.5.3.**

2.2 Key determinants of VC and BA investment

VC and BA investment activity is influenced by a number of factors. These determinants may be conducive or detrimental to stimulating VC and BA investment, depending on their nature. Of the few studies that examine the determinants of VC, few consider the impact of specific taxation policies. Jeng and Wells (2000) provide a comprehensive analysis of the determinants of VC for 21 countries. The authors acknowledge that they do not consider every potential important driving force (due to the lack of a robust measure available to include in an empirical analysis). Specifically, they state that although they believe that capital gains taxes are an important determinant, they find no statistically significant impact on VC and therefore do not report these results. However, the findings of Jeng and Wells (2000) largely shape the choice of determinants discussed below.

High-risk nature of VC and BA investments

The literature tends to focus on market or macro-level factors as determinants of VC. However, there are a number of determinants at the 'micro' or individual investment level that may determine overall VC or BA activity. As discussed in **Section 2.1.3**, the companies into which VC and BA investors invest are likely to be typically higher risk. This is due to the novelty of the products and business models that many of these businesses are pioneering, as well as the early stage at which these companies seek investment (which translates to a lack of past performance data). High levels of risk operate as an obstacle to investment, with investors requiring higher returns in order to compensate for this risk level. This study could not find clear evidence as to whether risk is a stimulant or a deterrent of VC and BA investment; but given that high risk is a deterrent to other investors such as traditional intermediaries, VC and BA funding often fills the funding gap. VC and BA financing is therefore more common in higher risk

[19] The term moral hazard problem refers to a situation where one party of a contract can take a risk without bearing (the full) costs. This implies that the incentives of the two contracting parties are not (fully) aligned and inefficiencies may arise.

[20] Two papers by Kanniainen and Keuschnigg (2003 and 2004) theoretically model the moral hazard problems in the VC investment decision. See also the technical appendix which describes the modelling and the potential tax policy remedy in more detail.

ventures, as VC and BA investors are able to compensate for the high risks through securing sufficient returns, whereas traditional financial intermediaries are unable to do this due to regulation and usury laws, as discussed by Zider (1998).

Information asymmetry and moral hazard

As discussed above, limited information that potential investors hold about the firm and entrepreneur prior to investing may pose an obstacle to investment. However, the prospect of further information asymmetries even after deciding to invest may present issues for the development of a successful VC market. It is difficult for investors to observe the effort of the entrepreneur, this effort being necessary for success. This effort comes at a cost for the entrepreneur, resulting in a moral hazard problem.

However, the entrepreneur may also rely on non-observable business advice from the investor, rendering the moral hazard problem two-sided. If investors or entrepreneurs anticipate this issue *ex-ante*, this may impede investment in the first place. If the investment is made and the double moral hazard problem results in the failure of the investment to produce the required return, this may deter serial entrepreneurs or investors.

Other market failures

Van der Schans (2012) provides a useful discussion on other market failures that restrict SMEs access to finance. For example, in addition to issues of information asymmetry and moral hazard, van der Schans outlines how the socially optimal level of investment in SMEs may not be reached as investors only consider the private benefit from investment, and not the positive externalities to society from knowledge spillovers. Evidence cited to support this is a positive relationship between VC and patent counts.

Ptacek and Kaderabkova (2014) also highlight how European venture capital markets fail in that the number of firms seeking investment greatly exceeds the number that receive finance due to risk aversion and imperfect information on the supply side. Additionally, on the demand side, firms may lack information on other sources of finance.

To conclude, VC and BA investment activity will be influenced by a range of market conditions. Depending on the nature of these conditions, they may encourage or discourage VC and BA investment. However, there are also a number of characteristics specific to VC and BA investment that result in inherent difficulties in driving VC and BA investment. The findings by Jeng and Wells demonstrate the importance of a differentiated approach to policy for different segments of the VC market.

IPOs

Given the risky nature of VC and BA investments, investors seek a higher rate of return by way of compensation. Though some VC or BA investors may receive some income in the form of dividends or interest throughout the holding period, it is more likely that they will realise their return on investment upon divestment. This is because, as demonstrated in **Figure 1**, typically start-ups and SMEs do not tend to breakeven until they are past early stage investments. Therefore, viable exit routes may drive levels of VC and BA investment. There are a range of divestments options, including by IPO, sale to another private equity firm or financial institution, or a trade sale. The literature suggests that IPOs are the most attractive option in terms of average yields (Jeng and Wells, 2000).

The strength of the IPO market is confirmed by a number of studies as an important determinant. Jeng and Wells (2000) provide an assessment of the determinants of VC funding across countries and over time. They find that IPOs are the primary driver behind cyclical fluctuations in VC investment over time. However, the authors note that "*the distinct stages of VC are fundamentally different*", and that the importance of IPOs for each stage differs accordingly. For example, although later stage investments are significantly impacted by IPOs, IPOs explain less of the cyclical swings over time for early stage investments. Further, government-funded VC is less sensitive to IPOs across countries. Despite this nuance, in general there is consensus on the importance of IPOs (see also Rin *et al*., 2004 and Felix *et al*., 2007). Felix *et al*. also find that trade sales divestments also have a strong positive impact. This is relevant for Europe, given that data shows that IPO divestments are less common in European private equity compared to trade sales (Invest Europe, 2015).

Financial markets and institutional investors

Financial markets and the appetites of institutional investors influence the supply of and demand for VC.

On the demand side, financial markets play a crucial role in SME access to finance and corresponding entry rates (Kerr & Nanda, 2009). Levine (1997) and Bonaccorsi di Patti & Dell'Ariccia (2001) found that the level of competition among banks was recognised as a key determinant in firm creation. Whereas, Rajan & Zingales (1998) highlighted the role of the depth of credit markets. Therefore, the structure and development of financial markets could be considered to be a determinant in the demand for VC and BA investment from SMEs and start-ups.

On the supply side, institutional investors searching for a diverse portfolio that delivers superior long-term returns may look to VC. Pension funds themselves typically only invest a small percentage of their total assets in VC (Chemla, 2004). However, the amount is significant in the context of the overall VC market. Invest Europe data (2016) shows that 7% of VC funding comes from pension funds. The equivalent figure for insurance companies, who also have long term liabilities that can match long term assets, is 3%. Therefore, pension funds and insurance companies may have an important role to play in the VC supply chain. Though public pension funds may also invest in VC, some countries require these funds to publicly disclose sensitive information about their investments, limiting the ability of VC to draw on these funds. Jeng and Wells (2000) consider the impact of private pension fund levels, which are found to be a significant determinant over time, but not across countries.

Labour market

The nature of the labour market affects the incentives to become an entrepreneur. Labour market rigidities as discussed by Sahlman (1990) may take the form of strict labour laws, stigma attached to unsuccessful ventures and cultural perceptions associated with leaving a company. These factors, in turn, reduce the demand for VC and BA as less people are inclined to start a higher-risk business and search for the required funding. Turning to factors that affect early (but not later) stage VC, Jeng and Wells show that labour market rigidities are a key determinant in explaining variation across countries i.e. labour market rigidities have a negative impact on VC investment. This study has been unable to source more recent literature to support Sahlman's findings.

Government policy

There are a number of ways in which a government might seek to intervene in a specific market. VC and BA investment could be stimulated by direct provision (e.g. government-sponsored VC funds) or subsidised provision. Other forms of intervention include regulation (including headline tax rates and specific tax incentives, and a stable and conducive legal framework) and subsidies. Another perspective regarding government intervention is offered by Autio and Rannikko (2016), who suggest that public sector sponsorship is broken down into two wider operations: buffering and bridging. Buffering involves governments giving resources to protect firms from scarcity and dependencies. Resources include financial subsidies, tax breaks and prioritised access to government contracts. Bridging helps to connect SMEs and start-ups with external parties, such as through networking activities, referral and introduction to BAs and VCs. This study characterises in more detail the different forms of policy intervention in **Section 2.3.3**.

As discussed in **Section 1.5**, the literature covering the extent to which taxation influences VC and BA investment is limited. In later sections of this report, this challenge is addressed by drawing on broader literature to contribute to relevant aspects of the research question. However, for the purposes of examining determinants of VC and BA investment at a high-level, there are some international studies that consider the role of taxation as a determinant more generally. For example, Rin *et al*. (2004) find that reductions in capital gains tax rates have a positive effect on VC (although this effect is weaker than for other determinants). Armour and Cumming (2009) look at the legal determinants of VC. They find that legislators may stimulate VC by reducing direct taxation, but not by providing investment subsidies. This study discusses the role of capital gains and other taxes in the subsequent sections.

When accounting for differences across countries Jeng and Wells (2000) suggest that government policy can be an important determinant. The authors state that the impact of government policy on VC flows is driven by its role in shaping the regulatory environment and promoting investment during economic downturns (Jeng and Wells, 2000). This policy may be in the form of tax incentives, subsidies or direct investment. This study provides an assessment of alternative government policies (e.g. subsidies) in **Section 5.5.5**. This study also considers the wider impacts of direct, government-sponsored VC in the context of crowding out private investment.

Macroeconomic and business environment

However, more general conditions may drive start-up activity and VC and BA investments across countries. A favourable environment may encourage investment by reducing the costs of doing business in a particular country. Looking at legal and political environments, Bonini and Alkan (2012) suggest that a favourable socio-political and entrepreneurial environments facilitate the development of VC (Armour and Cumming (2006) provide the specific example of liberal bankruptcy laws, discussed in greater detail in **Section 2.3.3**). Although Acs and Audretsch (1994) suggest that macroeconomic conditions influence general start-up activity, Jeng and Wells (2000) find that GDP and market capitalisation are not significant determinants in the case of VC. Felix *et al*. (2007) consider the unemployment rate, and find that it has a strong negative impact. There is stronger evidence for the impact of interest rates. Romain and Van Pottelsberghe (2004) provide evidence that short-term and long-term interest rates have a strong, positive impact on VC across 16 OECD countries. They note that rates affect the demand side more than the supply side.

Cross-border factors

A strong home bias is already found in the VC industry: VC tend to invest - and later exit - their investments in their home country. Invest Europe analysis showed that in 2015 cross-border VC investments within the EC totalled €994m in comparison to €2,499m domestic investments within EC countries. Jeng and Wells (2000) suggest this is partially explained by the time and effort it takes to monitor a distant company. Taxation may play into this bias, as the EC's Expert Group on removing tax obstacles to cross-border VC investment concluded in their 2010 report that VC cross-border investments require a local presence, thereby putting them at risk of double taxation. Thus, cross-border obstacles may continue to provide obstacles to the optimal level of VC in countries by preventing efficient matching between investors and entrepreneurs.

However, cross-border VC investment has intensified since 1990 (Aizenman and Kendall, 2008). Schertler and Tykova (2012) investigate whether, and to what extent, a number of the economic factors outlined above (and indeed, specifically borrowed from Jeng and Wells, 2000) affect gross and net cross-border VC inflows.[21] They highlight that most of the economic factors affect the two in a similar way, such as expected growth. However, in the case of the tax and legal environment, the impact on gross and net outflows is different: a poorer environment for VC intermediation is associated with lower gross inflows but higher net inflows. This suggests that VC located in countries with favourable tax (and legal) environments are attracted to investment opportunities in countries with less favourable environments, and that "*if policy fails to create a viable tax and legal environment… foreign venture capitalists may step in and offer funding to venture capital-seeking companies*".

2.3 Rationale for supporting VC and BA investment

In very simplified terms, the rationale for supporting VC and BA investment via public intervention can be reduced to two key facts: i) the belief that VC and BA investment is beneficial for the economy as a whole and ii) the belief that VC and BA investment are not adequately provided by the market itself.

2.3.1 Importance of VC and BA investment

Start-ups

There is clear evidence that young and innovative enterprises contribute substantially to economic growth and job creation.[22] Studies find evidence for a relationship between the age of the firm and jobs created: Criscuolo *et al*. (2014) find that while old firms tend to destroy jobs, young firms play a central role in creating them, even during the financial crisis. Similarly, Haltiwanger *et al*. (2013) find start-ups and young businesses created the most jobs in the US. In addition, one of the primary drivers of the innovation gap between the US and the EU is found to be that the EU has fewer young firms among its leading innovators (Cincery and Veugelers, 2013). At the same time, there is also the observation that only a very small subset of successful young firms are driving innovation and job creation. These so-called 'gazelle' firms constitute a small number of total SMEs, but have a large and positive overall impact (see Hendrekson and Johanson, 2010, for a survey of the literature on gazelles). Some authors therefore argue that since the majority of start-ups are not likely to be an outstanding success, public policy should not be to

[21] Net inflows defined as gross inflows to firms in a country from investors in another country, less outflows in the opposite direction

[22] See e.g. Ayyagari et al. (2011) for a broad overview for many countries and Haltiwanger et al. (2013) for a recent discussion about the job creation in the US.

encourage entrepreneurship in general, but rather to target the measures to the firms promising the highest potential impacts.[23]

It is well established that VC and BA investment constitutes a very small and specific fraction of the overall SME sector. For example, Robb and Robinson (2012) look into financing of new firms and construct a new dataset of the capital structure of entrepreneurs. They find that new firms rely heavily on external debt and only a very small minority have access to VC or BA financing. Firm-level responses to the ECB-European Commission SME survey on access to finance (SAFE) in 2016 show that only 2% of SMEs used equity financing, whereas 18% used bank loans. As such, the more relevant question for the argument in favour of public support for VC and BA is whether the subset of firms which are VC-backed are indeed the firms which are driving innovation, economic growth and job creation.

The importance of VC and BAs in comparison to other sources of finance

It is suggested that VC and BAs do play a crucial role in facilitating the development of young, high growth potential firms. Samila and Sorenson (2009) argue that, "*venture capital firms fill a niche that allows the necessary capital to reach some of the least developed and most uncertain ideas*", and argue that traditional bank financing cannot substitute for VC.

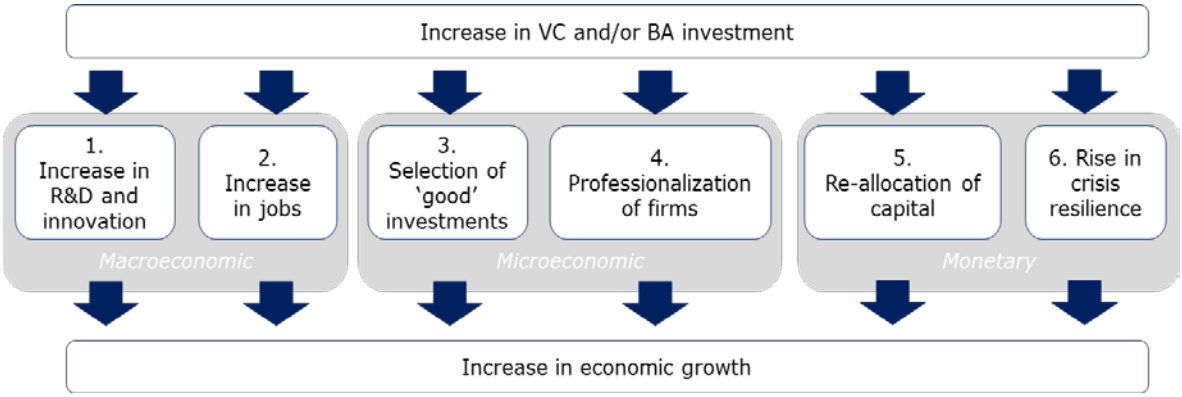
Zider (1998) explains that due to the high-risk nature of start-ups, in order to internalise risk, banks would need to charge a very high interest rate. However, usury laws prevent them from doing so. Additionally, when rationing credit, banks are more likely to select safer options, for example firms with collateral and a credit history. Equally, investment banks are restricted by regulatory barriers. 'Safe' investments are therefore made by banks, but riskier ventures are left unfunded. VC and BA therefore help to fill this void, taking an equity stake to provide a sufficient return on their investment.

Additionally, the literature suggests that VC and BA contracting can help to overcome the market failures discussed in **Section 2.2**. Kaplan and Stromberg (2001, 2003, 2004) explain how VC and BA mitigate informational asymmetries through, for example, allocation of cash-flow, voting and liquidation rights. Policy that increases VC and BA financing therefore helps to overcome informational market failures and increase the supply of funding to nearer the socially optimal level.

VC and BA financing lead to economic benefits such as economic growth and job creation through a number of transmission channels, as illustrated in **Figure 4** below, and discussed in greater detail in the following paragraphs.

[23] See e.g. Shane (2009) and Nightingale and Coad (2014).

Figure 4: Channels through which VC and BA financing increase economic growth



Source: PwC analysis extrapolated from literature review – see below

Gornall and Strebulaev (2015) find that, while most of the VC-backed companies fail, the outstanding performance of the successful projects results in a clearly positive contribution of VC to job creation and economic growth.

One channel through which VC and BA investment in start-ups contributes to economic growth is through productivity and spillover effects to the wider economy, via innovation. The presence of a causal relationship between VC and innovation has been investigated in several studies. Kortum and Lerner (2000) find that VC has a strong positive impact on innovation: increases in VC activity in an industry are associated with significantly higher patenting rates. Belke, Fehn and Foster (2003) deliver empirical evidence of a link between the presence of VC and innovation and job growth at the macroeconomic-level. It is mainly conducive to job creation in new and innovative firms, facilitating a process of structural change in the economy. As such, these findings may be particularly important in markets where there is evidence of structural problems restricting innovative firms' access to finance. For example, in the UK, innovative firms have done relatively worse compared to non-innovative firms and are particularly likely to face absolute credit rationing (Lee, Sameen and Cowling, 2015).

VC and BA investors are a source of experience and knowledge for companies, providing ongoing advice and networking support. This enables the professionalisation of portfolio companies, adding value to investments. Such knowledge spillovers could impact positively on the productivity of recipient firms. van Pottelsberghe de la Potterie and Romain (2004b) study the impact of VC on multi-factor productivity for 16 countries. They discuss a direct effect of venture capital on multi-factor productivity as well as an indirect effect arising from the development of an "*absorptive capacity of outside knowledge*". Significant direct and indirect effects of VC on multi-factor productivity are observed.

The strand of literature investigating whether VC-backed firms outperform other SMEs distinguishes between two effects. First, the venture capitalists or business angels will screen the market and only invest in the subset of firms with the highest growth potential (see **Section 2.1.4**), and where they can add the greatest value, for instance based on previous sectoral experience. This effect is known as the 'selection' effect. Second, the fact the entrepreneur receives an investment from a VC firm or a BA is expected to provide an additional benefit to the firm. The availability of the additional capital, the business advice provided by the investor, the

signalling function of the investment by an established VC fund or well respected BA and the possibility to draw on the network of the investor may all positively contribute to the development of the firm. This is summarized under the term 'treatment' effect by Bertoni *et al* (2011), who find the significant positive treatment effect dominating the selection effect for their subset of VC-backed Italian new technology-based firms (NTBFs). Engel and Keilbach (2007) find a positive impact of VC investment on innovation in their firm-level analysis of German VC-backed, which is largely dominated by the selection effect. More generally, a positive impact of VC and BA investment on economic performance is found in a number of studies at firm, industry or cross-country level[24]. For example, Hellman and Puri (2002) identify a number of channels through which VC investment professionalise Silicon Valley start-ups, and show the value that this creates is above and beyond more traditional sources of finance for start-ups. Specifically, firms that have received VC funding are more likely to adopt human resource policies, implement stock option plans and hire a marketing vice-president, in addition to replacing the founder with a CEO. Keuschnigg (2004d) develops a theoretical model exploring the relationship between VC advice and innovation driven growth.

Yet another necessary distinction in the observed positive effects of VC and BA investment are the 'substitution' effects as discussed by Samila and Sorensen (2011). These refer to positive contributions to job creation and economic growth of VC-backed firms which would have also occurred in the absence of VC investments. However, overall the authors find a positive significant effect of VC investments on firms, employments and wages. In doing so, they also account for the endogeneity arising from the observed level of VC investment being driven by equilibrium outcome in the VC market.[25]

A further channel through which VC and BA contribute to economic growth is the redistribution of capital. As highlighted by Zider (1998), VC investment is not long-term in nature, but rather a short-term injection into firms in their growth phase. VC, therefore, redirects capital from more established firms to more innovative start-ups where the rates of return are higher.

In addition to contributing to economic growth, equity financing also makes firms more resilient to crises in that firms are less liquidity constrained. For example, Carter and Van Auken (2006) highlight the significance of the lack of liquidity as a contributing factor to the bankruptcy of firms. These conclusions are reinforced by Cultrera and Bredart (2016), whose post crisis analysis also finds liquidity to be a key determinant of bankruptcy among SMEs.

Scale-ups

Though the preceding section provides an economic rationale relating to enterprises in the early stages of their SME journey, there is increasing focus on the importance of established but expanding companies, or 'scale-ups'.

A 'scale-up' is defined as an enterprise with average annualised growth in employees or turnover greater than 20% per annum over a three year period, and with more than 10 employees at the beginning of the observation period. Coutu (2014) argues that policies which target 'scale-ups' will positively impact on employment,

[24] See Da Rin et al (2013) for a survey of the literature. Furthermore, van Pottelsberghe de la Potterie and Romain (2004b) study the impact of venture capital on the multi-factor productivity and find both a direct and indirect positive effect of VC investment. Also Zhang et al. (2013) find a significant positive impact of VC investments on GDP using panel data from Israel.

[25] Please see annex 2 for more details on some of the papers discussing the impact of VC on economic outcomes.

productivity and tax revenues, whilst giving rise to, and strengthening, competitive advantages for EU countries in the decades to come. The literature on policy recommendations for scale-ups is scarce.

Coutu's report predominantly focuses on the UK, and estimates that a 1% increase in the number of 'scale-ups' would create 238,000 jobs and would add £38bn to GVA. Medium-term benefits would be £96bn per annum, whilst in the long run £225bn could be added to UK GVA by 2034. Extrapolating these figures across the EU suggests that the returns on investment in 'scale-ups' could be highly significant and worthwhile. Mariana Mazzucato of the University of Sussex adds: "*What I believe should be emphasised is not start-ups or entrepreneurs in and of themselves, but the innovation ecosystems within which they operate and which they depend on if they are to become what does matter: high-growth innovative firms (of any size) within that system*". The economic literature is less developed for scale-ups.

2.3.2 The need for policy intervention in the VC and BA market

Historically, European SMEs have been primarily dependent on bank finance. In the wake of the financial crisis, this source of funding has been restricted by banks' refinancing capacity, risk appetite and capital adequacy. This has forced young, growing and innovative businesses to seek finance from different sources. Lee *et al*. (2015) show that this is particularly the case for innovative SMEs as a result of the inherent risk involved and difficulty that banks have in valuation due to the dependence on intangible assets that are less suitable as collateral. The OECD (2009) make similar observations, and outline the need for a policy response to resolve this shortfall. Furthermore, Gambacorta and van Rixtel (2013) writing for the Bank for International Settlements also highlight how changes to banking regulation, such as the Liikanen "self-sufficiency" proposals, may further decrease finance from multinational banks that fund local lending through cross-border movement of capital via a centralised model. Alternatively more local funding may be required.

Generally speaking, these businesses are too small in scale to benefit from public equity issuances, and instead look to alternative sources of funding such as marketplace lending, crowdfunding, venture capital funds and business angels. However, these alternatives are substantially underdeveloped in the EU compared to the US. Notably, the US has a particularly strong venture capital ecosystem, with $79.3bn of investments in the US in 2015,[26] compared to only €5.3bn in the entirety of the EU, with significant concentrations of investment activity in the United Kingdom.[27]

Some of the characteristics of VC and BA investment discussed in **Section 2.1** may result in sub-optimal levels of VC or BA investment being provided by normally functioning markets. This 'funding gap' is broadly debated in the literature. Analysis by the CEPR (2015) estimates a substantial financing gap for European SMEs in general. Specifically, it estimates that the financing gap is three to five times larger than that of US SMEs. With regard to equity, the estimated gap across five Member States (France, Germany, Netherlands, Poland and Romania) suggests that there is a significant difference between the estimated demand and supply of equity, which is on average 3% of GDP. The authors note that as well-capitalised SMEs are able to mobilise further debt, filling the equity gap is thus more efficient than filling the loan gap.

26 Data from the American National Venture Capital Association http://nvca.org/research/venture-monitor/)
27 Data from Invest Europe (https://www.investeurope.eu/research/activity-data/annual-activity-statistics)

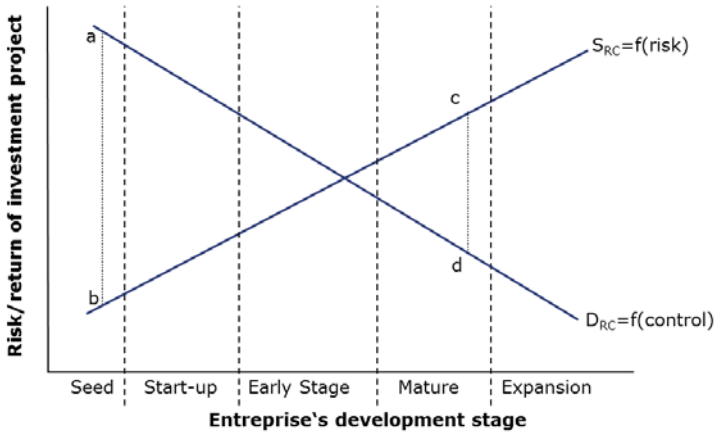
Policy interventions can stimulate supply of funds, and potentially even encourage entrepreneurs to start businesses, stimulating demand for funds. Viewed from a macroeconomic perspective, these interventions have the potential to be distortionary, leading to sub-optimal allocation of investment (e.g. to start-up companies with a lower rate of return). However, a properly designed intervention may correct for the market imperfections or distortions alluded to in **Section 2.1** above.

Engagement with policy makers: Perceived market failure is the main motivation of policy intervention

According to workshop participants, the perception of market failure is the main motivating factor for policy intervention to support the provision of business angel and venture capital investment in SMEs and start-ups. A number of workshop participants stressed that the correction of market failure, rather than investment additionality, was the key indicator of success of policy interventions in this area.

The literature on BA, or informal venture capital, repeatedly makes the case that the funding gap is more pronounced in earlier stages of enterprise development, as depicted in **Figure 5**. Following Aernhoudt (2005a and 2005b), demand for VC is shown as a function of the capital or business advice needed by the entrepreneur, which falls over time as the firm becomes more mature. The supply of VC by VC funds and BA is a function of the risk of the investment, which also decreases over the development stages of the firm. However, since the investor's supply of VC is negatively affected by risk, the supply function as depicted in **Figure 2** is increasing. Overall, this means that the funding gap is very large in early stages, shown as the distance between the points a and b.

Figure 5: Funding gap for informal venture capital



Source: Reproduced from Aernhoudt (2005a and 2005b)

The funding gap originates from the problem that a large number of very risky businesses are looking for capital and business advice in an early stage of their development and do not yet have high rates of return. In contrast, VC funds and BA require very high rates of return at this early stage which cannot be offered by the entrepreneurs. In later stages of firms' development the market changes, with more investors willing to accept the lower risks and less entrepreneurs ready to give up control of their already established businesses.

While **Figure 5** contributes to understanding the timing of the funding gap, there are other effects at work. Another key problem with regard to the funding gap for young enterprises is the information asymmetries discussed earlier, which result in higher risk for the investor and more generally in less access to external finance. SMEs, and in particular start-ups, are usually heavily dependent on external finance because of a lack of internal financing possibilities.[28]

Given the difficulties of attracting sufficient equity, young firms have traditionally relied on bank financing in the form of loans. However, the financial crisis resulted in severely restricted access to financial credit across many segments of the economy. In particular, bank lending to both households and businesses fell, with rejected loan applications between 2009 and 2013 being the most common financing obstacle for SMEs. Success rates for both loan and equity finance in the EU fell substantially between 2007 and 2010, by 19% and 15% respectively. Ireland, the Netherlands and the UK were among the countries that saw the greatest rise in the refusal rate for obtaining bank loans, with refusal of over 20% being reported by 2010.[29]

Empirical studies attempt to disentangle supply and demand effects in the credit crunch. Ciccarelli *et al.* (2015) find that for business loans in both the US and the Euro area, supply channel impacts are greater than for the demand channel. Similarly, Hempell and Sorensen (2010) present empirical evidence for the Euro area and find that during the crisis, banks' ability and willingness to supply loans affected overall bank lending.

The decline in lending disproportionately affected SMEs. Firm-level responses to the ECB-European Commission SME survey on access to finance (SAFE) between 2009 and 2010 confirmed that firms experiencing a credit crunch tended to be small and young (Artola and Genre, 2011). The deleveraging of European banks in particular led to reduced exposure to SMEs (Ciccarelli *et al.*, 2015). Although there have been signs of improvement in access to debt finance for SMEs since the crisis, the ECB's latest SAFE reports that in 2016 larger firms have a higher success rate and lower interest charges.

Despite this evidence, size does not necessarily determine whether or not a firm will face financing obstacles. McCann and McIndoe-Calder (2012) and Ferrando and Griesshaber (2011) for example find mixed evidence for firm size while firm age and ownership are important explanatory variables for firms' perceived financing obstacles. Firm size is, however, found to be important in explaining the choice of finance source. Larger firms prefer to (or are more able to) draw on external funds. In turn, choice of finance source is strongly related to the experience of financing obstacles. Smaller firms, on the other hand, tend to be more reliant on access to capital through banks (Chava and Purnanandam, 2011). Therefore, it seems that SMEs were particularly affected during the crisis because they tended to be heavily dependent on credit and have fewer financing options than larger firms (OECD, 2009).

As a result of credit constraints, firms' investments become cash-sensitive, as highlighted, for example, by Mizen and Vermeulen (2005). Any injection of cash, or

[28] The pecking order theory in the finance (cf. Myers and Majluf, 1984) stipulates that firms prefer to finance their investment with internal funds and in case of external funding that debt is preferred over equity. The tax deductibility of interest payments will further strengthen this ranking, see technical appendix for a discussion of debt financing and taxation.

[29] See Eurostat (2011). Furthermore, the OECD (Wehinger, 2014) provides a survey of selected literature on SME financing and the financial crisis.

indeed prevention of costs incurred, such as taxes, will therefore directly increase investment levels. In this way, cash injections from tax refunds may also have an impact on investment.

2.3.3 Characterising policy intervention in the VC and BA market

Policy intervention can take many different forms and can be used to support SMEs in the precarious period following the financial crisis. Warwick and Nolan (2014) discuss several approaches relevant to investment in SMEs and start-ups, such as policies which support R&D. A combination of tax incentives and focused direct support would tend to be cost-efficient; though it is noted that administrative costs would rise as a result of the policy. Financing research partnerships can also help to alleviate issues concerning 'picking winners', as noted by Autio and Rannikko (2016).

Engagement with policy makers: Tax incentives form part of a broader portfolio of policy tools

It was emphasised during the first workshop that tax incentives form part of a broader set of policy tools available to policy makers wishing to incentivise greater levels of business angel and venture capital investment in SMEs and start-ups. A number of Member States choose to provide support through the expenditure side of the budget, rather than through tax incentives. This can be motivated by a number of factors, but a general desire to maintain simplicity, minimise compliance burdens and reduce opportunities for abuse in the tax system were widely cited.

Matching grants would be particularly useful in selecting types of projects with the highest returns, which would help to lower public spending while incentivising BAs and VCs to invest in start-ups and SMEs receiving government backing. Moreover, the process for identifying firms must support both competition and transparency. SMEs should not be able to exert influence on selection procedures and incumbents should not necessarily be preferred to prospective entrants when deciding where to allocate grants.

In order to strengthen the cash flow of SMEs, R&D tax credits should avoid delays in refunds, whilst permitting firms to carry-over provisions across years. This enhances investments for BAs and VCs, as many valuations are calculated based on expected cash returns. Adding to this, overall tax policy should demonstrate stability over time, as the reduction in uncertainty helps to foster investment in SMEs and start-ups.

Public procurement centred on innovation can be another useful policy tool to attract BAs and VCs to European markets. Procurement bodies should be large enough to build relationships with innovation bodies, whilst appropriate legal frameworks should lay the foundations for managing risks.

Successful policy interventions in capital markets tend to make use of learning through experimentation, whilst encompassing the aim of leveraging private funding across sectors. Policies should also consider the perspective of the investee; ensuring that demand for funds matches levels of supply. Sectoral approaches and public-private partnerships can be used where state interests align with those of BAs and VC. Nonetheless, risks arise concerning deadweight losses through public outlays and the prospect of sectoral capture, whilst evidence to review the policies is restricted and the return on funds invested is particularly questionable.

Policy interventions focusing on business networks and clusters should aim to correct market failures, in addition to collaborating with current clusters instead of forming

new ones. Having a framework for communication between firms, the public sector and NGOs is especially useful in order to foster investment from BAs and VC. Infrastructure is particularly important in the wider context of success across clusters, whilst policy should be carried out within manageable time intervals, making use of network brokers with sufficient industry experience.

Extended public support for developing workers' skills and levels of technology are national policies which should attract investment towards SMEs and start-ups in the medium to long run. Regulatory frameworks should be properly established and well thought out in order for these strategies to succeed, while being under continuous evaluation and with plans in place for the future.

Autio and Rannikko (2016) state that it is justifiable to intervene with public policy if market mechanisms break down and if it is possible to generate public good benefits. Strategies which support start-ups and SMEs meet both of these conditions. In contrast to interventions, public sponsorship encourages the development of new organisations, in particular SMEs and start-ups, rather than targeting specific activities. In turn, this should broaden options for BAs and VC looking to invest, thus strengthening European markets relative to their US and Asian counterparts.

Public sector sponsorship is broken down into two wider operations: buffering and bridging, as discussed in **Section 2.2**. Both of these functions are crucial for fostering investment in European markets. Analysis by the ScaleUp Institute (2014, 2016) highlights a number of policy initiatives that governments can implement to encourage growth in scale-ups. One way in which governments can promote the growth of 'scale-ups' is through the freeing up of data, in addition to collaborating with key agents who can enable scale-ups to reach their full potential. Another crucial area of focus must be the financing of scale-ups; EU firms should be able to raise sufficient funds without reaching out to Asia or the US. Planning laws to expand premises should be flexible, and policy suggestions include permitting 'scale-ups' to use the same physical infrastructure as larger firms in their industries.

Additional promotion of scale-ups could include incentivising adults to work for the growing firms during the next stage of their careers. A special 'scale-up visa' would enable companies to hire applicants from abroad, whilst highlighting current scale-up successes would enable others to analyse their business models with the aim of achieving high rates of growth. International analysis shows that having a number of scale-ups is crucial for employment figures within an economy, as well as overall economic growth.

2.3.4 Complementarities between policy interventions in the VC and BA market

The literature also suggests that the policy interventions outlined above should not be viewed in isolation. Instead, there may be important complementarities between them. For instance even if an effective system of tax incentives is in place, growth in the VC and BA sector may be restricted if other policies are not also implemented.

For example, tax incentives that aim to encourage VC and BA investment may be inhibited if bankruptcy law punishes failure. Hasan and Wang (2008) highlight the importance of bankruptcy law to investors in protecting their wealth in the event of failure. This is particularly important for venture capital where investments are typically higher risk where the threat of losses is high. Armour and Cumming (2006) also reference the role of liberal bankruptcy laws in facilitating the growth of VC.

Similarly, VC investors are more likely to respond to tax incentives if viable exit routes are in place, as discussed by Acevado *et al* (2016). Well-developed stock markets with *"sufficient liquidity to absorb IPOs are essential"*. If investors see challenges in exiting they may be less likely to invest in VC in the first place.

In addition to the exit stage, complementary policy is also important at the holding phase. For instance, Henrekson and Sanandaji (2016) highlight the importance of stock option taxation in VC finance. Specifically they find that VC is more common in countries with more generous taxes, as in order to overcome information asymmetries and ensure founders exert effort, contracts may be developed to incentivise key personnel with stock options. Tax incentives encouraging stock options can, therefore, promote VC funding.

3. VC and BA investment and the tax system

Section Summary

- In practical terms, an investor will take account of any tax applicable across the investment lifecycle when making the initial investment decision. Seminal work by Domar and Musgrave (1944) states that the tax system can influence risk taking.
- Taxes on income generated during the holding period are less relevant in the context of VC and BA investments in start-ups, which may not generate any income in the earlier stages. However, income taxation may also affect entrepreneurial activity via differences in tax rates on corporate versus wage income (Gentry and Hubbard, 2000 and Keuschnigg and Nielson, 2004c). This, in turn, may affect the demand for VC and BA investment.
- Higher capital gains tax (CGT) rates may have a negative impact on the quantity and quality of investment. Theoretical and empirical literature suggests that higher CGT rates may have a negative impact on the quantity and quality of investment (Poterba, 1989a and 1989b, Keuschnigg, 2004 and Keuschnigg and Nielsen, 2004a, 2004b and 2004c), though the evidence on the extent and significance of this impact is mixed.
- Whilst there is little agreement on specific quantitative predictions and estimates, there is a general consensus that taxation rates across countries significantly influence key decisions regarding foreign direct investment (FDI). Indeed, the EC's Expert Group report identified the compliance costs generated by a lack of cohesion between Member States' tax systems as a key obstacle to cross-border VC and BA investment in the EU.
- The use of the tax system, such as through targeted tax incentives, to incentivise VC and BA investment is just one component of the portfolio of responses available to policy makers, and there are complementarities between various policy types.
- Tax incentives reduce the effective marginal cost of investing in smaller companies. As a result, in theory, investors should be willing to supply more capital to smaller companies through venture capital funds and/or as business angels benefitting from tax incentives and at lower expected rates of return.
- However, there is limited empirical evidence on the impact of tax incentives for VC and BA investment. The available studies that examine the empirical impacts of tax incentives find mixed effects.

Section 2 provided context to VC and BA investment, including defining characteristics and determinants of these types of investments. This context is important for understanding how taxation interacts with VC and BA investment. For example, it is noted that while some studies find evidence for the role of taxation in influencing VC and BA investment activity, there are a number of other important determinants, such as exit opportunities. As such, it is also necessary to examine how taxation impacts these factors.

This section of the report discusses interaction between the tax system and VC and BA investment. In particular, it considers whether, and if so, how, taxation affects the supply of VC and BA investment in young, innovative companies.

These questions are first considered by first providing a high-level discussion of the important issue of distortions caused by taxation. This frames the potential 'bigger

picture' impact of taxation in relation to the relevant taxes that apply to VC and BA investment (i.e. taxes levied on the income received from an investment). Finding that from this perspective, these taxes can generally be grouped into three stages: initial investment, receipt of investment income, and disposal of investment, evidence on the impact of these taxes on VC and BA investment is discussed in accordance with these. Then, using a conventional demand and supply framework, the theoretical impact of specific tax incentives is considered.

3.1 Minimising the distortionary impact of taxation

Taxation, in general, is described by economists as being 'distortionary'. The basic economic theory behind this is that taxes disrupt the signals and incentives provided by prices in the market by introducing a wedge between the price paid by the buyer and that received by the seller. This prevents beneficial exchanges from occurring, resulting in a loss of welfare for the buyer and the seller, known as 'deadweight loss'. The behavioural changes brought about by the tax can also have wider effects than the direct welfare loss to the participants, referred to as 'externalities'.

However, this does not take into account the outcomes that tax revenue achieves in the economy. Governments can use the proceeds of taxation to provide goods that would otherwise be underprovided by a free market and to correct other market failures. Taxation also allows governments to spend this money in the economy, which brings about a positive multiplier effect and higher economic activity. The most important question for policy makers is the net effect to society.

Academic literature indicates that some types of tax have more harmful effects on GDP than others. Johansson *et al.* (2008) produced a study for the OECD which ranks taxes according to their impact on GDP. Based on a panel data analysis of OECD countries they find that taxes on personal income are distortive as they directly affect labour utilisation, productivity, consumption and saving rates. Corporate taxes reduce the profits of firms, inhibiting both domestic and foreign direct investment and, thus, hindering economic growth. Corporate taxes also reduce competitiveness and makes it more difficult for firms to attract and recruit talent. Corporate and personal income taxes are less distortionary than taxes on the transactions that are involved in the acquisition or disposal of assets. These taxes initially discourage the ownership of assets, but transaction taxes also have the added cost of discouraging transactions that would allocate these assets most efficiently. Johansson *et al.* (2008) finds that capital gains taxes suffer similar problems as these also have the additional effect of eroding after-tax returns, reducing entrepreneurs' incentives to invest. Again, this distorts the allocation of private capital in the economy.

The EC (2012) have conducted a similar study in the 2012 volume of the quarterly report of the Euro area, assessing the impact of the output lost from increasing different tax revenues by 0.16 pp of GDP and the findings are reported in **Table 3** below.

Table 3: Comparing the marginal excess burden of key tax heads

Tax	Output loss (%) from increasing tax revenue by 0.16pp of GDP	Data source
VAT	-0.02	European Commission, 2012
Personal income tax	-0.1	European Commission, 2012

Tax	Output loss (%) from increasing tax revenue by 0.16pp of GDP	Data source
Corporate income tax	-0.3	European Commission, 2012

Source: European Commission 2012

There are a wide range of estimates relating to the impact of different tax heads and economic growth and the OECD (2010) provide an extensive analysis and review of the topic. Some examples of other estimates include: Johannson *et al*. (2008) who analyse the effects of a 5% cut in corporate tax rates from 35% to 30% and finds a 0.08 (0.1) percentage point on total factor productivity growth (median impact over 10 years). While Gemmell *et al*. (2013) suggest that a 1 percentage point increase in the top statutory rate of corporation tax leads to a 0.02-0.04% reduction in the growth rate of GDP (equivalent figures for labour income taxes would be -0.02 – 0.12% for the top statutory rate).

The fundamental choice in taxation of VC and BA activity is between the taxation of capital and the taxation of labour. Under a standard neoclassical growth model, taxing capital income is suboptimal in the long-run as it disincentivises the accumulation of utility-enhancing capital in society; physical labour, which cannot be accumulated, does not have this property. This means that the optimal tax strategy for society as a whole is to tax labour income rather than capital income (see Chamley 1986, Judd 1985 and Ordover and Phelps 1979). However, subsequently prominent authors (e.g. Aghion *et al*. 2012) have pointed out that zero taxation of capital is sub-optimal given requirements for public expenditure and too high labour taxation can have detrimental effects for labour supply and consequently innovation.

However, Aghion *et al*. (2012) point out that, where growth results from profit-motivated innovations which themselves result from R&D investments, and where R&D is used as an input to final goods, which are produced with capital and labour, taxing capital at a zero rate may be suboptimal. This is because, assuming a required level of public expenditure, not taxing capital implies taxing labour at a higher rate, which has a detrimental effect on the labour supply, which reduces innovation incentives (as labour is an input into the R&D process).

In the context of VC and BA taxation, it is possible to tax both labour and capital. However, the taxation of labour is less closely linked to the returns on investment (i.e. taxing labour income associated with a BA or VC investment would not fully capture the returns from asset disposal and would not necessarily reflect corresponding returns on capital). For this reason, this study does not focus its review on an in-depth analysis of the taxation of labour in the VC and BA context (a review did not highlight any substantial research in this area). Instead, this study focuses on different forms of capital taxation. Although it is worth mentioning that there is evidence that government sponsored VC tax schemes (e.g. Osborne and Sandler 1998) are often focussed on job creation, but do not use labour taxation as a policy tool.

3.1.2 The equity impact of taxation

Though, as outlined in **Section 3.1.1**, taxation is generally described to be 'distortionary,' public economics and political science also recognises the dual aim of taxation. Not only is tax policy optimised by taking into account efficiency concerns, but it is also a redistributive tool with significant influence over equality amongst

citizens. Progressive taxes and transfers influence the distribution of after-tax income, also known as disposable income, which determines how much citizens are able to spend and save.

Despite some arguments that redistributive tax systems have the potential for leakages in the form of administrative costs and the deadweight loss (e.g. Okun *et al.*, 1975), many research studies including one by the OECD (2012) conclude that "*tax and transfer systems play a key role in lowering overall income inequality*." Specifically, a number of economists have used regression analysis to assess the impact of different tax structures on the Gini coefficient, which measures the distribution of disposable income. The findings of this body of research supports and reiterates the theory and belief that the use of income taxes reduces inequality.

Capital gains are a particularly important component of income at the top of the income distribution. In 2006, approximately 3.5% of salary income was earned by the top 0.1% of people on the income distribution. However, the gap widens further when capital income is included. The top 0.1% account for approximately 1% of capital income, as well as almost 5% of capital gains on such income (Atkinson *et al.*, 2011).

In light of this, the taxation of capital gains is an important driver of income inequality. The OECD (2012) argues that increased taxation of capital gains would reduce inequality, while also providing scope for reduced taxation of labour income. They also indicate that the policy would reduce the potential for tax avoidance instruments for top income earners.

Despite the particularly distortionary impact of capital gains taxes discussed in **Section 3.1.1**, empirical evidence has shown that capital gains have been the largest contributor to rising inequality in recent years (e.g. Hungerford, 2012) and capital gains taxes have a large role to play in reducing inequality in the future.

As the wealthiest are more likely to invest in risky assets such as VC and BA investments (see for example Carroll (2000), tax incentives for VC and BA investment may have equity implications. However, total welfare may be increased by such incentives as a result of facilitating innovation enhancing investments as discussed in **Section 2.1**. Additionally, not all contributors to VC funds are high net worth individuals. Many less wealthy investors will contribute to funds indirectly through pension funds or insurance firms for example. Analysis by Invest Europe (2016) indicates that these institutional investors contributed a combined 10% of VC funding in 2015.

3.2 Tax and the VC and BA investment lifecycle

3.2.1 Taxes and the nature of investors

Taxation may influence the behaviour of investors in a number of ways. This will depend on the type of taxation and the nature of the investor or investment.

As defined in **Section 2**, the term BA refers to individuals or 'natural persons' that invest in young businesses, whereas VC refers to investment provided by through a fund.[30] As such, each group will be liable to pay different taxes throughout the investment process. For example, BAs will be liable to pay personal income tax, and wealth and/or inheritance taxes on investment returns. For corporate VC investors, corporate income tax and capital gains taxes are likely to be important.

[30] A natural person is defined as a human being, as opposed to a corporation or juridical person created by law.

However, for natural persons investing through a fund, all of the above taxes are relevant. This is because it is not always straightforward who bears the incidence of certain taxes. For example, capital gains taxes on a fund's returns may ultimately be passed on to, and borne by, individual investors in the form of reduced dividend payments. In practice, governments may seek to address this be developing tax transparent vehicles (such as the SICAR in Luxembourg).

When considering the impact of taxes on investment generally, the application of tax can be grouped into three stages: initial investment, receipt of investment income, and disposal of investment. The following high-level discussion of taxes and their interaction with investors is structured in accordance with these stages, given that there is no simple mapping between tax incentives and the various heads of tax (i.e. corporate income taxation (CIT), Personal income taxation (PIT) and Capital gains taxation (CGT)). For example, in some countries certain taxes are considered differently. For instance, capital gains tax is treated as PIT in some countries, CIT in others, and independently elsewhere.[31] Additionally, certain tax incentives may be relevant to multiple heads of tax. For example, tax reliefs on upfront investments can be offset against either personal or corporate income taxation. Similarly, during the holding period taxation of current income may either be CIT or PIT dependent on the type of investor in the VC fund (i.e. whether income is received as dividends or interest income respectively). Finally, taxation at disposal is typically CGT.

3.2.2 Tax and the initial investment decision

There are no examples of specific taxes levied on the initial investment amount. However, there are instances of tax incentives related to initial investments. For example, upfront tax reliefs to address investor risk aversion. In general, any tax regime applicable at the initial investment stage is likely to have the purpose of addressing the riskiness of VC and BA projects, a defining characteristic of VC and BA investments which may result in a funding gap (see **Section 2**). These aspects are discussed in more detail in **Section 4**, in the context of specific tax incentives for VC and BA.

Similarly, loss offset will influence the initial investment decision despite only coming into play at the end of the investment. The earlier on in the start-up lifecycle that the investment takes place (seed or early-stage), the higher the risk it will be. The impact of taxation on risk-taking has been of longstanding interest in the academic literature, with the seminal Domar and Musgrave (1944) paper stating that higher income taxes – under full loss offset - may increase risk taking because the government shares part of the risk.[32] However, since the assumptions of perfect loss offset and a proportional income tax do not reflect reality the results may not directly translate to the VC investment decision. Loss relief is discussed in more detail in **Section 3.2.4**.

Engagement with policy makers: Promoting risk taking

Working group participants agreed that tax incentives help to promote risk-taking. However, a number of participants also stated that in order for tax incentives to be effective, there needs to be a culture of risk-taking and investment in the jurisdiction.

[31] France, Israel, Japan, Portugal, South Korea, Spain, Sweden and the UK operate a unified tax base for corporate income and capital gains taxation. France, South Korea and Spain, operate a unified tax base for personal income and capital gains taxation.
[32] Please also see Mossin, 1968; Stiglitz, 1969 and Sandmo 1977; Kaplow, 1994.

In particular, it was stressed that it is important to make investment in SMEs and start-ups popular among investors in order to overcome supply-side constraints.

Investors look well into the future when making investment decisions. Evidence of this is the affect that changes in tax rates have on portfolio choices, for instance between debt and equity. For example, as found by Desai and Dharmapala (2011), following changes in dividend taxes in the US. De Mooij (2011) looks more broadly at the tax elasticity of corporate debt and finds a significant positive relationship between the corporate tax rate and debt-asset ratio of firms. Specifically, *"a one percentage point higher tax rate increases the debt-asset ratio by between 0.17 and 0.28".*

Wider evidence on the debt-equity tax bias further supports this. For example, Fatica *et al.* (2012) highlight how firms increase their leverage to levels higher than they otherwise would as a result of tax deductions on interest payments.

As a result, it can be agreed that any tax regime that affects the return on the investment can be linked back to the initial investment decision.

3.2.3 Tax and income generated during the holding period

Taxation during the holding period may be applied to investment income received during the investment, such as dividend or interest income.

In this case, personal or corporate income taxes would apply. However, it is important to note that taxes applied during the holding period are likely to be less relevant in the context of VC and BA investments. This is because the portfolio company may not be generating any income, depending on what stage in the start-up lifecycle it is at. Taxation of dividend income, for example, is likely to be of greater significance for more mature firms that are past breakeven point. Hence, for BAs in particular, who tend to invest at the very early seed stage, there is likely to be little interaction with the tax system during the holding period.

However, there are some examples of favourable dividend taxation regimes at the later stages of the start-up lifecycle (including post-exit). Jeng and Wells (2000) consider the growth of Israel's VC industry since 1992, and argue that this was in part down to favourable tax laws for individual investors. For individual residents, dividends are taxed at a maximum of 25% and interest at a maximum of 45%. Some resident corporations receive a tax break on dividends and foreign investors face a maximum rate of 25% on dividends and interest. Keuschnigg and Nielsen (2004b) also consider the impact of dividend taxation and find a negative impact on VC investment.

It is natural to consider the impact of taxation on the investor when seeking to understand how to incentivise VC and BA investment. However, taxation throughout the investment lifecycle may also affect entrepreneurial activity via differences in tax rates on corporate versus wage income. This, in turn, may affect the demand for VC and BA investment.

Poterba (1989a) focuses on the impact of changes in capital gains taxation (CGT). This will be discussed in more detail the following section. However, in the study, occupational choice of the entrepreneur is influenced by the differential in the tax treatment of the income under employment and self-employment. As such, personal income taxation and payroll taxes also have an indirect impact on the demand for VC.

Gentry and Hubbard (2000) find empirical evidence to support the hypothesis that when tax rates are less progressive there is a significant increase in entrepreneurial

activity. Similarly, incomplete loss offset also reduces the likelihood of individuals becoming entrepreneurs. Keuschnigg and Nielson (2004c) also discuss the impact of a progressive income taxation for the entrepreneur and find that it impairs entrepreneurship. In the context of the quality of investment, it is therefore important to consider how entrepreneurs with the most promising business projects do not become deterred by more progressive taxation.

Cullen and Gordon (2007) investigate the role of personal income taxation on risky entrepreneurship. They find that, contrary to conventional wisdom, a reduction in personal income tax rates reduces entrepreneurial activity. This owes to the reduction in taxes saved from entrepreneurship, where profits remain taxed at the corporate tax rate, relative to personal income taxes. This discourages risk-taking and therefore self-employment. These effects are not inconsequential. Cullen and Gordon estimate that a shift to a 20% flat tax would triple the self-employment rate. Gentry and Hubbard (2000) also stress the role of more progressive income taxation in reducing entrepreneurship.

Again, corporate income tax may also only be relevant for mature firms at a later stage when firms are past break-even. Feldstein (1970) points out that corporate investment is responsive to changes in retained earnings. Until 1958, the structure of profits taxation in the United Kingdom provided strong incentives for corporate saving by taxing dividends at a substantially higher rate than retained earnings.

However, there is little evidence specific to VC and BA investment. van Pottelsberghe de la Potterie and Romain (2004a) investigate the impact of the entrepreneurial environment on the VC intensity in 16 OECD countries for the time span 1990 to 2000, They find that the corporate income tax rate is not statistically significant at significance levels smaller or equal to 10%. This is in contrast to several other studies with a broader focus on entrepreneurship in general. For example, Da Rin *et al*. (2011) find a significant negative impact of corporate taxation on entrepreneurship.[33]

It is important to note that tax systems rarely subject corporate capital gains to a separate tax, preferring to tax corporate income and gains under the same corporate income tax regime. Therefore, it might be hard to split out the impact of corporate taxation on receipt of investment income and realisation of gains.

The rise of venture debt may lead to the taxation of interest income becoming increasingly important. Debt has well documented tax advantages over equity. Interest payments on debt are tax deductible to the corporation while dividend payments on equity are not. This ability to deduct interest payments is known as the 'tax shield'.

Start-ups in receipt of venture loans have no traditional means of paying these loans back, as they tend to have no income in the earlier stages. This means that they also do not tend to have income to deduct against, therefore lose the benefit of the tax shield.

However, Ibrahim (2010) points out that venture lenders typically will not lend until a VC fund has invested in a start-up. In this situation, VC presence effectively substitutes traditional loan repayment. Even if the start-up has no revenues in the early stages, the interest deduction on debt would increase the start-up's losses for those years, which would be carried forward as net operating losses (NOLs). These

[33] However, it is worth noting that firm entry defined as being a newly incorporate firm might capture organisation choice, rather than true entrepreneurship.

NOLs can be used to offset later income, with the ability to carry losses forward for fifteen years. Further, the cash flow from VCs reduces the direct costs of insolvency. To prevent abuses and avoidance, loss-offsetting may be limited to certain income categories (e.g. property income, employment income, investment income). Please see **Annex 1** for a short discussion of the tax advantages of debt versus equity financing.

3.2.4 Tax and disposals of investments

There are a number of ways to divest of a VC and BA investment, including trade sales, IPOs and sales of shares. Taxation at this stage of the investment affects the after-tax return on an investment.

The most commonly assessed tax at this stage is CGT. Poterba (1989a and 1989b) initiated the academic discussion on this when he observed that the changes in CGT (a significant drop in the rate which was reversed in the tax reform 1986) coincided with the vast increase and subsequent decrease of VC in the US. No claim about causality was made, but the positive correlation was motivated by theoretical arguments about the impact of CGT on demand and supply of VC. Specifically, a higher CGT will lower the after-tax return of equity investments relative to other forms of investment, such as corporate bonds. Consequently, one would directly expect a lower supply of VC.

However, Poterba caveats that, at this time, fewer than half of venture investors faced individual CGT liabilities on their gains, and only 10% of investors in organised VC partnerships were individuals. As a result, the majority of VCs are unaffected by individual CGT. Less than one third of reported gains are as a result of corporate equity appreciation, a small fraction of which are related to VC. As such, the relevance of individual CGT for VC may be limited.

In a series of papers - Keuschnigg (2004) and Keuschnigg and Nielsen (2004a, 2004b and 2004c) - the impact of various tax policies on the outcome in the VC market is investigated. Starting from the double moral hazard problem, which arises in the situation where the effort of the entrepreneur is unobservable to the investor and the provision of business advice by the venture capitalist is unobservable to the entrepreneur, the market outcome is an inefficiently low level of VC investment.[34] This theoretical framework is then extended in the various papers to shed some light on the role of various taxes on this outcome.

The key message in Keuschnigg (2004) is that capital gains taxation reduces BAs' effort in advising business and the size of the VC portfolio. Keuschnigg discusses the idea of a performance-related revenue subsidy, combined with a non-performance related tax on start-up investment costs. The former may potentially encourage higher investment quality, as a performance-related element will incentivise the investor to provide advice and the entrepreneur to provide effort. Effort by the entrepreneur or VC is strongly linked to the quality of investment However, the latter may expand portfolio size and crowd out advice per firm, hence the start-up tax. Subsidising start-up costs instead is not deemed to be helpful, because it does not increase effort for the duration of the project. Keuschnigg and Nielsen (2004a) confirms the welfare loss of a capital gains tax and also discusses the taxation of the entrepreneur in more detail.

[34] The model framework is derived from Kanniainen and Keuschnigg (2003). For a more detailed description see the technical appendix. For a description short description of the model of moral hazard (hidden action) problems and optimal contracts, see also Mas-Colell et al., 1995, Chapter 1.

A similar theme is discussed in the literature on the relationship between taxation and the quality of entrepreneurs. A number of studies find that high levels of progressivity in the tax system can increase entry into self-employment, but also reduce average quality of the firm (Asoni and Sanandaji, 2014, Haufler *et al*., 2014 and Baliamoune-Lutz & Garello, 2015).

For European countries, a number of empirical papers have also addressed the question how CGT influences VC investments. Overall, the evidence is mixed. For example, Da Rin *et al*. (2006) find a significant negative impact of corporate CGT for 14 European countries between 1988 and 2001, while Jeng and Wells (2000) conclude that they believe that CGT are important but fail to find a significant impact for a subset of 21 countries for the time span from 1986 to 1995. Schertler (2007) finds support for a significant, albeit small, negative impact of CGT in one subset of the specifications, specifically for the number of early stage investments.

More recently, Achleitner *et al*. (2012) and Watzinger (2011) investigate the role of CGT on VC investment on firm-level data for 32 countries in the time span from 2000 to 2010. Explicitly focusing on the tax rate for personal capital gains, they find a two-sided impact of taxation on VC investment. First, a higher tax rate reduces the number of firms receiving VC investment. However, at the same time the likelihood of a follow up investment and overall success rate is increased through a higher CGT rate. This could be due to either more scrutiny in the selection process as a result of the higher CGT.

This finding is important in the context of inducing quality investment rather than just increasing the overall level of investment. As discussed elsewhere in this report, in the absence of targeting, a CGT cut is a relatively blunt device for encouraging investment.

As with income taxes, CGT may also affect the entrepreneurs' incentives. Individuals might forgo wage and salary income in the early stages and, instead, accept compensation through corporate stock and related gain-producing investments later, which would be affected by CGT. Poterba (1989a) suggests that reducing CGT makes entrepreneurship more attractive, increasing the demand for VC: a 5% change in the statutory rate on realised gains implies roughly a 3% change in the effective tax rate for the entrepreneur.

Engagement with industry: Role of CGT

A number of representatives from the VC and BA investor community have stressed that their main focus in investing in SMEs and start-ups is to grow the company in question to a capital event. Therefore, the CGT treatment of an investment will influence the risk appetite and decision making process of a prospective investor. Specifically, a lower CGT rate increases the returns at exit, *ceteris paribus*, therefore increasing the propensity to invest at the initial investment stage.

IPOs are deemed to be a key determinant of VC activity (Jeng and Wells, 2000), as they are the most potent driver of venture capital investing. Indeed, IPOs are deemed to be the most successful exit route.

The treatment of capital gains becomes more important during the IPO phase. Similar to the case of corporate income taxation in the mature phase, CGT credits against current CGT are only valuable to investors if they are subject to taxation at the time.

The tax treatment of losses is particularly important for start-ups, the majority of which will be in a loss position in the early stages. Start-ups are less able than established firms with diversified revenue streams to claim losses (Palazzi, 2011). This treatment can have a considerable impact on risk-taking. Entrepreneurs will be inclined to take more risks the higher the degree to which business losses can be deducted against other income (instead of being ring-fenced) and the higher the degree to which losses can be carried forward or backward.

More flexible ring-fencing provisions would allow business losses to be deductible against other types of taxable income, in addition to providing loss carry-forward and possibly also loss carry-back provisions. More flexible rules could apply to losses of smaller firms, targeted under some measure of size, possibly with additional restrictions to steer relief where intended. Palazzi provides case studies of loss treatment. In the case of BAs in Japan, capital losses on investments in pre-registered entrepreneurial businesses were permitted to be carried forward for three years (Tashiro, 1999).

3.3 Tax and cross-border investment

Foreign investors may factor the tax system into their decision making in order to maximise their post-tax returns. Devereux and Maffini (2007) investigate the impact of taxation on the location of capital, firms and profits. A simple model assuming an open economy suggests that an increase in tax rates leads to a net capital outflow, thus reducing the size of the capital stock on an aggregate level. Investors typically demand higher pre-tax rates of return when taxes are source-based. Consequently, investment declines and aggregate economic growth suffers. Devereux and Maffini (2007) examine a variety of econometric studies, with the aim of quantifying the influence of taxation on location and investment decisions.

Feld *et al*. (2011) extend previous meta-analyses to moderate the influence of control variables (particularly public spending and agglomeration effects) on the effects of tax rates on FDI. Their most precise estimate of the semi-elasticity for corporate taxes on FDI is 1.39 in absolute terms, confirming the importance of taxes in FDI decisions.

A number of other factors influence cross-border investment choices. The econometric methods of controlling for other variables differ between academics, resulting in contrasting conclusions in some instances. It is noted that certain firms agglomerate with the ambition of gaining political influence, which can in turn be used to lobby lower tax rates. Moreover, whilst there is often positive correlation between companies' taxes and investment decisions, it can be misleading to conclude that government spending stimulates capital inflows. This is because the expenditure is funded by the firms' taxes – an example of a spurious relation between two variables.

Grubert and Mutti (1991) estimate that lowering a given country's tax rate from 20% to 10% leads to growth in the aggregate capital stock of 65%. Hines and Rice (1994) report even greater increases. This international substitution is consistent with domestic asset substitution and elasticities discussed in **Section 3.2.2.** For instance, Desai and Dharmapala (2011) highlight how US investors' portfolio choices changed following the implementation of differential treatment of dividend income depending on the country it was coming from.

However, the literature also suggests that differentials in international tax rates may not necessarily affect portfolio choice, but instead the location of the ultimate asset owner, and thus the jurisdiction within which the tax is paid (see for example Guttentag and Avi-Yonah, 2006). In instances such as this, a change in the tax rate in

the country where the investment is made may not therefore affect the portfolio choice, but rather the location of the investor.

In addition, it is found that export-centred production is especially responsive to tax differentials between countries; this would appear to be logical given the reduced necessity for proximity to a specific market. Taking wealth into consideration, low-income OECD countries are more sensitive to taxation in home states, whilst the overall elasticity has increased throughout time.

Devereux and Griffith (1998) find that the average effective tax rate is significant in determining the location of economic production, when conditioning on producing abroad. However, the marginal tax rate is not significant and the magnitude of effects vary across countries. For example, a 1% fall in the UK average effective tax rate would lead to a 1% greater probability of a US company deciding to operate in the UK. Furthermore, the statutory rate of taxation is more significant than the average effective rate for firms which do not tend to encounter difficulties when transferring taxable income to lower-taxed countries.

Whilst there is little agreement on specific quantitative predictions and estimates, there is a general consensus that taxation rates across countries significantly influence key decisions regarding FDI.

In the context of VC and BA specifically, the EC's Expert Group report identified the lack of cohesion between Member States' tax systems as a key reason for the EU VC market working below its potential. This lack of cohesion can lead to double taxation, tax treatment uncertainties and administrative obstacles. As a result, VC was found to generally be restricted to the domestic national market.

Most Member States have double taxation conventions (DTCs), which allocate taxing rights. However, the complex commercial structures in VC are not always accommodated by these conventions. The different tax treatment of VC funds in different Member States creates further problems.

Furthermore, the report suggests that the tax treatment applied to VC fund managers and investments in VC is less favourable than that applied to public equity: the activities of public equity managers are accepted as activities of independent agents and, as such, as not creating a permanent establishment for the investors in their country. The activities of managers of private equity funds, on the other hand, could constitute permanent establishments for the funds.

As a result, the current tax rules lead to funds restricting their activities artificially in order to avoid additional tax at the management level, reducing the effectiveness of VC in the EU single market.

Box 1: Main findings of the European Commission's Expert Group

- VC cross-border investments require a local presence (i.e. in the state of the portfolio company).
- Currently in Europe, when a fund manager operates in the state of the portfolio company, the Manager's activities risk creating a permanent establishment for tax purposes for the VC fund or for its investors in that state.
- The VC fund manager will wish to avoid this permanent establishment risk so as to prevent double taxation. Owing to this uncertainty regarding whether tax authorities of the local state view the activities of the VC Fund Manager as creating a permanent establishment or not, the Fund Manager currently has to limit its activities at the local level to the mere provision of advice.
- This advice is, in fact, usually provided by separate advisory companies which analyse the local market, identify and evaluate potential investment opportunities and prepare investment proposals, with appropriate input from the VC Fund Manager, but do not carry out management functions.
- Such a situation is highly inefficient, costly and complex and can potentially deter investments (and it does not completely eliminate the risk of permanent establishment).
- Another problem for VC funds is the fact that the tax classification and tax treatment of the funds varies from one Member State to another. The funds may be treated as transparent or non-transparent, subject to tax or not subject to tax and trading or non-trading. Different treatment in different Member States is a further potential source of double taxation which is not currently addressed.

However, as discussed in **Section 3.2**, there is evidence of cross-border investment. Schertler and Tykova (2012) present two reasons why VC invest across borders: if there is opportunity to exploit differences in risk-adjusted expected returns (though these must outweigh transaction and information costs) or because of deal flow considerations and value-adding activities (for example, joint investing spreads VC funds over a larger number of deals, combining several VC skillsets). In addition, a number of economic factors are found to have an impact on higher or lower gross and net cross-border flows, such as stock market capitalisation, expected growth, and the tax and legal environment. Evidence from Invest Europe (2016) indicates that cross-border VC investment within Europe is significant, although still only approximately a third of the size of domestic flows within Europe.

3.4 The role of tax incentives

As discussed above, the tax system can both enable and impede the supply of and demand for VC and BA investment. Tax incentives can be used, as part of a broader portfolio of forms policy intervention, to target particular features of the tax system with the intention of promoting greater levels of investment in SMEs and start-ups.

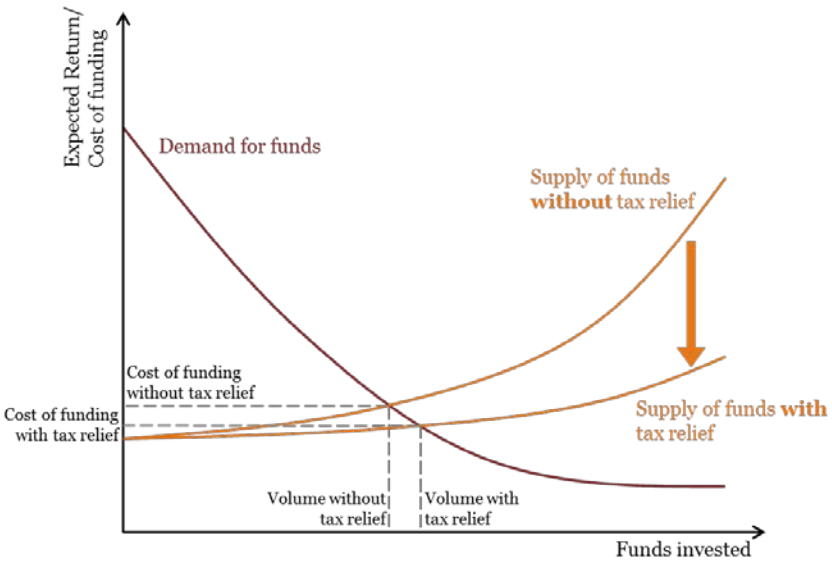
Tax incentives reduce the effective marginal cost of investing in smaller companies. As a result, in theory, more investors should be willing to supply more capital to smaller companies through venture capital funds and/or as business angels benefitting from tax incentives, and at lower expected rates of return. Tax incentives enable the re-allocation of capital and thus allow the benefits discussed in **section 2.3.1** to be

realised, thereby boosting economic growth. Additionally, the amount of forgone tax revenue can be limited

This can be explained using a conventional supply-and-demand framework, as shown in **Figure 6** below. The demand curve is downward sloping as it is effectively a schedule of investable opportunities: those with higher expected rates of return are featured on the left, and as the required expected rate of return falls, the number of opportunities that meet the requirement increases. The supply curve of venture capital is upward sloping as the willingness of venture capitalists to invest money increases as the expected rate of return available on such investments increases. Gompers and Lerner (1999) argue that the supply curve for venture capital should be elastic (i.e. relatively flat) given the ready availability of alternative investment opportunities in other asset classes.

The relative merits of different forms of tax incentives have been the subject of academic debate. Some tax incentive schemes reduce the cost of investing (such as upfront tax credits) and, therefore, move the supply curve down. Therefore, if there is an absence of market imperfections, this should allow smaller companies to (i) raise more funds for their future growth and (ii) raise funds at a lower cost of capital.

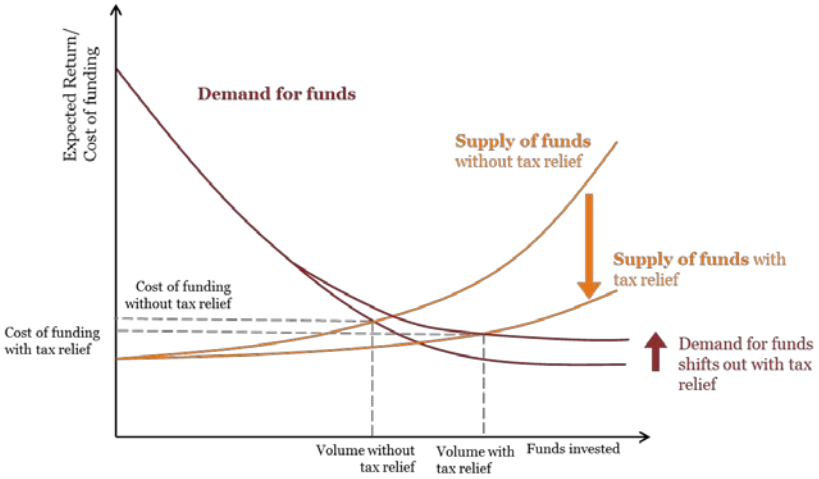
Figure 6: How tax reliefs may encourage venture capital investment



Source: own illustration

Poterba (1989), argued that tax incentives on capital gains *per se* were unlikely to cause venture capital supply curve to shift downwards in the US as many investors in small companies after 1980 were tax-exempt institutions. However, setting the capital gains tax rate below that of the personal income tax rate creates an incentive for salaried workers to become entrepreneurs. Therefore, it is possible that reducing capital gains tax rates could increase demand for venture capital as more individuals are incentivised to become entrepreneurs. This would increase the quantity of venture capital demanded and, hence, the size of the start-up/small companies segment, as shown in **Figure 6**. The overall size of the effect would depend on the extent by which the demand and supply curves shift, therefore on the elasticities of demand and supply.

Figure 7: How tax reliefs may encourage entrepreneurs and venture capital investment



Source: own illustration

Viewed from a macroeconomic perspective, tax incentives have the potential to be distortionary, leading to sub-optimal allocation of investment (e.g. to start-up companies with a lower rate of return). However, in the presence of factors such as moral hazard (Keuschnigg and Nielsen, 2004) and information asymmetry (Trester, 1998), a properly designed tax incentive may correct for other market imperfections or distortions.

For efficient policy design, it is thus essential to understand how different market imperfections interact with government policy. The empirical study performed by Da Rin *et al*. (2006) provides a useful example of this approach. The authors examined the impact of policy instruments on venture capital investments in 14 European countries between 1988 and 2001. The policies they considered included removing supply constraints and reducing barriers to entrepreneurship, as well as fiscal instruments. They found that policies aimed at increasing the expected return on projects, such as tax relief schemes, have a stronger effect on early stage and high-tech investments. They also found that other market conditions, such as labour market regulations and entry barriers, also have a strong negative effect on investments, and may dampen the effect of positive policy measures.

3.5 Empirical evidence on the impact of tax incentives

Although the theoretical perspectives on the effect of tax incentives on the supply of and demand for venture capital investment is clear, it is another question whether this is maintained in practice. A number of empirical studies have sought to analyse the impact generated by specific tax incentive schemes. A non-exhaustive selection of these are summarised in **Table 4** below.

The studies presented in **Table 4** provide mixed evidence on the impact generated by tax incentives on venture capital investment. Indeed, it is evident that the real world impact of tax incentives can, in fact, be contradictory to theoretical perspectives on their role. This is indicative of the many challenges inherent in assessing the effectiveness of tax incentives, but also of the need for more theoretical and empirical research in this area, as well as systematic monitoring by government.

Engagement with policy makers: In many cases, it is too soon to assess effectiveness

Views on the effectiveness of tax incentives for business angel and venture capital investment were mixed among the participants at the workshop. However, there was an emerging consensus that further evaluation is necessary and that in many cases it is simply too soon to observe effects. This was a result of the recent implementation of tax incentives combined with the characteristically long holding periods in investments of this nature.

Table 4: Overview of empirical studies

Author(s)	Date	Geographical focus	Key findings
Cumming and Li; *Journal of Corporate Finance*	2013	United States	An empirical study using US state-level data from 1995 to 2010 is provided by Cumming and Li (2013). While the authors find little evidence for a significant negative impact of the corporate income tax, they find a clearly positive impact of specific tax incentives for VC. Specifically, they find little evidence of the overall tax burden that gives rise to economic harm in terms of less entrepreneurial activity, but that Small Business Innovation Research (SBIR) awards are associated with more business starts and higher levels of venture capital per population.
Cowling *et al.*; *HMRC Research Report*	2008	United Kingdom	An evaluation of two UK fiscal incentives, the Enterprise Investment Scheme (EIS) and the Venture Capital Trusts (VCTs) by Cowling *et al.* (2008) finds small but positive effects on capacity building in recipient companies. Furthermore, the study found some additional limited evidence of a profit enhancing effect, which varied depending on the size, age and sector of the recipient company[35].
Hendon *et al.*; *Journal of Entrepreneurship and Public Policy*	2012	United States	Hendon *et al.* (2012) review a number of tax credit initiatives at the state level in the US and finds substantial heterogeneity in programs. Regarding the effects of the individual program the authors mainly note, that there is hardly any comprehensive assessment available so far, but that individual goals for tax incentives must be clear from the outset and that a one-size-fits all solution is unlikely.
Carpentier and Suret; *Venture*	2007	Canada	The Quebec Business Investment Company (QBIC) programme is evaluated and found

[35] An earlier assessment of the EIS by Boyns et al (2003) also found positive effects.

Author(s)	Date	Geographical focus	Key findings
Capital			to produce results which were not desired by Carpentier and Suret (2007). The failure of this programme is attributed to the programme design which does not incentivize active engagement of business angels in the firms and also fails to account for the adverse selection problem. The Labor Sponsored Venture Capital Corporation (LSVCC) is another Canadian tax incentive which has been criticised for crowding out private VC by Cumming and MacIntosh (2006). However, Cumming (2014) makes a strong claim against over generalization of crowding out especially for the tax incentives in Europe.
Mason; *International Small Business Journal*	2009	European Union	In an overview of public policy for informal venture capital, Mason (2009) concludes that there is very little evidence about the effectiveness of tax incentives.
Paul *et al.; Venture Capital*	2003	Scotland	Paul *et al*. (2003) survey Scottish BAs who see taxation as no major impediment to investment.
Stedler and Peters; *Venture Capital*	2003	Germany	Stedler and Peters (2003) find that for Germany investors, taxes play only a minor role.
Mason and Harrison; *Entrepreneurship and Regional Development*	2002	United Kingdom	Mason and Harrison (2002) find for the UK that taxes are the most important macroeconomic variable in the investment decision of BAs.

4. Analysis of design features of tax incentives for VC and BA investment

Section Summary

- Drawing on investigations of real world practices (see **Section 5**), the design features of tax incentives to improve the quantity and quality of VC and BA investment can be categorised into those relating to scope, qualifying criteria and administration.
- Design features of tax incentives can, and do, contribute to promoting quality of investment (for investors, investees and the wider economy), as well as quantity. An evaluation of the design features of tax incentives for VC and BA investment is contained in **Section 4.6**.
- There are a number of different forms of industrial policy intervention that can be used to promote investment in SMEs and start-ups. Studies of the impacts of non-tax approaches to incentivising VC and BA investment present mixed results.
- In the absence of conclusive evidence, it is, therefore, challenging to provide a definitive answer to the question of whether the tax system should be used to incentivise VC and BA investment. However, the clear implication is that it is essential to understand how different market imperfections interact with government policy when deciding on the most efficient policy response.

Building on the discussion in the previous section, this section of the report will now assess the impact that specific tax incentives may have on addressing the shortfall in investment attributable to the factors outlined in **Section 2.2**, in order to maximise the economic and social benefits discussed in **Section 2.3.1**. To do this, it will focus on the specific design features of tax incentives that might be introduced over and above the baseline tax system, and what implications different design choices might have for investors, beneficiaries and the economy as a whole.

The section also considers, at a high-level, wider impacts and issues relating to tax incentives, including revenue loss, cross-border competition and the potential for crowding out, as well as a brief discussion of policy alternatives to tax incentives. The section concludes with an evaluation of particular design features and an associated recommendation.

There are a number of theoretical and practical challenges that make it difficult to assess the impact of taxation and tax incentives on VC and BA investment. This has resulted in a relatively underdeveloped literature on the impact of the various design features of tax incentives on VC and BA investors in SMEs and start-ups.

To address the lack of literature, this section of the report discusses the policy design implications that can be inferred from the general literature on tax incentive design, as well as broader economic literature and economic analysis based on first principles. To the furthest extent possible, the general literature will be supplemented with the findings of those studies assessing the impact of tax incentives for VC and BA investors in SMEs and start-ups.

4.1 Design features

On the basis of a review of the literature and the independent analysis contained in this report (see **Section 3**), it is evident that the baseline tax system interacts across all stages of VC and BA investment to create a framework of incentives and disincentives.

As **Section 3.4** highlighted, the primary role of tax incentives that aim to promote investment in SMEs and start-ups is to reduce the effective marginal cost of investment. This is an important mechanism for addressing the typically higher risk nature of VC and BA investment (see **Section 2.1**).

However, this focuses purely on promoting quantity of investment and, as such, presents a narrow view of the role of tax incentives. Indeed, the design features of tax incentives can, and do, contribute to promoting quality of investment (for investors, investees and the wider economy), as well as quantity.

Drawing on preliminary investigations of real world practices (see **Section 6**), the design features of tax incentives to improve the quantity and quality of VC and BA investment can be categorised into those relating to scope, qualifying criteria and administration. The role and impact of these categories of design features will now be discussed in turn.

Engagement with policy makers: Tax incentive design is driven by international practice and the baseline tax system

During the workshop, it was discussed that the design of tax incentives for business angel and venture capital investment is influenced by a number of factors. International practice and the baseline tax system were widely cited by as important drivers of design features. It was discussed that inspiration is often drawn from the tax incentives implemented in leading venture capital markets and those schemes that have received approval through the State Aid process. However, it was also mentioned that the baseline tax system shapes the choice of design features. A number of Member States seek to maintain coherence between tax incentives and the baseline tax system by avoiding the introduction of concepts that are unfamiliar to the local taxpayer community. In addition, a number of members of the working group cited that the scope and form of incentives should correspond to the tax burden generated by the baseline tax system in order to provide sufficiently strong incentives. The ease of implementation of tax incentives was also mentioned as guiding the choice of design features.

4.2 Scope

The scope of a tax incentive is the key determinant of its functionality and is driven by the underlying policy objective. In respect of tax incentives designed to promote business angel and venture capital investment, the issue of scope can be divided into two themes:

1. The form of the incentive itself.

2. The timing of the incentive within the investment lifecycle, and the type of taxes that might be affected as a result.

It is also possible to observe significant variation in the use of different tax and incentive bases in tax incentive schemes. While these are important features, they are largely a derivative of other design characteristics, such as the targeting of particular classes of investors. The insight that can be gained from examining these features on a standalone basis is limited. As such, this section of the report will not explicitly discuss the issue of incentive and tax bases.

This section will now discuss each theme in turn, presenting theoretical and empirical evidence where possible to support the analysis.

4.2.1 Form of tax incentive

Easson and Zolt (2002) identify 12 forms of tax incentive that are widely applied by policy makers.[36] However, in practice, only a subset of forms can be observed in the design of tax incentive schemes for VC and BA investment in SMEs and start-ups. These include: tax exemptions, tax deferrals, tax deductions, tax credits and loss relief (see **Figure 10** in **Section 5.2.1** for definitions of each of these).Each of these different forms will undoubtedly generate a certain degree of incentive effect for investors. However, it is important to recognise that the generosity to the investor may differ, which will drive the strength of incentive effect generated.

In terms of generosity to the investor, the different forms of tax incentives can be grouped according to whether they are applied to the tax base or tax liability. Tax deductions and loss relief are applied to the tax base, whereas tax deferrals, exemptions and credits are applied to the tax liability itself.

Although the precise generosity of the different forms of tax incentive would, naturally, depend on the impact on effective tax rates driven by the provisions of incentives, a high-level ranking can be established. Tax exemptions can be considered as the most generous form of incentive as they serve to remove the entire tax base from the scope of tax, either permanently or temporarily followed by tax credits. Tax deductions (to the extent that they are not super-deductions) and loss relief would come next as their impact on effective tax rates is diluted by the rate of tax applied to the particular tax base. Tax deferrals can be considered as the least generous as their impact on effective tax rates is not permanent.

Based on this ranking, policy makers looking to maximise the strength of incentive effect generated would utilise forms of tax incentives that reduce the tax liability, such as tax exemptions and credits.

While this policy implication may hold true for investment in SMEs and start-ups, the role of loss relief bears further consideration. The nature of investment in typically higher risk SMEs and start-ups may suggest that the design of tax incentive schemes should address downside, as well as, upside investment risk. As such, loss relief is the only form of tax incentive that is able to incentivise downside investment risk.

[36] Easson and Zolt (2002) identify the following forms of tax incentives; corporate income tax rate reductions, tax holidays, tax credits, accelerated depreciation of capital assets, favourable deductions for certain types of expenditures, deductions or credits for reinvested profits, reduced rates of withholding tax on remittances to the home country, personal income tax or social security reductions for executives and employees, sales tax or VAT reductions, reduced import taxes and customs duties, property tax reductions, creation of special 'zones'.

4.2.2 Timing within the investment lifecycle

It is possible to apply tax incentives for VC and BA investment in SMEs and start-ups across the investment lifecycle. However, grouping of the timing of incentives around three key stages can be observed in practice: initial investment, receipt of investment income, and disposal of investment. The literature on the relative merits of tax incentives at each stage of the investment cycle is largely undeveloped, though this report has summarised the evidence that is available.

Initial investment

Investment tax incentives are commonly granted upon **initial investment**. From the perspective of investment in SMEs and start-ups, this has two key policy design implications.

Firstly, the application of tax relief at this stage of the investment lifecycle would address investor risk aversion. Due to the nature of investments in typically higher risk SMEs and start-ups, linking tax relief to the initial investment may create greater certainty and stronger incentive effects for investors. Tax relief on investment, in effect, subsidises the cost of the investment, which increases the amount that value of the investment would have to fall by before a loss was made. In a recent survey of investors in venture capital tax incentives in the United Kingdom, this design feature was perceived to address investor risk aversion (HMRC, 2016).

Secondly, tax relief granted upon initial investment would reward new capital, rather than creating windfall gains for existing investors (Shah, 2006).

However, granting tax relief upon initial investment may not generate sufficient alignment of interests between investor and investee. In the absence of tax relief on disposal of the investment, the application upon initial investment may mean that investors are less incentivised to support the development and growth of the investee firm. This would reduce the economic benefits the incentive is supposed to deliver, such as growth, job creation, and productive innovations which could have spillover effects to the wider economy.

Indeed, Hellman and Schure's (2010) evaluation of the Venture Capital Program in British Columbia, which offered investors a 30% tax credit upon investment, found that that retail funds had, on average, negative returns over medium- and long-term time horizons if the effect of the tax credit is ignored. While this can be interpreted as evidence of the inherent risks of investing in SMEs, it can also be seen to support the view that up front tax incentives depress incentives for the investor to ensure the success of the investment.

A related, but somewhat distinct, issue is the **treatment of reinvested gains and income**. A number of tax incentive schemes make use of **capital gains tax deferrals**, offered at the point of initial investment, for investments made from capital gains generated on previous disposals of assets. The combination of offering a tax deferral at the point of initial investment serves to create a link between investment and divestment. In the context of VC and BA investment, this provides policy makers with the unique ability to create incentives for reinvestment, which can support serial investment and the deepening of VC and BA markets.

When considering the promotion of serial investment it is important to recognise that investments of this nature are typically long-term and illiquid, and can take a number of years to exit. Indeed, Wiltbank (2009) found that loss-making exits took BA

investors 3.2 years to accomplish on average, whereas exits with return multiples of over 10 took eight years to achieve in the UK. Moreover, Mason and Botelho (2014) found that the length of time to exit BA investments has risen from approximately three years in 2005 to more than 10 years in 2013, in part driven by the effect of the financial crisis.

This suggests that if the objective of offering a tax deferral is to promote serial investment, the design should recognise the impact that lengthy investment exit periods can have on reinvestment rates (OECD, 2016). To address this, tax deferrals may be designed to contain provisions to allow investors to defer gains that are realised within a defined period of time after investment. The ability to retrospectively defer gains may act as an incentive to increase the rate and frequency of reinvestment.

Receipt of investment income

Tax incentives can also be applied to **income that is received during the life of the investment**, such as dividend or interest income. In principle, this may be attractive to investors, but the idiosyncrasies of start-ups and SMEs could weaken any potential incentive effect.

Dividend distribution policy among SMEs and start-ups is not uniform. As OECD (2009) discuss, growth-oriented businesses may choose to retain all corporate profits for reinvestment, whereas more mature firms may have a policy of full distribution. Given the uncertainty of SME and start-up dividend policy, VC and BA investors may not be motivated by the prospects of receiving investment income during the life of the investment, instead preferring to focus on the realisation of capital gains on disposal. Therefore, tax incentives applied to income received may not generate a significant inducement to VC and BA investors (though by the same token, their fiscal cost may be relatively cheap). They may also disincentivise the capital accumulation and associated business expansion that is part of the wider economic rationale for the tax incentive.

Disposal of investment

Tax relief for **gains realised on granted on the disposal of investment** introduces a performance-related component to a tax incentive scheme. The availability of tax relief for gains realised on disposal may create incentives for the investor to support the development and professionalization of the investee, such as through the knowledge spillovers created by active ownership and management. This could imply that tax relief granted on disposal may support quality of investment.

Conversely, as discussed above, the provision of loss relief on disposal can compensate the investor for excess downside risk associated with investments in SMEs and start-ups. As Palazzi (2011) states, capital gains tax regimes that provide symmetric treatment of capital gains and capital losses may encourage risk-taking among investors in start-ups.

Engagement with industry: Role of loss relief

Members of the VC and BA investor community stressed the importance of incentivising downside, as well as upside, investment risk. The provision of loss relief has been linked with encouraging greater risk-taking among investors, which influences the initial investment decision.

However, it was also mentioned that the incentive effect generated by the provision of loss relief may be weaker for experienced investors or those investing in established SMEs. There is a perception that more experienced investors and investors in established SMEs are less likely to make a loss.

While the application of tax relief for gains or losses realised on disposal may be desirable for entrepreneurs and investors, the perspective of the government should be considered as well. There is evidence to suggest that the fiscal cost of providing tax relief at the point of disposal may be greater than at other stages of the investment lifecycle (Palazzi, 2011).

As Wiltbank's (2009) study of business angel activity in the United Kingdom finds, 56% of business angel investments generated a loss and most lost the whole investment. From the 44% of successful investments, an average return multiple of 2.2 was realised, with approximately 9% realising multiples of over 10 (Wiltbank, 2009). While this finding may be influenced by country-specific factors, it is characteristic of the significant upside and downside risks inherent in investments of this nature. To the extent that capital losses are more common than capital gains and most capital gains are relatively modest, the fiscal cost of loss relief could outweigh relief for gains.

Applying tax relief on disposal generates significant complexity and subjectivity in the national budget process. To the extent that the cost of tax expenditures are recognised in the budget, governments may find it challenging or lack the capacity to prepare reliable and credible fiscal costings.

Additionally, less restrictive treatment of capital losses may generate opportunities for abuse, through inclusion in tax planning (Palazzi, 2011). The effect of this may be to increase investment quantity, without necessarily increasing levels of risk-taking. Therefore, it may be preferable for tax incentive scheme to introduce restrictions to the extent that losses can be relieved, such as limiting loss relief to similar types of income (Palazzi, 2011).

Further evidence on the question of timing of tax incentives, albeit at a less granular level, can be found in Aghion and Howitt (1997) discussion of the impact of *ex-ante* or *ex-post* subsides.

Policy makers can subsidise projects in expectation of a positive externality (*ex ante* subsidy) or after the outcome is known (*ex post* subsidy), which has parallels to the application of tax relief upon initial investment or on disposal.

As the probability of a good outcome depends on unobservable effort by the firm, the use of *ex post* subsidies could be justified. However, this policy implication is somewhat at odds with the observed practice of providing *ex ante* subsidies. The authors suggest that this gap between expectation and reality may be driven by a desire from governments to support credit-constrained R&D firms or innovations which are non-verifiable *ex-post*. The implication of this is that the timing of tax incentives should recognise the challenges and uncertainty in judging *ex ante* and *ex post* performance.

4.3 Qualifying criteria for tax incentives

4.3.1 General characteristics

As Esson & Zolt (2002) describe, tax incentives are tax expenditures that are specifically targeted to particular types of taxpayer or taxable activity. Following this definition, targeting is, therefore, an inherent design feature of tax incentives.

Targeting is achieved by the use of qualifying criteria that explicitly restrict eligibility. This is an essential part of the design of tax incentives. Restricting eligibility supports the achievement of the underlying policy objective and limits the fiscal cost to governments. Minola *et al*. (2016), looking at governmental venture capital suggest that effective and efficient investment selection processes are key drivers of success. They state that when screening investments, it is critical that decisions are guided by a selected number of easily applicable criteria.

However, as Bauer (2010) states, while making eligibility contingent upon meeting certain criteria increases the precision of the tax incentive, it does so at the expense of administrative simplicity. Excessive targeting, and/or mistargeting, can result in tax incentives that 'pick winners', and which can distort the efficient allocation of resources.

It is possible to group the qualifying criteria typically found in tax incentives to promote business angel and venture capital investment into four categories:

1. Business: the recipient of investment can be targeted in terms of age, size and sector.

2. Investor: the investor can be targeted in terms of status and connection with the recipient of investment.

3. Investment: the investment can be targeted in terms of size, investment through venture capital funds or whether the investment is in debt or equity instruments.

4. Duration: the minimum length of time qualifying investments must be held in order to attract tax relief.

Existing literature on each of the individual qualifying criteria is limited, though this study has been able to draw on some relevant sources in most instances, although often drawing on insights from working papers.

This section will now discuss each type of qualifying criteria in turn.

4.3.2 Business criteria

Tax incentives for VC and BA investors in SMEs and start-ups widely restrict eligibility to investments in particular types of businesses.

As discussed above, Shane (2009) argues that the typical start-up is not innovative and does not contribute significantly to job creation. Therefore, to realise the full potential of the beneficial macroeconomic outcomes generated by a vibrant SME sector, government policy should target those firms with a high growth potential.

Targeting of tax incentive schemes can be achieved through a combination of business age, size, or sector criteria. Each type business criteria will have related, but distinct, policy implications. However, all are driven by the understanding that only a subset of

SMEs and start-ups capable of generate the desired positive economic outcomes, such as job creation, through the commercialisation of radical innovations (Palazzi, 2011). Indeed, as the EC (2015b) highlights, *"A disproportionate share of Europe's future economic growth and jobs are likely to be generated by a small percentage of high-growth European SMEs"*.

Business age

Business age criteria can be used to differentiate between businesses at different stages of growth. The choice of business age ceiling can be informed by the need to address the market failures that afflict businesses at different stages of the growth cycle. Two groups of business age criteria can be observed in practice.

One option is to target new businesses (i.e. those that are in the early stages of the growth cycle). Younger firms, by nature, have a smaller track records. This compounds existing information asymmetries by limiting an already restricted amount of information available to an investor to make a decision. In addition, younger firms often lack the collateral required to attract external finance. As such, targeting younger firms may generate a greater proportional impact on access to finance.

Alternatively, tax incentives could choose to target more mature SMEs that have been trading for a number of years. While this would certainly support the correction of market failures experienced throughout the SME sector, it may not generate the same magnitude of impact. Additionally, providing tax incentivised investment to more mature firms that have successfully bridged the 'valley of death' may not promote investment additionality, increasing the deadweight costs of the scheme.

There is minimal literature examining whether targeting incentives on the basis of the age of firms is effective. Cornet and Vroomen (2005 and 2007) evaluated the impact of a payroll tax credit for young start-up firms in the Netherlands, relative to older firms. They found that the start-up scheme induced between 50 to 80 eurocents of additional labour expenditure, which was substantially larger than for the older group. However, the targeting of tax incentives in this fashion raises questions of administrative complexity, for example, anti-avoidance measures to ensure that companies do not constantly transfer their business into new, incentive-eligible, vehicles. Moreover, some evidence shows that, while young firms are more likely to be high-growth, the majority of high-growth firms are over five years old (Anyadike-Danes *et al*., 2009, Bravo-Biosca, 2011). Conversely, however, older high-growth firms may have less need for subsidy.

Engagement with industry: Business age

A number of recipients of VC and BA investment stated that the non-financial benefits of investment, such as knowledge spillovers, were greater for more mature companies. It was perceived that the scope for a VC or BA investor to transfer knowledge increased as the target company moved towards making more complex decisions or a strategic nature.

Business size

Business size criteria, either in terms of financial or human resources, can be used to target tax incentive schemes. The precise business size criteria observed in tax incentive schemes is driven by statistical definitions of micro-, small- and medium-sized enterprises. However, the underpinning policy implication is that the impact of government intervention is greatest for those businesses at the smaller end of the SME spectrum due to the disproportionate impact of market failures.

As Palazzi (2011) highlights, due diligence VC and BA investment costs include a significant fixed component that does not vary greatly with firm size. As such, VC and BA investors may be less inclined to pursue smaller investments. This could indicate that the marginal costs for investors of addressing information asymmetries decreases with firm size, ceteris paribus the market failure is felt most acutely by smaller firms. Therefore, policy intervention may want to target smaller firms in order to maximise impact. In instances such as this, where smaller firms are targeted, thresholds are typically applied at the point of investment and immediately after this point so as not to disincentivise growth of firms beyond the threshold level during the holding period.

Evidence collected in assessments of the United Kingdom's Enterprise Investment Scheme and Venture Capital Trust scheme found that both schemes had a positive impact on labour productivity in investee companies (Cowling *et al.,* 2008). However, the effect was greatest for smaller companies regardless of age, which suggests grounds for targeting on the basis of firm size.

Moreover, a more recent study on the United Kingdom's venture capital tax incentives (HMRC, 2016) found that the deadweight cost associated with the tax incentive increased with company size. This suggests that the design of tax incentive scheme should target smaller companies in order to minimise the associated deadweight cost.

An alternative view was found in Coutu's 2014 study of the role of scale-ups in the UK. Coutu (2014) defines a scale-up as a firm with average annualised growth in employees or turnover greater than 20% per annum over a three year period, and with more than 10 employees at the beginning of the observation period. As outlined in **Section 2.3.1**, the promotion of scale-ups could generate significant macroeconomic benefits for the UK and the EU over medium- and long-term. This suggests that the impact of tax incentives could be maximised by targeting scale-ups.

Note that OECD-compiled data indicates that the proportion of venture-backed companies by developmental stage (seed, start-up, and later stage) varies quite significantly between countries (OECD 2015). There may be an argument for tailoring tax incentives in light of specific in-country funding gaps.

Business sector

Business sector criteria can be used to target particular sectors or, at the very least, prohibit the participation of firms in certain sectors.

The rationale for targeting specific sectors may be informed by evidence or assumptions that certain sectors exhibit a disproportionate ability to generate favourable macroeconomic outcomes. As Palazzi (2011) notes, policy makers may wish to target sectors that display a concentration of innovation, or capacity to generate knowledge spillovers or are significant contributors to economic growth, such as high value-add sectors.

However, as European Commission (2014) states, the evidence on knowledge spillovers is not clear, with some studies providing evidence to support targeting specific sectors (Kasahara *et al*., 2013, Yohei, 2011, Lokshin and Mohnen, 2012, Baghana and Mohnen, 2009 and Bloom *et al.*, 2002) and some finding that other business criteria may be more relevant for targeting purposes (Corchuelo and Martinez-Ros, 2009, Dumont, 2013, Lhuillery *et al.*, 2013). Within the context of R&D tax incentives, (European Commission, 2014) reaches the policy implication that targeting specific sectors could discourage innovation occurring at the intersection between sectors.

Conversely, business sector targeting may explicitly exclude investments in certain sectors from the scope of the tax incentive. This may serve to sharpen the targeting of investments in those sectors where tax-incentivised investment is needed most and where it will be utilised to generate favourable macroeconomic outcomes. It may also be used as an anti-abuse provision, limiting the extent to which they can be used in tax planning structures, or in industries where extraction of profits from asset ownership is common instead of generating profits from innovation. For firms that sit between an excluded and a permitted sector, policy may state that the determined sector is the one that a business's trade 'mostly' takes place in.

There is also an equity question raised where similar firms defined in different sectors are treated dissimilarly.

The place of establishment of the investee company is also an important feature in some tax incentive schemes, as any forgone tax should lead to enhanced economic growth in that country in particular. Permanent establishment in the country where a tax incentive is available is typically required in order to ensure this (i.e. the investee firm should be present in the tax base of that country). In the absence of super national taxes, there is an incentive for policymakers to protect their national interests. The design of tax incentives often links the fiscal costs of operating in a country to the economic benefits of supporting the firm in that country.

Combining business criteria

It is important to recognise that the various types of qualifying criteria are rarely, if at all, used in isolation. Rather tax incentive schemes utilise a combination of business age, size and sector criteria. The use of multiple criteria can interact to restrict eligibility to certain profiles of businesses.

Intuitively, policy makers may wish to combine qualifying criteria to explicitly target certain profiles of businesses with high growth potential in order to maximise the generation of positive macroeconomic outcomes. Indeed, as Shane (2009) argues, restricting eligibility to certain profiles of firm is beneficial and supports investment quality.

Although there is limited evidence on the extent to which tax incentive schemes can be used to 'pick winners', a recent assessment of venture capital tax incentives in the United Kingdom reveals interesting implications. It was found that that smaller, younger companies, particularly those in primary, manufacturing or construction sectors, were more likely to use investment to finance growth rather than working capital (HMRC, 2016). Similarly, Coutu (2014) argues that policies which target 'scale-ups' will positively impact on employment, productivity and tax revenues. This suggests that targeting the schemes at these types of companies might generate higher levels of business growth.

However, in practice it is challenging for governments to successfully pick winners (Autio and Ranniko, 2016). Research on high growth entrepreneurship policy has widely shown that it is challenging to predict the success of any given venture and that by targeting support to certain types of firms, governments may inadvertently generate a crowding out effect (Coad *et al*., 2014, David *et al*. 2000, Storey, 1994).

Therefore, on balance, the practical policy implication for the design of tax incentives is that it may be better to incentivise investment in firms with high growth characteristics rather than specific businesses. As Autio *et al*. (2007) find, the problem

of picking winners can be overcome with a "*loose selection criteria*" for targeting policy support to entrepreneurial firms.

4.3.3 Investor criteria

Tax incentive schemes also make use of qualifying criteria to restrict eligibility to certain profiles of investors. This is often achieved through criteria placed on the nature of investor and the association between the investor and investee. Criteria on the tax residence status of investors are also observed in practice.

Tax incentives for VC and BA investors in SMEs and start-ups often diverge in their treatment of **natural persons (BA) and corporate (VC) investors**. While the literature on tax incentives is silent on the impacts of granting investment incentives to corporate investors, it does yield relevant policy implications for incentivising investment from natural persons. It is important to note that these policy implications can hold true, to varying degrees, for investment from natural persons in the capacity of a BA investor or an investor in a tax incentivised VC fund.

As Carpentier and Suret (2013) find, granting tax incentives to natural persons, in particular high net worth individuals (HNWIs), may increase the absolute number of investors but not necessarily the number of BAs. This finding has an important implication for the quantity versus quality of investment debate. It can be argued that in the absence of qualifying criteria placed on investor expertise and capacity to provide guidance, tax incentive design may inadvertently attract quantity over quality of investment. Therefore, when targeting natural persons, it may be beneficial to the quality of investment to utilise criteria to specifically target BAs.

Engagement with policy makers: Balancing quality and quantity

Tax incentives should seek to strike a balance between prioritising quality and quantity of investment. In order to be effective, tax incentives need to achieve a certain scale of uptake (quantity) to ensure that capital flows to capital scarce businesses.
However, it is important for the design of tax incentive scheme to promote beneficial outcomes for firms from the investment (quality), such as the generation and capture of knowledge spillovers.

A widely used investor criteria in the design of tax incentives for VC and BA investment in SMEs and start-ups is a restriction on the extent to which **related parties** can participate under the scheme. This is typically achieved by restricting eligibility to those investors that are not employed by or control the investee.

The use of such restrictions can be seen as a pragmatic design feature. Restricting the participation of related parties can reduce the deadweight costs of the scheme by limiting the extent to which owner-managed businesses or directors can utilise the scheme for tax planning purposes. For instance, the tax incentive schemes offering tax relief on dividend income may be abused as a way of extracting business profits in a tax efficient manner.

However, restricting the eligibility of related parties trades-off the ability for BAs to participate in the tax incentive schemes. BAs typically become actively involved in the management of the investee, such as through a directorship. This is critical to the generation of knowledge spillovers and may contribute to the success of the investment. Wiltbank (2009) found that more interaction, through board membership, was associated with better exit outcomes. Therefore, the design of tax incentives

should recognise the benefits brought by BA involvement in investee companies, such as through the introduction of specific provisions to ensure BA eligibility.

In addition, it is common practice for investor criteria to place some form of **restriction on the tax residency status of the investor**. At a minimum, these typically require the investor to have sufficient tax liabilities in the jurisdiction in question in order to absorb the tax relief being offered.

This design feature is undoubtedly driven by pragmatism. Placing a requirement on tax residency ensures that only VC and BA investors with some degree of experience and knowledge of the jurisdiction in question are eligible to participate. This could maximise the relevance of knowledge spillovers to the target firms.

However, this may create an inadvertent, and largely unavoidable, bias against new overseas investors. Overseas investors making their first investment in a jurisdiction may not have existing tax liabilities against which tax relief can be offset. Therefore, they may be ineligible for tax relief under the specific investor criteria of a tax incentive scheme.

It is important to recognise that in practice, these provisions may be less relevant for BA than for VC as BA investment tends to be concentrated in the home country of the investor. As Wiltbank (2009) found in the case of BA investment in the United Kingdom, 28% were not minded to invest in companies more than 50km from their home and 43% were prepared to invest in businesses up to 250km away. As such, it may not be necessary for tax incentive design to restrict BA investor ineligibility based on tax residency as the majority of BA investment is highly localised. Nonetheless, BA syndicates may make cross-border investments within the EU.

Considering whether BA and VC investments are complements or substitutes, the literature provides mixed evidence. For example, Hellman *et al.* (2013) find that BAs and VCs are substitutes. However, Harrison and Mason (2010) find complementarities between VC and BA investments, specifically in co-investment, sequential investment, deal referring and BA investment in VC funds. Policymakers should therefore favour one of BA or VC with caution.

4.3.4 Investment criteria

The main distinction made in the investment criteria of tax incentives for VC and BA investors in SMEs and start-ups is in the eligibility of debt and/or equity instruments. There are no clear arguments in the literature for or against the preferential treatment of one form of investment over the other.

It can be argued that incentivising equity instruments may support the transfer of knowledge spillovers between investor and investee. Unlike debt, equity provides the investor with a mechanism to become actively involved in the ownership and management of a firm, which is crucial for the transmission of knowledge spillovers (Da Rin *et al.*, 2006). Conversely, equity can create incentives for the investor to become actively involved due to the subordination of equity interests in the event of a winding up. Therefore, tax incentivised equity investment could be seen as supporting quality of investment.

However, it should also be noted that equity has historically played a minor role in the capital structure of SMEs and start-ups. As the EC (2015b) notes, equity financing accounts for an average of just 4%, 6% and 8% of micro-, small- and medium-sized business total financing respectively over the period 2009-2014. This historical

preference may be taken as evidence of weak demand for equity finance among SMEs. In which case, incentivising debt finance could arguably be more effective in supporting access to finance among SMEs given the widespread contraction in SME lending levels since the financial crisis. On the other hand, there are arguments for filling this financing gap with greater levels of equity investment.

Investment criteria may also stipulate that only newly issued securities or new investments may be eligible for tax relief. While this sits at the margins of the debate of the merits of incentivising debt or equity finance it is an important qualifying criteria.

As Shah (2006) states, incentivising new investment limits the extent to which windfall gains are generated for existing investors. As such, requirements restricting participation to new equity or debt instruments serves to maximise investment additionality, while limiting the deadweight costs of the scheme.

Another important, and prevalent, form of investment criteria is the use of restrictions placed on the monetary value of an investment that will attract tax relief. This design feature raises three key policy implications.

First, the use of thresholds may serve to contain the fiscal cost of the tax incentive, by placing an upper bound on the extent to which tax expenditures are incurred per investor. However, the effect of this may be eroded in circumstances where uptake of the scheme is significantly greater than forecast. Additionally, investors may group at or below the threshold that is set. This may limit the benefits that VC and BA investment bring, for instance through professionalization, as financing is below the socially optimal level because investors seek to operate within the permitted limits. Furthermore, investors may be less inclined to provide advice if their stake in the firm is lower. This would affect both start-ups and scale-ups. As discussed with regards to business sector criteria, implementing threshold criteria raises equity questions when similar parties marginally either side of a threshold are given different treatment.

Secondly, maximum investment values may limit the extent to which the use of tax incentive schemes is a feature in tax planning arrangements. Placing a cap on the tax advantage generated by the scheme could reduce its attractiveness to those wishing to engage in tax planning. This may also have the by-product of supporting quality of investment by deterring those investors that are either unwilling or unable to engage in active ownership.

Thirdly, restricting the size of investment qualifying for relief reflects the fact that the information costs associated with any single investment are finite, so relief should also be finite.

Finally, the use of maximum investment limits may help to limit the extent to which tax incentive schemes create unnecessary distortions to competition. While the overarching policy objective of such tax incentive schemes is to correct market failures that result in the under provision of VC and BA investment to SMEs it is important to place checks on the extent to which governments are able to provide support to certain types of firms. This is important from the perspective of competition in domestic and international markets, particularly given the highly mobile nature of capital.

4.3.4 Duration criteria

Another key design feature of tax incentives for VC and BA investors in SMEs and start-ups is the use of minimum investment holding periods. There are a number of possible impacts that this generates.

First, the use of minimum holding periods may facilitate the generation and capture of knowledge spillovers between the investor and the recipient firm. As **Section 2.1.1** outlined, VC and BA investment contributes to the professionalization of firms through the transfer of knowledge between investor and investee (van Pottelsberghe, de la Potterie and Romain, 2004b). To the extent that VC and BA investors are actively engaged in the ownership of portfolio firms, placing a minimum holding period on the investment may ensure a higher likelihood that knowledge is transferred, retained and utilised by the investee.

Secondly, placing a minimum holding period on investments may provide for a degree of stability in the capital structure of SMEs and start-ups and limit the prevalence of short-termism among investors. As the Cox Review of the United Kingdom's investment environment highlighted, short-termism can adversely influence resource allocation to research and development (Cox, 2013). Indeed, the Review concluded that one of the best ways of combatting the prevalence of short-termism in investment is to offer tax incentives for investments held for a specified period of time.

Thirdly, the use of minimum holding periods may reflect VC and BA market norms in the amount of time taken to reach divestment. As mentioned in the previous section VC and BA investments are, by nature, long-term and illiquid (Wiltbank, 2009). Therefore, the use of minimum holding periods may be a pragmatic choice to ensure alignment with the realities investors face in the market.

Finally, the use of minimum holding periods may serve to discourage the abuse of tax incentives, such as through complex tax planning structures. Attaching a minimum holding period may limit the attractiveness of such tax incentives to those investors that are participating in the scheme solely for the purpose of gain a tax advantage.

Although the use of minimum holding periods is prevalent, it is important to consider the possible implications of the use of maximum holding periods. To the extent that interest and dividend income is eligible for tax relief, a maximum holding period would serve to restrict the fiscal cost for the government. However, in the presence of lengthy and lengthening holding periods, with Mason and Botelho (2014) reporting an approximate BA holding period of 10 years in 2013, a maximum holding period may create undesirable behavioural responses. Such a design feature may encourage investors to prematurely exit investments to retain tax relief and/or only select those investments that mature quickly or close to the point of divestment. This would clearly limit the extent to which such tax incentives could address the funding gaps faced by the SME sector as a whole.

4.4 Administration

The literature examining the administration of tax incentives is even more limited than the literature examining other aspects of tax incentive design. However, where the literature does discuss the administration of tax incentives (albeit at a high-level), there are some common themes.

Firstly, it is suggested that tax incentives should be administrated only by the tax administration and with as little discretion as possible (Shah, 2006; James, 2009) i.e. they should be automatic. However, Holland and Vann (1998) consider the advantages of a discretionary approach: the ability to tailor incentives as priorities change and deny access if there is a risk of tax avoidance. In addition, it could allow the possibility of providing only the degree of incentive that is required to make the investment economic, improving cost-effectiveness. However, they note that these benefits are generally not realised in practice and that it may lead to corruption, a lack of transparency and a cumbersome and time-consuming approval and adaptation process. Despite this, they argue that a process to vet and approve investments that meet the relevant criteria would be beneficial, making it possible to monitor the extent to which the incentive is being used. This study provides a discussion of the wider implications of VC and BA tax incentives for tax planning and tax avoidance in **Section 4.5.1**.

A second common theme is that tax incentives, or tax expenditure, should be regularly monitored and evaluated in the interests of transparency, efficiency, and fiscal control. Bird (2008) notes that few developing countries have managed to follow basic rules of keeping tax incentives simple, keeping records, and evaluating results because "*the political advantages of ambiguity seem always to outweigh the potential social gains from transparency*". James (2009) suggests that governments should regularly prepare tax expenditure statements to measure and monitor the cost, and they should be reviewed periodically to assess their effectiveness. With regard to BA specifically, Mason (2009) points out that governments should invest in appropriate methodologies which can accurately measure investment trends, so that the need for public sector intervention can be demonstrated and the impact of such interventions can be measured.

A report by the UK National Audit Office (2014) on the effective management of tax reliefs outlines some key findings of its assessment of the UK's tax administrator, HMRC. The report suggests that, for a variety of reasons, HMRC's administration of tax reliefs does not offer value for money and is costing the exchequer money. It argues that this is due to HMRC's view that tax reliefs do not have administrative implications that differ from other parts of the tax system, coupled with the desire not to be directly accountable for tax reliefs. HMRC does not test whether tax reliefs are meeting objectives, which creates significant risks. As a result, the NAO recommend a range of measures to support a systematic approach to administering tax reliefs including:

- Drawing on good practice internally and internationally to develop principles and guidance for administrating and reporting on tax reliefs.
- Publishing data on the cost and effectiveness of significant tax reliefs.
- Tracking actual costs against forecasts.
- Reporting to parliament each year on the cost and impact of tax reliefs posing the greatest risks.
- Carrying out a pilot exercise to analyse behavioural reliefs systematically and identify and explore patterns and risks.

Engagement with industry: Stability and awareness

Linked to the issue of administration, a number of representatives of the VC and BA investor community stressed the importance of stability and awareness in the uptake of tax incentives.

A lack of stability in the administration of tax incentives was claimed to deter uptake. Irregular and unannounced changes to tax incentives limit the extent to which investors can price in the impact of the incentive on their investment with any degree of reliability. This may deter investors from using tax incentive schemes.

In addition, the characteristically long holding periods of investments of this nature may mean that investors will be investing across multiple political cycles. The political economy implications of tax incentives may mean that the availability and nature of tax incentives fluctuates between governments. This was cited as another source of instability that can deter uptake of schemes.

A number of investors also mentioned that a lack of awareness in the industry may limit uptake of tax incentives. Without adequate promotion, investors may simply be unaware of the availability of tax incentives. In this regard, the role of financial intermediaries was highlighted as being important for connecting qualifying investors to qualifying target companies.

4.5 Wider impacts and alternatives

4.5.1 Revenue loss and tax avoidance

Some of the difficulties in administrating tax incentives are discussed in **Section 4.4**. These difficulties can lead to revenue loss beyond the initial loss (i.e. foregone revenue). Bird (2008) discusses the conventional wisdom that tax incentives should be eliminated because they are usually redundant and ineffective – they reduce revenue and complicate the fiscal system. A study by the Clark *et al.* (2007) suggests that revenue loss from tax incentives may originate from three sources:

1. Revenue that would have been collected;
2. Revenue from projects that would have been undertaken even in the absence of tax incentives; and
3. Revenue from abuse or planning.

On the first source, lost revenue may be recouped if investments stimulate growth and jobs (i.e. the tax incentives pay for themselves). The economic rationale for incentivising VC and BA investment is set out in **Section 2.3**.

On the second source, if the investment would have been viable without the tax incentive, or partially viable i.e. the incentive is more generous than necessary, then a proportion of government revenue is transferred to the investor at the expense of the treasury (Clark *et al*., 2007).

On the third source, Bird (2008) argues that tax incentives facilitate evasion and encourage corruption. Holland and Vann (1998) provide a discussion of the ways in which tax incentives are hard to administer and note that tax holidays have been

particularly susceptible to tax planning, which can lead to considerable revenue leakage. They note that the scope is more limited for investment-related incentives at moderate rates. Zee *et al.* (2002) suggest that indirect tax incentives are very prone to abuse, and also argue that the more scarce resources devoting to administering tax incentives means that other tasks are impaired, jeopardising the system as a whole.

Clark *et al* (2007) also suggests that this may be because targeted tax incentives could result in a perceived lack of fairness, which can reduce compliance further. This, in turn, increases enforcement efforts, diverting tax administration resources away from revenue collection.

Authors (e.g. Bird, 2008) also acknowledge the non-quantifiable political difficulties surrounding tax incentives. For example, once created, concessions are usually hard to remove or lobbied for further, redefining "*existing concessions in unforeseen and presumably undesired ways*". This may be the case even if the tax incentive has not resulted in additionality. For some countries, tax incentives are deemed politically easier to provide than funds, or to correct structural market failures (Clark *et al*, 2007).

4.5.2 Tax competition and cross border issues

The EC's Export Group report on removing tax obstacles to cross-border VC investments found that one of the main obstacles to a coherent EU VC market was a lack of cohesion between member states' tax systems (European Commission, 2010). This lack of cohesion may dictate the location of investors such that investors or enterprises seek to benefit from more advantageous tax systems. This can lead to tax competition between countries. Tax competition is generally seen as harmful, leading countries to generate lower levels of revenue from particular types of activity than they would each individually choose. If it is the case that different tax incentives in different countries influence the location of VC and BA investment, then tax competition may occur in this context as well.

There is well known tax competition over the CIT rate (Klemm and Parys, 2012). In broader tax terms, Schertler and Tykova (2011) provide an empirical study on cross-border VC investments between 2000 and 2008. They show the impact of macroeconomic explanatory variables on the number of bilateral cross-border links. Focussing on the effect of the effective income tax, they find that the difference in tax rates has a positive and significant impact on a 5% significance level when the whole sample is applied, a positive and significant impact on a 10% significance level when the subsample of developed countries is used. When using the sample without US firms the impact becomes insignificant. This could suggest that tax incentives will become more influential as the European venture capital market develops and deepens.

With regard to more specific tax incentives, Klemm and Parys (2012) find strategic interaction between tax holidays. They do not find evidence for competition over investment allowances and tax credits. Blomstrom *et al*. (2003) note the lack of data on how FDI subsidies influence investment flows and firm behaviours. However, they find that tax holidays may affect operational decisions for years. These investors, driven by tax incentives rather than the economic fundamentals of the host country, are likely to be relatively footloose, and could move to other regions offering more generous incentive schemes either before the economic and social benefits of the VC or BA investment have been realised.

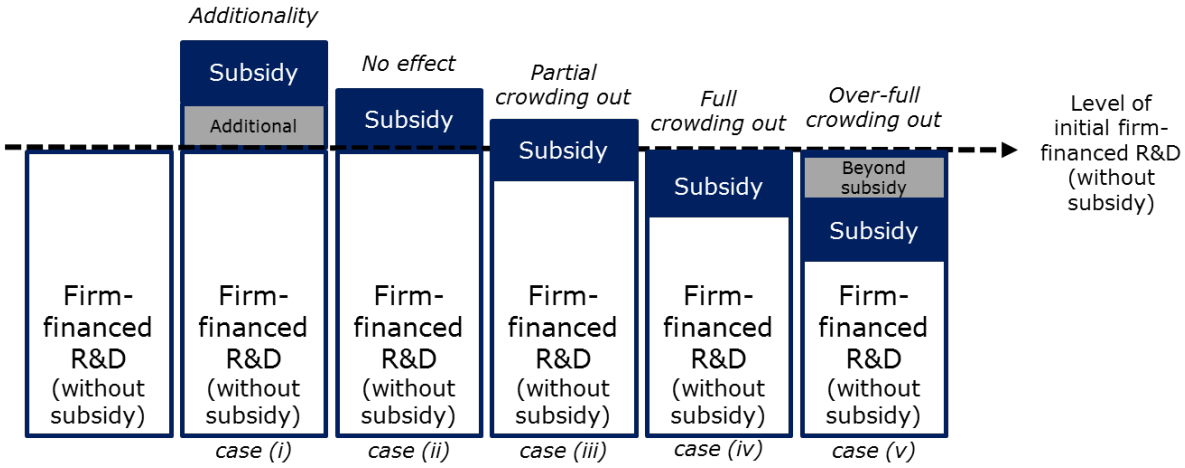
When discussing tax incentives, James (2009) suggests that regional cooperation should be encouraged to prevent harmful tax competition between countries.

4.5.3 Relationship between private and publicly funded VC

As discussed in **Section 2.1.5**, VC funding may be privately or publicly funded. The literature gives mixed results as to the relationship between these two types of investment, with some suggesting complementarity and others finding a crowding-out effect.

The term 'crowding out' refers to the economic effect of increased government spending and the idea that it displaces to some extent private spending, or fails to stimulate economic activity (Carlson and Spencer, 1975). Public support of private activity in theory decreases unit costs and increases the expected profitability of funded projects. This incentivises subsidised firms to invest over and above the counter-factual levels that firms would have undertaken without public support, leading to additionality. On the other hand, firms may substitute public funds for private funds that would have been committed in any case, leading to crowding out. There is a spectrum of potential outcomes between these two scenarios, as outlined by Dimos and Pugh (2016) in the context of R&D subsidies.

Figure 8: Potential outcomes on R&D expenditure as a result of government subsidy



Source: adapted from Dimos and Pugh

In line with this, Dimos and Pugh undertake a very recent analysis of the evaluation literature for R&D subsidies. Noting that the empirical literature on this topic is inconclusive, they contribute to the debate by conducting a meta-regression analysis in which they control for both publication selection bias and a range of same and study heterogeneities. Based on their findings, the authors reject the crowding out hypothesis. However, they also do not find evidence for substantial additionality.

There is a vast amount of literature on the topic of crowding out in the context of other industries and different types of government intervention. The evidence base is more limited for the BA/VC investment specifically, and the results are mixed. Some studies suggest public VC inhibits private VCs, whereas others find that the two forms of VC may in fact be complementary, for instance by promoting private VC also.

A series of studies for Canada find empirical evidence highly consistent with crowding out. Examining the labour-sponsored venture capital corporation (LSVCC) programme, Cumming and MacIntosh (2006) find a significant crowding out affect primarily due to the large tax breaks received by LSVCCs. The data suggest that crowding out has been prominent enough to lead to a reduction in the aggregate pool of VC in Canada. Brander, Egan and Hellman (2008) also find some evidence of crowding out in Canada. First, they note that government-sponsored VCs underperform private VCs on a variety of criteria, which may be due to selection (i.e. private VCs have a higher quality threshold for investment than government VCs) or treatment (i.e. subsidised VCs crowd out private investment and provide less effective mentoring and other value-added skills). Though the results are not definitive, they then find suggestive evidence that the poorer performance of the government-sponsored VCs is due to treatment.

However, more recent analysis for the US and a range of other economies (Brander, Du and Hellmann, 2015) finds significant evidence of additionality: government-sponsored VC activity increases the total amount of VC funding available, at both the enterprise and market levels. Enterprises that receive mixed funding receive more funding in total than purely private VC-financed enterprises. Furthermore, enterprises with mixed funding tend to have more VC investors and obtain more private VC funding than others. At the market level, they find further support that government-sponsored VC funding provides additional funding, thus supporting the notion that public and private VC funding are complimentary.

For Europe, Armour and Cumming (2006) find that government VC funds have crowded out private VC investments, though Cumming later finds that this depends on benchmarking and measurement. Leleux and Surelemont (2003) analyse the relationship between public and private sources of VC in Europe and find that public involvement seems to cause greater amounts of money to be invested in the industry as a whole.

Finally, Cumming (2012) notes that crowding out effects will be less severe during an economic crisis - where capital is scarce - publicly-sponsored VC funds are more likely to have positive economic effects.

The literature therefore suggests that public VC funds can be either complementary or conflicting with private VC, depending on the specific policy and scale of the private VC market.

4.5.4 Alternatives to tax incentives

As **Section 2.3.3** highlighted, there are a number of different forms of industrial policy intervention can be used to promote investment in SMEs and start-ups.[37] Warwick and Nolan (2014) and Autio and Ranniko (2016) discuss that tax incentives are just one component of the portfolio of options available to policy makers. It is, therefore, important to analyse the effectiveness of tax incentives relative to their substitute policy tools.

With regard to tax versus non-tax incentives, Burer and Wustenhagan (2009) investigate policies for VC and private equity investment in cleantech. They find that feed-in tariffs are considered especially effective by a wider variety of investors. Although this research is industry-specific, this suggests that policies (tax incentives

[37] Warwick and Nolan (2014) and Autio and Ranniko (2016) provide an overview of the different categories and forms of industrial policy intervention.

or otherwise) that reduce investment risk may be more effective. Further, they are an alternative to 'big corporation' policies (in this case, trading mechanisms), which may be seen as having a negative effect on entrepreneurial start-ups.

A recent study by Gustafsson *et al*. (2016) discusses innovation subsidies in Sweden. It states that subsidies have positive short-run effects on human capital investment and productivity of the smaller firms. However, there is a lack of significant positive evidence on the long-run impact. Woodside (1979) compares the effectiveness of subsidies with tax incentives, for example highlighting how tax incentives are typically less open to government interference than subsidies (i.e. where government may have a stake in the outcome of the subsidy).

Avnimelech *et al*. (2010) present the limitations of what they refer to as 'traditional' approaches to VC policy, defined as a sole focus on overcoming market failures via direct investment and financial incentives. They argue this approach suggests that VC policy is independent of the specific regional context, which is not empirically acceptable given the diversity of VC policy impacts. They propose an 'evolutionary' approach, in which policy features include a strategic and long-term commitment, a phased policy portfolio and a dynamic policy process adaptive to the specific regional context.

There is a strand of literature that relates solely to informal VC or BAs. This literature suggests that for states seeking to implement/improve angel tax credit programmes, administrators should focus on building relationships and visibility of investors, arguing that a law providing for tax incentives cannot alone create success. For example, (Williams, 2008) suggests that take-up of tax incentives in Vermont was low for a combination of reasons, including no one to champion the programme, and the fact that it was not widely publicised. It concludes, "*So, even though a state can construct a properly targeted angel investment credit program, the best practice that the state can put forth is one where building relationships and communication among entrepreneurs and angels can thrive.*" This links back to earlier research by Mason that suggests VC and BA tax incentives in EU member states and other selected countries.

The crowding out literature provides some general lessons around signalling. Manigart and Beuselinck (2001) conclude that the selective provision of government VC funds to underfunded young innovative firms can signal their high potential to private sector investors and, thus, foster the additional funding of these firms. Lerner (2009) similarly concludes that thanks to signalling effects, GVCs can have a positive, crowding-in effect on the development of VC markets. Signalling in this way suggests targeting by the government via specific investments, rather than tax incentives that are open to all VC or BA investors.

Finally, Cumming (2012) notes that crowding out effects will be less severe during an economic crisis; specifically when capital is scarce publicly-sponsored VC funds are more likely to have positive economic effects.

4.6 Evaluation of design features

On the basis of a review of the literature and the authors own independent analysis, as well as investigations of real world practices, the following relevant design features of tax incentives designed to improve the quantity and quality of VC and BA investment have been identified.

Table 5: Evaluation of design features

Area	Design feature	Comments	Recommendation
Scope	Upfront relief on amount invested	• Upfront relief helps to de-risk investments • Cited as important determinant by investors • May reduce scrutiny of quality of investment	• Offer upfront relief on investment
Scope	Relief on returns (dividends/ capital)	• Should increase scrutiny of quality of investment • Benefit may be too remote to materially increase investment volumes. Incentive may thus be an unnecessary fiscal cost, where investment is successful	• Impact unclear: explore further
Scope	Loss relief	• Addresses high-risk nature of VC and BA investment • Cashflow advantages for governments as tax expenditure deferred • Investors will generally anticipate future tax liabilities against which offset could be valuable • May reduce scrutiny of quality of investment	• Offer loss relief
Scope	Generosity	• More generous schemes have higher fiscal costs • More generous schemes have greater incentive effects	• Impact unclear: explore further
Qualifying criteria	Business age	• Deadweight cost associated with small companies with lower growth prospects • Young companies more likely to achieve high growth than older companies • Avoidance and administration issues • Majority of high-growth companies are older (>five years)	• Partially target incentives on basis of age (e.g. offer higher level of incentive)
Qualifying criteria	Business size	• Benefits of VC and BA investment greater for investments in smaller companies • Smaller companies face greater challenges accessing finance	• Partially target incentives on basis of size (e.g. offer higher level of incentive) • Incentives

Area	Design feature	Comments	Recommendation
		• Nature of funding gaps may be different in different countries	should reflect local funding gaps
Qualifying criteria	Business sector	• Certain sectors may be associated with higher levels of innovation/growth • Size of effects is small • Avoidance and administration issues • Location of investee firm is also important	• Do not target
Qualifying criteria	Investor	• BAs may bring greater expertise to recipient companies • BAs typically make larger investments in a single company • VC fund managers may bring greater expertise to appraisal of recipient companies • VC fund managers may combine investments in young, growing innovative companies with less risky portfolio investments	• Both BA and VC investment should be incentivized • Explore further whether there is case for offering BA investment larger thresholds and/or preferential treatment
Qualifying criteria	Related parties	• Offering incentives to owner-investors and other related parties may incur high deadweight costs as investment would occur anyway • Related parties do not face the same information asymmetries and moral hazard issues as external investors • BAs and VC fund managers may provide valuable expertise through taking on official governance roles in recipient companies	• Incentives are only available for investments resulting in ownership stakes below a certain threshold. The exact threshold would be context dependent and subject to further research. BA exemptions may be required.
Qualifying criteria	Cross-border investments	• Investors must typically have qualifying tax liabilities in the jurisdiction in order to receive tax credit incentives • No economic justification	• Consider ways of incentivising cross-border investments

Area	Design feature	Comments	Recommendation
		for restricting investor pool on national grounds • Less scope for fraud or aggressive planning where incentive matched to tax liability/taxable presence • Investors more likely to have, and be able to share, expertise in markets in which they have a taxable presence	
Qualifying criteria	Debt vs. equity	• Equity investments may be longer term • Equity investors have greater stake in success • Debt funding is tax privileged for recipient company • Increasing market in 'venture debt' • Shortfall in debt finance post-financial crisis	• Impact unclear: explore further
Qualifying criteria	New investment	• Incentivising old investments and existing equity stakes is by definition a deadweight cost	• Target new investments
Qualifying criteria	Investment size limits	• Limits potential fiscal cost of incentive • Limits scope for tax planning • Reflects finite information costs for any given investment • Limits scale of distortion risk	• Impose limits on investment size
Qualifying criteria	Investment duration	• Young growing companies benefit from stability of core financing arrangements • Longer investment lifespan increases prospect of knowledge transfer between investor and investee • Limits use of investments in tax planning strategies • Maximum duration could limit fiscal cost • Maximum duration could impose perverse	• Impose minimum requirements on investment duration • Do not impose maximum limits on availability of relief

Area	Design feature	Comments	Recommendation
		incentives to divest	
Administration	Discretion	• Discretionary tax incentives may be better targeted • Discretion can introduce risks of error and corruption • Tax authorities lack expertise necessary to 'pick winners'	• Tax incentives should be administered on a non-discretionary basis
Administration	Fiscal cost monitoring	• Cost of tax incentive should be monitored to ensure value-for-money	• Fiscal cost of tax expenditure should be monitored annually
Administration	Impact monitoring	• Impact of tax incentive should be monitored to ensure value-for-money	• Economic benefits of tax expenditure should be monitored annually

5. Business angel and venture capital tax incentives in the EU and selected OECD countries

Section summary

- In total, 46 tax incentives are offered by these countries, with 13 countries operating multiple schemes. France and the United Kingdom have the most sophisticated frameworks of tax incentives, operating six schemes each.
- In terms of the EU-28, there is a marked contrast between EU-15 and EU-13 in the prevalence of tax incentives. Nine of the EU-15 Member States operate tax incentives compared to just three (Malta, Poland and Slovenia) of EU-13.[38]
- The various choices taken by governments in the design and implementation of tax incentives to promote business angel and venture capital investment can be grouped into three main categories; 1) scope, 2) qualifying criteria and 3) administration.
- Tax credits in respect of the amount invested are the most popular form of incentive, followed by tax exemptions on the returns (current or capital) generated by the investment. However, it should be noted that it is common for schemes utilise multiple forms of incentive, with 13 doing so.
- All of the schemes in the country sample use combinations of qualifying criteria, of varying complexity, to target particular businesses, investors, investments and holding periods.
- By virtue of utilising qualifying criteria, all of the schemes in the country sample were found to be administered on a non-discretionary basis. However, there was a general lack of transparent monitoring of fiscal costs and economic impacts. Furthermore, there was a widespread lack of readily accessible guidance from implementing authorities on the design and operation of tax incentives.
- Generosity was measured using an adaptation of the "B-index methodology" for 29 tax incentives (those that offered upfront tax credits), from the 46 observed in the country sample. The results of the application of the B-Index are outlined in **Section 5.5.3**, but one notable case is in Israel's Angels Law, which offers 100% tax credit with the investment threshold of ILS 5 m (about €1.24 m) as it offers far the most amount to investors.

The need to adopt a systematic approach to innovation and economic growth has spread through traditional policy fields (such as regulation and procurement), leading to a widening of the innovation policy scope and the development of more sophisticated and diverse policy instruments (Borras, 2009; Flanagan *et al*., 2011). Tax policy has been affected by these developments, visible, for example, in the spread of R&D tax incentives in EU and OECD countries. With access to finance seriously affected by the crisis, a number of recent tax reforms in Member States have

[38] EU-13 refers to the following 13 Member States; Bulgaria, Croatia, Cyprus, Czech Republic, Estonia , Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

focused on increasing the availability of funding to smaller innovative companies (Garnier *et al*., 2014).

In order to ensure adequate financing of young, growing and innovative businesses, both in terms of volume and structure of funding available, many stakeholders argue that taxation should foster long-term investment in enterprises with higher risk and reward profiles. Such investments are generally less liquid than investments in more established companies, heightening the costs and risks to investors.

As discussed in the previous section, the evidence on the significance of taxation to venture capital investment is limited. Despite this, an increasing number of countries are already encouraging business angel and venture capital investment through directly targeted tax incentives as a means of increasing the supply of early-stage venture capital. Importantly, the EC's new State Aid guidelines[39] on risk finance provide for more flexibility and clearer conditions for tax incentives for investors.

Engagement with policy makers: State aid regulations

Workshop participants confirmed that the recent reform of state aid has been broadly beneficial. A number of participants described the state aid approval process as lengthy and burdensome. It was also mentioned that the state aid rulings could be more supportive, such as by explaining why a particular instrument has not met the requirements and providing options for revision to bring it into compliance. In addition, it was discussed that state aid regulations prevent close targeting of tax incentives, which often generates higher deadweight and fiscal costs. This often makes it challenging to operate tax incentives in countries that have a balanced budget rule.

This section will focus on mapping the current framework of tax incentives directly targeted to increasing the supply of early stage venture capital in EU-28 and eight selected OECD countries.[40]

Tax incentives targeted towards investment in young, growing and innovative businesses have become an increasingly common element of the general innovation policy mix. However, there is a broad spectrum of tax incentives targeted towards different growth and innovation drivers in the SME sector.

This study has adopted a number of parameters to focus the analysis presented in this report and avoid duplication of effort with the EC's previous studies on R&D and SME tax incentives. The parameters are as follows:

[39] http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52014XC0122%2804%29&from=EN#ntr20-C_2014019EN.01000401-E0020

[40] Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

- **Recipient of relief**: Only those tax incentives that are received by the investor and/or an intermediary, such as a professionally managed venture capital fund, will be considered.
- **Nature of investment**: Only those tax incentives relating to externally-sourced debt or equity investments will be analysed. While own capital is an important source of capital for SMEs, its provision is not subject to the same market failures (e.g. information asymmetries) and is often not as instrumental in the SME growth cycle as external finance. As such, it is not the focus of this study.
- **Research and development**: Tax incentives related to investments in businesses engaging in qualifying R&D activity will be considered by this study only where the above parameters have been met.

The various choices taken by governments in the design and implementation of tax incentives to promote business angel and venture capital investment can be grouped into three main categories:

- **Scope**: tax incentives are granted at various stages of the investment lifecycle, in different forms and over different incentive and tax bases.
- **Qualifying criteria**: tax incentives contain provision that restrict eligibility to certain qualifying investors and investments.
- **Administration**: tax incentives can be administered in differing ways and are monitored and evaluated with varying levels of rigour and frequency.

Each of these categories will be expanded upon and will be used to present an overview of the current practices in the country sample. More detailed descriptions of tax incentives in each country can be found in **Appendix 1** of this report.

5.1 Popularity and stability

Table 6 presents an overview of the popularity and stability of tax incentives to promote business angel and venture capital investment with tax policy makers. It distinguishes between those countries that currently operate such incentives and those that plan to. It also shows the popularity within, as well as between, countries by presenting the number of such tax incentives currently in operation.

Table 6: Popularity and stability

Country	Tax incentive(s) implemented	Number of tax incentives	Number of tax incentives abolished 2006-2016	Future tax incentive(s) planned
Australia	✓	3	0	X

Country	Tax incentive(s) implemented	Number of tax incentives	Number of tax incentives abolished 2006-2016	Future tax incentive(s) planned
Austria	X	0	0	X
Belgium	✓	4	0	X
Bulgaria	X	0	0	X
Canada[41]	✓	3	0	X
Czech Republic	X	0	0	X
Croatia	X	0	0	X
Cyprus	X	0	0	X
Denmark	X	0	0	X
Estonia	X	0	0	X
Finland	X	0	1	X
France	✓	6	0	X
Germany	✓	1	0	X
Greece	X	0	0	✓
Hungary	X	0	0	✓
Ireland	✓	1	0	X
Israel	✓	2	0	X

[41] Please note that although Canada is listed as having 3 tax incentives, 2 of these relate to incentives operated at the provincial level. Investment tax credits and Provincial Labour-Sponsored Venture Capital Corporation tax credits are offered in multiple provinces.

Country	Tax incentive(s) implemented	Number of tax incentives	Number of tax incentives abolished 2006-2016	Future tax incentive(s) planned
Italy	✓	3	0	X
Japan	✓	2	0	X
Latvia	X	0	0	X
Lithuania	X	0	0	X
Luxembourg	X	0	0	X
Malta	✓	1	0	X
Netherlands	X	0	1	X
Poland	✓	1	0	X
Portugal	✓	2	0	X
Romania	X	0	0	X
Slovakia	X	0	0	X
Slovenia	✓	1	0	X
South Korea	✓	2	0	X
Spain[42]	✓	2	0	X
Sweden	✓	1	0	X
Switzerland	X	0	0	X

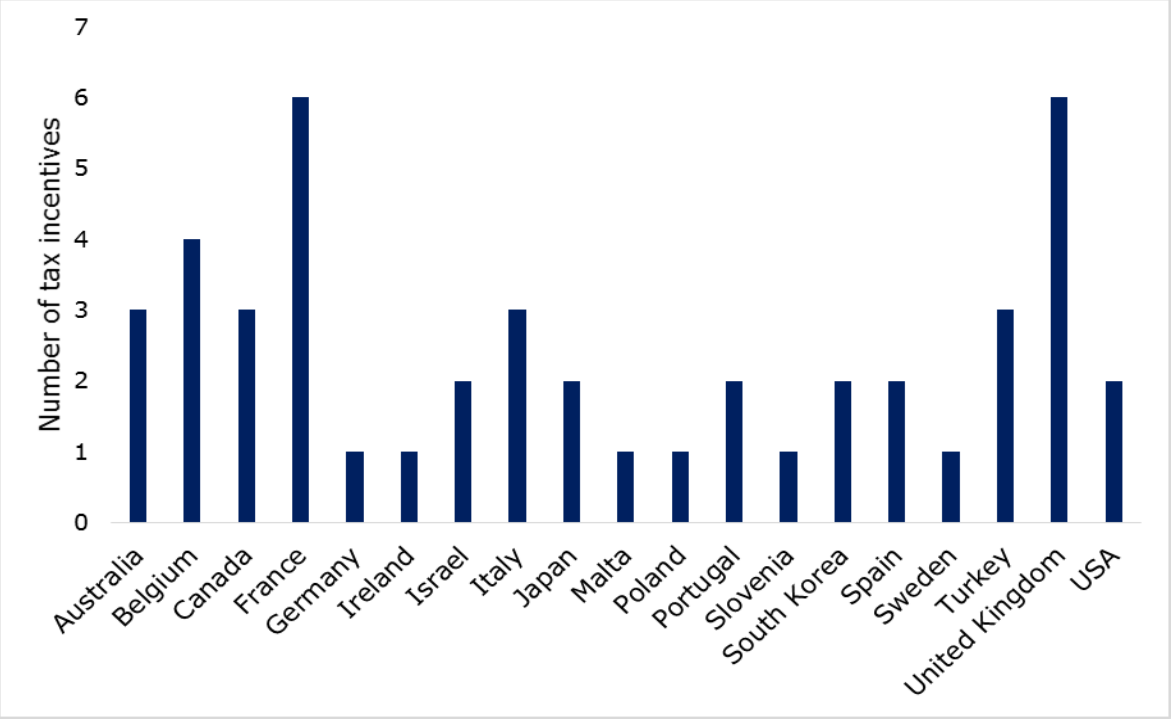
[42] Please note that although Spain is listed as having two tax incentives, one of these relate to incentives operated by a number of Spain's autonomous communities (Aragon, the Balearic Islands, Cantabria, Catalonia, Galicia, Madrid and Murcia).

Country	Tax incentive(s) implemented	Number of tax incentives	Number of tax incentives abolished 2006-2016	Future tax incentive(s) planned
Turkey	✓	3	0	X
United Kingdom	✓	6	1	✓
USA[43]	✓	2	0	X

As **Table 6** shows, the popularity of tax incentives between the countries surveyed to date is mixed. 19 of the 36 countries currently implement at least one tax incentive targeted towards business angel and venture capital investment in SMEs and start-ups. Of the 17 countries that do not currently implement tax incentives, two have announced plans to implement such tax incentives in the future.

Popularity within the countries is similarly mixed. Of the countries currently implementing tax incentives, six operate only one scheme and 13 operate multiple schemes, France and the UK have the highest number of distinct incentives, with six schemes each. This is shown in **Figure 9**.

Figure 9: Popularity within countries



Source: PwC analysis

[43] Please note that although the United States is listed as having two tax incentives, one of these relate to incentives operated at the state level. Investment tax credits are offered by a number of states.

Table 6 also shows the number of tax incentives that were abolished over the period 2006-2016, which can be taken as a high-level indicator of stability in a country's tax incentive framework. From the 36 countries in the sample, only three have been recorded as abolishing a tax incentive over the period 2006-2016. This would suggest a high degree of country-level stability across the sample (although this is not an indication of scheme-level stability). However, it is interesting to note that for two (Finland and Netherlands) of the three countries, the scheme that was abolished was the only VC/BA tax incentive available.

5.2 Scope

The scope of a tax incentive is the key determinant of its functionality and is driven by the underlying policy objective. In respect of tax incentives designed to promote business angel and venture capital investment, the issue of scope can be divided into four themes: the form of the incentive itself, the timing of the incentive within the investment lifecycle, the incentive base and the tax base.

5.2.1 Form of tax incentive

The form that a tax incentive will take is one of the most basic design choices available to tax policy makers. Tax incentives can take a number of forms, as outlined by Easson and Zolt (2002). However, only a subset can be observed in practice. These are tax deductions, tax exemptions, tax deferrals and loss relief, and may be used individually or in combination within a scheme of incentives. These are outlined in more detail in **Figure 10**.

Figure 10: Forms of tax incentives

Tax deduction	A tax incentive can be delivered through a tax deduction. This allows a taxpayer to reduce a specified tax base through the deduction of certain categories of actual or notional expenditure.
Tax exemption	A tax incentive can be delivered through a tax exemption, which removes a specific tax base from the scope of tax.
Tax credit	A tax incentive can be delivered through a tax credit, which can be offset against a tax liability in recognition of taxes payable or taxes paid. Unlike tax deductions or tax exemptions, which serve to reduce the tax base, a tax credit serves to reduce the tax liability itself.
Tax deferral	A tax incentive can be delivered through a tax deferral. Typically applied to income or capital gains, this form of tax incentive delays the payment of a tax liability to a future date.
Loss relief	A tax incentive can be delivered through loss relief. This form of tax incentive allows a taxpayer to offset losses realised on the disposal of assets against specified categories of taxable income or capital gains. Loss relief serves to reduce the tax base, rather than the tax liability.

Table 7 provides an overview of the different forms of tax incentives adopted in the country sample surveyed to date.

Table 7: Form of tax incentive

Country	Name of scheme	Tax deduction	Tax exemption	Tax credit	Tax deferral	Loss relief
Australia	Early Stage Venture Capital Limited Partnership program	X	✓	✓	X	X
	Venture Capital Limited Partnership program	X	✓	X	X	X
	Tax incentive for Early Stage Investors	X	✓	✓	X	X
Belgium	Tax shelter for investments in start-ups	X	X	✓	X	X
	Tax treatment of crowdfunding loans	X	✓	X	X	X
	Win-Win Lending Scheme	X	X	✓	X	X
	Loan “Coup de pouce” (Wallonia)	X	X	✓	X	X
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	X	X	✓	X	X

Country	Name of scheme	Tax deduction	Tax exemption	Tax credit	Tax deferral	Loss relief
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	X	X	✓	X	X
	Provincial Investment Tax Credits	X	X	✓	X	X
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	X	X	✓	X	X
	“Madelin” tax reductions	X	X	✓	X	X
	Wealth tax reliefs	X	X	✓	X	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	X	✓	X	✓	X
	Venture Capital Funds (including FCPR, FCPI and FIP)	X	✓	✓	X	X
	PEA-PME	X	✓	X	X	X

Country	Name of scheme	Tax deduction	Tax exemption	Tax credit	Tax deferral	Loss relief
Germany	"INVEST - Venture Capital Grant"	X	X	✓	X	X
Ireland	Employment & Investment Incentive	X	X	✓	X	X
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	X	✓	X	X	X
	The Angels Law	✓	X	X	X	X
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	X	✓	X	X	X
	Tax incentives for investing in innovative start-ups and innovative SMEs	X	✓	✓	X	X
	PIR (Piani Individuali di Risparmio)	X	✓	X	X	X
Japan	Tax Incentives to Promote Venture Investment	X	X	X	X	✓
	Angel Tax System	X	X	✓	X	✓

Country	Name of scheme	Tax deduction	Tax exemption	Tax credit	Tax deferral	Loss relief
Malta	Seed Investment Scheme	X	X	✓	X	X
Poland	Tax exemption on the disposal of stocks and shares	X	✓	X	X	X
Portugal	"Programa Semente" (Tax relief for investing in Startups)	X	✓	✓	X	X
	Tax Relief for Business Angels	X	X	✓	X	X
Slovenia	Corporate income tax regime	X	✓	X	X	X
South Korea	Tax exemptions for venture capital companies	X	✓	X	X	X
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	X	X	✓	X	X
Spain	Deduction for investments in newly or recently created companies	X	X	✓	X	X

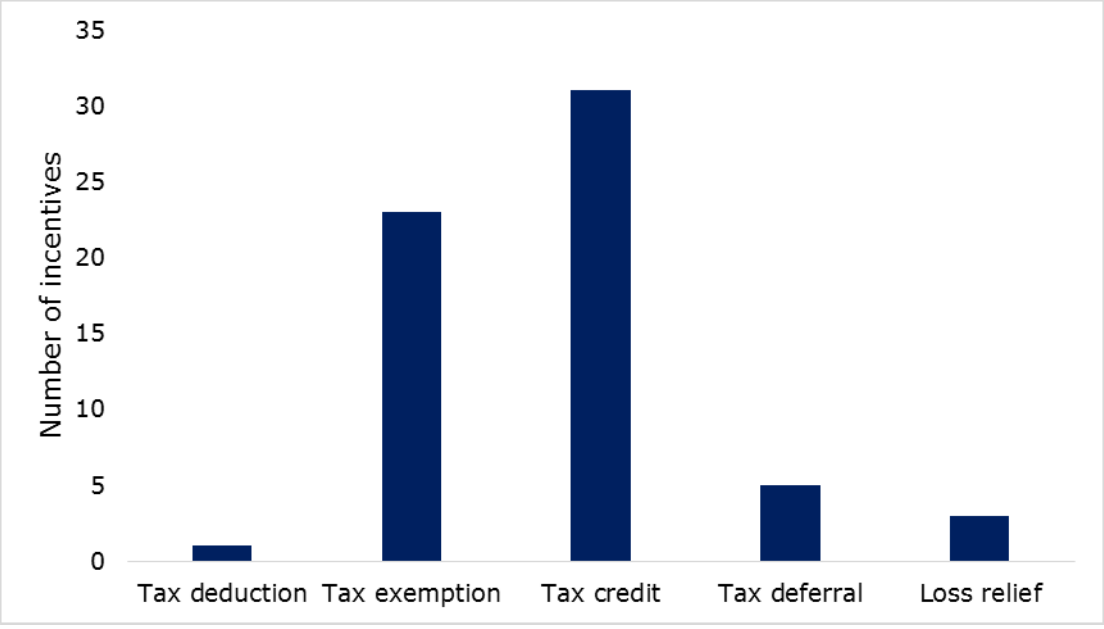
Country	Name of scheme	Tax deduction	Tax exemption	Tax credit	Tax deferral	Loss relief
	Regional incentives for business angels	X	X	✓	X	X
Sweden	New Investment Incentive	X	X	✓	X	X
Turkey	Business Angel Scheme	X	X	✓	✓	X
	Venture Capital Investment Trust Tax Exemption	X	✓	X	X	X
	Private Equity Investment Fund	X	✓	✓	X	X
United Kingdom	Enterprise Investment scheme	X	✓	✓	✓	✓
	Seed Enterprise Investment Scheme	X	✓	✓	✓	✓
	Venture Capital Trust	X	✓	✓	X	X
	Social Investment Tax Relief	X	✓	✓	✓	X
	Private Placement Withholding Tax Exemption	X	✓	X	X	X

Country	Name of scheme	Tax deduction	Tax exemption	Tax credit	Tax deferral	Loss relief
	Business Property Relief	X	✓	X	X	X
USA	Qualified small business stock (QSBS)	X	X	✓	X	X
	Investment tax credits	X	X	✓	X	X

Table 7 shows that the 12 of 19 countries with identified schemes focus on providing just one form of tax incentive within a scheme, rather than a combination of forms. Seven of the 19 countries utilise a number of forms of tax incentives within one scheme.

As **Figure 11** shows, the most widely used form of tax incentive is tax credit, with 31 of the 46 schemes identified provide this form of incentive. Tax exemptions are the next most widely used form of incentive, with 23 of the 46 schemes utilising this form. Only one of the countries surveyed utilise tax deductions for incentivising business angel and venture capital investment.

Figure 11: Forms of tax incentives



Source: PwC analysis

5.2.2 Timing of tax incentive

Tax incentives can be applied at various stage of the investment lifecycle, either individually or in combination within a scheme. The design of tax incentives schemes typically focus on applying tax incentives at three points within the investment lifecycle. **Figure 12** provides an overview of the different timing choices open to tax policy makers.

Figure 12: Timing options for tax incentives

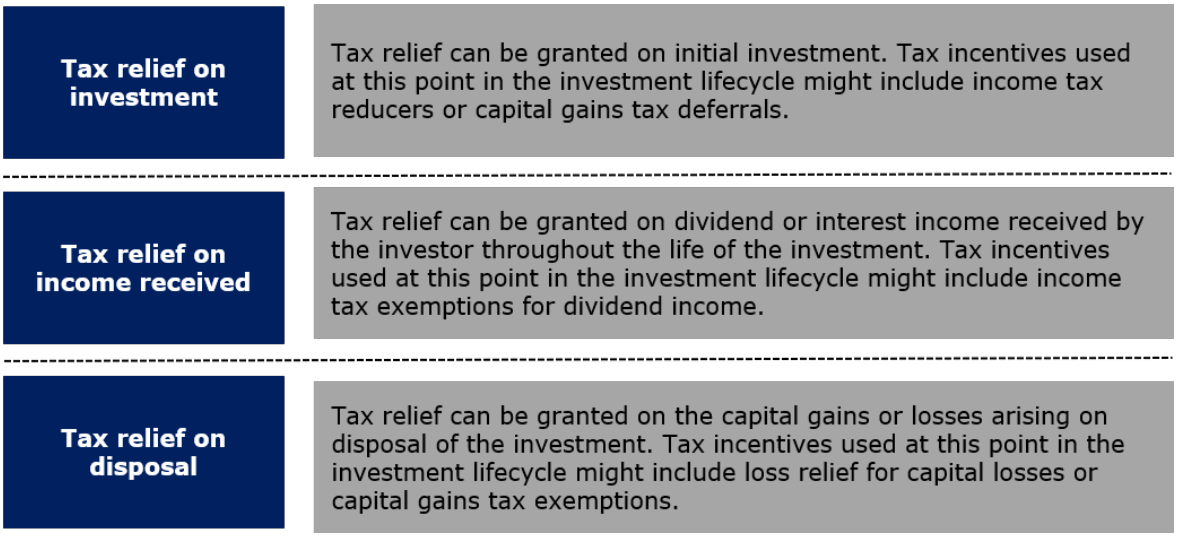


Table 8 provides an overview of the timing of tax incentives across the investment lifecycle in the country sample.

Table 8: Timing across the investment lifecycle

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
Australia	Early Stage Venture Capital Limited Partnership program	✓	✓	✓
	Venture Capital Limited Partnership program	X	✓	✓
	Tax incentive for Early Stage Investors	✓	X	✓

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
Belgium	Tax shelter for investments in start-ups	✓	X	X
	Tax treatment of crowdfunding loans	X	✓	X
	Win-Win Lending Scheme	X	✓	✓
	Loan “Coup de pouce” (Wallonia)	✓	X	X
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	X	X
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	✓	X	X
	Provincial Investment Tax Credits	✓	X	X
France	Additional allowance on sale of shares in young (<10yrs incorporated) SME	X	X	✓

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
	"Madelin" tax reductions	✓	X	✓
	Wealth tax reliefs	✓	X	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	X	✓	✓
	Venture Capital Funds (including FCPR, FCPI and FIP)	✓	✓	✓
	PEA-PME	X	✓	✓
Germany	"INVEST - Venture Capital Grant"	✓	✓	X
Ireland	Employment & Investment Incentive	✓	X	X
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	X	✓	✓
	The Angels Law	✓	X	✓

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	X	✓	X
	Tax incentives for investing in innovative start-ups and innovative SMEs	✓	X	X
	PIR (Piani Individuali di Risparmio)	✓	X	X
Japan	Tax Incentives to Promote Venture Investment	X	X	✓
	Angel Tax System	✓	X	✓
Malta	Seed Investment Scheme	✓	X	X
Poland	Tax exemption on the disposal of stocks and shares	X	X	✓
Portugal	"Programa Semente" (Tax relief for investing in Startups)	✓	X	X

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
	Tax Relief for Business Angels	✓	X	X
Slovenia	Corporate income tax regime	X	✓	✓
South Korea	Tax exemptions for venture capital companies	X	✓	✓
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	X	✓	✓
Spain	Deduction for investments in newly or recently created companies	✓	X	✓
	Regional incentives for business angels	✓	X	X
Sweden	New Investment Incentive	✓	X	X
Turkey	Business Angel Scheme	✓	X	X

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
	Venture Capital Investment Trust Tax Exemption	X	✓	✓
	Private Equity Investment Fund	✓	✓	✓
United Kingdom	Enterprise Investment scheme	✓	X	✓
	Seed Enterprise Investment Scheme	✓	X	✓
	Venture Capital Trust	✓	✓	✓[44]
	Social Investment Tax Relief	✓	X	✓
	Private Placement Withholding Tax Exemption	X	✓	X
	Business Property Relief	X	X	✓
USA	Qualified small business stock (QSBS)	X	X	✓

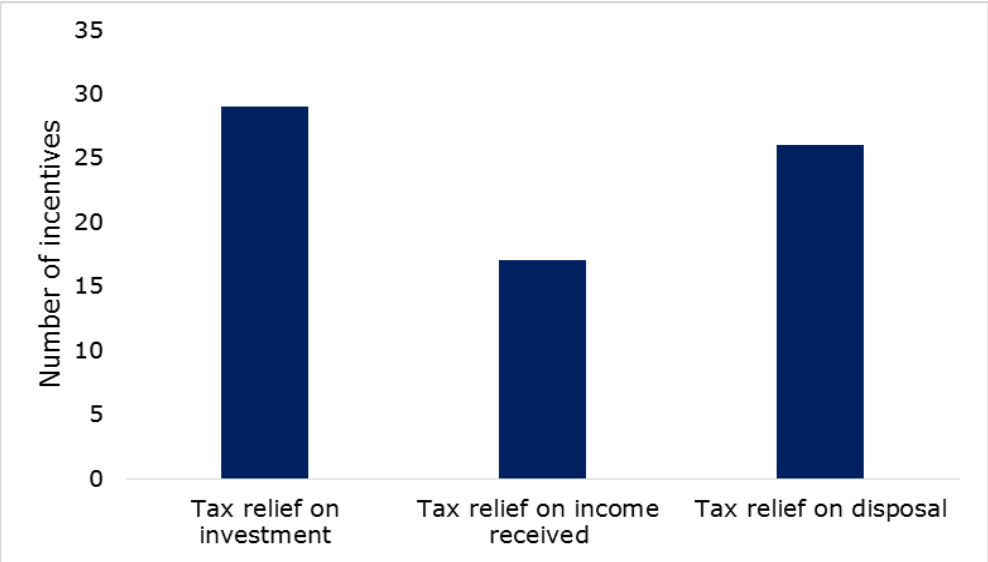
[44] The United Kingdom's Venture Capital Trust (VCT) scheme provides tax relief on disposal of investments in qualifying business for the VCT itself. The scheme also provides tax relief on disposal of shares in qualifying VCTs for the investor in a VCT.

Country	Name of scheme	Tax relief on investment	Tax relief on income received	Tax relief on disposal
	Investment tax credits	✓	X	X

The findings presented in **Table 8** show that nearly all countries provide tax incentives at multiple stage of the investment lifecycle, with the focus being on initial investment and subsequent disposal.

As **Figure 13** shows, the most widely used point of application in the investment lifecycle is the initial investment. This is followed very closely by application on disposal and then finally on income received.

Figure 13: Timing across the investment lifecycle



Source: PwC analysis

The picture is somewhat different within countries. At the level of individual schemes, the application of tax incentives across the investment lifecycle appears to depend on the nature of the qualifying investment. Those schemes granting tax relief over debt finance are among the only to provide tax relief on (interest) income received. This is driven by the fact that interest income is the source of return on debt finance and, as such, is a clear choice for the application of tax relief.

5.2.3 Incentive base

The incentive base refers to financial inputs or outputs as a result of which tax relief is granted. Incentive bases differ between and within countries but can be grouped into six different categories, corresponding to the financial inputs and outputs at different stages of the investment lifecycle.

Figure 14 outlines the different incentive bases available to tax policy makers.

Figure 14: Different incentive bases

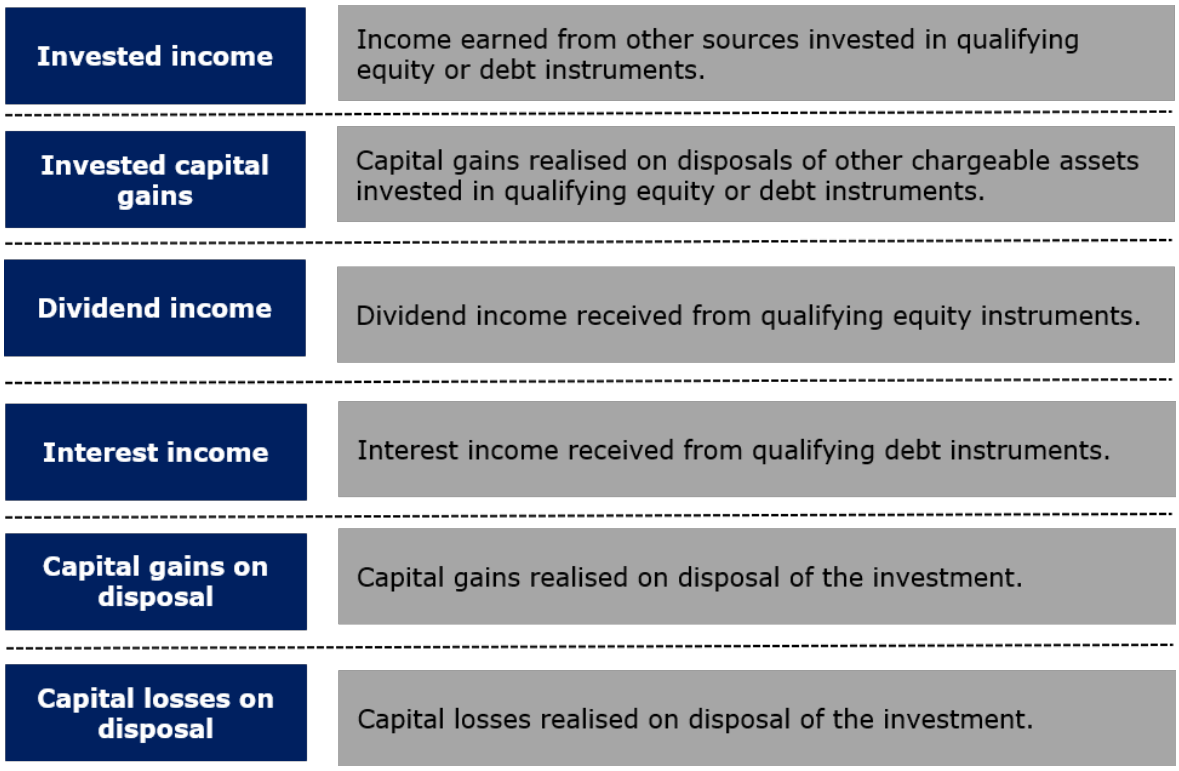


Table 9 provides an overview of the different incentive bases used across the country sample.

Table 9: Incentive bases

Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
Australia	Early Stage Venture Capital Limited Partnership program	✓	✓	X	X	✓	X
	Venture Capital Limited Partnership program	X	X	X	X	✓	X

Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
	Tax incentive for Early Stage Investors	✓	✓	X	X	✓	X
Belgium	Tax shelter for investments in start-ups	✓	✓	X	X	X	X
	Tax treatment of crowdfunding loans	X	X	X	✓	X	X
	Win-Win Lending Scheme	X	X	X	✓	X	✓[45]
	Loan “Coup de pouce” (Wallonia)	✓	✓	X	X	X	X
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	X	X	X	X
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit5	✓	✓	X	X	X	X
	Provincial Investment Tax Credits	✓	✓	X	X	X	X

[45] The Win-Win Lending Scheme grants investors an additional tax credit if the borrower defaults on repayment of the loan.

Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	X	X	X	X	✓	X
	"Madelin" tax reductions	✓	✓	X	X	✓	X
	Wealth tax reliefs	✓	✓	X	X	X	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	X	X	✓	✓	✓	X
	Venture Capital Funds (including FCPR, FCPI and FIP)	✓	✓	✓	X	✓	X
	PEA-PME	X	X	✓	X	✓	X
Germany	"INVEST - Venture Capital Grant"	✓	✓	✓	X	X	X
Ireland	Employment & Investment Incentive	✓	✓	X	X	X	X

Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	X	X	✓	X	✓	X
	The Angels Law	✓	✓	X	X	✓	X
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	X	X	✓	✓	X	X
	Tax incentives for investing in innovative start-ups and innovative SMEs	✓	✓	X	X	X	X
	PIR (Piani Individuali di Risparmio)	✓	✓	X	X	X	X
Japan	Tax Incentives to Promote Venture Investment	X	X	X	X	X	✓
	Angel Tax System	✓	✓	X	X	✓	✓
Malta	Seed Investment Scheme	✓	X	X	X	X	X

Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
Poland	Tax exemption on the disposal of stocks and shares	X	X	X	X	✓	X
Portugal	"Programa Semente" (Tax relief for investing in Startups)	✓	✓	X	X	X	X
	Tax Relief for Business Angels	✓	✓	X	X	X	X
Slovenia	Corporate income tax regime	X	X	X	X	✓	X
South Korea	Corporate income tax regime	X	X	✓	X	✓	X
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	X	X	✓	X	✓	X
Spain	Deduction for investments in newly or recently created companies	✓	✓	X	X	✓	X
	Regional incentives for business angels	✓	✓	X	X	X	X

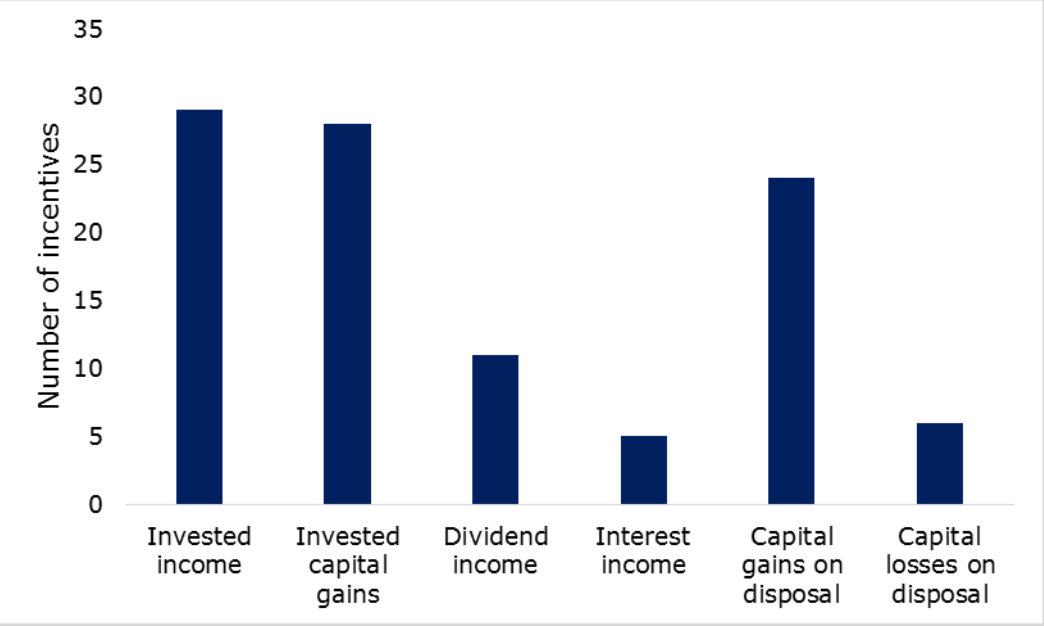
Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
Sweden	New Investment Incentive	✓	✓	X	X	X	X
Turkey	Business Angel Scheme	✓	✓	X	X	X	X
	Venture Capital Investment Trust Tax Exemption	X	X	✓	X	✓	X
	Private Equity Investment Fund	✓	✓	✓	X	✓	X
United Kingdom	Enterprise Investment scheme	✓	✓	X	X	✓	✓
	Seed Enterprise Investment Scheme	✓	✓	X	X	✓	✓
	Venture Capital Trust	✓	✓	✓	X	✓[46]	X
	Social Investment Tax Relief	✓	✓	X	X	✓	✓
	Private Placement Withholding Tax Exemption	X	X	X	✓	X	X

[46] The Venture Capital Trust scheme provides tax relief on chargeable gains for the VCT itself and the investor in a VCT.

Country	Name of scheme	Invested income	Invested capital gains	Dividend income	Interest income	Capital gains on disposal	Capital losses on disposal
	Business Property Relief	X	X	X	X	✓	X
USA	Qualified small business stock (QSBS)	X	X	X	X	✓	X
	Investment tax credits	✓	✓	X	X	X	X

Table 9 shows that the use of incentive bases varies between the schemes, but is linked to the application of the tax incentive across the investment lifecycle. As **Figure 15** illustrates, the most popular incentive bases are invested income and capital gains, with the majority of countries using these incentive bases. This corresponds closely to the popularity of applying the tax incentive upon initial investment.

Figure 15: Incentive bases



Source: PwC analysis

5.2.4 Tax base

The tax relief granted can be set against different tax bases corresponding to the nature of the return generated by the investment and whether natural persons and/or corporate investors are eligible to claim the relief. The most widely used tax bases include corporate income, personal income and capital gains. Other forms of tax base are used less widely, but typically include wealth taxes and inheritance taxes. It is important to note that a number of countries operate unified income and capital gains tax bases for corporate and/or personal tax.

Table 10 provides an overview of the different tax bases to which tax relief is applied.

Table 10: Tax base

Country	Name of scheme	Corporate income tax[47]	Personal income tax[48]	Capital gains tax	Other
Australia	Early Stage Venture Capital Limited Partnership program	X	✓	X	X
	Venture Capital Limited Partnership program	X	✓	X	X
	Tax incentive for Early Stage Investors	X	X	✓	X
Belgium	Tax shelter for investments in start-ups	X	✓	X	X
	Tax treatment of crowdfunding loans	X	✓	X	X
	Win-Win Lending Scheme	X	✓	X	X

[47] France, Israel, Japan, Malta, Portugal, South Korea, Spain, Sweden and the UK operate a unified tax base for corporate income and capital gains taxation.
[48] France, Malta, South Korea and Spain, operate a unified tax base for personal income and capital gains taxation.

Country	Name of scheme	Corporate income tax[47]	Personal income tax[48]	Capital gains tax	Other
	Loan “Coup de pouce” (Wallonia)	✓	✓	X	X
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	X	X
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	X	✓	X	X
	Provincial Investment Tax Credits	X	✓	X	X
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	X	✓	✓	X
	“Madelin” tax reductions	X	✓	✓	X
	Wealth tax reliefs	X	X	X	✓
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	✓	✓	✓	X

Country	Name of scheme	Corporate income tax[47]	Personal income tax[48]	Capital gains tax	Other
	Venture Capital Funds (including FCPR, FCPI and FIP)	✓	✓	✓	✓
	PEA-PME	X	✓	X	X
Germany	"INVEST - Venture Capital Grant"	X	✓	X	X
Ireland	Employment & Investment Incentive	X	✓	X	X
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	X	✓	✓	X
	The Angels Law	X	✓	X	X
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	✓	✓	X	X
	Tax incentives for investing in innovative start-ups and innovative SMEs	✓	✓	X	X

Country	Name of scheme	Corporate income tax[47]	Personal income tax[48]	Capital gains tax	Other
	PIR (Piani Individuali di Risparmio)	✓	✓	X	X
Japan	Tax Incentives to Promote Venture Investment	✓	X	X	✓
	Angel Tax System	X	✓	✓	X
Malta	Seed Investment Scheme	X	✓	✓	X
Poland	Tax exemption on the disposal of stocks and shares	✓	X	✓	X
Portugal	"Programa Semente" (Tax relief for investing in Startups)	X	✓	✓	X
	Tax Relief for Business Angels	✓	✓	X	X
Slovenia	Corporate income tax regime	✓	X	X	X
South Korea	Corporate income tax regime	✓	✓	✓	X

Country	Name of scheme	Corporate income tax[47]	Personal income tax[48]	Capital gains tax	Other
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	X	✓	✓	X
Spain	Deduction for investments in newly or recently created companies	✓	✓	✓	X
	Regional incentives for business angels	X	✓	X	X
Sweden	New Investment Incentive	X	✓	✓	X
Turkey	Business Angel Scheme	X	✓	X	X
	Venture Capital Investment Trust Tax Exemption	✓	X	X	X
	Private Equity Investment Fund	✓	✓	X	X
United Kingdom	Enterprise Investment scheme	X	✓	✓	X

Country	Name of scheme	Corporate income tax[47]	Personal income tax[48]	Capital gains tax	Other
	Seed Enterprise Investment Scheme	X	✓	✓	X
	Venture Capital Trust	✓[49]	✓	✓	X
	Social Investment Tax Relief	X	✓	✓	X
	Private Placement Withholding Tax Exemption	✓	X	X	X
	Business Property Relief	✓	✓	X	X
USA	Qualified small business stock (QSBS)	X	X	✓	X
	Investment tax credits	✓	✓	X	X

Table 10 shows a high degree of uniformity in the use of tax bases across the countries surveyed. Personal income tax is the most popular tax base, with nine of these countries operating a unified tax base for income and capital gains taxation. Again, this corresponds closely to the findings on incentive base and is a product of targeting these schemes to natural persons. Five of the countries surveyed provide use of all three tax bases within one tax incentive.

Two of the countries operate other tax bases, including a scheme offered by France providing investors with a deduction of 50% of total amount invested up to €90,000 from their wealth tax liability.

[49] Corporate Tax relief on chargeable gains only applies to the Venture Capital Trust, not the investors in qualifying Venture Capital Trusts.

5.3 Qualifying criteria

The targeting of tax incentives to promote business angel and venture capital investment is achieved by the introduction of qualifying criteria that explicitly restrict eligibility. This is an essential part of the design of such tax incentives as the qualifying criteria ensure that only those investments that meet the policy objectives are incentivised through the various tax reliefs available.

Qualifying criteria are typically grouped into four categories:

- **Business**: the recipient of investment can be targeted in terms of age, size and sector.
- **Investor**: the investor can be targeted in terms of status and connection with the recipient of investment.
- **Investment**: the investment can be targeted in terms of size, investment through venture capital funds or whether the investment is in debt or equity instruments.
- **Duration**: the minimum length of time qualifying investments must be held in order to attract tax relief.

5.3.1 Business criteria

Qualifying criteria can be used to specifically target investment in businesses with certain profiles. The combination of business criteria will be determined by the overarching policy objectives, but typically cover age, size and sector. Business criteria also widely contain implicit targeting to only those businesses either headquartered or with a permanent establishment in the jurisdiction granting the tax relief.

Table 11 provides an overview of the different criteria used to target the recipient of investment.

Table 11: Business criteria

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
Australia[50]	Early Stage Venture Capital Limited Partnership program	X	✓	X	X	✓	X	✓	✓

[50] Investee company must be an Australian tax resident except where all the investments made by the ESVCLP/VCLP that are in entities that are not Australian residents do not exceed 20% of the partnership's committed capital.

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
	Venture Capital Limited Partnership program	X	✓	X	X	✓	X	✓	✓
	Tax incentive for Early Stage Investors	X	X	X	X	X	✓	X	✓
Belgium	Tax shelter for investments in start-ups	X	✓	✓	X	✓	X	✓	✓
	Tax treatment of crowdfunding loans	✓ <4 years	✓	✓	X	X	✓	✓	✓
	Win-Win Lending Scheme	✓ <8 years	✓	✓	X	X	✓	✓	✓
	Loan “Coup de pouce” (Wallonia)	✓ <5 years	X	✓	X	✓	X	✓	✓

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit[51]	X	✓	✓	X	✓	X	X	✓[52]
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	X	✓	✓	X	✓	X	X	✓
	Provincial Investment Tax Credits	X	✓	X	X	✓	X	X	✓
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	✓ <10 years	X	X	X	✓	X	X	X
	"Madelin" tax reductions	✓ <7 years	✓	✓	X	✓	X	✓	X

[51] Qualifying criteria for businesses vary by province, target companies are usually based on financial size, number of employees and sector.

[52] Based on the example of Nova Scotia, and the business must have a permanent place of business in Nova Scotia.

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
	Wealth tax reliefs	✓ <7 years	✓	✓	X	✓	X	✓	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	X	X	X	X	X	✓	✓	X
	Venture Capital Funds (including FCPR, FCPI and FIP)	X	✓	X	X	X	✓	✓	X
	PEA-PME	X	✓	✓	X	X	✓	X	X
Germany	"INVEST - Venture Capital Grant"	✓ <7 years	✓	✓	X	X	✓	X	✓[53]
Ireland	Employment & Investment Incentive	X	✓	✓	X	✓	X	✓	X

[53] A capital company with its head office in the EEA and at least one branch in Germany registered in the commercial register or a business establishment registered in the trade register.

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
Israel	Plan for Encouragem-ent of Institutional Investment in Hi-Tech	✓ >3 years	X	X	✓	X	X	X	✓
	The Angels Law	✓ >2 years	✓	X	X	X	✓	✓	X
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	✓ <3 years	✓	X	X	X	✓	✓	✓
	Tax incentives for investing in innovative start-ups and innovative SMEs	✓ <5 years	✓	X	X	X	✓	✓	✓
	PIR (Piani Individuali di Risparmio)	X	X	X	X	X	✓	X	✓

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
Japan	Tax Incentives to Promote Venture Investment	No info	No info	No info	No info	No info	No info	No info	No info
	Angel Tax System	X	✓	✓	X	X	✓	X	X
Malta	Seed Investment Scheme	✓ <3 years	✓	✓	X	✓	X	✓	✓
Poland	Tax exemption on the disposal of stocks and shares	X	✓	X	X	✓	X	✓	✓
Portugal	"Programa Semente" (Tax relief for investing in Startups)	✓ <5 years	X	X	X	X	✓	X	X
	Tax Relief for Business Angels	✓ <3 years	X	X	X	✓	X	X	X
Slovenia	Corporate income tax regime	X	X	X	X	X	✓	X	X

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
South Korea	Corporate income tax regime	No info	No info	No info	No info	No info	No info	No info	No info
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	No info	No info	No info	X	✓	X	No info	No info
Spain	Deduction for investments in newly or recently created companies	X	✓	X	X	✓	X	X	X
	Regional incentives for business angels	✓	✓	✓	X	✓	X	No info	✓
Sweden	New Investment Incentive	X	✓	✓	X	✓	X	✓	✓
Turkey	Business Angel Scheme	X	✓	✓	X	X	✓	✓	✓

Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
	Venture Capital Investment Trust Tax Exemption	X	X	X	X	X	✓	X	X
	Private Equity Investment Fund	X	X	X	X	X	✓	X	X
United Kingdom	Enterprise Investment scheme	X	✓	✓	X	✓	X	✓	✓
	Seed Enterprise Investment Scheme	✓ <2 years	✓	✓	X	✓	X	✓	✓
	Venture Capital Trust	X	✓	✓	X	✓	X	✓	✓
	Social Investment Tax Relief	X	✓	✓	X	✓	X	✓	X
	Private Placement Withholding Tax Exemption	X	X	X	X	X	✓	✓	X
	Business Property Relief	X	X	X	X	X	✓	✓	X

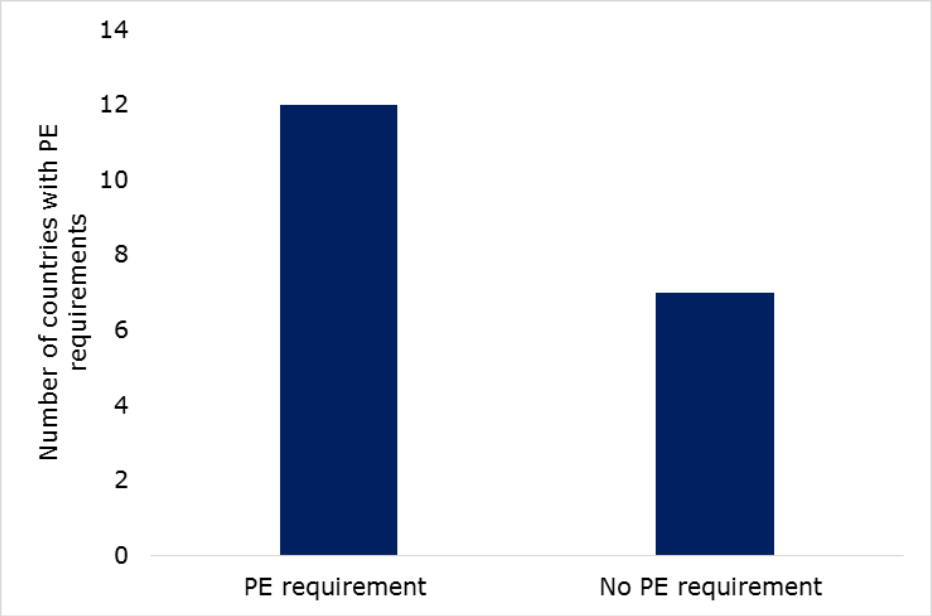
Country	Name of scheme	Age	Financial size	Number of employees	Sector targeting			Unquoted	Headquartered or permanent establishment in jurisdiction granting tax relief
					Sector targeting	Excluded sectors	None		
USA	Qualified small business stock (QSBS)	X	✓	X	X	✓	X	X	✓
	Investment tax credits[54]	X	X	X	X	X	✓	X	✓[55]

Table 11 shows that, of the countries that provide some investment criteria, there is a high degree of uniformity placed on the recipient of investment. Almost all apply financial size, number of employees and stock exchange listing criteria to restrict eligible business to SMEs and start-ups. It is also common for countries to target businesses operating in specific sectors or carrying on certain types of trade, or at the least, to prohibit certain trades or sectors from participating in the scheme.

As **Figure 16** shows, the majority of countries surveyed apply provisions stipulating that the business must either be headquartered, or at least have a permanent establishment in the country operating the scheme. These provisions link the tax expenditure incurred by the government to the positive spillovers of fostering investment in SMEs and start-ups operating within its borders.

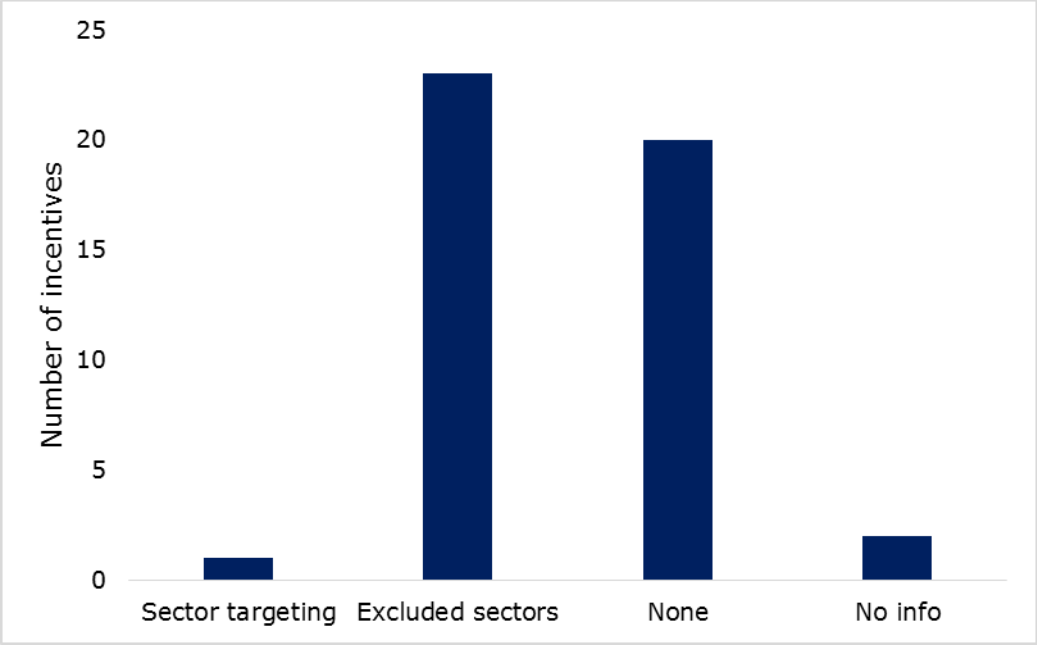
[54] Qualifying criteria for businesses vary by state, target companies are usually based on financial size, number of employees and sector.
[55] Based on the example of Iowa, and the business must have a permanent place of business in Iowa.

Figure 16: Permanent Establishment



Source: PwC analysis

Figure 17: Sector targeting

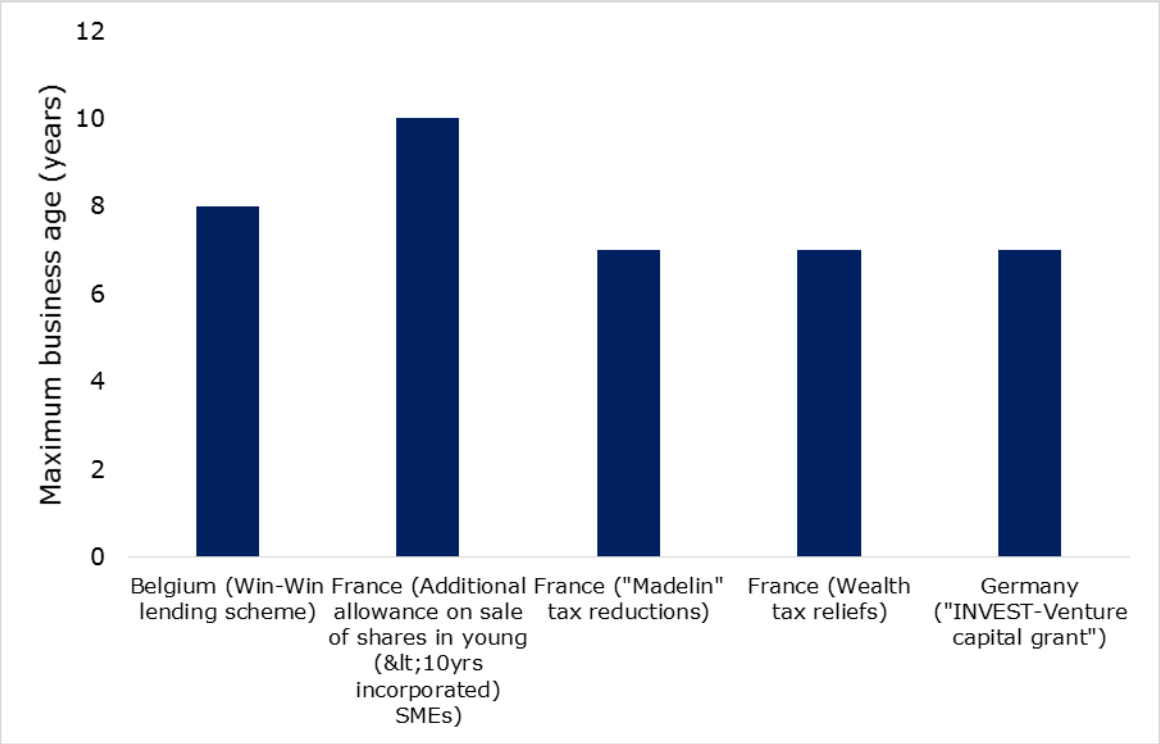


Source: PwC analysis

The use of sector targeting is widespread throughout the country sample, with 23 schemes utilising specific sector exclusions (typically real estate and investment) and only one explicitly targeting certain sectors. However, as **Figure 17** shows, 20 schemes use no form of sector targeting.

Although it is not documented in **Table 11** or **Figure 17**, a number of schemes utilising sector exclusions include provisions that state that where a business sits across included and excluded sectors (e.g. Fintech), eligibility is determined with reference to the sector with the majority of trade.

Figure 18: Business age criteria



Source: PwC analysis

A point of divergence in the countries surveyed is the use of business age criteria. As **Figure 18** shows, five countries of the 19 using business age criteria have a maximum over five years, with France topping the table with a scheme offering a 10 year maximum age criteria.

5.3.2 Investor criteria

Qualifying criteria can be used to target specific investor profiles. The main distinction made is in targeting corporate investors and/or natural persons. The connection with the recipient business can also be targeted by restricting eligibility for employees and directors, or majority/existing shareholders. However, special provisions for business angels employed within the recipient business can be introduced so as not to exclude them from claiming tax relief.

Table 12 provides an overview of the different criteria used to restrict the eligibility of investors.

Table 12: Investor criteria

Country	Name of scheme	Corporate investor	Natural person	Tax resident	Connection with business	Provisions for business angels
Australia	Early Stage Venture Capital Limited Partnership program	✓	X	X	No info	X
	Venture Capital Limited Partnership program	✓	X	X	No info	X
	Tax incentive for Early Stage Investors	✓	✓	X	Not permitted	X
Belgium	Tax shelter for investments in start-ups	X	✓	✓	Permitted	X
	Tax treatment of crowdfunding loans	X	✓	✓	Permitted	X
	Win-Win Lending Scheme	X	✓	✓	Not permitted	X
	Loan “Coup de pouce” (Wallonia)	X	✓	✓	Permitted	X
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	✓	No info	X

Country	Name of scheme	Corporate investor	Natural person	Tax resident	Connection with business	Provisions for business angels
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	X	✓	✓	No info	X
	Provincial Investment Tax Credits	X	✓	✓	No info	X
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	X	✓	X	No info	X
	“Madelin” tax reductions	X	✓	X	No info	X
	Wealth tax reliefs	X	✓	X	No info	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	✓	✓	X	No info	X
	Venture Capital Funds (including FCPR, FCPI and FIP)	✓	✓	X	No info	X
	PEA-PME	X	✓	X	No info	X

Country	Name of scheme	Corporate investor	Natural person	Tax resident	Connection with business	Provisions for business angels
Germany	"INVEST - Venture Capital Grant"	X	✓	X	X	X
Ireland	Employment & Investment Incentive	X	✓	✓	Not permitted	X
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	✓	X	X	No info	X
	The Angels Law	X	✓	X	No info	X
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	✓	✓	X	No info	X
	Tax incentives for investing in innovative start-ups and innovative SMEs	✓	✓	X	No info	X
	PIR (Piani Individuali di Risparmio)	X	✓	X	No info	X
Japan	Tax Incentives to Promote Venture Investment	✓	X	X	No info	X

Country	Name of scheme	Corporate investor	Natural person	Tax resident	Connection with business	Provisions for business angels
	Angel Tax System	X	✓	X	No info	X
Malta	Seed Investment Scheme	X	✓	✓	Not permitted	X
Poland	Tax exemption on disposal of stocks and shares	✓	X	✓	✓	X
Portugal	"Programa Semente" (Tax relief for investing in Startups)	X	✓	✓	No info	X
	Tax Relief for Business Angels	X	✓	X	Not permitted	X
Slovenia	Corporate income tax regime	✓	X	X	No info	X
South Korea	Corporate income tax regime	✓	X	X	No info	X
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	X	✓	X	No info	X

Country	Name of scheme	Corporate investor	Natural person	Tax resident	Connection with business	Provisions for business angels
Spain	Deduction for investments in newly or recently created companies	X	✓	X	No info	X
	Regional incentives for business angels	X	✓	✓	Permitted	No info
Sweden	New Investment Incentive	X	✓	✓	No info	X
Turkey	Business Angel Scheme	X	✓	✓	Permitted	✓
	Venture Capital Investment Trust Tax Exemption	✓	X	✓	No info	X
	Private Equity Investment Fund	✓	X	X	No info	✓
United Kingdom	Enterprise Investment scheme	X	✓	✓	Not permitted	✓
	Seed Enterprise Investment Scheme	X	✓	✓	Not permitted	✓
	Venture Capital Trust	✓[56]	✓	✓	Not permitted	X

[56] The Venture Capital Trust scheme provides tax relief to the Venture Capital Trust as well as the investors in qualifying Venture Capital Trusts.

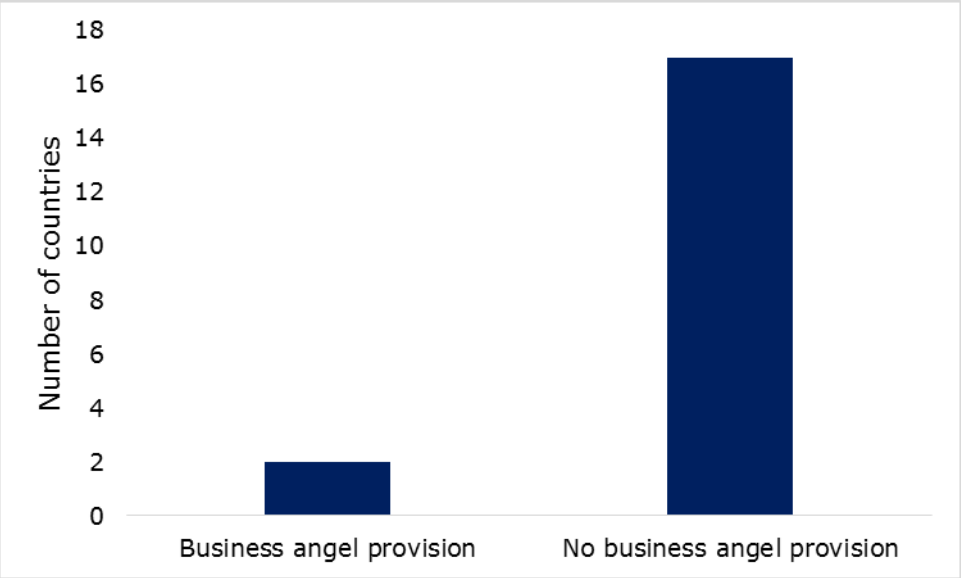
Country	Name of scheme	Corporate investor	Natural person	Tax resident	Connection with business	Provisions for business angels
	Social Investment Tax Relief	X	✓	✓	Not permitted	X
	Private Placement Withholding Tax Exemption	✓	X	✓	No info	X
	Business Property Relief	X	✓	✓	No info	X
USA	Qualified small business stock (QSBS)	X	✓	✓	No info	X
	Investment tax credits	✓	✓	✓	No info	X

Table 12 shows that the majority of tax incentive schemes are targeted to natural persons that are either tax resident, or have sufficient tax liabilities, in the country in question.

It is common for tax incentive schemes to exclude investors that have a connection with the business, such as a contract of employment or a directorship.

However, a very small portion of countries provide special provisions to allow business angels to participate in the tax incentive scheme. As **Figure 19** shows, only two of the 19 countries apply specific provisions to allow business angel investors to participate while maintaining involvement in the management of the business.

Figure 19: Provisions for business angels



Source: PwC analysis

5.3.3 Investment criteria

Qualifying criteria can be used to promote certain types of investment in qualifying businesses. The key distinction made in the possible qualifying criteria is the eligibility of investments in equity or debt instruments. In addition, upper and lower bounds on the monetary value of investment per investor that attracts tax relief can be used to restrict overuse or abuse of the tax incentive, such as by limiting generosity or encouraging diversification of portfolio holdings.

Table 13 provides an overview of the different criteria used to restrict the nature of investment made in qualifying businesses by qualifying investors.

Table 13: Investment criteria

Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
Australia	Early Stage Venture Capital Limited Partnership program	✓	✓	X	N/A	X
	Venture Capital Limited Partnership program	✓	✓	X	N/A	X

Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
	Tax incentive for Early Stage Investors	✓	✓	X	Max AUD 1m	X
Belgium	Tax shelter for investments in start-ups	X	✓	X	Max €100k	X
	Tax treatment of crowdfunding loans	X	X	✓	Max €15k	N/A
	Win-Win Lending Scheme	X	X	✓	Max €100k	N/A
	Loan “Coup de pouce” (Wallonia)	X	✓	X	Max €50k	✓
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	X	Max C$200k	X
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	X	Max C$5k	X
	Provincial Investment Tax Credits	X	✓	X	Max C$50k	X

Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	X	✓	X	N/A	X
	"Madelin" tax reductions	X	✓	X	Max €50k	X
	Wealth tax reliefs	X	✓	X	Max €90k	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	X	✓	X	N/A	X
	Venture Capital Funds (including FCPR, FCPI and FIP)	X	✓	X	N/A	X
	PEA-PME	X	✓	X	Max €75k	X
Germany	"INVEST - Venture Capital Grant"	X	✓	X	Max €500k	X
Ireland	Employment & Investment Incentive	X	✓	X	€250 - €150k	Max 30%

Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	✓	✓	X	N/A	X
	The Angels Law	X	✓	X	Max NIS 5m	X
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	✓	✓	X	Min €100k - €2.5m	X
	Tax incentives for investing in innovative start-ups and innovative SMEs	X	✓	X	Max €1.8m	X
	PIR (Piani Individuali di Risparmio)	X	✓	X	Max €150k	X
Japan	Tax Incentives to Promote Venture Investment	X	✓	X	N/A	X
	Angel Tax System	✓	✓	X	N/A	X
Malta	Seed Investment Scheme	X	✓	X	Max €714,286	X

Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
Poland	Tax exemption on disposal of stocks and shares	X	✓	X	Max €50m	Min 10%
Portugal	"Programa Semente" (Tax relief for investing in Startups)	X	✓	X	€10k - €100k	X
	Tax Relief for Business Angels	✓	✓	X	N/A	X
Slovenia	Corporate income tax regime	X	✓	X	N/A	X
South Korea	Corporate income tax regime	X	✓	X	N/A	X
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	X	✓	X	N/A	X
Spain	Deduction for investments in newly or recently created companies	X	✓	X	Max €250k	X

Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
	Regional incentives for business angels	X	✓	X	Max €3-100k (varies by region)	Max 35-40% (varies by region)
Sweden	New Investment Incentive	X	✓	X	Max SEK 1.3m	X
Turkey	Business Angel Scheme	X	✓	X	TL20K – TL 1m	X
	Venture Capital Investment Trust Tax Exemption	✓	✓	X	N/A	X
	Private Equity Investment Fund	X	✓	✓	N/A	X
United Kingdom	Enterprise Investment scheme	X	✓	X	Max £1m	Max 30%
	Seed Enterprise Investment Scheme	X	✓	X	Max £100K	Max 30%
	Venture Capital Trust	✓	✓	✓[57]	Max £200K	X[58]

[57] The Venture Capital Trust scheme permits Venture Capital Trusts to invest in debt instruments in qualifying companies. Natural persons are only permitted to invest in share capital issued by the Venture Capital Trust.

[58] The Venture Capital Trust scheme does not restrict the size of equity holding in a business. Instead, no single holding in a company should exceed 15% of value of all the Venture Capital Trust's investments.

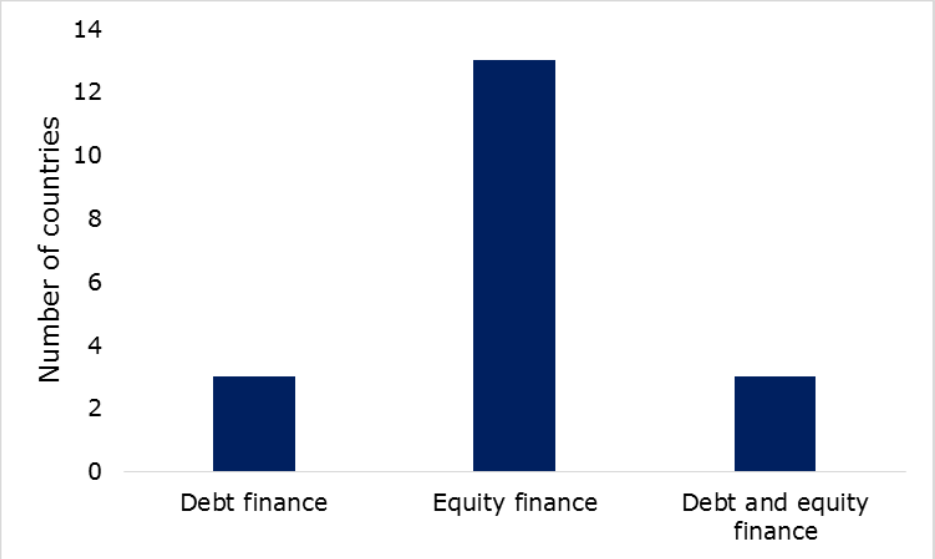
Country	Name of scheme	Investment in approved venture capital fund	Equity	Debt	Range of monetary value attracting relief	Equity interest restrictions
	Social Investment Tax Relief	X	✓	✓	Max £1m	Max 30%
	Private Placement Withholding Tax Exemption	X	X	✓	N/A	X
	Business Property Relief	X	✓	X	N/A	X
USA	Qualified small business stock (QSBS)	X	✓	X	N/A	X
	Investment tax credits	X	✓	X	N/A	X

Table 13 shows that there is significant convergence in the approach to targeting specific types of investment. It is common across the majority of countries to set a range of monetary values of investment that will attract tax relief, with 15 countries out of 19 offering schemes doing so. It can be seen that these ranges are set with reference to the nature of investment being incentivised and the targeting of businesses at different stages of the lifecycle. For instance, Belgium's tax treatment of crowdfunding loans has a maximum investment value of €15,000, which reflects perceptions of the typical size of a crowdfunding loan.

An interesting divergence in the countries surveyed to date is the treatment of debt and equity instruments in the qualifying criteria of tax incentives. As **Figure 20** shows, 13 countries target equity investments, three target debt investment and three countries provide tax incentives for both debt and equity capital.

Where equity investments are incentivised, it is common to place a restriction on the maximum interest an investor can hold in the company. In total, 29 incentive schemes use such a restriction, and Poland imposes a minimum restriction of at least 10%.

Figure 20: Debt and equity finance



Source: PwC analysis

5.3.4 Duration criteria

Qualifying criteria can be used to place a requirement on the minimum length of time a qualifying investment must be held in order to attract tax relief. This is particularly important for creating stability in the capital structure of the recipient business and for mitigating the risk of the tax incentives being abused.

Table 14 provides an overview of the different criteria used to restrict the minimum length of time a qualifying investment must be held.

Table 14: Investment duration criteria

Country	Name of scheme	Duration criteria	Minimum duration required
Australia	Early Stage Venture Capital Limited Partnership program	✓	1 year
	Venture Capital Limited Partnership program	✓	1 year
	Tax incentive for Early Stage Investors	✓	1 year

Country	Name of scheme	Duration criteria	Minimum duration required
Belgium	Tax shelter for investments in start-ups	✓	4 years
	Tax treatment of crowdfunding loans	✓	4 years
	Win-Win Lending Scheme	✓	8 years
	Loan “Coup de pouce” (Wallonia)	✓	4 years
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	No info
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	No info	No info
	Provincial Investment Tax Credits	✓	No info
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	✓	1 year
	“Madelin” tax reductions	✓	5 years
	Wealth tax	✓	5 years

Country	Name of scheme	Duration criteria	Minimum duration required
	reliefs		
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	✓	5 years
	Venture Capital Funds (including FCPR, FCPI and FIP)	✓	5 years
	PEA-PME	✓	5 years
Germany	"INVEST - Venture Capital Grant"	✓	3 years
Ireland	Employment & Investment Incentive	✓	3 years
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	No info	No info
	The Angels Law	✓	3 years
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	No info	No info
	Tax incentives for investing in innovative start-ups and innovative SMEs	No info	No info
	PIR (Piani Individuali di	No info	No info

Country	Name of scheme	Duration criteria	Minimum duration required
	Risparmio)		
Japan	Tax Incentives to Promote Venture Investment	No info	No info
	Angel Tax System	No info	No info
Malta	Seed Investment Scheme	✓	3 years
Poland	Tax exemption on disposal of stocks and shares	✓	2 years
Portugal	"Programa Semente" (Tax relief for investing in Startups)	No info	No info
	Tax Relief for Business Angels	X	n/a
Slovenia	Corporate income tax regime	No info	No info
South Korea	Corporate income tax regime	No info	No info
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	No info	No info

Country	Name of scheme	Duration criteria	Minimum duration required
Spain	Deduction for investments in newly or recently created companies	✓	3 years
	Regional incentives for business angels	✓	3-4 years (varies by region)
Sweden	New Investment Incentive	✓	5 years
Turkey	Business Angel Scheme	✓	2 years
	Venture Capital Investment Trust Tax Exemption	X	n/a
	Private Equity Investment Fund	X	n/a
United Kingdom	Enterprise Investment scheme	✓	3 years
	Seed Enterprise Investment Scheme	✓	3 years
	Venture Capital Trust	✓	5 years[59]
	Social Investment Tax Relief	✓	3 years

[59] Minimum holding period is for natural persons investing in Venture Capital Trusts.

Country	Name of scheme	Duration criteria	Minimum duration required
	Private Placement Withholding Tax Exemption	✓	3 years
	Business Property Relief	✓	2 years
USA	Qualified small business stock (QSBS)	✓	5 years
	Investment tax credits	Varies per state	Varies per state

Table 14 shows that it is common practice across all countries to stipulate a minimum investment holding period in the qualifying criteria of a tax incentive scheme. It is interesting to note that this finding does not correspond to the use of the tax or incentive bases or the stage of the investment lifecycle at which the incentive is applied. Belgium stands out in the duration category with an eight year holding period requirement for one of the incentives available, the highest in our sample.

5.4 Organisation

The organisation of a tax incentive can be broken down into two components. First, the way in which the taxpayer interacts with the various administrative features. Secondly, the way in which the operation of the tax incentive is monitored and evaluated.

5.4.1 Administration

The application procedure for a tax incentive drives the costs of compliance for investors and the administrative burden placed on revenue authorities. High compliance costs may deter investors and high administrative burdens on revenue authorities may slow application processing times (as well as adding to the fiscal costs). Manuals prepared and published by revenue authorities can lower compliance costs for investors and provide certainty to the application process.

Penalties and clawback provisions built into the operation of the tax incentive create a cost to the detection of non-compliant or fraudulent claims for the investor. They may also introduce uncertainty for the investor to the extent that breaches of the qualifying criteria can be triggered by the recipient business.

Table 15 provides an overview of the different administrative features within, and between countries.

Table 15: Administrative features

Country	Name of scheme	Online application	Paper-based application	Option to apply at source	Clawback provisions	Other penalties	Revenue authority manuals
Australia	Early Stage Venture Capital Limited Partnership program	✓	✓	X	X	X	✓
	Venture Capital Limited Partnership program	✓	✓	X	X	X	✓
	Tax incentive for Early Stage Investors	X	✓	X	X	X	✓
Belgium	Tax shelter for investments in start-ups	✓	✓	X	X	X	X
	Tax treatment of crowdfunding loans	✓	✓	X	X	X	X
	Win-Win Lending Scheme	✓	✓	X	X	X	X
	Loan “Coup de pouce” (Wallonia)	✓	✓	X	X	X	X
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	X	X	X	✓

Country	Name of scheme	Online application	Paper-based application	Option to apply at source	Clawback provisions	Other penalties	Revenue authority manuals
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	✓	✓	X	X	X	✓
	Provincial Investment Tax Credits	✓	✓	X	X	X	✓
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	✓	✓	X	X	X	X
	“Madelin” tax reductions	No info	No info	No info	No info	No info	No info
	Wealth tax reliefs	✓	✓	X	X	X	X
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	No info	No info	No info	No info	No info	No info
	Venture Capital Funds (including FCPR, FCPI and FIP)	No info	No info	No info	No info	No info	No info
	PEA-PME	No info	No info	No info	No info	No info	No info

Country	Name of scheme	Online application	Paper-based application	Option to apply at source	Clawback provisions	Other penalties	Revenue authority manuals
Germany	"INVEST - Venture Capital Grant"	✓	X	X	X	X	✓
Ireland	Employment & Investment Incentive	✓	✓	X	✓	X	✓
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	No info	No info	No info	No info	No info	No info
	The Angels Law	No info	No info	No info	No info	No info	No info
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	X	✓	X	X	X	✓
	Tax incentives for investing in innovative start-ups and innovative SMEs	✓	✓	X	X	X	✓
	PIR (Piani Individuali di Risparmio)	No info	No info	No info	No info	No info	No info
Japan	Tax Incentives to Promote Venture Investment	✓	✓	X	X	X	X

Country	Name of scheme	Online application	Paper-based application	Option to apply at source	Clawback provisions	Other penalties	Revenue authority manuals
	Angel Tax System	No info	No info	No info	No info	No info	No info
Malta	Seed Investment Scheme	X	✓	X	✓	✓	✓
Poland	Tax exemption on disposal of stocks and shares	No info	✓	X	X	X	X
Portugal	"Programa Semente" (Tax relief for investing in Startups)	No info	No info	No info	No info	No info	No info
	Tax Relief for Business Angels	No info	No info	No info	No info	No info	No info
Slovenia	Corporate income tax regime	No info	No info	No info	No info	No info	No info
South Korea	Corporate income tax regime	No info	No info	No info	No info	No info	No info
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	No info	No info	No info	No info	No info	No info

Country	Name of scheme	Online application	Paper-based application	Option to apply at source	Clawback provisions	Other penalties	Revenue authority manuals
Spain	Deduction for investments in newly or recently created companies	X	✓	X	X	X	X
	Regional incentives for business angels	No info	No info	No info	✓	No info	No info
Sweden	New Investment Incentive	No info	No info	No info	No info	No info	No info
Turkey	Business Angel Scheme	✓	✓	X	X	X	✓
	Venture Capital Investment Trust Tax Exemption	No info	No info	No info	No info	No info	No info
	Private Equity Investment Fund	No info	No info	No info	No info	No info	No info
United Kingdom	Enterprise Investment scheme	✓	✓	✓	✓	X	✓
	Seed Enterprise Investment Scheme	✓	✓	✓	✓	X	✓
	Venture Capital Trust	✓	✓	✓	✓	X	✓

Country	Name of scheme	Online application	Paper-based application	Option to apply at source	Clawback provisions	Other penalties	Revenue authority manuals
	Social Investment Tax Relief	✓	✓	✓	✓	X	✓
	Private Placement Withholding Tax Exemption	X	✓	X	X	X	X
	Business Property Relief	✓	✓	X	X	X	X
USA	Qualified small business stock (QSBS)	✓	✓	X	X	X	X
	Investment tax credits	X	✓	X	X	X	X

Table 15 shows the challenges of assessing the administrative features of tax incentives. The use of online and paper-based applications is mixed throughout the countries surveyed.

Although, this may not be suitable for all investors, the option to have the relief applied at source (e.g. tax relief applied through the payroll) will generate compliance cost savings for the taxpayer.

It is common practice for investors to be able to access information to apply online. The actual application may not be able to be submitted online for all countries but guidance is available from all countries on how to apply via online guidance. The United Kingdom is the only country surveyed to offer investors the option to have the tax relief applied at source.

The provision of revenue authority manuals is mixed in the countries surveyed. On the basis of the data collected, eight countries offer revenue authority manuals on the scope and administration of tax incentives.

5.4.2 Monitoring and evaluation

The review of the literature on the impact of tax incentives on venture capital and business angel investment highlighted that there is little evidence of the impact of these forms of intervention. Monitoring and evaluation is thus extremely important to ensure such schemes create value for money.

Table 16 provides an overview of the extent of monitoring and evaluation between, and within, countries. The data captured on impact assessment relates solely to assessments conducted or commissioned by government institutions.

Table 16: Extent of monitoring and evaluation

Country	Name of scheme	Fiscal cost estimated	Impact assessment planned	Impact assessment performed
Australia	Early Stage Venture Capital Limited Partnership program	No information available	No information available	No information available
	Venture Capital Limited Partnership program	No information available	No information available	No information available
	Tax incentive for Early Stage Investors	No information available	No information available	No information available
Belgium	Tax shelter for investments in start-ups	✓	No information available	No information available
	Tax treatment of crowdfunding loans	✓	No information available	No information available
	Win-Win Lending Scheme	✓	No information available	No information available

Country	Name of scheme	Fiscal cost estimated	Impact assessment planned	Impact assessment performed
	Loan “Coup de pouce” (Wallonia)	No information available	No information available	No information available
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	✓	No information available	✓
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	✓	No information available	✓
	Provincial Investment Tax Credits	✓	No information available	No information available
France	Additional allowance on sale of shares in young (<10yrs incorporated) SMEs	✓	No information available	No information available
	“Madelin” tax reductions	✓	No information available	No information available
	Wealth tax reliefs	✓	No information available	No information available
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	✓	No information available	No information available

Country	Name of scheme	Fiscal cost estimated	Impact assessment planned	Impact assessment performed
	Venture Capital Funds (including FCPR, FCPI and FIP)	✓	No information available	No information available
	PEA-PME	✓	No information available	✓
Germany	"INVEST - Venture Capital Grant"	✓	No information available	✓
Ireland	Employment & Investment Incentive	✓	No information available	✓
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	✓	No information available	No information available
	The Angels Law	✓	No information available	No information available
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	No information available	No information available	No information available
	Tax incentives for investing in innovative start-ups and innovative SMEs	No information available	No information available	No information available

Country	Name of scheme	Fiscal cost estimated	Impact assessment planned	Impact assessment performed
	PIR (Piani Individuali di Risparmio)	No information available	No information available	No information available
Japan	Tax Incentives to Promote Venture Investment	✓	No information available	No information available
	Angel Tax System	✓	No information available	No information available
Malta	Seed Investment Scheme	✓	No information available	X
Poland	Tax exemption on disposal of stocks and shares	X	No information available	X
Portugal	"Programa Semente" (Tax relief for investing in Startups)	✓	No information available	No information available
	Tax Relief for Business Angels	✓	No information available	No information available
Slovenia	Corporate income tax regime	No information available	No information available	No information available
South Korea	Corporate income tax regime	No information available	No information available	No information available

Country	Name of scheme	Fiscal cost estimated	Impact assessment planned	Impact assessment performed
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	No information available	No information available	No information available
Spain	Deduction for investments in newly or recently created companies	No information available	No information available	No information available
	Regional incentives for business angels	No information available	No information available	No information available
Sweden	New Investment Incentive	✓	No information available	No information available
Turkey	Business Angel Scheme	✓	No information available	✓
	Venture Capital Investment Trust Tax Exemption	✓	No information available	No information available
	Private Equity Investment Fund	✓	No information available	No information available
United Kingdom	Enterprise Investment scheme	✓	No information available	✓

Country	Name of scheme	Fiscal cost estimated	Impact assessment planned	Impact assessment performed
	Seed Enterprise Investment Scheme	✓	No information available	X
	Venture Capital Trust	✓	No information available	✓
	Social Investment Tax Relief	✓	No information available	X
	Private Placement Withholding Tax Exemption	No information available	No information available	No information available
	Business Property Relief	✓	No information available	No information available
USA	Qualified small business stock (QSBS)	✓	No information available	No information available
	Investment tax credits	No information available	No information available	✓

Table 16 shows that the monitoring and evaluation performed on the impact and effectiveness of tax incentives varies in terms of extent and rigour. 13 of the countries currently implementing tax incentives surveyed to date have issued publically available estimates (*ex ante* and *ex post*) of the fiscal cost of operating tax incentives.

5.5 Generosity

The previous sections have presented an overview of the range of choices taken by policy makers in the design of tax incentives in the countries sampled. It is useful to consider the design features in isolation, but it is also important to consider the

interaction between them. One way of conceptualising the effect of this interaction is to consider the generosity of the scheme to an investor.

5.5.1 Drivers of generosity

The point of departure for identifying the drivers of generosity in a tax incentive is to make the distinction between those design features that drive generosity and those that drive flexibility. The two concepts are closely related but should be treated differently.

Generosity refers to the quantum of benefit an investor receives by participating in the tax incentive scheme. As such, generosity can be considered as one of the most important products of the interaction between design features in a particular tax incentive. By contrast, flexibility refers to the extent to which an investor can receive the benefits of the scheme (e.g. through targeting particular investors or types of investment, or through restrictions on exiting the investment). Flexibility can be considered as the means to access the generosity of a tax incentive, either through limited eligibility or through shaping investment decisions.

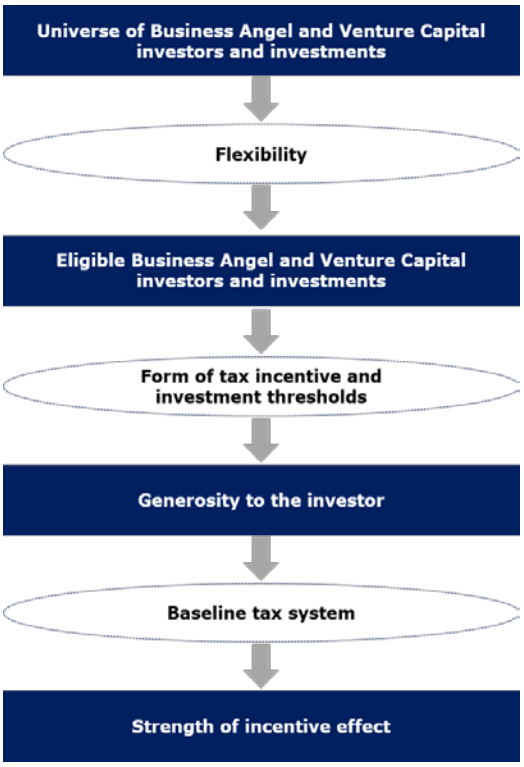
So what are the drivers of generosity? In short, they are the design features that interact to produce the quantum of financial benefit received by an investor utilising a tax incentive.

This is driven by the interaction between the form of the incentive and the limits on the monetary value of the investment that can attract tax relief. Limiting the monetary value of the investment that can attract tax relief creates a theoretical upper bound on the financial benefit.

The form of the relief is a key driver of generosity as it determines whether relief is applied to the tax base or tax liability. For instance, tax deductibility reduces the tax base, which results in tax relief that is diluted by the prevailing rate of tax. By contrast, a tax credit reduces the tax liability itself, which results in tax relief that is undiluted by the prevailing rate of tax.

The relationship between flexibility, generosity and the strength of an incentive effect is described in **Figure 21** below.

Figure 21: Relationship between flexibility, generosity and incentive effects



Source: PwC analysis

5.5.2 Measuring generosity

Measuring the generosity of a tax incentive is a conceptually challenging and imperfect exercise. There are a number of lenses through which to quantitatively measure generosity, each with distinct advantages and disadvantages.

Average fiscal cost

One of the most straightforward ways of conceptualising generosity would be to analyse the mean fiscal cost per successful application. This would draw on data on the actual fiscal cost of the tax expenditure and the number of successful applications for a particular scheme.

Such a measure would view generosity as the mean monetary transfer between the government and the investor. This has the advantage of generating a simple measure of generosity that draws on information that should be collected by implementing authorities. It also accounts for, albeit implicitly, the influence of the baseline tax system. However, this measure only indirectly measures the characteristics of the scheme itself, and thus is not appropriate for international comparisons: it may be that a high average fiscal cost per successful application says more about the distribution of investors and investment opportunities in a particular jurisdiction (e.g. that there are more people willing to invest more money, and thus claim more relief), than it does about the generosity of the scheme.

Effective tax rates

A more complex measure would be to view generosity as the tax benefit of using the tax incentive for the investor. This can be established through one of two ways. Firstly, the difference between the statutory tax rate and the effective tax rate resulting from the tax incentive scheme could be calculated for a number of model investors. Alternatively, the effective tax rate for a number of model investors could

be compared against the effective tax rate generated for investors by the tax incentive scheme.

This measure would examine the tax advantage for an investor at three points across the investment lifecycle; upon initial investment, on income received and on gains realised on disposal. Effective tax rates could be calculated using the Devereux/Griffith model[60] with the support of assumptions on the parameters of model investors. These would include, but not be limited to, the nature of investment, size of the investment, holding period, dividend or interest income received and rate of return realised on disposal. The assumptions can be inferred from market data and/or consultation with members of the VC and BA community.

The advantage of viewing generosity through the lens of the tax benefit created for the investor, would be that it would recognise the influence of the baseline tax system. In this sense, it would approach an approximation of the incentive effect generated by a tax incentive.

However, there are two key drawbacks to using this approach.

Firstly, it would be necessary to make a number of assumptions in order to generate the model investments. Ideally, the model investments would reflect the pattern of investments and investment outcomes found in the VC and BA markets in each country. Unfortunately, VC and BA investment data is disclosed on an inconsistent and incomplete basis. Therefore, the limited empirical basis for formulating the required assumptions would impart a certain degree of subjectivity to the measure of generosity generated by this approach.

Secondly, such an approach may present an unrealistic view of the generosity of a tax incentive to an investor. Although, it is widely understood that an investor will 'price in' the effect of the baseline tax system at all stages of the investment lifecycle before taking the decision to invest, there is a large degree of uncertainty in this process. For instance, given the preference to reinvest profits among SMEs, receiving tax relief on dividend income may be unlikely. Similarly, due to the nature of investing in typically higher risk start-ups and SMEs, it may be unlikely that the investor will realise the generosity of tax relief on capital gains. Therefore, certain elements of the tax advantage generated by a tax incentive may be too remote and uncertain to influence an investor.

Tax subsidy rate

In many countries, research and development (R&D) tax incentives to stimulate private sector research spending are a significant element of technology and innovation policy. Analysts have proposed a model for calculating the relative attractiveness of these tax incentives by reference to the rate of before-tax return necessary for a given expenditure to break even.

This "B-index methodology" has been used to compare the relative generosity of R&D tax support across tax jurisdictions. The more generous the tax treatment of R&D, the lower the rate of return required to break-even on a given unit of investment, and the lower the country's B-index. However, even though the B-index is a useful analytical and comparative tool, it does not consider the full range of taxes in a country, or the effects of other types of technology policies on research spending. Nevertheless, it can provide a useful if crude measure of generosity that is internationally comparable.

Algebraically, the B-index is equal to the after-tax cost of an investment expenditure of €1 divided by one minus the tax rate. The after-tax cost is the net cost of the investment, taking into account all the available tax incentives.

[60] Please see Devereux and Griffith (1999) for an overview of the methodology.

$$B = \frac{1 - \tau - c}{1 - \tau}$$

where c = the discount of depreciation allowances, tax credits and special allowances; and τ = the tax rate. In a country with full write-off of current investments and no BA / VC tax incentive scheme, $c = 0$, and consequently $B = 1$. The more favourable a country's tax treatment, the lower its B-index.

Overall, the B-index is a good benchmarking measure for international comparisons. It shows the tax system's role in channelling investment to specific areas/sectors through the generosity of incentives.

The approaches to measuring generosity presented above recognise the difficulties of establishing a single measure of generosity for complex tax incentives such as these. It is important to note that there is a trade-off between simplicity and relevance in the choice of approach. The first approach establishes a simple measure of generosity that is not influenced by subjective assumptions, but relevance to VC and BA investors may be limited. The second approach loses simplicity but gains relevance by focusing on the tax advantage for typical VC and BA investors. In comparison, the third approach regains some simplicity, focuses on elements of a tax incentive's generosity that the investor can price in to their investment decision with certainty, but runs the risk of ignoring the influence of more remote forms of generosity.

On balance, this study will approach generosity through the lens of the rate of tax subsidy on initial investment. Although this may present a narrow interpretation of generosity across the country sample, it avoids subjectivity and focuses on elements of generosity that an investor can realise with a high degree of certainty.

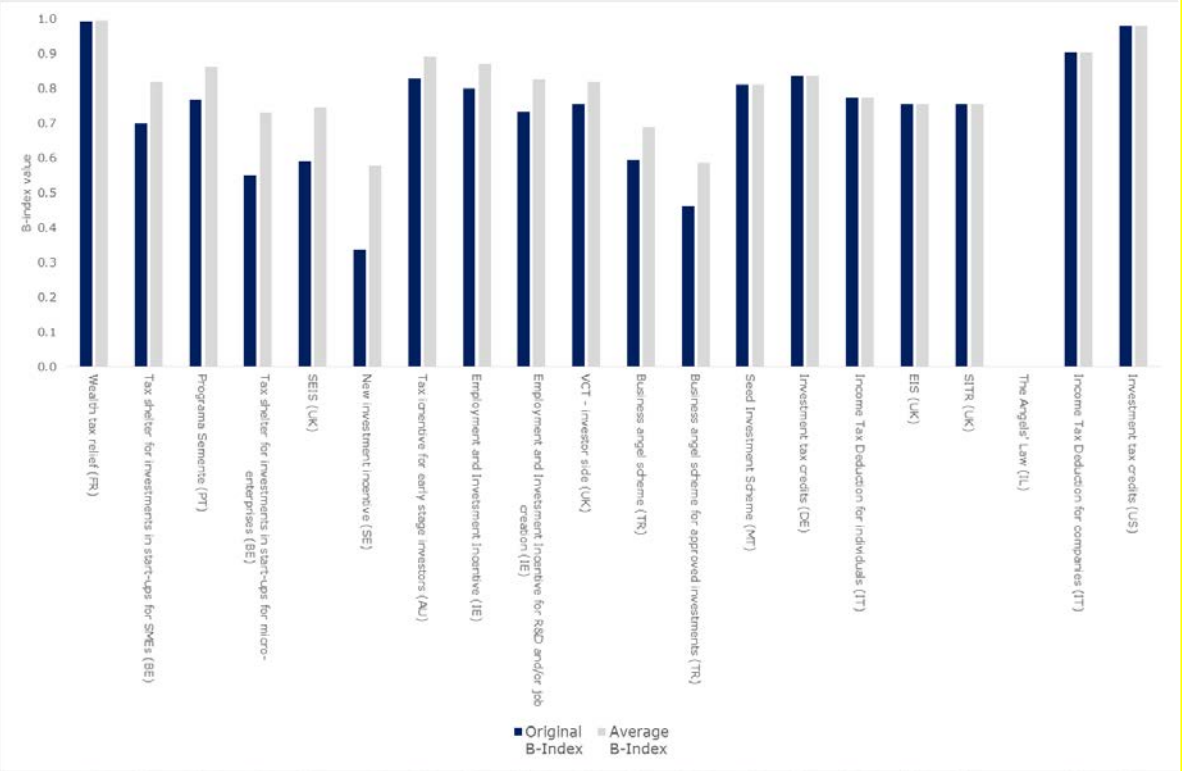
5.5.3 Generosity of business angel and venture capital tax incentives

The original B-index, which was designed to analyse upfront tax credits for R&D expenditure, needs to be modified to for the measurement of generosity of investor tax incentives. See **Appendix 3** for a discussion of the various possible extensions we considered. In particular, we wanted to capture the relative impact of maximum thresholds on investment size on generosity. Our conclusion was that average market data on investment sizes would reflect investment opportunities at a country-level, which would not lend themselves to cross-country comparison, and moreover average investment sizes might be influenced by thresholds for tax incentives in these countries. Consequently, a simpler approach was adopted: the first (small investment) and third quartile (large investment) of the threshold sizes offered by all the tax credit schemes surveyed were identified, and a B-index generosity score was computed for an investment equal in value to each of these levels (€50,000 and €500,000 respectively). Our overall generosity figure is the average of these two figures.

In the country sample, 29 instruments were identified that featured investment thresholds as well as upfront tax credits. In most cases, the top rate of personal income tax was used as base rate, as most instruments are connected to personal income tax (though corporate income tax rates where used where appropriate, e.g. for incentives targeted at corporate investors). The Euro was chosen as the common reference currency for our analysis, and conversion was carried out according to the ECB exchange rate on the first working day of 2017 (Jan 2).

The distribution of tax credits is quite wide, ranging from 2.5% to 100%, with an average of 36.02% and a standard deviation of 22.72%, while investment thresholds range from €533 to €1.911m with an average of €402,388 and a standard deviation of €544,617.

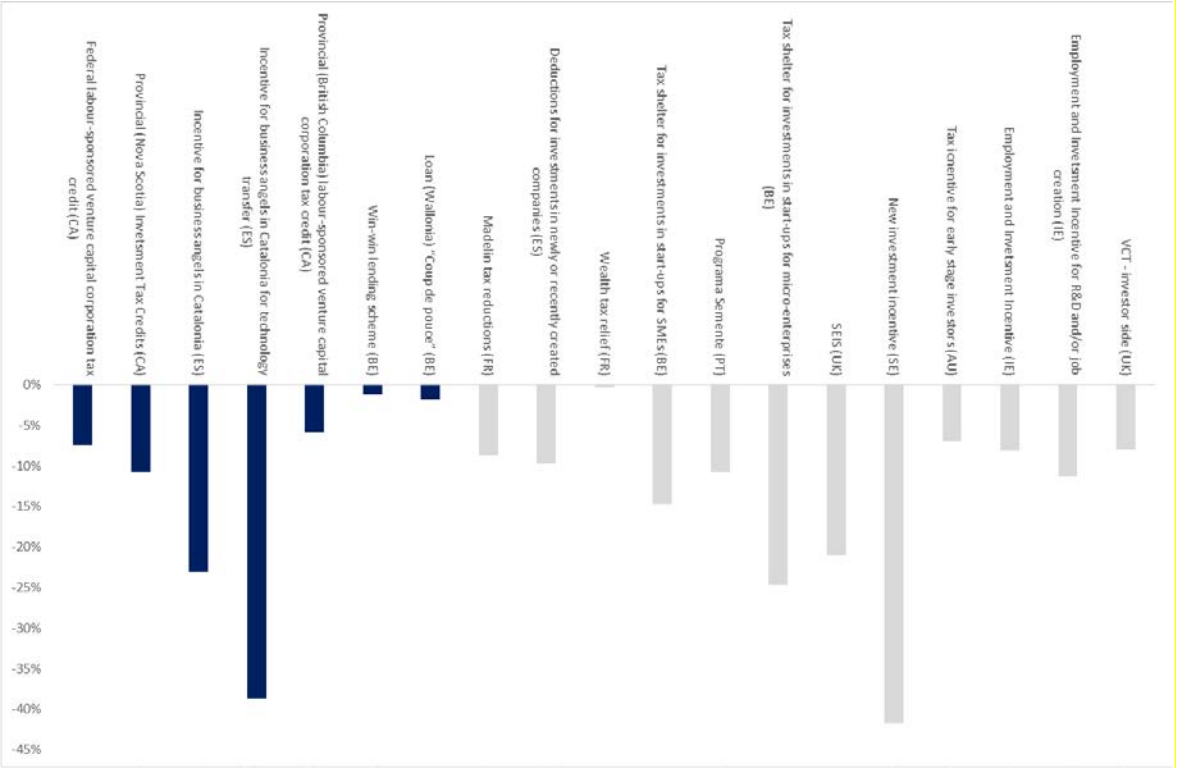
Figure 22: Original B-index in the sample of tax incentives



The average B-index is an average of the B-index calculated in the case of a small investment (Q_1 B-index) and a large investment (Q_3 B-index). This leads to three possible groupings of incentive schemes:

- Firstly, for Group One, the threshold is smaller than Q_1, therefore both the Q_1 and Q_3 B-indexes are larger (less generous) than the original B-index (which was computed on the basis of the tax credit level alone, with no recognition of the threshold restriction): there are nine such cases.
- For Group Two, the threshold surpasses Q_1, but does not surpass the value of Q_3, so the Q_1 B-index equals the original B-index, but the Q_3 B-index is larger and thus less generous (12 cases).
- For Group Three, the threshold surpasses Q_3, so both the Q_1 and Q_3 B-indexes are equal to the original B-index.

Figure 23: Difference between Group One and Two in % (Group One in blue, Group Two in grey)



The average difference between the original B-index and the average B-index in Group Two (15.2%) is larger than Group One (11.9%). This follows from the construction of the index, as in the case of Group Two, we calculated an average of the original B-index and another sub-index (Q_1 B-index) which are by their own smaller than the original B-index. While in the case of Group One we calculate an average of two sub-indices (Q_1 and Q_3 indices), which are by their own larger (less generous) than the original B-index.

Figure 24: Maximum amount paid to investors

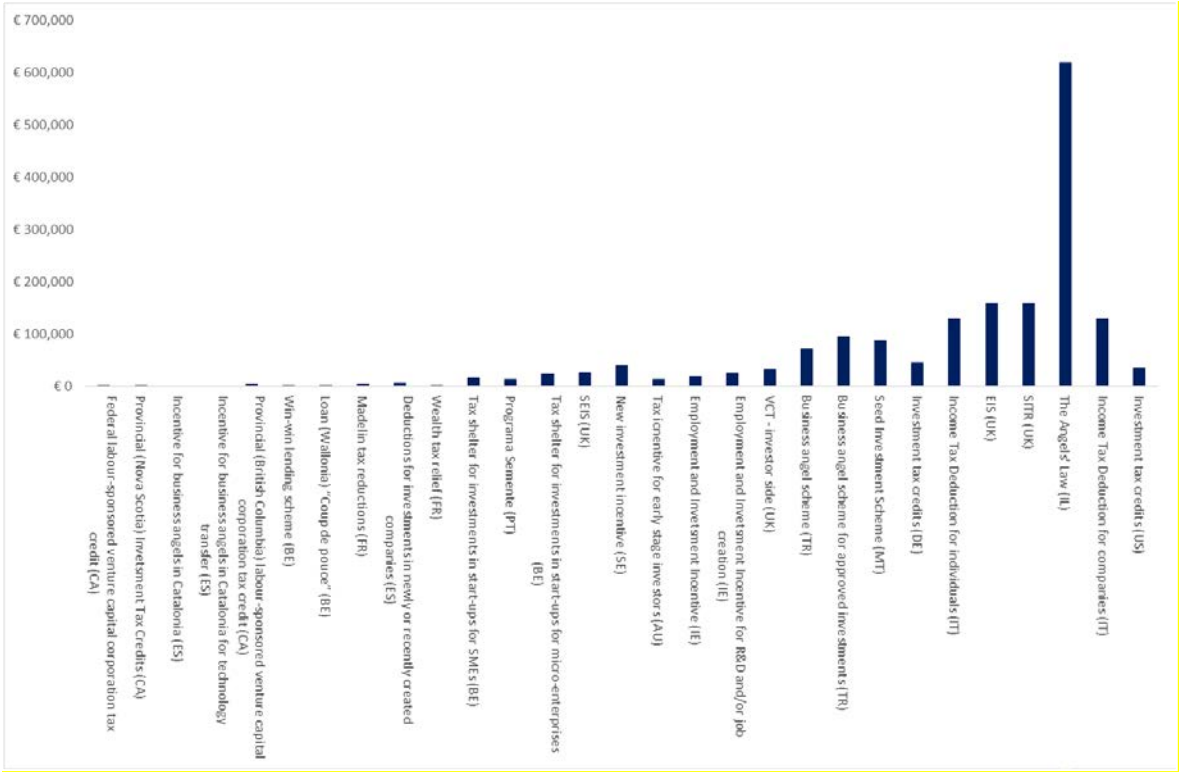


Figure 24 shows the maximum amount of upfront credit investors can claim per year. Israel's so-called Angel's Law is particularly noticeable, as it offers 100% tax credit with the investment threshold of ILS 5m (about €1.24m). Because the threshold and the tax credit rate are both especially high, therefore our "large" investment (slightly €500,000) is not large enough to exploit properly the full potential of this incentive. The use of first and third quartile thresholds for benchmarking incentives allows us to emphasise the value of the upfront tax credit rate relative to the investment threshold, as this will be the more salient feature of an incentive scheme to all but a minority of larger investors.

6. Benchmarking business angel and venture capital tax incentives

Section summary

- The data collected on the tax incentives designed to promote business angel and venture capital investment used in the EU-28 and selected OECD countries has been benchmarked using a four-step process driven by the methodology contained in the EC's 2014 study on R&D tax incentives.
- The selected benchmark variables correspond to the various choices taken by national governments in the design and implementation of tax incentives to promote business angel and venture capital investment (scope, qualifying criteria and administration). In addition, the best practice implications of generosity have also be considered.
- Good and non-recommended practices have been identified for the benchmark variables, where appropriate. These have been derived from the results of the literature review component of this study and are listed in **Table 17**. It was not possible to generate a good practice recommendation for generosity as the optimal level of generosity is dependent on country-specific market failures and investor preferences.
- The top three highest scoring tax incentives are, in descending order, the United Kingdom's Seed Enterprise Investment Scheme (SEIS), the United Kingdom's Enterprise Investment Scheme (EIS), and France's "Madelin" tax reductions scheme. The benchmarking results for top five scoring tax incentives and the country sample are set out in **Table 18** and **Annex 4** respectively.
- There is a degree of uniformity in both the qualifying criteria and administration benchmarking scores. In terms of scope, there is a higher degree of dispersion in the scores, ranging from 1 to 4. The trends and patterns in the benchmarking are outlined in more detail in **Section 6.2.2**.
- Drawing on the benchmarking results, a number of good practice cases have been highlighted to outline particular aspects of individual schemes in more detail. The good practice cases are shown in **Table 19** and analysed in **Appendix 2**. They have been selected on the basis of their benchmarking scores, as well as the diversity, novelty and promise of particular aspects of their approaches.

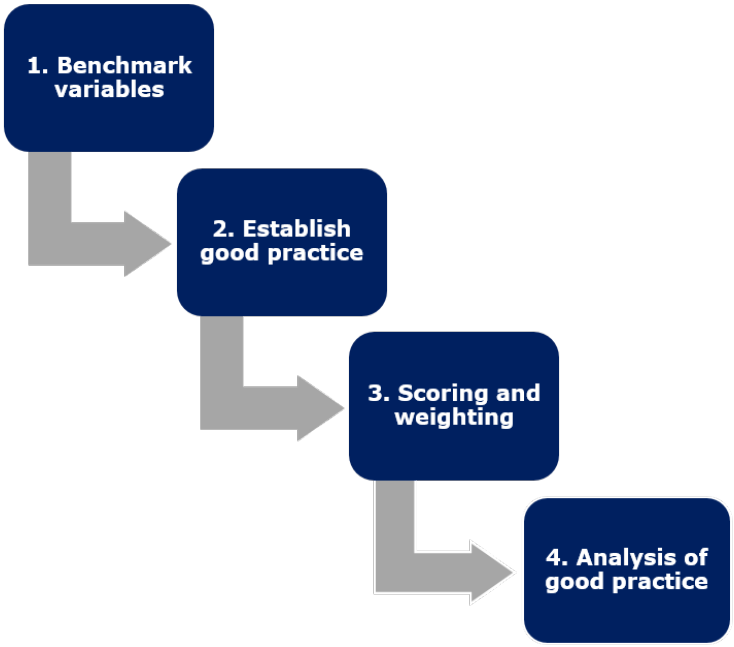
The previous section of this report presented an overview of the tax incentives designed to promote business angel and venture capital investment used in the EU-28 and selected OECD countries. However, to place this information in a format that is relevant for policy makers, the relative merits of each scheme needs to be assessed and ranked. In other words, where do the individual tax incentives fall on a spectrum of international best practice?

To answer this question, this section of the report will present the results of the benchmarking component of this study. An overview of the benchmarking methodology will be presented, before documenting its results. This section will close with analysis of the trends and patterns emerging from the benchmarking results.

6.1 Benchmarking methodology

Using the benchmarking methodology contained in the EC's 2014 study on R&D tax incentives as a guiding framework, the benchmarking component of this study has been conducted in a four-step process. This is outlined in **Figure 25** and expanded upon below.

Figure 25: Benchmarking methodology



The benchmarking methodology recognises that perspectives on VC/BA tax incentives differs between policy makers and investors. Policy makers will, to a certain extent, value different aspects of good practice in scheme design than investors. Given that contributing to policy making is a key objective of this study, the benchmarking methodology has targeted the perspective of policy makers, while recognising that investor preferences should be acknowledged in order to secure uptake of scheme.

6.1.1 Benchmark variables

The first step of the benchmarking methodology requires the identification of the benchmark variables to be assessed. The core and additional benchmark variables are outlined below.

In the interests of consistency, the various choices taken by national governments in the design and implementation of tax incentives to promote business angel and venture capital investment will provide the core benchmarking variables. These design choices analysed are grouped into three main categories:

- **Scope**: the stage in the investment lifecycle at which the tax incentive is applied and the choice of different forms, incentive base and tax base.
- **Qualifying criteria**: provision that restrict eligibility to certain qualifying investors and investments.
- **Organisation**: the way in which the tax incentive is administered, monitored and evaluated.

In addition, the best practice implications of generosity and stability have also be considered. However, these aspects have not be benchmarked due to uncertainty around the optimal level of generosity and challenges in measuring stability at a scheme-level.

6.1.2 Establishing good practice

The second step of the benchmarking exercise is to identify good practice, from the perspective of policymakers, within each core benchmark variable.

The basis of any benchmarking exercise relies on the identification of good practice or, at the very least, practice that should be avoided. To this end, good and non-recommended practice will be identified for each core benchmark variable, where appropriate.

It is important to note that this is an inherently judgemental and context-dependent process. What works well in one country may not work in another. As such, the methodology does not prejudge the possibility that there is no such thing as universal best practice in the field of venture capital and business angel tax incentives. The real picture may be more complex, with different practices preferable for different countries at different times. This will be recognised in the analysis of good practice, which will outline the additional contextual factors and how they might influence the transferability of good practice.

The good and not recommended practices listed below have been identified from the results of the review the literature on the design of tax incentives of this nature, which were in turn influenced by real world design features drawn from the data collection component of this study.

Scope

Upfront relief on amount invested

Good practice: Upfront tax relief granted to eligible investors

Not recommended: Absence of upfront relief

The provision of upfront tax relief on the amount invested, such as upfront tax credits, has been identified as being an important tool for reducing investment risk. In a recent survey of investors in venture capital tax incentives in the United Kingdom, this design feature was perceived to address investor risk aversion (HMRC, 2016). In addition, tax relief granted upon initial investment would reward new capital, rather than creating windfall gains for existing investors Shah (2006).

However, granting tax relief upon initial investment may not generate sufficient alignment of interests between investor and investee. There is some evidence to suggest that the provision of upfront tax incentives reduces incentives for the investor to ensure the success of the investment.

While adverse impacts on investment quality may be present, the use of upfront tax relief contributes to addressing the market failures that result in the under provision of investment to SMEs and young, innovative companies.

Relief on returns

Good practice: Offer relief on capital gains

Neutral: Offer tax relief on investment returns without distinguishing between investment income and capital gains

Not recommended: No tax relief on investment returns

Tax incentive schemes often offer tax relief on the returns (investment income and/or capital gains) generated by qualifying investments. In principle, this may be attractive to investors, but the idiosyncrasies of start-ups and SMEs could weaken any potential incentive effect and could create undesirable incentives for SMEs.

Dividend distributions of growth-oriented businesses are not uniform and the risks associated with businesses of this nature may mean that a capital gain is not made, which could weaken the incentive effect generated by offering tax relief on both income and gains.

However, offering tax relief on returns introduces a performance-related aspect to tax incentive schemes and, to the extent that returns are uncertain, could be a cost-effective form of relief for governments. Alternatively, offering tax relief on investment income could create pressure for SMEs to make dividend distributions, which could have undesirable consequences for the retention of profit.

The good practice position would be to offer tax relief on capital gains. The not recommended practice position would be to not offer relief on any form of investment return. The neutral practice position would be to offer tax relief on investment income without distinguishing between investment income and capital gains.

Loss relief

Good practice: Loss relief granted to eligible investors on more favourable terms than the baseline tax system

Neutral: Loss relief allowed as per the baseline tax system

Not recommended: Withdrawal of loss relief

As with the use of upfront tax relief, loss relief is an important tool for addressing investor risk aversion. Palazzi (2011) states that capital gains tax regimes that provide symmetric treatment of capital gains and capital losses may encourage risk-taking among investors in start-ups. Therefore, tax incentives schemes that offer loss relief on more favourable terms than the baseline tax system (e.g. offering full loss relief where only partial loss relief is generally allowed) could be argued to be supporting risk-taking.

Qualifying criteria

Business age targeting

Good practice: Partial targeting on the basis of business age

Not recommended: No targeting on the basis of business age

The use of business age criteria can be used to target investments in either new businesses or more mature businesses of a certain age. Targeting younger firms may generate a greater proportional impact on access to finance. By contrast, targeting more mature firms, particularly those that have bridged the so-called 'valley of death', may not promote investment additionality, increasing the deadweight costs of the tax incentive scheme.

Moreover, some evidence shows that, while young firms are more likely to be high-growth, the majority of high-growth firms are over five years old (Anyadike-Danes *et al.*, 2009, Bravo-Biosca, 2011). Conversely, however, older high-growth firms may have less need for subsidy.

On balance it is likely to be desirable for tax incentive schemes to use partial targeting on the basis of business age. This would allow the scheme to restrict participation,

while not making strong assumptions as to the growth prospects of firms of different ages.

Business size targeting

Good practice: Partial targeting on the basis of business size

Not recommended: No targeting on the basis of business size

Business size criteria can be used to target firms of a particular size, either in terms of financial or human resources. The impact of market failures on access to finance is felt most acutely by smaller firms and a recent study on the United Kingdom's venture capital tax incentives (HMRC, 2016) found that the deadweight cost associated with the tax incentive increased with company size. This suggests that tax incentive schemes should target smaller firms.

However, on balance it is likely to be desirable for tax incentive schemes to use partial targeting on the basis of business size. Such an approach would recognise the benefits of targeting business size, while recognising that size is not a sole indicator of innovativeness or growth potential thus avoiding the risks for governments associated with 'picking winners'.

Business sector targeting

Good practice: Restrictions to prevent capital preservation schemes (e.g. excluding certain sectors but with provisions for businesses that operate across sectors)

Neutral: Do not target on the basis of business sector

Not recommended: Targeting on the basis of business sector

Business sector criteria can be used to target particular sectors or, at the very least, prohibit the participation of investors in certain sectors in order to prevent capital preservation schemes. Policy makers may wish to target sectors that display a concentration of innovation or capacity to generate knowledge spillovers or are significant contributors to economic growth (Palazzi, 2011). However, this may discourage innovation from occurring at the intersection between sectors (European Commission, 2014).

The exclusion of certain sectors (e.g. financial services, real estate, renewable energy) may be used as an anti-abuse provision, limiting the extent to which they can be used in tax planning structures or capital preservation schemes. Such exclusions can also increase the extent to which the tax incentive promotes the generation of income from economic activity, rather than asset ownership. However, it is often desirable to accompany exclusions with provisions to permit the participation of businesses that operate across sectors (e.g. Fintech).

On balance, it is likely to be desirable for tax incentive schemes to place restrictions on selected sectors, with provisions for businesses operating across sectors, to limit opportunities for abuse and to promote economic activity. Not recommended practice would be to target on the basis of business sector due to the challenges associated with picking winners which may undermine the overall effectiveness of a scheme. Given the uncertainty of the balance of benefits associated with limiting potential for abuse and the costs of picking winners, a neutral position would be to permit the participation of all sectors.

Investor targeting

Good practice: Target both business angel and venture capital investors within one scheme or across multiple schemes

Not recommended: Target either business angel or venture capital investors within one scheme or across multiple schemes

Tax incentives for VC and BA investors in SMEs and start-ups often diverge in their treatment of natural persons (BA) and corporate (VC) investors. Considering whether BA and VC investments are complements or substitutes, the literature provides mixed evidence. For example, Hellman *et al*. (2013) find that BA and VCs are substitutes, however Harrison and Mason (2010) find complementarities between VC and BA investments, specifically in co-investment, sequential investment, deal referring and BA investment in VC funds. Policymakers should therefore favour a certain type of investor (whether BA or VC) with caution.

From the perspective of tax incentives for natural persons, in particular HNWIs, there is evidence to suggest that they increase the absolute number of investors but not necessarily the number of BAs wanting to invest in higher-risk businesses (Carpentier and Suret, 2013). Therefore, when targeting natural persons, it may be beneficial to the quality of investment to utilise criteria to specifically target BAs. The literature on tax incentives is silent on the impacts of granting investment incentives to corporate investors.

In practice, however, the distinction between BA and VC may be less stark. There is anecdotal evidence to suggest that BA and VC investors may be substitutes in terms of investing across the stages of the venture capital lifecycle, providing support to the professionalization of portfolio firms and co-investment. Therefore, on balance, the hypothetical good practice implication would be to target both VC and BA investors, with not recommended practice being to target one type of investor, while recognising that countries may operate different schemes to target particular types of investor.

Related parties targeting

Good practice: Restrict participation of related parties. However, in the case of schemes specifically targeting natural persons, an allowance is introduced for business angels

Not recommended: Restrict participation of related parties. However, in the case of schemes specifically targeting natural persons, an allowance has not been introduced for business angels

Tax incentive schemes widely restrict the participation of related parties by restricting eligibility to those investors that are not employed by and/or do not control the investee. Such restrictions can reduce the deadweight costs of the scheme by limiting opportunities for owner-managed businesses or directors to engage in tax planning, and for investments that do not face the usual information asymmetries associated with the sector. However, restricting the eligibility of related parties trades-off the ability for more active BAs to participate in the tax incentive schemes.

Therefore, it may be desirable for tax incentives to restrict the participation of related parties as a minimum. However, where a tax incentive scheme targets business angel investors, it would be desirable to also introduce specific allowances to permit the participation of business angels in the management of the investee company.

Cross-border investments targeting

Good practice: Permit the participation of cross-border investors

Not recommended: Restrict to national investors

It is common practice for investor criteria to place some form of restriction on the tax residency status of the investor. At a minimum, these typically require the investor to have sufficient tax liabilities in the jurisdiction in question in order to absorb the tax relief being offered.

Placing a requirement on tax residency ensures that only VC and BA investors with some degree of experience and knowledge of the jurisdiction in question are eligible to participate. However, this may create an inadvertent, and largely unavoidable, bias against new overseas investors, particularly where upfront relief is granted. Overseas investors making their first investment in a jurisdiction may not have existing tax liabilities against which upfront tax relief can be offset.

It is important to recognise that targeting overseas investors without tax liabilities in the jurisdiction may be beyond the capabilities of the tax system (as tax relief, particularly upfront relief, needs to be granted with reference to tax liability). However, good practice in tax incentive design would suggest that cross-border investors, providing they have sufficient tax liabilities in the jurisdiction in question, should not be prohibited from participating in tax incentive schemes. Alternatives, such as upfront grants and co-funding contributions, could also be considered to encourage cross-border investors.

Debt vs. equity targeting

Good practice: Target equity investment

Neutral: Make no distinction between debt and equity investment

Not recommended: Target debt investment

Tax incentive schemes often make the distinction between the eligibility of debt and/or equity instruments. Incentivising equity investment may support the transfer of knowledge spillovers between investor and investee. In addition, as an asset class, equity may be more accepting of the high-risk nature of these businesses as young and innovative businesses may not have the same capacity to raise debt finance due to limited or predominantly intangible asset bases.

However, equity has historically played a minor role in the capital structure of SMEs and start-ups. Therefore, incentivising debt finance could arguably be more effective in supporting access to finance among SMEs given the widespread contraction in SME lending levels since the financial crisis. On the other hand, there are arguments that this financing gap could be filled with greater levels of normal debt finance.

Therefore, good practice in tax incentive design could be to target equity investment due to the ability to generate knowledge spillovers and its alignment to the risk profile of high-risk businesses. The neutral position would be to permit investment in both debt and/or equity instruments due to the historical preference for debt finance among SMEs and the rise of venture debt. Not recommended practice would be to solely target debt investment due to the obstacles in transmitting knowledge spillovers and the limited capacity to raise debt among highly innovative businesses, and the positive impact patient capital can have on said businesses.

New investment targeting

Good practice: Restrict eligibility to newly issued securities (e.g. newly issued share capital)

Not recommended: Allow existing investments to qualify for tax relief

Qualifying criteria may also stipulate that only newly issued securities or new investments may be eligible for tax relief. As Shah (2006) states, incentivising new investment limits the extent to which windfall gains are generated for existing investors. Therefore, it is desirable for tax incentive schemes to restrict eligibility to newly issued securities.

Investment size limits

Good practice: Impose upper or upper and lower limits on investment size attracting tax relief

Not recommended: No limits or just a lower limit on investment size

Restrictions placed on the maximum monetary value of qualifying investments that attract tax relief support the administration and functionality of tax incentive schemes in a number of ways. Investment thresholds help to contain the fiscal cost of offering the incentive and also reduce the extent to which they feature in tax planning arrangements. They reflect the fact that the information costs associated with any single investment are finite and they also limit the extent to which the scheme creates an unnecessary distortion to competition.

Investment duration

Good practice: Impose minimum holding periods

Not recommended: No required holding period or impose maximum holding periods

Tax incentive schemes commonly make use of restrictions placed on the holding period of qualifying investments. The use of minimum holding periods may have a number of advantages, including supporting the generation and capture of knowledge spillovers, providing stability to capital structure, reflecting VC and BA investment holding period norms and discouraging abuse of tax incentives. The use of maximum holding periods may encourage investors to prematurely exit investments to retain tax relief and/or only select those investments that mature quickly or close to the point of divestment.

Therefore, it would be desirable for tax incentive schemes to utilise a minimum holding period, rather than a maximum holding period or having no holding period requirement.

Administration

Discretion

Good practice: Administered on a non-discretionary basis

Not recommended: Administered on a discretionary basis

It is suggested that tax incentives should be administrated only by the tax administration and with as little discretion as possible (Shah, 2006; James, 2009). Discretionary approaches allow tax authorities to deny access if there is a risk of tax avoidance as well as tailoring the degree of incentive. However, as Holland and Vann (1998) state, these benefits are generally not realised in practice and that it may lead

to corruption, a lack of transparency and a cumbersome and time-consuming approval and adaptation process.

Based on this, it is desirable for tax incentives to be administered on a non-discretionary basis.

Fiscal cost monitoring

Good practice: Transparent annual monitoring of fiscal costs

Neutral: Undisclosed regular monitoring of fiscal costs

Not recommended: Irregular, non-existent or opaque monitoring of fiscal costs

Regular and systematic monitoring of the fiscal costs of providing tax incentives is widely held as good practice and helps promote transparency, efficiency, and fiscal control. Indeed, James (2009) suggests that governments should regularly prepare tax expenditure statements to measure and monitor the cost.

However, it should also be recognised that the public disclosure of expenditure statements is subject to political decision. As such, the absence of transparent annual monitoring of fiscal costs should not be taken to mean that such activity does not happen.

Therefore, the good practice implication would be for policy makers to conduct annual monitoring of fiscal costs. The not recommended practice implication would be for policy makers to either not conduct monitoring of fiscal costs or to conduct it on an irregular and opaque basis. The neutral position would be for policy makers to conduct annual monitoring of fiscal costs, but to not publically disclose the results.

Impact monitoring

Good practice: Transparent annual monitoring of economic impacts

Neutral: Undisclosed regular monitoring of economic impacts

Not recommended: Irregular, non-existent or opaque monitoring of economic impacts

Regular and systematic monitoring of the economic impacts of providing tax incentives is widely held as good practice and helps promote value for money. Mason (2009) states that governments should invest in appropriate methodologies which can accurately measure investment trends, so that the need for public sector intervention can be demonstrated and the impact of such interventions can be measured.

As for fiscal cost monitoring, it should also be recognised that the public disclosure of impact assessments is subject to political decision. As such, the absence of transparent annual monitoring of economic impacts should not be taken to mean that such activity does not happen.

Therefore, the good practice implication would be for policy makers to conduct annual monitoring of economic impacts. The not recommended practice implication would be for policy makers to either not conduct monitoring of economic impacts or to conduct it on an irregular and opaque basis. The neutral position would be for policy makers to conduct annual monitoring of economic impacts, but to not publically disclose the results.

Generosity

Good practice: Uncertain

Not recommended: Over-subsidising

The good practice implications of generosity are unclear. The evidence on the crowding out effect would suggest that generous tax incentives can over-subsidise investment which can lead to a certain degree of crowding out. For instance, Cumming and MacIntosh (2006) find a significant crowding out effect in Canada primarily due to the large tax breaks received by LSVCCs. The data suggests that crowding out has been prominent enough to lead to a reduction in the aggregate pool of VC in Canada. Therefore, it can be argued that overly generous tax incentives should not be recommended.

However, there is a lack of evidence on the optimal level of generosity, which makes it impossible to identify a good practice implication.

Stability

Good practice: Fixed design features with prior announcement of design changes

Not recommended: Frequent and/or unannounced changes to design features

Stability of, and prior announcement of changes to, tax policy, including tax incentives, supports taxpayers to make long-term investment decisions. In the context of VC/BA investment stability in incentive design has added importance given the characteristically long time horizons of investments. Indeed, Mason and Botelho (2014) found that the length of time to exit BA investments has risen from approximately three years in 2005 to more than 10 years in 2013, in part driven by the effect of the financial crisis.

There is a lack of evidence on the scope and nature of changes in the design features of individual schemes and a lack of consistency across the country sample in what constitutes a 'change' in design features. This makes it very challenging to infer a good practice implication.

Data has been collected on the stability of the country-level framework of tax incentives over the period 2006-2016 (number of schemes that have been abolished). However, this does not give an indication of the stability of individual schemes.

Table 17 presents a summary of good practice for the core benchmark variables.

Table 17: Summary of good practice

Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
Scope	Upfront relief on amount invested	Upfront relief granted to eligible investors	N/A	Absence of upfront relief
Scope	Relief on returns (investment income/ capital gains)	Offer relief on capital gains	Offer tax relief on investment returns without distinguishing between investment	No tax relief on investment returns

Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
			income or capital gains	
Scope	Loss relief	Loss relief granted to eligible investors on more favourable terms than the baseline tax system	Loss relief allowed as per the baseline tax system	Withdrawal of loss relief
Qualifying criteria	Business age targeting	Partial targeting on the basis of business age	N/A	No targeting on the basis of business age
Qualifying criteria	Business size targeting	Partial targeting on the basis of business size	N/A	No targeting on the basis of business size
Qualifying criteria	Business sector targeting	Restrictions to prevent capital preservation schemes (e.g. excluding certain sectors but with provisions for businesses that operate across sectors)	Do not target on the basis of business sector	Targeting on the basis of business sector
Qualifying criteria	Investor targeting	Target both business angel and venture capital investors within one scheme or across multiple schemes	N/A	Target either business angel or venture capital investors within one scheme or across multiple schemes
Qualifying criteria	Related parties targeting	Restrict participation of related parties. However, in the case of schemes specifically targeting natural persons, an allowance is introduced for business angels	N/A	Restrict participation of related parties. However, in the case of schemes specifically targeting natural persons, an allowance has not been introduced for

Category of benchmark variable	Practice	Good practice	Neutral	Not recommended
				business angels
Qualifying criteria	Cross-border investments targeting	Permit the participation of cross-border investors	N/A	Restrict to national investors
Qualifying criteria	Debt vs. equity targeting	Target equity investment	Make no distinction between debt and equity investment	Target debt investment
Qualifying criteria	New investment targeting	Restrict eligibility to new investments (e.g. newly issued share capital)	N/A	Allow existing investments to qualify for tax relief
Qualifying criteria	Investment size limits	Impose upper or upper and lower limits on investment size attracting tax relief	N/A	No limits or just a lower limit on investment size
Qualifying criteria	Investment duration	Impose minimum holding periods	N/A	No required holding period or impose maximum holding periods
Administration	Discretion	Administered on a non-discretionary basis	N/A	Administered on a discretionary basis
Administration	Fiscal cost monitoring	Transparent annual monitoring of fiscal costs	Undisclosed regular monitoring of fiscal costs	Irregular, non-existent or opaque monitoring of fiscal costs
Administration	Impact monitoring	Transparent annual monitoring of economic impacts	Undisclosed regular monitoring of economic impacts	Irregular, non-existent or opaque monitoring of economic impacts
Generosity	Generosity	Uncertain	N/A	Over-subsidising
Stability	Stability	Fixed design features with prior announcement of design changes	N/A	Frequent and/or unannounced changes to design features

6.1.3 Scoring and weights

The third step of the methodology is to score each of the benchmark variables and establish a composite index which will serve as the basis for ranking tax incentives schemes. This study's methodology is in-line with that adopted in the Commission's 2014 report on R&D tax incentives. It aims to weight individual variables equally within the three overarching categories of scope, qualifying criteria and administration.

However, this study's methodology diverges in the weighting across categories of benchmark variables. Where the previous study applies weights so that the more theoretical categories of scope and qualifying criteria equally with administration, this study has weighted all categories equally.

The reason for this is twofold. First, the literature review component of this study has not revealed an empirical basis for giving a higher weight to one category of benchmark variables. This suggests that the effectiveness of a tax incentive scheme relies on a balance of good design a good administration. Secondly, and related to this, to give a higher weight to one category of benchmark variables would impart of certain degree of avoidable subjectivity to the benchmarking.

Scoring

A four-point scale will be used to score the performance of the tax incentives against the core benchmark variables. A score of 4 will be awarded to those tax incentives displaying good practice. A score of 1 will be given to those tax incentives displaying non-recommended practice. A score of 3 will be given to those tax incentives that fall between the bounds of good practice and non-recommended practice. In the event of missing or incomplete information on a benchmark variable, a score of 2 will be given.

The mean score for each category of benchmark variable (scope, qualifying criteria and administration) will be taken as the overall score for that category. In arriving at the mean score, any instances of missing or incomplete information on a benchmark variable (i.e. a score of 2) will be excluded from the averages in order to base the benchmarking solely on observable design features.

The scoring methodology used in this study has adopted a four-point scoring framework ranging from 4 to 1, whereas the previous study used a three-point scoring framework ranging from 1 to -1. This presents two key divergences.

First, the scoring framework used in this study has moved away from negative scoring (i.e. awarding a score of -1 to not recommended practice). This avoids the negative connotations attached to negative scoring, as well as creating a larger points wedge between good and not recommended practice.

Secondly, and perhaps more importantly, the scoring framework makes the distinction between no information and neutral practice. It is important to makes this distinction so that the benchmarking results can be based on observable design features by excluding the instances of missing information from the benchmarking.

Aggregation

A composite score for each tax incentive will be arrived at by aggregating the scores of each category of benchmark variable. The mean scores for each category of

benchmark variable will be summed, with equal weights being applied to all categories of benchmark variable, so as not to privilege one category of variable over another. This will then be divided by three to arrive at the mean score for each tax incentive.

The score for each tax incentive is computed as follows:

$$x_i = \frac{s_i + q_i + a_i}{3}$$

Where:

- x_i is the overall score for each tax incentive.
- s_i is the total score for the scope benchmark variables.
- q_i is the total score for the qualifying criteria benchmark variables.
- a_i is the total score for the administration benchmark variables.

6.1.4 Limitations

When interpreting the benchmarking results, it is important to recognise that there are a number of limitations inherent in the methodology outlined above.

Data availability

In some instances it has not been possible to access sufficient data on every benchmark variable. Where this is the case, a score of zero has been given, as per the scoring system outlined in the benchmarking methodology. This has the effect of discounting the results for those schemes where data is unavailable for certain benchmark variables, which may influence the ranking of schemes.

However, it is important to note that in the real world, the search for data on the design and functionality of a tax incentive scheme represents a compliance cost for the investor. Where compliance costs are high, the prospective investors may be deterred from participating in a scheme or may make unsuccessful applications for tax relief. This may influence uptake of the scheme, which can adversely influence the effectiveness of the tax incentive.

In this regard, the effect of discounting schemes where information is either not available or easily accessible can be considered to have the effect of accounting for the compliance costs of prospective investors.

Limited evidence base

The principles of good practice have been based on theoretical, as well as empirical, evidence. This is due to the gaps in the literature and the inherent challenges of empirically researching tax incentives of this nature.

As a result, the principles of good practice may change as future research and evidence becomes available, which will influence the benchmarking results.

Limited benchmark variables

The selection of benchmark variables is bounded by the extent to which the evidence base can support their inclusion. Limitations in the number of benchmark variables means that the methodology may only partially capture the aggregate impact of the design features of a tax incentive scheme on its overall effectiveness. This is because the methodology will not capture those variables that have not been observed or are hard to observe, such as perception of the tax incentive scheme among the investor population.

Success of schemes

Due to the uneven availability of assessments of the wider economic impacts of individual schemes in the country sample, it has not been possible to include a measure of the success of each scheme within the benchmarking methodology.

Success can be defined as whether the tax incentive in question has met its underpinning policy objective. Although the overall success of a scheme will be influenced by its constituent design features, it is not exclusively determined by them.

Therefore, while a tax incentive scheme may score highly against the good practice principles, it may, for a variety of reasons, be unsuccessful in reality. The inability to include this level of detail in the benchmarking methodology will mean that such anomalies go unnoticed.

Scoring, weighting and aggregation

The scoring and weighting framework this study has used in this report has diverged from the approach adopted by the EC's 2014 report on R&D tax incentives in a number of ways.

In order to protect the integrity of the benchmarking results, the methodology has weighted all categories of benchmark variable equally. The previous study placed a double weight on administration to provide equal representation of the theoretical and practical aspects of tax incentive design in the index (so as not to privilege the former).

It could be possible to weight individual benchmark variables or categories of benchmark variables differently to reflect the importance of certain design features to different stakeholders (e.g. investors and/or policymakers). It might also be desirable to weight individual benchmark variables or categories of benchmark variables differently to reflect the differences in the economic impacts they generate.

However, as mentioned above, the literature review component of this study has not yielded an empirical basis on which to do so. As the empirical evidence on BA and VC tax incentives grows, it may be possible to introduce weight the categories of

benchmark variable differently to reflect their relative importance or contribution to the effectiveness of such schemes.

The scoring framework used in this study uses the previous study's approach of scoring missing information being scored above not recommended practice. It may be possible to score missing information more harshly (i.e. scoring no information below not recommended practice) in order to better reflect the compliance costs faced by taxpayers searching for information on the functionality of an individual scheme. However, to do so would be challenging given the difficultly of conclusively proving a negative (that information is entirely absent). The data collection component has been conducted within the budgetary and time constraints of this study. As such, this study has relied on non-exhaustive search procedures designed to strike a balance between breadth and depth of data collection.

Finally, the method for aggregation the scores across all benchmark variables into one index excludes instances of missing information. Linked to the discussion of alternative scoring frameworks, it may be possible to include instances of missing information in the aggregation process. This could provide a reflection of the compliance costs faced by taxpayers searching for information on the functionality of an individual scheme. However, this would generate the same challenge of conclusively proving a negative (that information is entirely absent).

A discussion of the robustness of the benchmarking results can be found in **Annex 4** of this report.

6.2 Benchmark results

The full benchmarking results are presented in **Annex 4** of this report. However, this section presents an overview of the key results, as well as patterns and trends, emerging from the benchmarking results.

On first impression, it is evident that there are more negative benchmark scores than there are positive. While this will indicate the inclusion of not recommended design features in individual tax incentive schemes, it also reflects the presence of zero values due to neutral practice or a lack of information. Therefore, it is important to recognise that the rank may be a better indicator of where a particular tax incentive falls on the spectrum of good practice, rather than the benchmark score.

6.2.1 Highest scoring tax incentives

Table 18 shows the five highest ranked tax incentives.

The United Kingdom's Seed Investment Scheme (SEIS) is the highest ranked tax incentive. This was driven by high scores across scope, qualifying criteria and administration. SEIS uses a combination of age, size and specific sector exclusions to target entrepreneurial firms. It restricts the participation of related parties, but has introduced allowances for business angels. It targets newly issued ordinary share capital, imposing a maximum investment value attracting tax relief and a minimum holding period. In terms of administration, SEIS is administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs.

The United Kingdom's Enterprise Investment Scheme (EIS) comes in second place. EIS' ranking is driven by good scores across scope, qualifying criteria and administration. The scheme offers upfront tax relief and provides loss relief on a more

favourable basis than allowed by the baseline tax system. It targets entrepreneurial firms on the basis of size and excluded sectors, but does not use age targeting. It has introduced allowances to related party restrictions to permit the involvement of business angels. It is also administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs.

France's "Madelin" tax reduction scheme features third in our ranking. The ranking is largely driven by its scope and qualifying criteria scores. The scheme offers an upfront tax credit of 18% on investments, as well as granting relief for gains realised on disposal of qualifying investment. The scheme restricts participation through its partial targeting of business size, age and sector. In addition, it imposes a minimum holding period of five years and a maximum investment allowance that is eligible for relief.

The United Kingdom's Social Investment Tax Relief (SITR) comes in fourth place. SITR's ranking is driven by its scope and administration scores. The scheme offers upfront tax relief but does not provide loss relief on a more favourable basis than allowed by the baseline tax system. It is also administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs. Although SITR is very similar in design to EIS, its qualifying criteria score diverges as it specifically targets social enterprises and does not contain allowances to permit the involvement of business angels.

Germany's Venture Capital Grant (Invest) incentive is ranked in joint fifth place out of all the incentives. The ranking was also driven mainly by the scores on scope and qualifying criteria, where it scores consistently well. The scheme offers both individual and corporate investors an upfront relief in the form of a grant of 20% of the investment sum on the acquisition of shares. There is also an exit relief that applies to individual investors only. The scheme is available online and provides online manuals on its administrative requirements for investors.

The United Kingdom's Venture Capital Trust (VCT) scheme is also ranked in joint fifth place. The scheme scores well across the scope, qualifying and administration criteria. The VCT scheme offers upfront relief and relief on gains for investors, as well as tax-transparent treatment of investment returns for the VCT itself. It employs a relatively sophisticated set of qualifying criteria and its fiscal cost is monitored and publicly disclosed on an annual basis.

Table 18: Top five tax incentives

Country	Scheme	Scope score	Qualifying criteria score	Administration score	Overall score	Rank
UK	Seed Enterprise Investment Scheme	4.00	4.00	3.00	3.67	1
UK	Enterprise Investment scheme	4.00	3.70	3.00	3.57	2
FR	"Madelin" tax reductions	4.00	4.00	2.67	3.56	3
UK	Social Investment Tax Relief	3.67	3.50	3.00	3.39	4

Country	Scheme	Scope score	Qualifying criteria score	Administration score	Overall score	Rank
UK	Venture Capital Trust	3.33	3.60	3.00	3.30	5
DE	“INVEST - Venture Capital Grant"	3.33	3.60	3.00	3.30	5

The list of the 5 highest scoring tax incentives is dominated by those schemes that offer upfront tax relief on the amount invested. This is indicative of the importance of subsidising the cost of investment in order to address investor risk aversion, but also the way in which the high-risk nature of these types of investment would dilute the incentive effect of offering tax relief on investment returns. The top 5 is also dominated by schemes that target direct investment in SMEs and start-ups, rather than indirect investment through a fund structure.

6.2.2 Trends and patterns

There is a degree of uniformity in the scope benchmarking scores. The provision of upfront relief on the amount invested was common throughout the country sample, with 29 of the 46 tax incentives doing so. Similarly, 17 out of 46 tax incentives offered a form of relief for investment returns (either current or capital). Finally, only 4 tax incentives offered loss relief on a more favourable basis than was afforded by the baseline tax system.

In terms of the scope criteria, there is a higher degree of dispersion in the scores, ranging from 1.00 to 4.00. Only 12 schemes conform to good practice in the targeting of businesses. These schemes use a combination of business age and size criteria with either no sectoral targeting or exclusion of certain sectors.

39 schemes differentiate between natural persons and corporate investors; only four have introduced provisions to allow the participation of business angels. The lack of business angel provisions may limit the extent to which angel investment through the schemes can share knowledge with and contribute to the professionalisation of the recipient of investment. The widespread lack of information would also suggest significant compliance costs for prospective investors.

The majority of schemes permitted the participation of cross-border investors providing they had sufficient tax liabilities in the country in question to absorb the tax relief. It is interesting to note that both of the sub-national schemes in Belgium required the investor to live in the region in question.

43 schemes distinguished between debt and equity. Only 20 schemes targeted newly issued securities, which indicates that there may be a certain degree of avoidable deadweight cost occurring due to the eligibility of existing debt or equity instruments. However, this risk is mitigated by the prominence of upfront tax credits, which generally cannot be claimed retrospectively.

The majority of schemes conformed to good practice in the use of investment thresholds. 28 schemes imposed a maximum investment value that attracts tax relief, three schemes imposed a minimum investment threshold, and no information was available for 18 schemes. This indicates that the majority of the country sample are limiting the fiscal exposure of government budgets to the tax incentives. However, the absence of information for 18 schemes suggests an additional compliance cost for investors.

Similarly, 31 schemes impose a minimum holding period, with four schemes using a maximum holding period and there was either no holding period requirement or information was unavailable for 15 schemes. This indicates that the majority of tax incentives conformed to good practice, thereby maximising the opportunity for the generation and capture of knowledge spill overs, limiting the opportunities for abuse, and improving the stability of funding for start-ups.

In general, the country sample performed poorly in terms of the administration variables. Although all tax incentives were administered on a non-discretionary basis, a product of the use of qualifying criteria, very few underwent regular and transparent monitoring of fiscal costs and none were subject to regular and transparent impact assessments. This may indicate the challenges of assessing the impact of tax incentives of this nature (e.g. establishing whether investment additionality has occurred). However, it represents a significant deviation from good practice and may limit the extent to which value for money is being achieved through the operation of these tax incentives.

6.5 Analysis of good practice

In the final step of the benchmarking methodology, this section provides an in-depth overview of good practice in the design and operation of tax incentives emerging from the benchmark data.

The good practices highlighted will form the basis of good practice fiches which explore, in more detail, particular aspects of the schemes. The impact of the tax incentive scheme in question and the extent to which this case of good practice can be exported to other Member States will also be discussed.

6.5.1 Criteria for selecting good practice

Drawing on the data collection and benchmarking data, good practice cases have been selected using the following three criteria:

1. Benchmarking score: Tax incentive schemes with high benchmarking scores will be selected.
2. Novel and promising approaches: Tax incentive schemes exhibiting novel and promising design features will be selected.
3. Diversity of approaches: Tax incentive schemes displaying a diverse range of approaches will be selected.

6.5.2 Overview of good practice cases

Based on the selection criteria outlined above, 10 good practice cases have been selected. An overview of these is presented in **Table 19** and the basis for selection of each scheme is outlined in more detail below.

Full good practice case studies can be found in **Annex 2** of this report.

Table 19: Overview of good practice cases

Scheme Name	Country	Reason(s) for highlighting case	Category of good practice		
			Scope	Qualifying criteria	Administration
INVEST	Germany	Germany's INVEST incentive is ranked highly in the country sample and scores strongly across all categories of benchmark variable.	✓	✓	✓
Employment and Investment Incentive	Ireland	The EII's additional tax credit creates an explicit incentive for investment to be used for the achievement of specific outcomes (e.g. employment).	✓		✓
Tax treatment of crowdfunding loans	Belgium	Belgium's tax treatment of crowdfunding loans is the only tax incentive in the country sample that is specifically targeted to investors in SMEs through crowdfunding platforms.		✓	
"Madelin" tax reductions	France	France's "Madelin" tax reductions had one of the highest scores for qualifying criteria in the country sample. This was driven by good practice in business targeting.		✓	
Angel Tax System	Japan	Japan's Angel Tax System is one of the highest scoring	✓		

Scheme Name	Country	Reason(s) for highlighting case	Category of good practice		
			Scope	Qualifying criteria	Administration
		tax incentive in terms of scope in the country sample. This is because it offers investors an upfront tax credit and loss relief on a more favourable basis than provided for in the baseline tax system.			
Venture Capital Trust	United Kingdom	The United Kingdom's Venture Capital Trust (VCT) scheme ranks in the top 10 tax incentive out of the country sample. It scores well across all benchmark variables.	✓		✓
Social Investment Tax Relief	United Kingdom	The United Kingdom's Social Investment Tax Relief (SITR) ranks third in the benchmarking, but is the only tax incentive to specifically target social enterprises.		✓	✓
Venture Capital Limited Partnership program	Australia	Australia's Venture Capital Limited Partnership (VCLP) program ranked 38th in the country sample, but was one of the only schemes to target foreign venture capital investors explicitly.		✓	
Tax shelter for investments	Belgium	Belgium's tax shelter for investments in	✓		

Scheme Name	Country	Reason(s) for highlighting case	Category of good practice		
			Scope	Qualifying criteria	Administration
in start-ups		start-ups ranked joint 28th in the country sample, but is the only scheme to differentiate tax relief based on the size of the business.			
Business Angel Scheme	Turkey	The BAS displays an interesting approach to investor targeting. Through its use of income/wealth and experience criteria, it effectively screens out those prospective investors that may not be professional and/or experienced business angels.		✓	

1. INVEST, Germany

Germany's Venture Capital Grant (Invest) incentive is ranked at joint fifth in the country sample and scores strongly across majority of the benchmark variables.

The aim of the incentive is to provide sustained support to the venture capital market in Germany by private investors.

The scheme offers both individual and corporate investors an upfront relief in the form of a grant of 20% of the investment sum on the acquisition of shares. Structuring upfront relief as a grant, rather than a tax credit, could overcome the potential obstacles to cross-border investment generated by requirements for investors to have sufficient tax liabilities in the jurisdiction to absorb the tax credit.

There is also an exit relief that applies to individual investors only. The scheme provides detailed guidance on which businesses and investors qualify for relief.

2. Employment and Investment Incentive Scheme, Ireland

Ireland's Employment and Investment Incentive Scheme ranked 33rd in the country sample and is one of the only schemes to utilise performance-related tax relief.

The scheme offers a basic 30% upfront tax credit like many such tax incentive schemes. However, it also offers an additional 10% tax credit where it has been established that additional jobs were created or the company used the capital raised for expenditure on research and development. This creates an incentive for the investor to ensure, to the extent possible, that their investment is used to create positive macroeconomic outcomes (in this case, job creation and increasing R&D).

The Employment and Investment Incentive Scheme was designed to replace an earlier tax incentive (Business Expansion Scheme) that was criticised for not targeting job creation.

In addition, the fiscal cost of the Employment and Investment Incentive Scheme is monitored and publically disclosed on an annual basis.

3. Tax treatment of crowdfunding loans, Belgium

Belgium's tax treatment of crowdfunding loans is the only tax incentive in the country sample that is specifically targeted to investors in SMEs through crowdfunding platforms.

The scheme provides a withholding tax exemption for the first €15,000 per annum of interest income received by investors through a crowdfunding platform. In order to qualify for the exemption, the investor must make a loan through a recognised crowdfunding platform with a term of at least four years and with interest paid annually.

Crowdfunding and fintech is changing the nature of investment in SMEs and start-ups and is providing market access to new profiles of investor. A tax exemption of this nature reduces the tax compliance costs of crowdfunding, which can promote greater investment. It could also reduce the administrative burden related to investigating cases of small-scale tax evasion, such as non-declaration of interest income from crowdfunding investments.

4. "Madelin" tax reductions, France

France's "Madelin" tax reductions had one of the highest scores for qualifying criteria in the country sample. This was driven by good practice in business targeting.

The scheme uses partial targeting of business size and age, which corresponds to good practice, as well as prohibiting the involvement of certain sectors (finance and real estate). This loose framework of business criteria adheres to Autio *et al*.'s (2007) suggestion for overcoming the problem of trying to pick winners targeting policy support to entrepreneurial firms.

5. Angel Tax System, Japan

Japan's Angel Tax System is one of the highest scoring tax incentive in terms of scope in the country sample. This is because it offer investors an upfront tax credit and loss relief on a more favourable basis than provided for in the baseline tax system.

The Angel Tax System allows investors to deduct a proportion of the value of the investment from their income tax base at the time of investment and to carry forward capital losses realised on the disposal of qualifying investments for a

period of three years. Under the baseline tax system, losses realised on the disposal of unlisted shares are offset against gains from the disposal of unlisted shares in the same year. Therefore, the loss carry forward provisions in the Angel Tax System introduce a certain degree of flexibility, which may be more favourable to the investor.

The literature on the role of tax incentives in reducing investor risk aversion highlights the role of upfront tax relief and loss relief. However, there are concerns that the combination of an upfront tax credit and favorable tax treatment of losses may not generate sufficient alignment of interests between investor and investee.

Offering both forms of tax relief over and above the baseline tax system can address downside investment risk from two angles, but should be accompanied by supporting anti-avoidance provisions and design features that would promote active ownership.

6. Venture Capital Trust, United Kingdom

The United Kingdom's Venture Capital Trust (VCT) scheme is a top-5 tax incentive in the country sample. It scores well across all benchmark variables.

The VCT scheme offers upfront relief and relief on gains for investors, as well as tax-transparent treatment of investment returns for the VCT itself. It employs a relatively sophisticated set of qualifying criteria and its fiscal cost is monitored and publically disclosed on an annual basis.

7. Social Investment Tax Relief, United Kingdom

The United Kingdom's Social Investment Tax Relief (SITR) ranks fourth in the benchmarking and is the only tax incentive to specifically target social enterprises.

SITR is similar in nature to the UK's EIS but with two notable amendments that have been introduced to target social enterprises. Firstly, the business criteria list a qualifying business as being a social enterprise, rather than an entity that is managed on a commercial basis with a view to the realisation of profits. Secondly, it permits investment in debt, as well as equity instruments, which allows social enterprises that cannot issue share capital due to their legal form (e.g. companies limited by guarantee) to participate in the scheme. These provisions have the effect of addressing issues in the design of other tax incentives that may prohibit social enterprises from participating.

In addition, the fiscal cost of the SITR is monitored and publically disclosed on an annual basis.

8. Venture Capital Limited Partnership program, Australia

Australia's Venture Capital Limited Partnership (VCLP) program ranked 38th in the country sample, but was one of the only schemes to target foreign venture capital investors.

The VCLP program is designed to increase the amount of foreign investment in early stage Australian businesses. The program is open to both foreign and domestic investors, but only foreign investors are entitled to a capital gains tax exemption on their share of returns the VCLP makes from eligible venture capital investments.

The VCLP program's tax exemption for foreign investors can reduce the double taxation risks associated with cross-border investment, which may promote greater levels of cross-border VC. This approach can be useful for countries wishing to attract cross-border VC to either increase investment volumes or to augment the development of a domestic VC industry.

9. Tax shelter for investments in start-ups, Belgium

Belgium's tax shelter for investments in start-ups ranked 25th in the country sample, but is the only scheme to differentiate tax relief based on the size of the business.

The tax shelter for investments in start-ups grants qualifying investors an upfront tax credit of 30% of a maximum investment of €100,000 per person for investments in SMEs. However, the rate of tax credit is increased to 45% for investments in micro-enterprises.

In offering a differentiated rate of tax credit, the scheme recognises the difference in the scale of investment risk between SMEs and microenterprises. This can be argued to create incentives to investment that are responsive to the market failures present at different stages of the SME growth cycle.

10. Business Angel Scheme, Turkey

Turkey's Business Angel Scheme is one of only two schemes in the country sample to require the investor to be a registered business angel in order to participate.

The Business Angel Scheme requires the investor to obtain an Angel Investor License, which is valid for five years, from the Ministry of Finance. Investors must meet income/wealth and relevant business experience criteria in order to obtain the license.

While the administrative burden of obtaining an Angel Investor Licence may deter some prospective investors, it could promote investment quality by reducing the ability for non-professional or passive investors to participate.

7. Conclusions

Section summary

- Answers to research questions underpinning this study are outlined in **Section 7.1**. These have been translated into policy implications that are salient, actionable and grounded in best practice. These are outlined in **Section 7.2** in detail. At a high-level, it is desirable for tax incentives to address investor risk aversion, avoid the problems of picking winners, seek to promote high quantities of quality investment, maintain stability and raise awareness among investors to promote uptake, and undergo systematic monitoring and evaluation.
- When considering the good practice and policy implications generated by this study, it is important to recognise that there are a number of conditions for successfully transferring good practice across countries. These are outlined in detail in **Section 7.3**, but include the need to adopt the design to meet the requirements of the local context, map out the associated incremental administrative requirements, accompany changes with capacity building and training for those responsible for administering the tax incentive, raise awareness of the changes before, during and after their introduction and develop robust monitoring and evaluation frameworks to assess the *ex post* impact of changes.

European SMEs and start-ups have been historically dependent on bank finance. The financial crisis severely affected SMEs' access to finance by restricting the refinancing capacity, risk appetite and capital adequacy of the banking sector. This has forced young, growing and innovative businesses to seek finance from different sources, such as peer-to-peer lending, crowdfunding, VC funds and BAs.

However, the availability of these sources of finance is limited in the EU compared to other countries, such as the US. This has led to a growing interest in the role of tax incentives in promoting, and/or removing obstacles to, BA and VC investment.

To this end, this section of the report will draw together the outputs of the various workstreams of the study to synthesis a number of conclusions. The conclusions seek to provide answers to the underpinning research questions of this study, but also to outline the policy implications arising from these answers, and potential conditions for successfully transferring good practice across countries.

7.1 Answers to research questions

As outlined in **Section 1**, this report sought to answer a number of research questions. These research questions have underpinned the direction of this study. Drawing on the outputs of the various workstreams of this study, answers to the research questions have been provided below.

Why is VC and BA investment desirable?

Young and innovative businesses, known as 'gazelles', have been shown to be key drivers of job creation (Criscuolo *et al.*, 2014 and Haltiwanger *et al.*, 2013), as well as innovation (Cincery and Veugelers, 2013). VC and BA investment in these types of firms has been empirically shown to have positive impacts on innovation and productivity in a number of studies (Kortum and Lerner, 2000, Belke, Fehn and Foster, 2003, Engel and Keilbach, 2007 and van Pottelsberghe de la Potterie and Romain, 2004b).

The decline in bank lending, a key source of SME finance, triggered by the financial crisis disproportionately affected small and young enterprises (Ciccarelli *et al.*, 2015 and Artola and Genre, 2011). As a result of this, SMEs are turning to alternative sources of finance, such as VC and BA.

The challenges in securing adequate financing faced by many SMEs coupled with the positive macroeconomic outcomes associated with VC and BA investment creates a compelling economic rationale as to why VC and BA investment is desirable.

What are the drivers of and obstacles to VC and BA investment?

VC and BA investment activity is influenced by a number of factors. These determinants may be conducive or detrimental to stimulating VC and BA investment, depending on their nature. Of the few studies that examine the determinants of VC, fewer still consider the impact of specific taxation policies.

Characteristics of VC and BA investments that deter investors include the high-risk nature of these types of investment, information asymmetries and moral hazard.

In addition, VC and BA investment activity can be driven or blocked by a number of determinants at the macro-level. Influential work by Jeng and Wells (2000) provide a comprehensive analysis of the determinants of VC for 21 countries, which states that the strength of IPO markets, financial markets and the appetites of institutional investors, labour market rigidities, government policy (including taxation) and the macroeconomic and business environment may drive investment levels.

How does the tax system influence VC and BA investment?

In practical terms, an investor will take account of any tax applicable across the investment lifecycle when making the initial investment decision. Seminal work by Domar and Musgrave (1944) stated that higher income taxes – under full loss offset - may increase risk taking.

Taxes on income generated during the holding period are less relevant in the context of VC and BA investments in start-ups, which may not generate any income in the earlier stages. However, income taxation may also affect entrepreneurial activity via differences in tax rates on corporate versus wage income (Gentry and Hubbard, 2000 and Keuschnigg and Nielson, 2004c). This, in turn, may affect the demand for VC and BA investment.

Higher capital gains tax (CGT) rates may have negative impact on the quantity and quality of investment. This has been shown in a range of theoretical and empirical literature (Poterba, 1989a and 1989b, Keuschnigg, 2004 and Keuschnigg and Nielsen, 2004a, 2004b and 2004c), though the evidence on the extent and significance of this effect is mixed.

Whilst there is little agreement on specific quantitative predictions and estimates, there is a general consensus that taxation rates across countries significantly influence key decisions regarding foreign direct investment (FDI). Moreover, the EC's Expert Group report identified the compliance costs generated by a lack of cohesion between member states' tax systems as a key obstacle to cross-border VC and BA investment in the EU.

Should VC and BA investment be incentivised through the tax system?

Policy makers can draw on a portfolio of approaches to incentivise VC and BA investment (Warwick and Nolan, 2014 and Autio and Ranniko, 2016). The use of the tax system, such as through targeted tax incentives, is just one component of this portfolio.

Tax incentives reduce the effective marginal cost of investing in smaller companies. As a result, in theory, more investors should be willing to supply more capital to smaller companies through venture capital funds and/or as business angels benefitting from tax incentives, and at lower before-tax expected rates of return.

Viewed from a macroeconomic perspective, tax incentives have the potential to be distortionary, leading to sub-optimal allocation of investment (e.g. to start-up companies with a lower rate of return). However, in the presence of factors such as moral hazard (Keuschnigg and Nielsen, 2004) and information asymmetry (Trester, 1998), a properly-designed tax incentive may help to correct for other market imperfections or distortions.

The limited empirical evidence base on the impact of tax incentives for VC and BA investment finds mixed effects. A number of studies of realworld tax incentives have found positive impacts (Cumming and Li, 2013 and Cowling *et al*., 2008), while a number of found evidence of negative impacts (Carpentier and Suret, 2007, Cumming and MacIntosh, 2006 and Mason, 2009).

Literature on alternative approaches to incentivising VC and BA investment presents a similarly mixed picture, with a number of studies finding positive impacts of non-tax incentives and a number finding negative impacts.

In the absence of conclusive evidence, it is, therefore, challenging to provide a definitive answer to the question of whether the tax system should be used to incentivise VC and BA investment. Further understanding of the characteristics of effective incentives, and the wider economic circumstances under which such incentives are effective, is necessary. The implication of the mixed evidence is that, when deciding on the most efficient policy response, it is essential to understand how different market imperfections interact with government policy.

What tax incentives are currently available for VC and BA investment?

The overview of tax incentive schemes presented in **Section 5** of this report reveals that 19 of the 36 countries in the country sample implement tax incentives targeted to VC and BA investors in start-ups and SMEs. Out of the 17 countries that do not currently operate tax incentives, two plan to implement tax incentives in the future.

In total, 46 tax incentives are offered by these countries, with 13 countries operating multiple schemes. France and the United Kingdom have the most sophisticated frameworks of tax incentives, operating six schemes each.

In terms of the EU-28, there is a marked contrast between EU-15 and EU-13 Member States in the prevalence of tax incentives. Nine of the EU-15 Member States operate tax incentives compared to just three (Malta, Poland and Slovenia) of EU-13.[61] This difference can be explained in a number of ways. Firstly, EU-13, in general, choose to incentivise investment activity through other means. This includes the baseline tax system, such as through distributed profits taxes (e.g. Estonia), low tax rates (e.g. Bulgaria) or other forms of government support to investment in SMEs, such as

[61] EU-13 refers to the following 13 Member States; Bulgaria, Croatia, Cyprus, Czech Republic, Estonia , Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

subsidies or loan guarantees. As such, providing targeted tax incentives to VC and BA investors may be deemed unnecessary given the existing incentive effects generated by the baseline tax system or other forms of government-backed support. However, it is important to note that such an approach would incentivise all forms of investment, not just VC and BA. As such, generating incentives through the baseline tax system could be considered a blunt instrument compared to the precision afforded by targeted tax incentives.

Secondly, in general the EU-13 have smaller, less developed venture capital markets than the EU-15. Assuming that venture capital drives the demand for tax incentives, the low levels of VC investment in these countries could explain the widespread absence of tax incentives. Of course, causality could run the other way, with tax incentives driving demand for VC, which could explain the low levels of VC investment observed in EU-13.

Tax credits in respect of the amount invested are the most popular form of incentive, followed by tax exemptions on the returns (current or capital) generated by the investment. However, it should be noted that it is common for schemes utilise multiple forms of incentive, with 13 doing so.

All of the schemes in the country sample use combinations of qualifying criteria, of varying complexity, to target particular businesses, investors, investments and holding periods. Targeting business based on their age and size (financial and/or number of employees) were the most common approaches. Investor targeting was mixed, with 28 schemes targeting individual investors, 10 schemes targeting corporate investors and eight schemes targeting both. The majority of schemes imposed an upper limit on the monetary value of investment attracting tax relief and all schemes place requirements on the investment holding period.

By virtue of utilising qualifying criteria, all of the schemes in the country sample were found to be administered on a non-discretionary basis. However, there was a general lack of transparent monitoring of fiscal costs and economic impacts.

Furthermore, there was a widespread lack of readily accessible guidance from implementing authorities on the design and operation of tax incentives. In terms of this study, this had the effect of limiting the coverage of data collection where alternative information sources could not be found. However, the real world impact of this will be the creation additional and avoidable compliance costs for prospective investors, in particular cross-border investors that are unfamiliar with the tax system of the jurisdiction in question. This could deter uptake of tax incentives, reducing the magnitude of their potential impact and/or create additional administrative costs associated with processing incorrect applications for relief.

The 46 tax incentive schemes were also compared in terms of the generosity afforded to the investor. This was assessed using an extension of the B-index (see **Section 6** for more detail). B-Index values were calculated for 29 tax incentives (those that offered upfront tax credits), from the 46 observed in the country sample. The results of the application of the B-Index are outlined in **Section 5.5.3**, but one notable case in is Israel's Angels Law, which offers 100% tax credit with the investment threshold of ILS 5m (about €1.24m), as it offers the greatest value of rebate to investors.

Among Member States, there is a high degree of convergence in characteristics of the various tax incentives. The majority of schemes operated by Member States utilised an upfront tax credit with business size targeting, restricted to individual investors with an investment size restriction and a minimum holding period.

Although there is no empirical foundation to this phenomenon, anecdotal evidence from policy makers has suggested that the State Aid approval process has created incentives for Member States to replicate the characteristics of schemes that have

already received State Aid approval. While reviewing international practice is a sensible step in the policy making process, importing international best practice without amendment may not be advisable. Such an approach could result in tax incentives that are not tailored to the local environment, which could fail to generate sufficient incentive effects, introduce concepts that are unfamiliar to the local investor base or create opportunities for abuse.

What are the desirable design features of VC and BA tax incentives?

Based on a review of the literature and analysis of real world examples of tax incentives a number of desirable design features were identified.

These are listed in **Table 1**. However, it is important to note that a number of design features shared common reasons for their desirability.

A number of design features were shown to contribute to addressing investor risk aversion, such as the provision of upfront tax relief and loss relief. This is important for addressing the market failures that result in an under-provision of investment to start-ups and SMEs. However, such design features may not be conducive to generating quality investment.

Certain design features promote the efficiency of tax incentive schemes by minimising their deadweight costs. These design features include related party restrictions, targeting new investment, investment thresholds and minimum investment holding periods. While these design features may not individually drive investment quality, they can, when used in combination, reduce the extent to which schemes can be abused for tax avoidance purposes. This should, to a certain extent, limit the volume of poor quality investment under such schemes.

Some design features, increase the efficacy of tax incentive schemes by targeting particular profiles of entrepreneurial firms. A combination of targeting in terms of business age, size and either the exclusion of certain sectors (finance or real estate) or an absence of sector targeting can avoid the problems associated with picking winners. These also serve to limit the deadweight costs of such schemes.

Other design features, such as systematic monitoring of fiscal costs and economic impacts can provide evidence to improve the effectiveness of the scheme or, at the very least, support the abolition of ineffective tax incentive schemes.

It is important to note that there were some instances where it was not possible to assess the desirability of certain design features. The main reason for this was a lack of research on the impacts of the design features in question. Tax incentives of this nature are under-researched in academia and by governments. Further research is required to bridge the gaps in our understanding of the impacts of design features.

How do existing tax incentives for VC and BA investment perform against best practice?

Using 16 principles of best practice derived from the desirable features of VC and BA tax incentive design, this report has benchmarked the 46 tax incentive schemes in operation in the country sample.

The United Kingdom's Seed Investment Scheme (SEIS) is the highest ranked tax incentive. This was driven by achieving high scores across scope, qualifying criteria and administration. SEIS uses a combination of age, size and excluded sectors to target entrepreneurial firms. It restricts the participation of related parties but has introduced allowances for business angels. It targets newly issued ordinary share

capital, imposing a maximum investment value attracting tax relief and a minimum holding period. In terms of administration SEIS is administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs.

The United Kingdom's Enterprise Investment Scheme (EIS) comes in second place. EIS' score is driven by good scores across scope, qualifying criteria and administration. The scheme offers upfront tax relief but does not provide loss relief on a more favourable basis than allowed by the baseline tax system. It targets entrepreneurial firms on the basis of size and excluded sectors, but does not use age targeting. It has introduced allowances to related party restrictions to permit the involvement of business angels. It is also administered on a non-discretionary basis and is subject to transparent annual monitoring of fiscal costs.

France's "Madelin" tax reductions was the third ranked incentive of the country sample. The scheme uses partial targeting of business size and age, which corresponds to good practice, as well as prohibiting the involvement of certain sectors (finance and real estate). It is only one of two schemes that score maximum for both the scope and qualifying criteria's.

In general, there was a high degree of homogeneity in the scope and administration benchmarking scores. However, there was a higher degree of heterogeneity in terms of qualifying criteria.

In terms of scope, the use of upfront relief on the amount invested and relief for investment returns was widespread. However, only three of the 48 tax incentives offered loss relief on a more favourable basis than afforded by the baseline tax system. This suggests that the role of upfront relief is widely recognised, but that there are opportunities to increase the extent to which schemes address downside investment risk through the use of loss relief.

In terms of administration, all tax incentives were administered on a non-discretionary basis, by virtue of the use of qualifying criteria, but very few underwent regular and transparent monitoring of fiscal costs and none were subject to regular and transparent impact assessments. This suggests that there are significant opportunities to increase the rigour and extent of monitoring and evaluation, which can provide useful information to increase the effectiveness of tax incentives.

In terms of qualifying criteria, the use of business targeting, investment thresholds and minimum holding period was common through the tax incentive schemes. However, a number of schemes did not conform to good practice in the use of business angel allowances in related party restrictions, or in targeting new investment, and information was unavailable for aspects of the qualifying criteria of a number of schemes. This indicates opportunities exist to increase the extent to which business angels can share knowledge with recipient companies, to reduce the deadweight cost of schemes, and to reduce compliance costs for investors.

Drawing on the benchmarking results, as well as controlling for the novelty, promise and diversity of different approaches, the following aspects of individual schemes were highlighted as good practice.

1. **INVEST, Germany:** Use of upfront relief administered outside the tax system, as well as transparent cost and impact monitoring.
2. **Employment and Investment Incentive Scheme, Ireland:** Use of additional performance-related tax incentive and regular and transparent fiscal cost monitoring.
3. **Tax treatment of crowdfunding loans, Belgium:** Novel targeting of investments through crowdfunding platforms.

4. **"Madelin" tax reductions, France:** Use of a combination of business criteria to target eligible firms.
5. **Angel Tax System, Japan:** Combining upfront tax relief with loss relief on more favourable terms than the baseline tax system.
6. **Venture Capital Trust, United Kingdom:** Tax-transparent treatment of investment returns and its fiscal cost is monitored and publically disclosed.
7. **Social Investment Tax Relief, United Kingdom:** Novel targeting of social enterprises.
8. **Venture Capital Limited Partnership program, Australia:** Novel targeting of foreign investors to promote cross-border VC.
9. **Tax shelter for investments in start-ups, Belgium:** Novel differentiation of relief for micro-enterprises and SMEs.
10. **Business Angel Scheme, Turkey:** Use of requirements for investor wealth/income and experience.

7.2 Policy implications

An overarching objective of this study is to provide best practice recommendations in the design of tax incentives for VC and BA investors. This is an increasingly popular area of tax policy. However, policy makers are not able to benefit from an extensive body of evidence when designing tax incentives of this nature.

Therefore, it is important that the answers to the research questions underpinning this study be translated into policy implications that are salient, actionable and grounded in best practice. These policy implications are outlined below.

Addressing investor risk aversion

The typically higher risk nature of investments in start-ups and SMEs, compounded by information asymmetries, presents a critical obstacle to VC and BA investment. Policy interventions aiming to stimulate VC and BA investment should aim to address investor risk aversion.

In terms of the design of tax incentives, this would suggest that policy makers should ensure that the features of a tax incentive contribute to derisking investments in SMEs and start-ups. This could include offering upfront tax credits or loss relief on a more favourable basis than afforded by the baseline tax system.

The problem of picking winners

While it may be conceptually desirable for policy makers to pick winners, in practice it is challenging for governments to successfully predict the success of any given venture and that by targeting support to certain types of firms, governments may inadvertently generate a crowding out effect (Coad *et al*., 2014, David *et al*. 2000, Storey, 1994).

Tax incentive design should recognise this by targeting entrepreneurial firms based on a number of criteria, such as age and size. It may be desirable to limit the involvement of certain sectors (e.g. finance and real estate) to avoid deadweight costs associated with incentivising capital preservation, but the exclusions should not be overly restrictive so as to prohibit the participation of innovative businesses that may sit at the intersection of sectors, such as fintech.

Achieving quantity of quality investment

It is important to recognise that not every investor using a tax incentive scheme is an active business angel or venture capitalist. However, that is not to say that schemes should prioritise investment quality over investment quantity. Rather, tax incentive schemes should seek to maintain a balance, promoting greater quantities of quality investment.

Investment quality can be achieved through a number of ways. The tax incentive could utilise qualifying criteria that limit the extent to which the scheme can be used for pure tax avoidance purposes, such as related party restrictions. Alternatively, schemes could utilise qualifying criteria that screen out unqualified investors, such as business experience criteria. They could also use performance-related tax relief to create incentives for the generation of knowledge spillovers.

However, it is important to balance this with maintaining an administrative framework that is not excessively exclusive so as to achieve viable levels of investment volume and coverage across the target population of SMEs.

Stability and awareness

Although not explicitly discussed in this study, a core tenet of good tax policy making is stability. The stability of the political and tax environment is a crucial factor for individuals and businesses making long-term investment decisions.

Tax incentives for VC and BA investment often sit at the margins of a tax system and are targeted to a relatively small subset of taxpayers. Therefore, there may be a tendency for policy makers to frequently refine and reform the features of tax incentive schemes.

Anecdotal evidence suggests that a lack of stability may deter the uptake of tax incentives. In the presence of instability in the tax system, the characteristically long holding periods of VC and BA investments may leave investors exposed to changes in the level of investment risk. This can dissuade VC and BA investors from utilising tax incentive schemes.

In addition to stability, awareness among target investors is another key concept that influences the uptake of tax incentive schemes. Empirical and anecdotal evidence suggests that investors may be simply unaware of the availability of tax incentives, which creates a fundamental obstacle to uptake. Linked to this, the lack of readily available revenue authority guidance on the operation of tax incentives can create additional and avoidable compliance costs for investors, as well as limiting awareness.

The uptake of tax incentives could be improved through a combination of increased stability in design features over time and awareness-raising.

Systematic monitoring and evaluation

Systematic monitoring and evaluation of tax incentives can support their design and reform, as well as promoting value for money.

It is undeniable that governments are a counterparty to investments made through these tax incentives; governments forego tax revenue in the expectation of positive macroeconomic outcomes and a growing tax base in the future. However, there is a widespread absence of transparent and systematic monitoring by governments of the fiscal costs and economic impacts generated by these tax incentives. While this is symptomatic of the challenges of analysing the impact of tax incentives for VC and BA investment, it may also be preventing the attainment of value for money.

Systematic monitoring of the fiscal costs of tax incentives can enable policy makers to manage the fiscal exposure of government budgets to individual schemes. Whereas, systematic evaluation of impacts of tax incentives could enable policy makers to increase the effectiveness of schemes by employing evidence-based design, as well as supporting the abolition of ineffective schemes.

Transparency and public disclosure of the results of systematic monitoring and evaluation of tax incentives could promote public engagement in policy, such as by encouraging public scrutiny and providing the foundations for public consultation on tax incentive reform. It would also provide much needed contributions to the international evidence base on the impact of tax incentives, which could stimulate new strands of analysis by researchers and academics.

7.3 Conditions of transferability

As this study has highlighted, international practice is a key source of inspiration in the design of tax incentives for VC and BA investors. Indeed, the policy implications set out above have been distilled from an analysis of international practice.

However, a focus on specific elements of international practice can often result in features of the enabling environment being overlooked. This can result in recommendations being divorced from the local context, which, when imported to another country, can result in inadequate consideration of the conditions required for successful transfer.

In order to support the successful transfer of international practice, a number of conditions of transferability have been set out below and are considered in more detail in **Appendix 2** to this document.

Design requirements

Elements of international practice that correspond to domestic policy objectives or the specific nuances of local market failures or investor preferences should be considered carefully before being transposed into the local tax system. It is important to ensure that design features such as these are adapted to fit the needs of the local context (legal, institutional, economic, political or otherwise).

Administrative requirements

The introduction of any form of international practice will be accompanied by new requirements and/or processes in the administration of tax incentive schemes. These should be considered carefully, with any necessary changes to existing administrative requirements being designed and tested in advance of the date of implementation.

Capacity building and training

Linked to the previous point, changes in administrative processes, regardless of the complexity or familiarity of new ideas, should be accompanied with support to those responsible for administering the tax incentive scheme in the implementing authority.

Capacity building and training initiatives in implementing authorities in response to the introduction of elements of international practice can support the efficient administration of tax incentive schemes.

Engagement with policy makers: Capacity building in revenue authorities

Training and capacity building in revenue authorities was viewed as critical to the success of tax incentives by workshop participants. A number of participants stressed that the need for training has grown in recent years as the public sector is expected to improve service quality amid tightening financial and manpower constraints.

Prior announcement and ongoing communication

The introduction of elements of international practice should be accompanied with prior announcement and ongoing communication to business, investor and advisor communities from the implementing authority. This should ensure that existing and prospective investors are aware of the scope and nature of changes to tax incentive schemes, which should support greater levels of uptake of schemes. In addition, prior announcement of changes can support scheme-level stability.

Engagement with policy makers: Consultation on policy reform

Working group participants agreed that consultation with investor and SME communities is a useful and necessary part of the reform process. However, a number of participants mentioned that the consultation process should be proportionate to the changes being considered. In addition, it was discussed that consultation may not always be desirable, particularly where reform is designed to combat the abuse of tax incentives.

Monitoring and evaluation frameworks

Development or refinement of monitoring and evaluation frameworks should accompany the introduction of elements of international practice in tax incentive design. This will ensure that the incremental fiscal cost and broader economic impacts of the design change will be assessed, which contributes to evidence-based policy making and the attainment of value for money.

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Annex 1: Debt and taxes

The aim of this annex is to briefly discuss the tax advantages of debt compared to equity financing. This section is mainly based on Graham, 2000, 2003 and 2006.

The author defines a 'classical tax system' as follows: Corporate income is taxed at rate τ_C. Interest payments are tax deductible and are paid out before taxes (assuming that a firm is not bankrupt). Profits are not tax deductible and can be paid from the residual cash flow remaining after interest and taxes. In addition, if an investor obtains interest payments, dividends or capital gains, these payments are taxed with rates τ_P, τ_D=τ_P and τ_G. For incomes from equity, the tax rate τ_E is applied (which is often modelled as a mixture of the tax rates on dividends and capital gains; see Graham, 2000). In the following it is assumed that these rates are constant (i.e. the rates τ_P, τ_C, τ_D, τ_G and τ_E neither depend on the income subject to be taxed by the corresponding tax nor on other forms of income).

Next the net benefit of one unit of income arising from buying debt to equity is compared. For one unit of interest, the investor gets $(1-\tau_P)$ while for one unity from equity the investor obtains$(1-\tau_C)(1-\tau_E)$ the difference is:

$$(1-\tau_P)-(1-\tau_C)(1-\tau_E)\ . \tag{1}$$

If expression (1) is positive, then there is an advantage for debt financing.

In more detail, when a frictionless economy with rational agents and without taxes is considered, the Modigliani and Miller (1958) theorem holds, where the firm value does not depend on leverage. By introducing a corporate income tax (and the assumptions that $\tau_E=\tau_P=0$ as well as "*the risk of cash-flows arising from tax deductions and of debt of the corresponding firm are the same*" hold), Modigliani and Miller (1963) show that a tax advantage exists and the firm value is affine linear in the corporate income tax rate τ_C, that is:

$$V_L=V_E+\tau_C D\ , \tag{2}$$

where V_L is the firm value of a levered firm, V_E is the firm value of a purely equity financed firm and D is the debt of the firm considered. Hence, in the economy considered in Modigliani and Miller (1963), pure debt financing is optimal.

Based on these quite extreme predictions of Modigliani and Miller (1958) and Modigliani and Miller (1963), corporate finance literature obtained models where the "*value increases with the use of debt because of tax benefits up to the point where the marginal cost equals the marginal benefit of debt*" (see Graham, 2006, Proposition 1). Prominent examples presented in Graham (2006) are Miller (1977) and DeAngelo and Masulis (1980). By introducing personal taxes with rates τ_P and τ_E, the authors show that:

$$V_L=V_E+\left[1-\frac{(1-\tau_C)(1-\tau_E)}{(1-\tau_P)}\right]D\ . \tag{3}$$

A net debt advantage exists if the term in squared brackets in expression (3) is positive. Note that equations (2) and (3) become equal if $\tau_P=\tau_E$.

The arguments discussed above do not include different kinds of cost arising in debt or/and equity financing. By including/approximating these cost, Graham (2000) obtained estimates of a tax rate function. By means of this tax function the author estimates a capitalized benefit on the firm value from debt of approximately 10%. Further discussions and empirical estimates are provided in Graham (2003) and Graham (2006).

Annex 2: Growth and venture capital

The aim of this annex is to outline, in more detail, the empirical results on the impact of venture capital financing on the economy.

Descriptive information on venture capital and aggregate variables are provided in Gornall and Strebulaev (2015) for the US. To measure the possible impacts of venture capital financing on the US economy, the authors distinguish between venture capital-backed and non-venture capital-backed public companies traded on the AMEX, the NASDAQ or the New York stock exchange. In their study, a company is called venture capital-backed if the firm received early stage funding by a venture capital fund. By selecting this data, the authors claim that *"..., by excluding private companies and acquisitions, our results underestimate the impact of VC on the US economy*." For the year 2014, the authors obtained data from 3,832 firms, where 17% were venture capital-backed (for more details see Gornall and Strebulaev, 2015, Table 2).

Regarding the impacts of venture capital, the authors state that "*Looking at the contribution of VC-backed public companies both overstates and understates the importance of VC. We overstate the importance of VC to the extent that successful VC backed companies may well have been successful even without VC financing. Of course, the fact that so many successful entrepreneurs choose VC financing suggests that this financing plays an important role in the entrepreneurial ecosystem. On the other hand, we the importance of VC financing understate because we ignore the positive spillovers these firms create*." In their overview article, Gornall and Strebulaev (2015) also provide descriptive statistics on job creation and R&D expenditures. Figure 2 in Gornall and Strebulaev (2015) shows the annual changes in employment for venture capital-backed companies as well as non-venture capital backed companies from 1974 to 2014. While the effect on employment of venture capital-backed companies was small in the 1970s and 1980s, for the last decades it can be observed that the employment arising from firms obtaining venture capital funding is substantial. Similar figures are observed for R&D.

The descriptive statistics provided in Gornall and Strebulaev (2015) do not 'prove' that venture capital creates employment and innovation. Also for the non-venture capital backed firms employment was created, R&D expenditures are also substantial. In addition, as already mentioned by the authors, observing correlation between the success of firms and venture capital investing need not imply that the success (parts of the success) are caused by the imputation of venture capital.

The remainder of this annex will discuss a number of studies that investigate the impact of venture capital on macroeconomic variables.

van Pottelsberghe de la Potterie and Romain (2004b) study the impact of venture capital on the multi-factor productivity. In their study, yearly data from 1990 to 2001 for 16 countries[62] was used. The authors discuss a direct effect of venture capital on multi-factor productivity, as well as an indirect effect arising from the development of an 'absorptive capacity of outside knowledge'. To investigate these effects the authors assume a Cobb-Douglas technology and estimate the model:

$$\ln MFP_{it} = \alpha_i + \alpha_t + \beta_{svc} \ln SVC_{it} + \beta_{sbrd1} \ln SBRD_{it-1} + \beta_{sbrd2} \ln SBRD_{it-2} + \sigma_U \Delta U_{it} + \sigma_G G + u_{it}\,, \quad (4)$$

[62] Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, the United Kingdom and the United States

where MFP_{it} is a multi-factor productivity index, SVC_{it} abbreviates the stock of domestic venture capital, $SBRD_{it-1}$ is the public R&D capital stock U_{it} stands for one minus the unemployment rate, while G is a dummy variable used to cope for the German unification in 1991. While model (4) is used to estimate the direct effect, the authors apply the following specification to investigate the indirect effect:

$$\begin{aligned}\ln MFP_{it} = {} & \alpha_i + \alpha_t + \beta_{sbrd1} \ln SBRD_{it-1} + \beta_{sbrd1r} (\ln SBRD_{it-1}) RDI_{it-1} \\ & + \beta_{sbrd1VC} (\ln SBRD_{it-1}) VCI_{it-1} + \beta_{sbrd2} \ln SBRD_{it-2} + \beta_{sbrd2r} (\ln SBRD_{it-2}) RDI_{it-2} \\ & + \beta_{sbrd2VC} (\ln SBRD_{it-2}) VCI_{it-2} + \sigma_U \Delta U_{it} + \sigma_G G + u_{it}.\end{aligned} \tag{5}$$

RDI_{it} and VCI_{it} abbreviate the R&D and the venture capital intensity (i.e. R&D or venture capital expenditures over gross domestic product). Table III in van Pottelsberghe de la Potterie and Romain (2004b) provides parameter estimates for model (5). By focusing on the impact of venture capital, it can be observed that the log venture capital stock has a significant impact on the log multi-factor productivity (on a 1% significance level). Regarding the indirect effect, the parameter estimates are provided in Table V in van Pottelsberghe de la Potterie and Romain (2004b). In addition, the parameters for the variables $(\ln SBRD_{it-1}) VCI_{it-1}$ and $(\ln SBRD_{it-2}) VCI_{it-2}$ are significant on a 1% significance level. Hence, based on van Pottelsberghe de la Potterie and Romain (2004b) significant direct and indirect effects of venture capital on multi-factor productivity are observed. Furthermore, section two in van Pottelsberghe de la Potterie and Romain (2004b) provides further literature in economic growth and venture capital.

In another article, Zhang *et al*. (2013) use yearly Israeli data for the time span 1995 to 2008 to investigate the impact of venture capital on gross domestic product. The authors consider a cointegrating regression:

$$\ln GDP_{it} = c + \beta^T x_t + u_t \ , \tag{6}$$

where GDP_{it} abbreviates the gross domestic product and x_t contains the natural logarithms of the variables venture capital, other capital, and employment variable, R&D expenditure over government expenditure in percentage terms and expenditures for education. The authors estimated the parameters by means of ordinary least squares and obtained the result that venture capital has a significant impact of venture capital on gross-domestic product.

Samila and Sorenson (2009) use yearly panel data of metropolitan areas in the US to investigate the impact of venture capital on the number of firms, employment and aggregate income. The time span considered is 1993 to 2002. Before presenting the empirical results obtained by the authors it is worth noting that Samila and Sorenson (2009) provide a careful discussion on what they call 'selection' and 'substitution'. That is to say, the question arises whether in the absence of venture capital start-up/firms would have obtained financing from alternative sources and "*how much of the firm value of the venture capital at the firm level stems from pre-investment activities?*". In their empirical analysis, the dependent variables, y_{it}, where $i = 1, \dots n = 329$ (metropolitan statistical areas) and $t = 1, \dots T = 10$ (periods 1993 to 2002), are establishments (the number of firms), employment (the number of employees) and total payroll (aggregate wages). The explanatory variables used are innovations, I_{it-1}, measured by the number of patents, supply of venture capital VC_{it} and the growth in the populations in region i at t, P_{it}. In addition, the authors consider

regional fixed and effects η_i, time trends ν_i as well as time fixed effects ϕ_t, resulting in the following fixed effects model:

$$\ln y_{it} = \beta_1 \ln I_{it-1} + \beta_2 \ln P_{it} + \beta_3 \ln VC_{it} + \phi_t + \eta_i + \nu_i t + u_{it} \ . \quad (7)$$

Tables 6 to 8 provide estimates for the fixed effects models where the venture capital variable turned out to be significant on a 5% significance level for most of the regression models. Since VC_{it} arises from and intersection of supply and demand (and VC_{it} can be considered to be jointly determined with the dependent variables), regressor endogeneity cannot be excluded. Based on this argument the authors constructed an instrumental variable LPR_{it} based on limited partnership returns. By using this instrument Samila and Sorenson (2009) performed instrumental variable estimation by using a likelihood estimator proposed by Stock and Yogo (2005). The results are presented in the Tables 9 to 11 and show statistically significant impacts of venture capital on employment, the number of new firms and aggregate wages.

Annex 3: Generosity

Possible extensions – Steps of development

Start with the B index for a R&D tax credit as proposed by Warda (2001, p. 205). Here the (corporate) statutory tax rate is denoted as τ and c is the tax credit. The simple B index is then defined as:

$$B = \frac{1-\tau-c}{1-\tau}$$

In the case of tax credits applicable to investments, the incentive is defined as a x percentage reduction of the applicable tax rate. Hence the B index can be rewritten as

$$B = \frac{1-\tau-\tau x}{1-\tau}$$

Combination of multiple forms of tax incentives in one scheme

There are a number of schemes in which incentives other than up-front tax relief are provided, for example, by relieving some or all of the tax due on dividend payments, or capital gains on disposal of shares.

If there are different forms to be included within a certain tax incentive, then instead of a certain value of τ, a tax-rate function of T should be introduced as an implementation of an if-then sequence, specific to a certain incentive:

$$B = \frac{1-T-Tx}{1-T}$$

Different minimum holding periods
If there are different holding periods, then from the view of B-index, there should be a technical split between each entry point in the investment cycle; therefore, in this case the actual B-index should be the summary of sub-B-indices:

$$B = i^2 \sum B_i = i^2 \sum \frac{1-T-Tx_i}{1-T}$$

B-index is a stock measure by nature, therefore does not have a time component. However, there is a possibility to use double-sums to express flow, but it should also be noted that this will increase the number of cases, and therefore the complexity of each individual measurement significantly:

$$B = c\frac{i^2}{j}\sum_j \sum_i \frac{1-T-Tx_i}{1-T_j}$$

It is also a possibility to measure the incentive with n holding periods with n different B-indices.

Thresholds

This approach is closely aligned with the original B-index. The values are normally between zero and unity, and a lower value of the B-index describes a more generous subsidy. Theoretically it can take any value. However, a value above unity would imply an additional tax on VC/BA investment and would therefore hardly be called a tax incentive. A negative value of the B-index is also possible and simply would imply a very generous tax credit (whereby the investment could be loss-making and still break-even for the investor). The generosity depends on the standard tax rate and the corresponding tax reduction. The most generous case in our sample is Israel with a 50% standard tax rate and full 100% reduction for BA/VC investment. This results in a B-index of zero (for investments below the threshold).

Thresholds (maximum amount of investment on which an investor can claim tax credit) should be incorporated as a key aspect of generosity. To do this, the first and third quartile of the threshold sizes offered by all the tax credit schemes are worked out, and the B-index generosity level computed for an investment for each of these levels. Our overall generosity figure will be the average of these two figures (where Q_1 is the value of the first, while Q_3 is the value of third quartile and η_i is the threshold for the actual incentive):

$$B = \begin{cases} \dfrac{\dfrac{1-\tau-\tau x\frac{Q_1}{\eta_i}}{1-\tau}+\dfrac{1-\tau-\tau x\frac{Q_3}{\eta_i}}{1-\tau}}{2} & if\ \eta_i < Q_1 \\ \dfrac{\dfrac{1-\tau-\tau x}{1-\tau}+\dfrac{1-\tau-\tau x\frac{Q_3}{\eta_i}}{1-\tau}}{2} & if\ \eta_i < Q_3 \\ \dfrac{\dfrac{1-\tau-\tau x}{1-\tau}+\dfrac{1-\tau-\tau x}{1-\tau}}{2} & \text{otherwise} \end{cases}$$

Annex 4: Robustness of benchmarking results

Section 6.1 of this report outlines the method for computing the benchmarking results. However, it is important to consider the robustness of the core assumptions made in this approach.
Aside from the principles of good practice, the main assumptions taken in this approach are as follows:

- Uniform weights across all categories of benchmark variables.
- Exclusion of missing information scores from the benchmarking.

In order to assess the impact of these assumptions relative to the baseline benchmarking methodology, two alternative benchmarking approaches have been developed. These are as follows:

- **Double-weight on administration**: The baseline benchmarking approach has been adapted to include a double-weight on administration, as per the approach taken in the European Commission's 2014 study on R&D tax incentives.
- **Inclusion of missing information scores**: The baseline benchmarking approach has been adapted to include missing information scores (i.e. scores of 2) in the benchmark variable category averages.

The Spearman's rank correlation for the rankings produced by each of the alternative benchmarking approaches has been calculated and is shown in **Table 19**. As is evident, the three approaches produces rankings that are highly correlated, providing an indication of the robustness of the core assumptions made in the baseline approach.

Table 20: Spearman's rank correlation for alternative benchmarking approaches

	Baseline	Double-weight on administration	Inclusion of missing information scores
Baseline	1.00	N/A	N/A
Double-weight on administration	0.99	1.00	N/A
Inclusion of missing information scores	0.91	0.92	1.00

Indeed, as **Table 21** shows, the top five schemes are consistent under the three options. The only change in the top five schemes occurs with the inclusion of missing information scores, where the United Kingdom's Social Investment Tax Relief scheme moves to third place and France's Madelin tax reduction scheme moves to fourth place.

Table 21: Robustness of top five schemes to alternative benchmarking approaches

Scheme	Country	Baseline	Uniform weights	Inclusion of missing information scores
Seed Enterprise Investment Scheme	UK	1	1	1
Enterprise Investment Scheme	UK	2	2	2
“Madelin” tax reductions	FR	3	3	4
Social Investment Tax Relief	UK	4	4	3
Venture Capital Trust	UK	5	5	5
“INVEST - Venture Capital Grant"	DE	5	5	5

Annex 5: Benchmarking results

Scope scores

Country	Scheme	Upfront relief on amount invested	Relief on returns	Loss relief	Mean
Australia	Early Stage Venture Capital Limited Partnership program	4	3	1	2.67
	Venture Capital Limited Partnership program	1	3	1	1.67
	Tax incentive for Early Stage Investors	4	4	1	3.00
Belgium	Tax shelter for investments in start-ups	4	1	3	2.67
	Tax treatment of crowdfunding loans	1	3	3	2.33
	Win-Win Lending Scheme	1	3	4	2.67
	Loan “Coup de pouce” (Wallonia)	4	1	3	2.67
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	4	1	3	2.67
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	4	1	3	2.67
	Provincial Investment Tax Credits	4	1	3	2.67
France	Additional	1	4	2	2.50

Country	Scheme	Upfront relief on amount invested	Relief on returns	Loss relief	Mean
	allowance on sale of shares in young (<10yrs incorporated) SMEs				
	"Madelin" tax reductions	4	4	2	4.00
	Wealth tax reliefs	4	1	3	2.67
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	1	3	2	2.00
	Venture Capital Funds (including FCPR, FCPI and FIP)	4	3	2	3.50
	PEA-PME	1	3	1	1.67
Germany	"INVEST - Venture Capital Grant"	4	3	3	3.33
Ireland	Employment & Investment Incentive	4	1	1	2.00
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	1	3	1	1.67
	The Angels Law	4	4	1	3.00
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	1	3	3	2.33
	Tax incentives for investing in innovative start-ups and innovative SMEs	4	1	3	2.67
	PIR (Piani Individuali di	4	1	3	2.67

Country	Scheme	Upfront relief on amount invested	Relief on returns	Loss relief	Mean
	Risparmio)				
Japan	Tax Incentives to Promote Venture Investment	1	4	4	3.00
	Angel Tax System	4	4	4	4.00
Malta	Seed Investment Scheme	4	4	1	3.00
Poland	Tax exemption on the disposal of stocks and shares	1	1	1	1.00
Portugal	"Programa Semente" (Tax relief for investing in Startups)	4	1	2	2.50
	Tax Relief for Business Angels	4	1	3	2.67
Slovenia	Corporate income tax regime	1	4	2	2.50
South Korea	Tax exemptions for venture capital companies	2	3	1	2.00
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	2	3	1	2.00
Spain	Deduction for investments in newly or recently created companies	4	4	3	3.67
	Regional incentives for business	4	1	3	2.67

Country	Scheme	Upfront relief on amount invested	Relief on returns	Loss relief	Mean
	angels				
Sweden	New Investment Incentive	4	1	3	2.67
Turkey	Business Angel Scheme	4	1	3	2.67
	Venture Capital Investment Trust Tax Exemption	1	3	1	1.67
	Private Equity Investment Fund	4	3	3	3.33
United Kingdom	Enterprise Investment scheme	4	4	4	4.00
	Seed Enterprise Investment Scheme	4	4	4	4.00
	Venture Capital Trust	4	3	3	3.33
	Social Investment Tax Relief	4	4	3	3.67
	Private Placement Withholding Tax Exemption	1	3	3	2.33
	Business Property Relief	1	4	3	2.67
United States	Qualified small business stock (QSBS)	1	4	3	2.67
	Investment tax credits	4	1	3	2.67

Qualifying criteria scores

Country	Scheme	Business age targeting	Business size targeting	Business sector targeting	Investor targeting	Related parties targeting	Cross-border investment targeting	Debt vs. equity targeting	New investment targeting	Investment size limits	Investment duration	Mean
Australia	Early Stage Venture Capital Limited Partnership program	1	4	4	4	2	4	4	4	4	4	3.67
	Venture Capital Limited Partnership program	1	4	4	4	2	4	4	4	4	4	3.67
	Tax incentive for Early Stage Investors	1	1	3	4	3	4	4	4	4	4	3.20
Belgium	Tax shelter for investments in start-ups	1	4	4	1	3	4	4	4	4	4	3.30
	Tax treatment of crowdfunding loans	4	4	3	1	4	4	1	4	4	4	3.30
	Win-Win Lending Scheme	1	4	3	1	3	1	1	4	4	4	2.60
	Loan “Coup de pouce” (Wallonia)	4	4	4	1	3	1	4	4	4	4	3.30
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	4	4	4	4	2	4	4	2	4	4	4.00
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	4	4	4	4	2	4	4	2	4	2	4.00
	Provincial Investment Tax Credits	4	4	4	4	2	4	4	4	4	4	4.00
France	Additional	4	4	4	4	2	4	4	1	1	4	3.33

Country	Scheme	Business age targeting	Business size targeting	Business sector targeting	Investor targeting	Related parties targeting	Cross-border investment targeting	Debt vs. equity targeting	New investment targeting	Investment size limits	Investment duration	Mean
	allowance on sale of shares in young (<10yrs incorporated) SMEs											
	"Madelin" tax reductions	4	4	4	4	2	4	4	4	4	4	4.00
	Wealth tax reliefs	4	4	4	4	2	4	4	1	4	4	3.67
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	2	2	3	4	2	1	4	1	1	4	2.57
	Venture Capital Funds (including FCPR, FCPI and FIP)	1	4	3	4	2	4	4	1	4	4	3.22
	PEA-PME	1	4	3	4	2	4	4	1	4	4	3.22
Germany	"INVEST - Venture Capital Grant"	4	4	3	1	2	4	4	4	4	4	3.56
Ireland	Employment & Investment Incentive	1	4	4	1	3	4	4	4	4	4	3.30
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	4	1	1	4	2	4	4	2	1	2	2.71
	The Angels Law	4	4	3	4	2	4	4	4	4	4	3.89
Italy	Tax incentives for investing in Venture Capital	4	4	3	4	2	2	4	1	4	2	3.43

Country	Scheme	Business age targeting	Business size targeting	Business sector targeting	Investor targeting	Related parties targeting	Cross-border investment targeting	Debt vs. equity targeting	New investment targeting	Investment size limits	Investment duration	Mean
	Funds (VCF)											
	Tax incentives for investing in innovative start-ups and innovative SMEs	4	4	3	4	2	4	4	1	4	2	3.50
	PIR (Piani Individuali di Risparmio)	1	1	3	4	2	1	4	1	4	2	2.38
Japan	Tax Incentives to Promote Venture Investment	2	2	2	4	2	4	4	1	2	2	3.25
	Angel Tax System	4	4	3	4	2	4	4	1	1	1	2.89
Malta	Seed Investment Scheme	4	4	4	1	3	2	4	4	4	4	3.56
Poland	Tax exemption on the disposal of stocks and shares	1	4	4	1	2	4	4	1	4	4	3.00
Portugal	"Programa Semente" (Tax relief for investing in Startups)	4	4	3	1	2	4	4	1	4	4	3.22
	Tax Relief for Business Angels	4	4	4	1	3	4	4	1	2	1	2.89
Slovenia	Corporate income tax regime	2	2	3	4	2	4	4	2	2	2	3.75
South Korea	Tax exemptions for venture capital companies	2	2	2	4	2	4	4	4	2	2	4.00

Country	Scheme	Business age targeting	Business size targeting	Business sector targeting	Investor targeting	Related parties targeting	Cross-border investment targeting	Debt vs. equity targeting	New investment targeting	Investment size limits	Investment duration	Mean
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	2	2	4	4	2	4	4	2	2	2	4.00
Spain	Deduction for investments in newly or recently created companies	4	4	4	1	4	4	4	1	4	4	3.40
	Regional incentives for business angels	4	4	4	1	4	4	4	2	4	4	3.67
Sweden	New Investment Incentive	1	4	4	1	1	4	4	1	4	4	2.80
Turkey	Business Angel Scheme	1	4	3	4	4	4	4	1	4	4	3.30
	Venture Capital Investment Trust Tax Exemption	1	1	3	4	2	1	4	1	1	1	1.89
	Private Equity Investment Fund	1	1	3	4	2	1	3	1	2	1	1.88
United Kingdom	Enterprise Investment scheme	1	4	4	4	4	4	4	4	4	4	3.70
	Seed Enterprise Investment Scheme	4	4	4	4	4	4	4	4	4	4	4.00
	Venture Capital Trust	1	4	4	4	2	4	3	4	4	4	3.56
	Social Investment Tax Relief	1	4	4	4	3	4	3	4	4	4	3.50

Country	Scheme	Business age targeting	Business size targeting	Business sector targeting	Investor targeting	Related parties targeting	Cross-border investment targeting	Debt vs. equity targeting	New investment targeting	Investment size limits	Investment duration	Mean
	Private Placement Withholding Tax Exemption	1	1	3	4	3	4	1	4	1	2	2.44
	Business Property Relief	1	1	3	4	2	4	4	1	1	4	2.56
USA	Qualified small business stock (QSBS)	1	4	4	4	2	1	4	4	1	4	3.00
	Investment tax credits	4	4	3	4	2	4	4	1	4	4	3.56

Administration scores

Country	Scheme	Discretion	Fiscal cost monitoring	Impact monitoring	Mean
Australia	Early Stage Venture Capital Limited Partnership program	4	3	1	2.67
	Venture Capital Limited Partnership program	4	3	1	2.67
	Tax incentive for Early Stage Investors	4	3	1	2.67
Belgium	Tax shelter for investments in start-ups	4	3	1	2.67
	Tax treatment of crowdfunding loans	4	4	1	3.00
	Win-Win Lending Scheme	4	4	1	3.00
	Loan “Coup de pouce” (Wallonia)	4	3	1	2.67
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	4	3	1	2.67
	Federal Labour-Sponsored Venture Capital Corporation Tax Credit	4	4	1	3.00
	Provincial Investment Tax Credits	4	3	1	2.67
France	Additional allowance on sale of shares	4	3	1	2.67

Country	Scheme	Discretion	Fiscal cost monitoring	Impact monitoring	Mean
	in young (<10yrs incorporated) SMEs				
	“Madelin” tax reductions	4	3	1	2.67
	Wealth tax reliefs	4	3	1	2.67
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	4	3	1	2.67
	Venture Capital Funds (including FCPR, FCPI and FIP)	4	3	1	2.67
	PEA-PME	4	3	1	2.67
Germany	“INVEST-Venture Capital Grant"	4	4	1	3.00
Ireland	Employment & Investment Incentive	4	4	1	3.00
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	4	3	1	2.67
	The Angels Law	4	3	1	2.67
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	4	3	1	2.67
	Tax incentives for investing in innovative start-ups and innovative SMEs	4	3	1	2.67
	PIR (Piani Individuali di Risparmio)	4	3	1	2.67
Japan	Tax Incentives to Promote Venture	4	3	1	2.67

Country	Scheme	Discretion	Fiscal cost monitoring	Impact monitoring	Mean
	Investment				
	Angel Tax System	4	3	1	2.67
Malta	Seed Investment Scheme	4	3	1	2.67
Poland	Tax exemption on the disposal of stocks and shares	4	3	1	2.67
Portugal	"Programa Semente" (Tax relief for investing in Startups)	4	3	1	2.67
	Tax Relief for Business Angels	4	3	1	2.67
Slovenia	Corporate income tax regime	4	3	1	2.67
South Korea	Tax exemptions for venture capital companies	4	3	1	2.67
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	4	3	1	2.67
Spain	Deduction for investments in newly or recently created companies	4	3	1	2.67
	Regional incentives for business angels	4	3	1	2.67
Sweden	New Investment Incentive	4	3	1	2.67

Country	Scheme	Discretion	Fiscal cost monitoring	Impact monitoring	Mean
Turkey	Business Angel Scheme	4	3	1	2.67
	Venture Capital Investment Trust Tax Exemption	4	3	1	2.67
	Private Equity Investment Fund	4	3	1	2.67
United Kingdom	Enterprise Investment scheme	4	4	1	3.00
	Seed Enterprise Investment Scheme	4	4	1	3.00
	Venture Capital Trust	4	4	1	3.00
	Social Investment Tax Relief	4	4	1	3.00
	Private Placement Withholding Tax Exemption	4	3	1	2.67
	Business Property Relief	4	4	1	3.00
USA	Qualified small business stock (QSBS)	4	3	1	2.67
	Investment tax credits	4	3	1	2.67

Overall scores and ranks

Country	Scheme	Benchmark scores				
		Scope	Qualifying criteria	Administration	Overall score	Rank
Australia	Early Stage Venture Capital Limited Partnership program	2.67	3.67	2.67	3.00	15
	Venture Capital Limited Partnership program	1.67	3.67	2.67	2.67	38
	Tax incentive for Early Stage Investors	3.00	3.20	2.67	2.96	21
Belgium	Tax shelter for investments in start-ups	2.67	3.30	2.67	2.88	25
	Tax treatment of crowdfunding loans	2.33	3.30	3.00	2.88	25
	Win-Win Lending Scheme	2.67	2.60	3.00	2.76	34
	Loan “Coup de pouce” (Wallonia)	2.67	3.30	2.67	2.88	25
Canada	Provincial Labour-Sponsored Venture Capital Corporation Tax Credit	2.67	4.00	2.67	3.11	12
	Provincial Investment Tax Credits	2.67	4.00	3.00	3.22	8
France	Additional allowance on sale of shares in young	2.67	4.00	2.67	3.11	12

Country	Scheme	Benchmark scores				
		Scope	Qualifying criteria	Administration	Overall score	Rank
	(<10yrs incorporated) SMEs					
	"Madelin" tax reductions	2.50	3.33	2.67	2.83	29
	Wealth tax reliefs	4.00	4.00	2.67	3.56	3
	Venture Capital Firms (Sociétés de Capital Risque or SCR)	2.67	3.67	2.67	3.00	15
	Venture Capital Funds (including FCPR, FCPI and FIP)	2.00	2.57	2.67	2.41	43
	PEA-PME	3.50	3.22	2.67	3.13	11
Germany	"INVEST-Venture Capital Grant"	1.67	3.22	2.67	2.52	41
Ireland	Employment & Investment Incentive	3.33	3.56	3.00	3.30	5
Israel	Plan for Encouragement of Institutional Investment in Hi-Tech	2.00	3.30	3.00	2.77	33
	The Angels Law	1.67	2.71	2.67	2.35	44
Italy	Tax incentives for investing in Venture Capital Funds (VCF)	3.00	3.89	2.67	3.19	9
	Tax incentives for investing in innovative start-ups and innovative SMEs	2.33	3.43	2.67	2.81	30
	PIR (Piani Individuali di	2.67	3.50	2.67	2.94	22

Country	Scheme	Benchmark scores				
		Scope	Qualifying criteria	Administration	Overall score	Rank
	Risparmio)					
Japan	Tax Incentives to Promote Venture Investment	2.67	2.38	2.67	2.57	40
	Angel Tax System	3.00	3.25	2.67	2.97	18
Malta	Seed Investment Scheme	4.00	2.89	2.67	3.19	9
Poland	Tax exemption on the disposal of stocks and shares	3.00	3.56	2.67	3.07	14
Portugal	"Programa Semente" (Tax relief for investing in Startups)	1.00	3.00	2.67	2.22	45
	Tax Relief for Business Angels	2.50	3.22	2.67	2.80	31
Slovenia	Corporate income tax regime	2.67	2.89	2.67	2.74	35
South Korea	Tax exemptions for venture capital companies	2.50	3.75	2.67	2.97	18
	Tax deductions and exemption from capital gains tax for individual investors in venture capital funds	2.00	4.00	2.67	2.89	23
Spain	Deduction for investments in newly or recently	2.00	4.00	2.67	2.89	23

Country	Scheme	Benchmark scores				
		Scope	Qualifying criteria	Administration	Overall score	Rank
	created companies					
	Regional incentives for business angels	3.67	3.40	2.67	3.24	7
Sweden	New Investment Incentive	2.67	3.67	2.67	3.00	15
Turkey	Business Angel Scheme	2.67	2.80	2.67	2.71	37
	Venture Capital Investment Trust Tax Exemption	2.67	3.30	2.67	2.88	25
	Private Equity Investment Fund	1.67	1.89	2.67	2.07	46
United Kingdom	Enterprise Investment scheme	3.33	1.88	2.67	2.63	39
	Seed Enterprise Investment Scheme	4.00	3.70	3.00	3.57	2
	Venture Capital Trust	4.00	4.00	3.00	3.67	1
	Social Investment Tax Relief	3.33	3.56	3.00	3.30	5
	Private Placement Withholding Tax Exemption	3.67	3.50	3.00	3.39	4
	Business Property Relief	2.33	2.44	2.67	2.48	42
USA	Qualified small business stock (QSBS)	2.67	2.56	3.00	2.74	35
	Investment tax credits	2.67	3.00	2.67	2.78	32

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