Chapter 4

Financing of public research-based spin-offs

The financing of public research-based spin-offs – from research to market – takes place at various stages in the firm development cycle. National policy instruments have focused on the seed funding stage, but support has shifted to proof-of-concept and prototype funding. Universities and PRIs are also providing institutional support, ranging from institutional risk capital funds, mentoring and incubation support to IP assessment services and business development plans. Corporate venturing, research crowdfunding and using IP for financing purposes represent additional sources of financing for public research spin-offs, but the scale of financing remains limited in most cases.

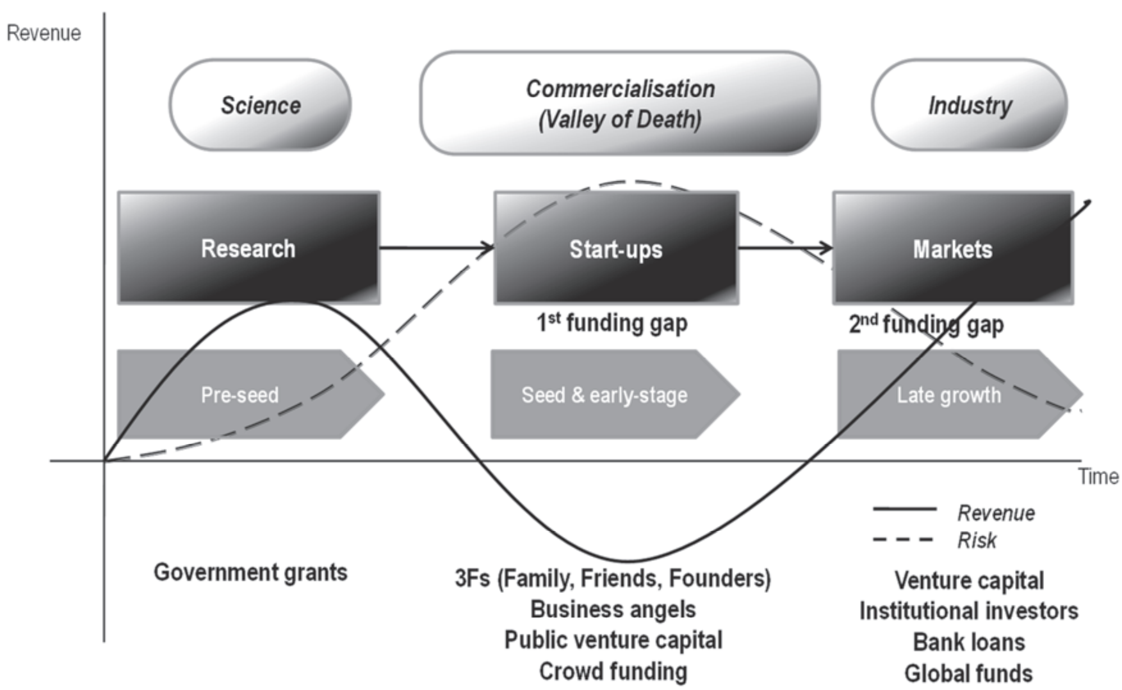
Constraints in financing public research spin-offs

The financing of innovation from invention through to commercialisation requires long-term capital commitments. New ventures, particularly technology-based public research spin-offs, face the liabilities of newness and smallness, which impede their access to resources such as financial capital. The economic and financial crisis has accentuated the difficulties for early-stage firms to finance their innovation activities, and in addition reduced confidence in the ability of markets for complex products to address information asymmetries and align risks and rewards.

Traditional financing techniques based mainly on debt and guarantees, as well as mezzanine finance, have only limited relevance for research spin-offs, due to uncertain technological success and typically because most spin-offs have not reached profitability. Broad empirical evidence has found that public research-based spin-offs and start-up firms in R&D-intensive and high-technology industries face a higher cost of capital (e.g. due to asymmetric information between inventor/entrepreneur and investor) than their larger competitors and firms in other industries (Hall, 2009). In addition to higher capital costs, failures in financial markets and the inherent risks with regard to the outcomes of public research results have justified public support to academic entrepreneurs.

This gap between the need for resources to develop entrepreneurial ideas into commercial products and services and the availability of funding is often referred to as the "valley of death" (Auerswald and Branscomb, 2003; see Figure 4.1). The existence of a funding gap that limits the possibility to turn research results into commercially viable products and services and to attract private investors has led governments and, increasingly, individual institutions to provide financing to public research spin-offs.

Figure 4.1. Financing tools for different stages of research commercialisation



National-level support

There has been a rise in specific national financial schemes that target certain stages of the spin-off process (Table B.4), but also an increase in funding for advisory and technical services. Generally, the different types of national support for research spin-offs vary in terms of their size, scope, and degree of interaction, and can be distinguished between 1) proof-of-concept (PoC), 2) pre-seed and 3) seed funding (Table 4.1). Rasmussen and Sørheim (2012) observe that spin-off programmes have developed away from offering funding in the form of seed schemes and toward initiatives that tackle technological and organisational uncertainties, which may inhibit the diffusion and adaption of new technologies.

Table 4.1. The main characteristics of different types of government funding for public research spin-offs

	Proof-of-concept	Pre-seed	Seed
Goal	Reduce the technological uncertainty of the project by verifying its technological feasibility	Reduce the organisational uncertainty of the project by preparing it organisationally for further investment	Reduce the investment risk associated with the project by providing funding that accepts a higher risk than would most private actors
Approach	Demand-side: increase the attractiveness of university spin-offs for investors	Demand-side	Supply-side: increase the supply of early-stage funding
Type of government support	Usually 100% grant-based	Usually grant based but sometimes convertible to equity	Usually equity or loans
Manager of funds	Usually government agency	Varies, but often regional agent	Usually private agent or independent government unit
Funding decision	Usually by application and panel review, similar to research funding	Varies, but usually made at regional level	Investment decision accepting high risk
Type of activity supported	Technology development at project level	Market and management development by entrepreneurs or consultants	Venture launch
Main criteria for funding	Market potential of technology	Combination of individual and project characteristics	Growth potential of the new venture
Anticipated outcome	University spin-off or license to existing firm	University spin-off	High-growth university spin-offs

Note: Based on observations from Canada, Finland, Ireland, Norway, Sweden and the United Kingdom.

Source: Rasmussen and Sørheim, 2012.

In Germany, for example, support for university spin-offs was developed through the EXIST programme. EXIST consists of three components: culture of entrepreneurship, business start-up grant, and transfer of research. These initiatives focus primarily on encouraging commercialisation of research results generated by universities and research institutes, and provide both grants and coaching for scientists, university graduates and students at early-stage start-ups, who develop their ideas into a marketable product (Box 4.1).

In Austria, the Federal Ministry for Transport, Innovation and Technology (BMVIT) supports new technology-based firms through the Seed Financing programme (operated by Austria *Wirtschaftsservice* – AWS) and spin-offs through the AplusB – Academy plus Business programme, operated by the Austrian Research Promotion Agency (FFG). The former promotes high-technology start-ups before and during the establishment phase. The criteria for allocations are novelty, technological intensity, development potential and willingness to risk. The Seed Financing programme provides mezzanine capital for high-growth technology-based SMEs and guarantees for venture capital. As a sponsoring bank, the AWS – which covers all forms of business-related support for economic operators – offers several programmes in this context: subsidies, favourable interest rates on credits from the AWS-administered agency fund ERP, assumption of liability, backing, and advice (*Eigenkapitalförderung*, Protec 2002+, etc.). AWS provides soft aid programmes, especially to SMEs, to support inward technology transfer (“protec TRANS”) and innovation management (“protec INNO”). The AWS has a special funding programme, High-Tech Double Equity, which doubles private equity or venture capital via a 100% guarantee for a bank loan.

The Netherlands has experimented with several schemes for the creation of new firms and SMEs. The Dutch TechnoPartner Seed Facility – introduced in 2005 as part of the overall TechnoPartner programme to raise the number and quality of high-technology start-ups by improving access to capital and providing specific information and coaching – seeks to eliminate the equity gap frequently faced by Dutch high-technology start-ups. Drawing on experience with related schemes in the United States and the United Kingdom, this facility aims to stimulate small business investment companies (SBICs) established by private parties. Own capital brought into the SBICs is matched by government loans.

In the United States, the Small Business Innovation Research (SBIR) programme, which was launched in 1982, aims to encourage novel R&D with a high-risk focus on creating a new venture, serving as a bridge between universities and markets. The SBIR programme is highly decentralised, as is most US R&D funding, spread across 11 agencies with different missions and sizes and no formal budget process. SBIR funding is equal to 2.5% of federal R&D funding, a percentage that will rise to 3.2% by 2017. In addition, the Small Business Technology Transfer Research (STTR) funds high-risk R&D with commercial potential, enabling researchers to overcome financial barriers. A key criterion for funding is that small businesses must formally collaborate with PROs. Participating agencies set aside 0.3% of their R&D budgets to support the programme.

The United Kingdom provides support for the commercialisation of university-based research with programmes such as the University Challenge, Science Enterprise Challenge and Higher Education Fund. In Russia, the START programme was launched in 2004 to stimulate spin-off activity from universities and PRIs. Similar to the SBIR programme in the United States, it consists of three phases over three years. The programme targets filling the funding gap particularly for young, small start-ups at seed and early stages.

Canada’s Idea to Innovation Grants (I2D) aims to accelerate the pre-competitive development of technology originating from public research by providing funding to researchers to support the creation of spin-offs. Eligible activities for proof-of-concept funding include (but are not limited to) verifying applications, conducting field studies, preparing demonstrations, building prototypes and performing beta trials.

Norway's FORNY2020 has been streamlined into two funding schemes: basic funding and proof-of-concept funding. The basic funding targets Norwegian technology transfer offices (TTOs); the aim of the PoC scheme is to reduce technological and commercial risks to such an extent that existing industry and/or venture capitalists are willing to buy into the project and bring it to fruition. Projects applying for funding must originate from publicly funded R&D institutions. PoC funding from FORNY2020 requires that the projects have as their target the development of products, processes or services that are new to the international market. The scheme is technology-neutral. TTOs receive basic funding; other bodies focusing on commercialisation and representing publicly funded R&D institutions and micro enterprises originating from publicly funded R&D institutions may apply.

Box 4.1. Examples of national programmes supporting public research spin-offs

Commercialisation Australia (Australia)

Commercialisation Australia is a government flagship initiative for the Australian entrepreneurs. The programme places emphasis on turning IPs into a commercial reality, and provides financing as well as mentoring. It is a competitive, merit-based program and constitutes key four components:

- Skills and knowledge: grants up to AUD 50 000, to access expert advice and services, on an 80:20 basis, up to one year.
- Experienced executives: grants up to AUD 350 000 over two years, to engage an experienced chief executive officer (CEO) or other executives, on a 50:50 basis.
- Proof of concept: grants from AUD 50 000 up to AUD 250 000, to assist with establishing the commercial viability of a new product, process or service, for a year (up to 18 months, if agreed), on a 50:50 basis.
- Early stage commercialisation: grants from AUD 50 000 up to AUD 2 million, to undertake activities focused on bringing a new product, process or service to market, for two years, on a 50:50 basis.

EXIST programme (Germany)

The EXIST Culture of Entrepreneurship supports a variety of projects at universities to nurture entrepreneurship on a three-year basis. The EXIST Business Start-up Grant aims to support early-stage start-ups from universities and public research institutions (PRIs). The maximum period of support is one year and the grant varies from EUR 800 to EUR 2 500 per month, depending on the level of degree.

- Doctorate holders: EUR 2 500/month; graduates: EUR 2 000/month; undergraduates: EUR 800; child supplement: EUR 100/month/child.
- Material expenses: up to EUR 10 000 for individual start-ups; up to EUR 17 000 for teams.
- Start-up related coaching: EUR 5 000.

The EXIST Transfer of Research promotes technology-based business start-up projects in the pre-start-up and start-up stages from universities and research institutes. It complements the broadly targeted EXIST Business Start-up Grant with an excellence-oriented measure for high-tech start-ups.

- Phase I: up to EUR 60 000 at pre-start-up stage for material expenses; staff cost separately paid, up to 18 months, enabling start-ups to provide proof of the technological feasibility of their product idea.
- Phase II: up to EUR 150 000, at start-up stage, but at most 75% of the project-related costs, allowing them to continue the product design and the prototype realisation.

…/…

Box 4.1. Examples of national programmes supporting public research spin-offs *(cont'd)*

***START Programme* (Russian Federation)**

The START programme aims to stimulate commercialisation, focusing on spin-offs from universities and PRIs. The three-year budget totals USD 250 000, and about 400 new teams join the programme each year, out of approximately 1 500 applications. Around 25-30% of the 400 graduate to the second year, and about 70% qualify to receive financing in the third year.

- 1st year: financing up to USD 40 000, to cover R&D and convince private investors of the commercial potential of the new venture.
- 2nd year: financing is granted only if private investors participate on a 50:50 basis.
- 3rd year: financing is granted only if developments are in line with the business plan and sales have already started in addition to the co-financing on a 50:50 basis.

SBIR programme (United States)

The SBIR programme finances early-stage R&D projects in small firms (a number of which are spin-offs from PROs) in two steps, through a merit-based open competition. Only about 14% receive Phase I awards and 40 out of these receive Phase II awards.

- Phase I: USD 150 000 total costs up to 6 months for a feasibility study.
- Phase II: USD 1 000 000 total costs up to 2 years, granted only to Phase I awardees to continue the R&D efforts initiated in Phase I.
- Phase III: pursue commercialisation of projects resulting from Phases I and II, with non-SBIR funds through either procurement fund from federal agencies or private investments.

Institutional-level support

Many PRO administrations are taking further steps to complement national programmes by setting up their own PoC and seed funds (i.e. institutional risk capital funds), either fully funded or co-funded with institutional resources. The first pioneering experiences were in the United States after the Second World War to sustain technology-based spin-offs from MIT (Lerner, 2005). In 2011, there were about 70 universities in the United States that had established internal gap funding programmes (Johnson, 2011). In Europe, around 73 university and PRIs oriented seed funds and 48 PoC funds have been identified. Typically, most gap funding programmes, whether PoC or seed funds, also provide business and advisory services, incubator space, market research and educational training.

There is however a wide heterogeneity in gap funding programmes, in terms of which stages of commercialisation they support (e.g. from proof-of-concept funding to post-seed funding), governance (e.g. managed by internal or external TTO, investment professionals or a venture capital [VC] firm) and business models (e.g. investment focus, number of serviced institutions). Some funds also share features with private sector patent and IP funds. For example, the Karolinska Development Fund in Sweden invests money raised from the capital market back into the 26 partly owned portfolio spin-offs.

The available empirical evidence of the positive impact of institutional gap funding programmes is mixed. Lerner (2005) states that governments and institutions should be cautious about the success of later-stage equity funds, given the limited number of ventures generated. By analysing Boston University's VC subsidiary and ARCH initiative of the University of Chicago, Lerner (2009) concludes that this type of instrument runs the risk of generating a limited deal-flow or backing unsustainable ventures. For the United Kingdom, Nightingale et al. (2009) find that public schemes, including from universities, have a positive impact on firm performance but the size of their impact remains modest. In addition, they find that the recipients of university seed funding seem to be characterised by a higher likelihood to be acquired than other types of VC-backed new ventures. Exploratory results by Munari and Toschi (2013) indicate that a minimum efficient scale in terms of fund size and specialised competences from the management team are required to positively impact firm performance. In addition, publicly funded risk capital funds may encounter a recurring set of problems (Box 4.2).

Box 4.2. Publicly financed and managed risk funds – performance and stylised facts

- The managers of public funds are often civil servants. As such, they may lack the experience and skills required to successfully select and support investee firms.
- Incentive systems in publicly owned funds may fail to attract suitably skilled venture fund managers. They may also fail to encourage good performance in ways that private venture funds would, for instance through performance-linked bonuses.
- Public funds may displace private funds. This is especially likely if public schemes finance projects at below-market rates. Displacement is not only financial: public investment expertise will also displace private expertise, which is likely to be more skilled. There is evidence both for and against the proposition that public funds "crowd out" private funds.
- If public funds forego commercial objectives so as to meet other policy goals, the ability to attract private investments and professional fund managers might be limited. In such cases, the sustainability of the programme will be in jeopardy.

Source: OECD (2013), *OECD Reviews of Innovation Policy: Sweden 2012*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264184893-en;
Leleux and Surlemont (2003), "Public versus private venture capital: Seeding or crowding out? A pan-European analysis", *Journal of Business Venturing*, Vol. 18, pp. 81-104.

Spin-offs created on the basis of a patent usually enter a licensing agreement with the PRO, which is the owner of the patent. After a spin-off completes the license agreement, the PRO usually requires upfront licensing fees or a fee for patent-related expenses before it has had time to repay this through income streams. This may constitute a serious problem for undercapitalised spin-offs. While some PROs provide patent assistance programmes, some have begun to take equity shares or shares of future revenues instead. Case study evidence from Canadian and US universities shows that the financial reward of taking equity is more than ten times the average annual income from a traditional license, and is significantly higher than the amount usually received as a license issue fee (Bray and Lee, 2000). Survey results in Europe show that 48% of PROs take equity shares and 46% shares of future revenues (European Commission, 2012).

Closely tied to financing is the provision of facilities and equipment through bridging organisations such as technology/business incubators and science parks (Chapter 3.2 for overview). Created by PROs and in most cases assisted with government funding, business incubators and science parks attempt to create environments in which new ventures can flourish. The creation of science parks (and their synonyms such as technology and research parks) in the late 1970s and early1980s was followed in the 1990s by increasing efforts to establish business incubators. Clarysse et al. (2005)

analysed business incubation strategies at European PROs; they distinguish between three models: *i)* low selective (oriented towards maximising the number of spinoffs created); *ii)* supportive (oriented towards generating revenue from spin-offs); and *iii)* the incubator model (oriented towards a financial gain at the point of exit). However, whether science parks and business incubators prove to be effective in terms of incubating successful spin-offs remains unclear (Salvador, 2011).

Alternative and new sources of financing

Venture capital investors are generally willing to provide financing to spin-offs that have not yet reached positive cash flows. Not only do they play a crucial role by providing capital investments, but they also emerge as critical for establishing networks with suppliers and customers and increasing the managerial competencies of the spin-off team. Survey evidence from Ortin-Angel and Vendrell-Herrero (2010) indicates that public research spin-offs are more likely to obtain venture capital investments than other late-stage start-ups (see also Toole and Czarnitzki, 2007). The authors conclude that this may be due to the lack of managerial skills, which usually venture capital investors are able to provide. Providing platforms to connect spin-offs with venture capital firms or experienced entrepreneurs can be thus an effective mechanism to provide the necessary financial funds and management expertise. CoFoundersLab is such an example, where a large group of entrepreneurs is looking to join a start-up or be joined on their venture, allowing the entrepreneurs to access resources and network relationships.[1]

While venture capital tends to attract the bulk of the attention from policy makers, the primary source of external seed and early-stage equity financing in many countries is angel financing, not venture capital (OECD, 2011). Angel funding can be an alternative, in particular as the mobilisation of angel funding is becoming easier as structures form. However, while angel funding represents an alternative, angel investors appear to remedy the funding gap only marginally, as they usually raise smaller amounts of capital than other investors (Wright et al., 2007).

The Internet has also contributed to an alternative or new source of early-stage equity capital, such as crowdfunding –"democratised" or highly distributed capital raisings. Crowdfunding, in all its varieties, is a potential source of pre-seed and seed capital, loans, revenue and donations. According to Crowdsourcing.org, almost USD 1.5 billion was raised world-wide in 2011 by crowdfunding platforms, some of them operating to fund public research ventures. *#SciFund Challenge*, for example, brings researchers together to raise money directly from society at large; it aims to fund research activities in new ways and to connect the ordinary citizen to the excitement of doing science. At the institutional level, the University of Utah's TTO entered an exclusive agreement in 2013 with crowdfunding platform RocketHub. The aim is to streamline university crowdfunding under a new web portal and to showcase promising university spin-offs that would otherwise have had inadequate funding to demonstrate the viability of their technology.[2]

There is an active debate surrounding the potential of crowdfunding to alleviate the financing gap faced by research-based ventures. Currently, equity-based crowdfunding is not allowed in most OECD countries, largely due to the lack of institutionalisation. In the United States the JOBS Act, passed in 2012, allows businesses to raise equity capital from crowdfunding, thus providing an exemption from Securities and Exchange Commission (SEC) regulations for transactions. This may be a significant signal about the institutionalisation of crowdfunding.

Despite doubts on the sustainability of crowdfunding for research and commercialisation due to regulatory and legal impediments as well as practical challenges (e.g. lack of funding scale), there may be ancillary effects, signalling to larger investors that there is a potential market for public research-based technology. Another and perhaps more important effect of crowdfunding for research is that scientists are becoming more active in disclosing their ideas and promoting their research findings to potential investors and to society. At the same time, there may also be ethical concerns; researchers may be tempted to oversell their research outcomes in order to attract funding, for example.

External corporate venturing activities, such as joint venturing, acquisitions and corporate venture capital (CVC) also constitute a potential source of financial capital and managerial expertise for public research spin-offs. For example, Qualcomm, a major semiconductor company, funds the research of public research spin-offs and start-ups against a target for generating a number of patents. They can exercise the right to acquire up to half of these patents for a price agreed in advance.

While many corporate venturing programmes came to an end after the bursting of the Internet bubble and the economic and financial crisis in 2008, recent years have seen an increase in corporate venturing activities. In order to encourage and strengthen these activities, a report by the UK Royal Society of Arts (RSA) (2012) recommends a number of policy measures, such as venture connectivity forums, co-investment funds/schemes and fiscal incentives.

The market for IP rights for financing purposes

Spin-offs seeking debt financing may find that their most valuable property for use as collateral is their trademarks, copyrights, patents or prototypes (e.g. Harhoff, 2011; Audretsch, Bönte and Mahagaonkar, 2012). Rights to intellectual assets can be used, at least in principle, to secure funding for business activities of public research spin-offs. This could provide in some cases a much-needed source of collateral, particularly for firms with a limited track record such as public research spin-offs. Established companies are increasingly implementing strategies and business models to use knowledge-based capital assets as a mechanism for raising finance in multiple forms.[3] For example, a EUR 1.6 billion loan financing deal was recently secured by Alcatel-Lucent using its extensive patent portfolio as collateral.[4]

IP equity funds, for example, invest money raised from the capital market in promising inventions; especially in inventions related to future-oriented technologies (see also Chapter 3 for government-backed IP funds). These entities acquire rights to a number of invention sources, such as universities, PRIs, individual inventors and spin-offs. Large investment banks and boutique private equity (PE) firms alike have been involved in these activities targeted at IP and other intangible assets. Investors in the fund themselves may not have specific interests with regards to the use of the IPRs, but it is in their interest that the IPRs are fully utilised to maximise revenues for the fund (OECD, 2013a).

Notes

1 . www.cofounderslab.com (accessed 16 February 2013).

2. www.techventures.utah.edu/news/2012/12/university-of-utah-embraces-crowdfunding-to-develop-technologies/ (accessed 16 February 2013).

3. Yanagisawa and Guellec (2009) discuss different types of companies that provide IP-based financial instruments. These have also been examined by Ellis (2009) and Nikolic (2009).

4. www.ft.com/intl/cms/s/0/0e2b714e-45dd-11e2-b780-00144feabdc0.html (accessed 13 May 2013).

References

Audretsch, D.B., W. Bönte and P. Mahagaonkar (2012), "Financial signaling by innovative nascent ventures: The relevance of patents and prototypes", *Research Policy*, Vol. 41, pp. 1407-1421.

Auerswald, P.E. and L.M. Branscomb (2003), "Valleys of death and Darwinian seas: Financing the invention to innovation transition in the United States", *The Journal of Technology Transfer*, Vol. 28, pp. 227-239.

Bray, M.J. and J.N. Lee (2000), "University revenues from technology transfer: Licensing fees versus equity positions", *Journal of Business Venturing*, Vol. 15, pp. 385-392.

Clarysse, B. et al. (2005), "Spinning out new ventures: A typology of incubation strategies form European research institutions", *Journal of Business Venturing*, Vol. 20, pp. 183-216.

Ellis, I. (2009), "Maximizing intellectual property and intangible assets", Athena Alliance Working Paper No. 07.

European Commission (2012), "Interim Findings 2011 of the Knowledge Transfer Study 2010-2012", Bonn/Maastricht/Solothurn.

Hall, B.H. (2009), "The Financing of innovation", in S. Shane (ed.), *Handbook of Technology and Innovation Management*, North-Holland, pp. 409-430.

Harhoff, D. (2011), "The role of patents and licenses in securing external finance for innovation", in Audretsch, D.B. et al. (eds.), *Handbook of Research on Innovation and Entrepreneurship*, Edward Elgar Publishing, Cheltenham, pp. 55-73.

Johnsen, J. (2011), “Mind the Gap 2011: The University Gap Funding Report”, Innosource.

Leleux, B. and B. Surlemont (2003), “Public versus private venture capital: Seeding or crowding out? A pan-European analysis”, *Journal of Business Venturing*, Vol. 18, pp. 81-104.

Lerner, J. (2005), “The university and the start-up: Lessons from the past two decades”, *The Journal of Technology Transfer*, Vol. 30, pp. 49-56.

Lerner, J. (2009), The Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed – and What to Do About It, Princeton University Press, Princeton.

Munari, F. and L. Toschi (2013), “Mapping university seed funds and proof of concepts funds in Europe: Initial evidence from the FinKT project”, *Workshop Presentation on “Financing Knowledge Transfer in Europe”*, Bologna, 6 February 2013.

Murphy L.M., P. Jerde, L. Rutherford and R. Barone (2007), “Enhancing commercial outcomes from R&D”, Technical Report, NREL/TP-110-40463.

Nightingale, P. et al. (2009), “From funding gaps to thin markets – UK government support for early-stage venture capital”, NESTA (National Endowment for Science, Technology and the Arts) and BVCA (British Venture Capital Association) report.

Nikolic, A. (2009), “Securitization of patents and its continued viability in light of the current economic conditions”, *Albany Law Journal of Science & Technology*, Vol. 19, pp. 393-420.

OECD (2013a), “Knowledge Networks and Markets”, *OECD Science, Technology and Industry Policy Papers*, No. 7, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k44wzw9q5zv-en.

OECD (2013b), *OECD Reviews of Innovation Policy: Sweden 2012*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264184893-en.

OECD (2011), *Financing High-Growth Firms: The Role of Angel Investors*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264118782-en.

Ortín-Ángel, P. and F. Vendrell-Herrero (2010), “Why do university spin-offs attract more venture capitalists?”, *Venture Capital*, Vol. 12, pp. 285-306.

Rasmussen, E. and R. Sørheim (2012), “How governments seek to bridge the financing gap for university spin-offs: Proof-of-concept, pre-seed, and seed funding”, *Technology Analysis & Strategic Management*, Vol. 24, pp. 663-678.

RSA (Royal Society of Arts, United Kingdom) (2012), “Corporate Venturing in the UK”.

Salvador, E. (2011), “Are science parks and incubators good ‘brand names’ for spin-offs? The case study of Turin”, *The Journal of Technology Transfer*, Vol. 36, pp. 203-232.

Toole, A.A. and D. Czarnitzki (2007), “Biomedical academic entrepreneurship through the SBIR program”, *Journal of Economic Behaviour & Organization,* Vol. 63, pp. 716-38.

Wright, M., B. Clarysse, P. Mustar and A. Lockett (2007), *Academic Entrepreneurship in Europe,* Edward Elgar, Cheltenham.

Yanagisawa, T. and D. Guellec (2009), ”The Emerging Patent Marketplace”, *OECD Science, Technology and Industry Working Papers*, No. 2009/09, OECD Publishing, Paris, http://dx.doi.org/10.1787/218413152254.

From:

Commercialising Public Research

New Trends and Strategies

Access the complete publication at:

https://doi.org/10.1787/9789264193321-en

Please cite this chapter as:

OECD (2013), “Financing of public research-based spin-offs”, in *Commercialising Public Research: New Trends and Strategies*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/9789264193321-8-en