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## NoGAP

Knowledge Transfer Community to bridge the gap between research, innovation and business creation

# Deliverable 2.5

## BROCHURE / FINANCING ISSUES IN TECHNOLOGY TRANSFER AND INNOVATION

**Authors:** Peter Bielik  
Danka Moravčíková, Zuzana Lajdová, Ján Gaduš, Anna Bandlerová, Natália Turčeková, Izabela Adamičková, Georgetta Pašová, Vladislav Valach

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## List of acronyms and abbreviations

COSME	Competitiveness of Enterprises and SMEs
EaP	Eastern Partnership countries
EEN	Enterprise Europe Network
<i>e.g.</i>	<i>exempli gratia</i>
<i>etc.</i>	<i>et cetera</i>
EU	European Union
IP	Intellectual Property
IPR	Intellectual Property Rights
POC	Proof of concept
PPP	Public-private partnership
PRI	Public Research Institution
R&D	Research and Development
SME	Small and medium-sized enterprise
TT	Technology Transfer
TTC	Technology Transfer Centre
WIPO	World Intellectual Property Organization

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## 1. Introduction

This deliverable was prepared by the Slovak University of Agriculture in Nitra as a task leader of Task 2.2 (WP2) within the FP7-INCO project NoGAP: *Knowledge Transfer Community to bridge the gap between research, innovation and business creation.*

Technology transfer (TT) and commercialization can create significant benefits for the socio-economic development. These benefits are realized through collaboration between economic sectors and universities or research institutions and technology transactions that can range from simple technical consultancy all the way to licensing of intellectual property (IP). In general, by improving the process of knowledge/innovation/technology transfer modern societies can foster innovation and thereby raise productivity, create better job opportunities, and address various challenges arising from societal and economic development. Sustainable development is increasingly related to the capacities of global, national, regional and local economies to change and to innovate. Innovations are widely regarded as one of the most important factors of increased competitiveness, and promotion of innovation is a central feature and main priority in the Europe 2020 strategy. Innovation is not restricted to new practices or behaviours or new products only, it is also about improving and upgrading the existing ways of “doing something” or about new processes and thus about “doing old things in a new way”. The innovative approach to socio-economic development is an interactive process involving multiple stakeholders and different source of knowledge and information.

The relevance of innovation for economic growth and competitiveness has resulted in the increasing attention to the process through which innovative ideas and knowledge are transferred from universities and/or research institutions to the market-place. The effectiveness of this process is strongly influenced by (i) the public contribution (public investment, general “philosophy” of policy intervention); (ii) specific conditions and factors that affect such processes and demand for them; and (iii) the level of awareness of all key actors involved. TT refers to the movement of assets like know-how, skills, technical knowledge, procedures, methods, expertise or technology from universities and research institutions to firms or governmental institutions, generating economic value and development. Commercialization refers to the valorization of research and IP by industry or other economic sectors. It implies the selling/licensing/contracting of technology services, IP and related-knowledge into spin-off and start-up creation and research and development collaboration.

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Deliverable 2.5 (D2.5) is closely connected to other tasks of Work Package 2 (WP2) *Developing innovation support services to foster innovation partnership in the societal challenge secure, clean and efficient energy*. In Eastern Partnership (EaP) countries, international partnership as well as national partnership in the societal challenge secure, clean and efficient energy are still in an early stage, not to say almost non-existing. Thus, developing innovation support services to foster innovation partnership between the stakeholders with initiative in the field of energy efficiency and renewable resources is a primary goal for this project.

D2.5 is part of the activities in Task 2.2 *Development of specific services in the field of energy efficiency and renewable energy in Bio-based Economy based on methodology of T1.3 and KIC and DTC services*. The overall aim of D2.5 is to prepare a brochure related to financing issues in TT and Innovation, in order to help stakeholders to understand financing issues and to forecast the cash flow needed.

Besides, D2.5 is strongly interdependent with the elaboration of D2.9 *Report on how to finance services for Technology Transfer Centre (TTC) – Business Plan Model*. This report tries to understand how to finance services for TTCs using a proper Business Plan Model. The focus of D2.5 and D2.9 is thus a different one - D2.5 focuses on questions of TT in general, and D2.9 on the contrary concentrates on TTCs.

The following document comprises four sections. Chapter 2 emphasizes importance of finances for TT and innovation in general, followed by the description of innovation policy tools, basic characteristics and actors of the intellectual property rights (IPR) market. Chapter 3 introduces funding schemes and existing EU programmes and platforms for financing innovation. Chapter 4 describes indicators, actors, and key information about innovation performance in the EU.

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## 2. Role of finance for technology transfer and innovation

Finance plays a crucial role in innovation as it allows institutions to realize research, to adopt innovative technologies as well as to develop and commercialize innovations. Most of firms are looking for access to external finance for innovation. They can fund innovation using a variety of funding instruments provided by different types of intermediaries. Access to external finance is often particularly challenging at the seed and early stages of business development as at this stage companies face high barriers for accessing finance notably as they lack a track record. Both funding needs and funding availability are closely related to the stage of development of the firm and its innovation projects. Large firms can more easily finance their R&D activities, whether using internal resources, getting a loan from a bank (using their tangible assets as collateral if required), issuing bonds, or raising equity finance in the stock markets. Start-ups do not have as many assets to use as collateral and their innovation investment is less diversified, and may also represent a much larger share of their activities for really innovative firms. As a result, their funding options are much more limited, and often need to rely on friends and family before being able to access other sources of capital.

Strengthening the science-industry links is the core path for TT and commercialization and requires time and sustained public efforts. Public support to endorse such path includes:

- **Cluster policies:** are based on the premise that a company can realize higher levels of competitiveness when it strategically partners with others. Clusters contribute to the generation of innovations through the further development of knowledge spillovers, coordination between actors, reduction of coordination failures, and a better pooling of physical, human and financial resources for innovation.
- **Grants for collaborative R&D:** include competitive research and development and partner matching grants the former aiming at near-to-market technology generation and the latter promoting research partnerships for the development of novel products or services.
- **Centres of excellence:** aimed at stimulating creative and efficient research and training environments. Establishing concentrations of researchers and resources is considered as a means to increase quality and relevance of public sector research at the international level.
- **Innovation vouchers:** small lines of credit provided by governments to SMEs for the purchase of services from public knowledge providers (universities, PRIs) in order to promote collaboration and stimulate the creation of small-scale innovations at firm-level.

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- Technology platforms and fora: industry-led stakeholder forums that aim to define research priorities and action plans in a broad range of strategic technological areas where achieving competitiveness at the national or regional level requires major research and technological progress in the medium to long term.
- Provision of knowledge services: consulting and knowledge transfer, including case studies and policy briefs.
- Technology matching services: virtual problem solving mechanisms (web-based platforms) that connect knowledge intensive organizations and bring together expertise on new product development while increasing the potential of future tangible partnerships.
- Market intelligence services: information collected by organizations to assess market opportunities, develop strategies to access markets, and make marketing decisions.
- Technology foresight: a process of intense iterative periods of open reflection, networking, consultation and discussion, with the aim of drafting and exploiting long term technological opportunities.

### **2.1 Innovation policy tools and support mechanisms**

Markets generally provide less finance for innovation than would be socially desirable. Markets require a set of well-functioning institutions in order to work, so institutional failures can severely damage access to finance for innovators. This is why many governments use different types of intervention to increase the amount of finance available for innovation activities. Government intervention is often justified on several grounds, such as market failures and system failures. There are several instruments that policy makers can use to increase the availability of finance for innovation. These include direct funding, such as R&D grants and pre-commercial procurement contracts; debt risk-sharing schemes, such as credit guarantees schemes; fiscal measures, such as R&D tax credits and tax deductions for early stage investors; or other interventions to increase the availability of equity finance for innovative firms; such as venture capital schemes. Regardless of the rationale for intervention, the decision to intervene needs to weight both benefits and risks, since there are several government failures which can make public intervention impractical or even counterproductive.

The general financing instruments available for TT begin with public-sector instruments, followed by instruments that are a combination of public sector and private-sector instruments, and ends with private-sector instruments:

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- Public-private partnerships (PPPs). Public and private financiers invest jointly in projects based on a common interest in promoting risky projects within a jointly agreed framework of goals, roles and risk-sharing. PPPs can be useful for large, complex projects.
- Public-sector instruments. There are a number of financing instruments in this category. To begin with, *subsidies and grants* can be used to attract private financing, for example, by subsidizing specific costs that prevent a project from becoming financially viable. Subsidies could also serve as an incentive to extend a project to specific target groups or to an area that is financially less attractive. *Government contracts and specialized programmes* are subsidies applicable when technology transfer fits into a wider set of public priorities. These programmes can build on the results of earlier subsidized programmes from the pioneering phase and focus on scaling up or replicating these results. A *concessional loan*, sometimes also called *seed financing*, is used in the preparatory or pioneering phase of implementation, when the uncertainty of outcomes would make it difficult to access commercial financing.
- Private sector instruments. The developer's contribution to the project capital, called *entrepreneur's equity*, is a key element of financing. Even if it is small, it shows the developer's commitment to the project. To promote the sale of their equipment, equipment suppliers often provide *credit* to buyers. These loans usually have to be repaid within a few months, so they are not important for projects with a long financial horizon. However, they can be helpful in situations where the buyer intends to resell the equipment quickly. *Build-own-transfer* financing is applied mostly in large infrastructure projects that are built and operated by private investors. Such projects are expected to generate cash flows large enough to provide an attractive rate of return to private investors. After a specific period, project ownership is transferred to the government. Guarantees have a key role in situations where a high level of perceived risk deters private investors. If the risk turns out to be real, the guarantee compensates the financier; if the risk does not materialize, the money will not be spent. The guarantees are often partial, so that the risk is shared by the financier and the guarantor. In most cases, *bank loans* are suitable for established companies and mature sectors, and standard loan instruments seldom form a crucial self-standing part of innovative financing solutions. However, standard loan instruments can be modified and blended with other financing instruments to become part of innovative financial packages.



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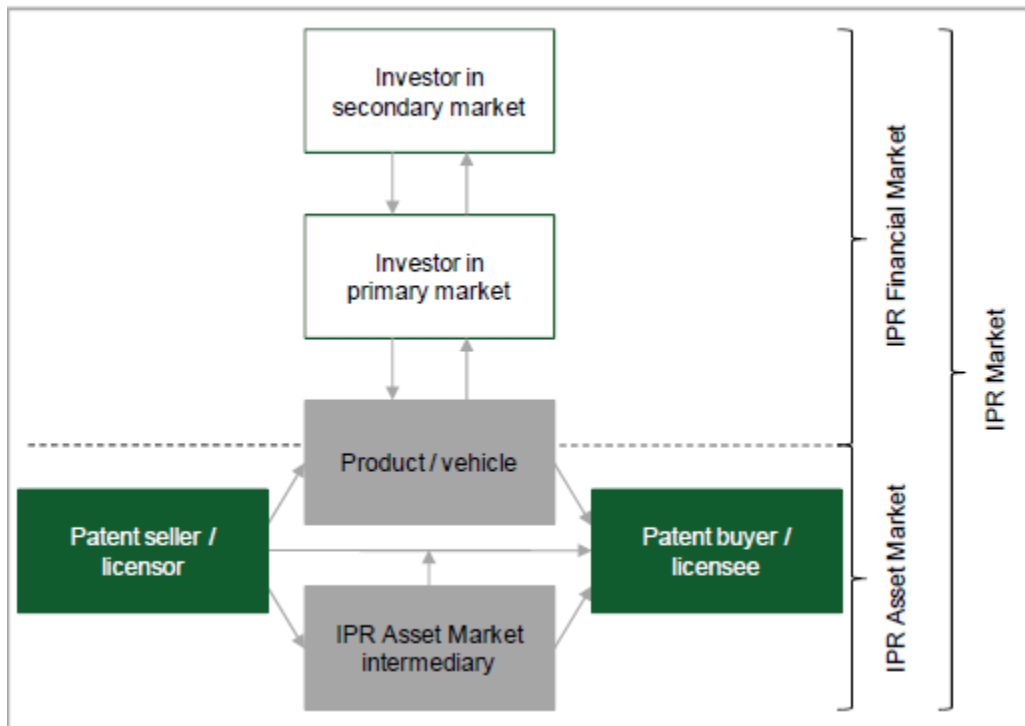
## **2.2 IPR market: sources, funding opportunities, related financial products**

A market for IPR increases innovation, TT and economic value. In the knowledge economy, knowledge has become an important economic good. Thus, IPR gain in importance. From a geostrategic perspective, European firms and institutions may face increasing pressure in future, mainly arising from the US and Asia. The need for a critical analysis of the current IPR system is therefore gaining momentum. Access to IPR is a serious issue for research organisations and firms wishing to further develop their products, to complement the technological state of the art, or to place new products on technology markets – marketplaces where IP can be sold and bought, which follow clear and transparent rules and open ways for innovators to access IPR.

Firms can use either internal or external sources of finance to fund their innovation activities. The main internal source of finance is retained earnings, the profits accumulated over time which have not been returned to shareholders. Firms typically prefer to use internal financing rather than external financing as the latter can be very costly. As a result, there are projects that firms would choose to undertake if they had sufficient internal resources available, but which will not be taken forward if firms need to access external finance to develop them. In many cases firms do not have the option to access external financing. In contrast, external sources of financing includes debt and equity (as well as some hybrid forms), which can be provided by individual investors (such as business angels), venture capital funds, banks and capital markets (among others). Conditional on having to resort to external funds, debt is generally preferred to equity, since if available debt is typically a cheaper source of finance (even if still more expensive than internal funds).

The IPR Market comprises the IPR Asset Market and the IPR Financial Market. In order to be both successful and sustainable, an IPR Financial Market requires a properly functioning IPR Asset Market. This structure is considered to be a new concept and serves to clarify the interdependencies between the markets (see Figure 1):

Figure 1: Indicative market structure



Source: Institute of Technology Management University of St. Gallen; Fraunhofer Zentrum für Mittel und Osteuropa (2011). *Creating a financial market for IPR* (Final report for EU Tender No 3/PP/ENT/CIP/10/A/NO2S003).

IPR Asset Market. Although the IPR Asset Market currently has shortcomings, it already exists. This IPR Asset Market concept is the basis for investigating the IPR Financial Market but may be enhanced, as will be shown in the course of this study. In the IPR Asset Market, patent sellers (e.g., original patent holders) transfer their IPR to patent buyers in exchange for monetary compensation. This may take place directly or through brokers, dealers and vehicles (e.g., funds, companies, etc.).

IPR Financial Market. In the IPR Financial Market, the vehicles create financial products (shares, bonds, etc.) which investors can purchase. The primary market is created there when the product or vehicle issues shares, bonds, etc., whereas the secondary market arises as soon as these financial products can be traded between different investors.

Financial products or vehicles connect the IPR Financial Market with the IPR Asset Market. The characteristics of these products or vehicles influence the trade in assets, i.e. patents. There are private vehicles, public-private vehicles and commoditisation vehicles:

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- Private vehicles are financial instruments funded by investors from the private sector (as opposed to the public sector), and can be subdivided into two different instrument types. On the one hand, there are equity-based instruments (e.g., patent funds and their shares). On the other hand, there are debt-based instruments (e.g., IPR securitisation and related financial products). Equity-based vehicles may invest in both early-stage and mature technologies, depending on the risk-return profile of the targeted investors. Debt-based vehicles tend to be more appropriate for technologies which already generate stable revenues.
- Public-private vehicles are financial instruments fully or partially funded by public money. They may be structured as a financial product suitable for trading on an IPR Financial Market. Public-private vehicles may be used as a tool to foster early-stage technologies.
- The commoditisation vehicle aims at the continuous trading of the asset and is therefore suitable for licence rights rather than patents, as the latter are unlikely to be traded continuously.

### 2.3 Main actors

Although markets for technology are growing rapidly, IPR Market actors still face immanent transaction obstacles. Developing the IPR Market could impact its main actors significantly.

SMEs do not focus on IPR as much as they should. It is uncommon for SMEs to trade IPR. Owing to their size, monetary and capacity constraints, SMEs lack the necessary resources to successfully engage in the IPR Market. Acquiring information on the possibilities of IPR trading and patenting is costly. By not selling IPR, SMEs are missing out on one of the opportunities to fund their technology development and product commercialisation. Of all the IPR Market actors, SMEs would benefit most from the further developing of the IPR Market. Well-established IPR Markets would save them money and time that could be invested in promoting innovation. By gaining access to high-quality patents, SMEs would be enabled to more easily find solutions for their technological problems.

Most research institutions are primarily interested in producing publications and maintaining their networks. IPR are not considered the most important outcome of their work. Research institutions, like SMEs, have limited resources for IPR monetisation. Patenting is considered costly. These institutions do not have a clear understanding of how to use their IPR to

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finance their research. At the moment, they rely mainly on their networks for IPR dissemination. Policies providing them with additional channels for IPR distribution and facilitating their fund-raising through IPR trading would foster innovation.

IPR Market intermediaries have emerged to facilitate more efficient market transactions of technologies, technical knowledge, intellectual property and, particularly, patents by developing new models (e.g., IPR auctions and patent portfolio funds). The current role of market intermediaries will change if IPR Markets face substantial changes. However, the overall effect cannot be clearly estimated in respect of all the intermediaries. The impact of an improved IPR Market on specific intermediaries will depend on their respective business strategies.

Economy/economic sectors might be impacted negatively by the creation of a single European IPR Market due to the increased transparency and openness. Transparency in IPR trading would have a positive impact on facilitating IPR transactions and IPR circulation in general, but could allow competitors to discover confidential business strategies. IPR trading systems should take all the market actors' needs into account in order to benefit innovation.

Financial institutions/investors generally focus on fact-based, reliable, and comprehensible information. In particular, cash flows, key performance indicators derived from companies' balance sheets, and past management team successes are used to evaluate if and to what extent an investment could be profitable. The most trusted piece of information in IPR financing is the IPR developer's reputation. IPR value is mostly derived from future expectations which are, in turn, based on many sources of know-how and information (commercial, financial and technological feasibility), thus making value speculations challenging. Having clear, established valuation methods for IPR would therefore have a particularly positive impact on financial institutions.

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### 3. Access to finance for firms and innovative entrepreneurs

Access to finance is a key driver in the creation, survival and growth of innovative firms. Lack of finance may prevent firms from investing in innovative projects, improving their productivity, financing their growth, covering working capital requirement and meeting market demand. Innovative firms face several barriers for accessing finance. Finance mismatch may occur when supply of finance does not meet demand. Potentially profitable projects might not be financed. One of the main reasons for this capital market imperfection is the risk arising from information asymmetries between lenders/investors and borrowers. Innovative entrepreneurs suffer from a lack of financing for innovation, in particular in the seed and early stages of business development. They face specific financial constraints due to their inherent riskiness, insufficient collaterals and lack of track record. Financing requirements arise for public R&D aimed at increasing the stock of knowledge so as to provide the basis for the development of new products, processes and technologies. These organizations may include firms as well as universities and public research institutes that transfer academic inventions via the sale, transfer or licensing of intellectual property to existing firms or to new ventures (e.g. through TTCs and academic spin-offs).

The main policy approaches to address challenges associated to demand for financing innovation include the following:

#### Firms' access finance for innovation

- Subsidizing loans (e.g. through the intermediation of a national development bank) or supporting alternative types of debt finance, such as convertible loans and subordinated loans.
- Providing direct support to innovative firms (e.g. through grants and subsidies) as well as indirect support (e.g. through R&D tax incentives).

#### Access to finance for innovative entrepreneurship

- Stimulating the venture capital industry (e.g. creating public funds that directly invest in start-up firms, establishing public "fund-of-funds").
- Supporting business angels (e.g. providing tax incentives to private individuals investing in specified types of investments and businesses).
- Setting the framework conditions for new sources of private funding, such as crowd funding.

#### Finance for TT and commercialisation

- Encouraging R&D collaboration of universities and public research institutions with firms (e.g. through grants), and innovation networks and clusters.

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- Supporting spin-off firm creation by universities and public research institutions (PRIs) - e.g. creating proper incentives programs to stimulate researchers transfer knowledge and technologies to business entities, supporting incubators and Science & Technology parks.
- Encouraging the development of special intermediary organizations such as technology transfer offices to facilitate science-industry links.
- Promoting consulting and extension services by universities and PRIs (e.g. improving legal and regulatory frameworks that allow for more open collaboration between firms and universities on the consultancy projects and beyond, promoting institutional development to enable effective science-industry consultancy links and other forms of collaboration).

### **3.1 Spin-offs and start-ups**

Spin-offs and start-ups can be growth opportunities for companies with strong core businesses because they create new revenue streams. In strictly financial terms, a spin-off is a formal split of a company into two or more separate entities, while a start-up is a new brand entity created by an existing company. (A complete start-up, on the other hand, is a new entity created by an entrepreneur or investment group.) Spin-offs can be seen as new entities managing existing resources originating from a mother company, whereas the resources of individual start-ups originate from elsewhere.

Firms have both tangible and intangible resources. Physical assets such as capital, buildings, and codified knowledge are tangible. Examples of intangible assets are organisational routines, human resources, and tacit knowledge. Especially intangible assets are hard to control and it is inevitable that firms spill-over part of these assets, either to the business environment or to their employees. Employees accumulate knowledge about the production process, the sector, and the network of providers and customers of a company. Tacit knowledge about the operation of the market and the company, which has been acquired by the employee, can be used as input for a new firm. General knowledge of entrepreneurship can be deployed in every new firm and is of great benefit to potential entrepreneurs. It is ruled out as a distinguishing factor for spin-offs. Spin-offs are by definition based on sector specific knowledge. Individual start-ups are based on resources that mainly originate from the entrepreneur, the individual. Spin-offs and corporate spin-offs are built on existing resources and they are supported by a mother company. Support is a continuous term, as there are many levels of support.

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**Figure 2: Qualitative advantages and disadvantages of a start-up versus a spin-off**

Start-up		Spin-off	
Plus	Minus	Plus	Minus
<b>Retention of full upside</b> <b>Brand new project</b> <b>Full patent life</b> <b>Versatility</b>	No company track record Money limitations Troubleshooting, planning, and operations limitations Lack of visibility Time lag to milestone delivery Absolute reliance on one or very few initial projects	Preassembled team Experience Faster to operational status Time and money pre-investments Good visibility and positioning Established networks Established and/or additional projects to tap into Attraction to potential partners	Heavy royalties due Pre-contracted options, limiting upside Second choice project Residual patent life Limited potential of third-party partnering

Source: Persidis, A., De Rubertis, F. (2000): Spin-offs versus start-ups as business models in biotechnology. In: *Nature Biotechnology* Vol. 18, p. 570 – 571.

It makes sense to develop a spin-off or start-up when the company's future growth appears to have reached a plateau or has significantly slowed. Often, this occurs when a company's product concept has matured. Additionally, executives will need to have both the financial strength and the ability to leverage the assets of the platform company. Leveraging assets can provide economies of scale for the spin-off or start-up that, in combination with the knowledge base of the platform company, can help the spin-off or start-up succeed. While spin-offs largely leverage customer lists and brand positioning opportunities, both start-ups and spin-offs have the opportunity to leverage all key assets at management's disposal. Executives should consider a spin-off when an opportunity exists for a company to extend its brand and product line to the same core customer. The ability of a spin-off to use the existing platform company's customer files when developing circulation and contact plans, for example, gives the spin-off an advantage as it enters a new marketplace.

Innovations are regarded as an important driver for future economic growth. Technologies developed within universities and research institutes can greatly contribute to these innovations. There are several ways to put academic knowledge to use in a commercial environment. One mechanism to transfer knowledge to the market place is the start of a

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new, separate company, termed academic spin-off, with the aim to commercially develop and exploit the knowledge generated in the university.

**Figure 3: Basic differences between university spin-off and start-up**

	<b>Spin-off</b>	<b>Start-up</b>
<b>Created by</b>	university	outside university
<b>Technologies</b>	owned by university	licensed to the start-up by university
<b>Financed by</b>	university	outside founder
<b>Managed by</b>	university staff	outside university

Source: WIPO

Knowledge transfer in general and specifically spin-off formation has an important role in the US, where the formation of academic spin-offs has been a common phenomenon for decades. European governments and universities have realized the strategic role of laboratories and research centres in innovation and economic growth in later stage.

### 3.2 Funding schemes

A start-up may require several rounds of financing before it can generate sufficient cash flow from sales to finance operations. The amounts and sources for each round vary by company and industry. The earliest funding rounds are seed and early-stage funding. Companies need these funds to support operations, such as product development, administration and marketing.

Seed capital is the funding required to get a new business started. This initial funding, which usually comes from the business owner(s) and perhaps friends and family, supports preliminary activities such as market research, product R&D and business plan development. Seed capital funding is considered high-risk because the business is not fully functional and has no track record. Investors who provide seed capital funding often do so for a stake in the company. Once a start-up has demonstrated feasibility, it is more likely to attract venture capital or angel investment to provide the greater funds necessary to get the business up and running. Seed funding represents the earliest round of capital for a start-up company. Early-stage funding is defined as start-up company's first round of substantial funding. Early-stage funding usually consists of two parts, commonly known as Series A and Series B



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financing. Seed funding allows a start-up to develop a prototype product and generate sufficient investor interest for successive financing rounds. Early-stage funding allows additional operational flexibility over the medium to long term. The sources of seed funding include the founders' personal savings and investments from family and friends. Banks usually do not lend to start-up companies because of the high risks, and venture capitalists tend to stay away from seed funding. However, a start-up entrepreneur might have more success with angel investors and private equity funds. Angels are former entrepreneurs and other wealthy investors who get involved in some start-up companies. Private equity funds pool money from individuals and institutions to invest in high-growth companies. Early-stage funding typically comes from venture capitalists, who may also bring experience and industry contacts that can help a start-up rapidly grow its business.

A proof of concept (POC) is a demonstration, the purpose of which is to verify that certain concepts or theories have the potential for real-world application. POC is therefore a prototype that is designed to determine feasibility, but does not represent deliverables. Proof of concept is also known as proof of principle. Proof of concept is a term with various interpretations in different areas. POC in software development describes distinct processes with different objectives and participant roles. POC may also refer to partial solutions involving a small number of users acting in business roles to establish whether a system satisfies certain requirements. The overall objective of POC is to find solutions to technical problems, such as how systems can be integrated or throughput can be achieved through a given configuration. In the business world, POC is how start-ups demonstrate that a product is financially viable. POC involves extensive research and review and is submitted as a single package to concerned parties. It includes examination of the revenue model, in which companies show projected revenue from products and services, and indicate development cost, long-term finance projections and how much the service costs to maintain and market. It's an excellent way for a business to evaluate itself internally and at proposed acquisitions and projects.

Crowdfunding is an emerging alternative source of financing. It refers to open calls to the public, generally via internet, to finance a project through either a donation, a monetary contribution in exchange for a reward, product pre-ordering, lending, or investment. Any type of project can launch a crowdfunding campaign: SMEs, artists, innovative start-ups, social entrepreneurs may all benefit from different forms of crowdfunding. Crowdfunding is a proven way to get initial funding for the commercialization of an invention. Crowdfunding

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involves posting a project description on the internet, asking for pledges to complete the project, and if the minimum amount of pledges is received by a certain deadline, having the funds transferred to the project. Crowdfunding adds a new source of funds, the initial consumers. Inventors, called *project creators*, get committed funds and guaranteed customers. The customers, called *project backers*, get to be the first to get an exciting new product. If the funds are raised, project creators know they have a market and they have the resources to produce the product. If the funds aren't raised, creators still get valuable market feedback which they often use to re-launch a product and still achieve commercial success. Crowdfunding is a new way to measure market acceptance for a new invention and raise funds for initial production. New websites offering crowdfunding of projects are being created around the world and the business models are undergoing evolution. For inventors looking to promote a new idea and for backers looking to support new ideas, it's a promising option worth exploring. Great care should be taken, however, not only to protect your own IPR, but make sure you don't infringe the IPR of others as well.

### 3.3 Brief overview of the EU programmes and platforms for fostering TT and innovation

#### COSME

COSME is the EU programme for the Competitiveness of Enterprises and SMEs running from 2014 to 2020. COSME will support SMEs in the following area:

Better access to finance for SMEs: COSME will facilitate and improve access to finance for SMEs through two different financial instruments, available from 2014:

- The Loan Guarantee Facility: the COSME budget will fund guarantees and counter-guarantees for financial intermediaries (e.g. guarantee organisations, banks, leasing companies) to help them provide more loan and lease finance to SMEs. This facility will also include securitisation of SME debt finance portfolios. By sharing the risk, the COSME guarantees will allow the financial intermediaries to expand the range of SMEs they can finance. This will facilitate access to debt finance for many SMEs who might otherwise not be able to raise the funding they need.
- The Equity Facility for Growth: the COSME budget will also be invested in funds that provide venture capital and mezzanine finance to expansion and growth-stage SMEs in particular those operating across borders. The fund managers will operate on a commercial basis, to ensure that investments are focused on SMEs with the greatest growth potential.

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### Access to markets

All businesses have access to the services of the Enterprise Europe Network and can freely approach the local partner in their region. Over 600 partner organisations in 54 countries have built a capacity to reach out to more than 2 million SMEs.

### Supporting entrepreneurs

Entrepreneurs and their new businesses are key to European growth and competitiveness. Promotion of entrepreneurship and entrepreneurial culture is therefore one of the four main objectives of COSME. The *Entrepreneurship 2020 Action Plan* is a decisive call for joint action at European, national, regional, and local level.

Initiatives under the Action Plan include three main improvements:

- Entrepreneurship education – COSME will support exchanges among European educators and trainers support best practice in entrepreneurship education in the EU.
- Improving the business environment so entrepreneurs can grow and flourish – together with improving the legal and fiscal environment, experts will also develop recommendations on the best support for businesses throughout their lifecycles. Specific support for Web entrepreneurs will be provided.
- Role models and outreach to specific groups – under COSME groups such as young people, women or senior entrepreneurs will be able to benefit from mentoring or other tailored programmes.

### More favourable conditions for business creation and growth

COSME aims at lightening the administrative burden on businesses by removing unnecessary reporting and information requirements. As research indicates, SMEs are disproportionately affected by regulation. A special focus is thus needed to create more favourable conditions for them.

## **Enterprise Europe Network (EEN)**

Helping small companies make the most of the business opportunities in the EU is the EEN's mission. The EEN brings together business support organisations from more than 50 countries (see Figure 4). They are connected through powerful databases and know Europe inside out. Using Europe's largest database of cutting-edge technologies, containing more than 23,000 profiles, the Network brings together research and commercial applications. The database is updated with new profiles on a weekly basis.

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**Figure 4: Countries involved in EEN**



Source: <http://een.ec.europa.eu/>

EEN can help to evaluate the company's financial situation and source the right support:

- Venture capital and loans are important for the company's seed, start-up and growth phases.
- Funding from investors can be topped up with aid from regional, national or EU authorities.
- Tax credits are another way to finance the company.

The Network provides information and advice on IP. It works closely with specialist organisations that help small businesses to use IPR to protect and profit from their ideas and innovation.

**SME instrument:** Horizon 2020 actively supports SMEs by providing both direct financial support, and indirect support to increase their innovation capacity. *Innovation in SMEs* aims at creating a bridge between the core of the framework programme - support to research, development and innovation projects - and the creation of a favourable ecosystem for SME innovation and growth. The goal of the actions bundled under this specific objective is to build innovation management capacity for SMEs. Innovation management capacity is the

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internal ability of companies to manage innovation processes from the generation of the idea to its profitability on the market. SME support will be targeted with a dedicated SME instrument, which is a novel approach to support SMEs' innovation activities. It shall attract more SMEs to Horizon 2020, provide support to a wider range of innovation activities and help to increase the economic impact of project results by its company-focused and market-driven approach. The SME instrument addresses the financing needs of internationally oriented SMEs, in implementing high-risk and high-potential innovation ideas. It aims at supporting projects with a European dimension that lead to radical changes in how business (product, processes, services, marketing etc.) is done. It will launch the company into new markets, promote growth, and create high returns of investment. The SME instrument addresses all types of innovative SMEs so as to be able to promote growth champions in all sectors. *Innovation in SMEs* also includes actions which provide indirect support to SMEs in the form of tailored services and projects (innovation management capacity building, IPR management, etc...), networking and mobilization actions for innovation service providers and policymakers (i.e. exchange of experience between national innovation agencies); moreover, Horizon 2020 provides direct support to the EEN, a key player in improving SMEs' access to funding opportunities. *Innovation in SMEs* funds additional activities intended to support entrepreneurship, internationalisation, and improving access to markets (through the COSME programme).

**Eurostars:** Eurostars is a programme that supports research-performing SMEs, which develop innovative products, processes and services, to gain competitive advantage. Eurostars does this by providing funding for transnational innovation projects; the products of which are then rapidly commercialized. Eurostars provides funding and support to research-performing companies, especially SMEs. In a Eurostars project, the R&D-performing SME takes a leading position in a transnational consortium. First though, all projects must pass through a highly competitive selection process, and the scrutiny of a panel of international research and business experts, to ensure that only the best business ideas and strong consortia get the funding they need. It has already been shown that Eurostars helps businesses grow their teams, find new expertise - and attract private investors. Participation in a Eurostars project can become a passport to growth, further innovation, an opening to new global markets and even greater business success. Funding for Eurostars participants is provided on a country-by-country basis.

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#### 4. Measuring innovation performance

Innovation is important for SMEs and corporations – and SMEs and corporations are essential for innovation. Empirical studies show that innovative SMEs grow faster and create more jobs than non-innovative SMEs. They are the so-called *Gazelles*. Empirical studies show as well that innovative start-ups (where the creation of the start-up was based on an innovation) create more new jobs than non-innovative start-ups. However, policy measures should not only focus on SMEs. The share of innovative SMEs increases gradually with the size of the companies. Policy measures should recognize that large firms are essential for the innovation system. The recent trend of concentrating resources on SMEs ignores the natural ecology of industry. An often neglected target group is the medium-sized firm above the SME threshold. This category probably has the greatest potential for increasing R&D spending. The contribution of innovative SMEs is also key for large firms: many of the smaller firms are acquired at some stage by large ones, which use them as a source of radical innovations that the more closed and stratified context of large firms does not facilitate. At the same time, access to the funding, manufacturing and distribution capacities of a large firm allows in many cases to leverage the innovative performance of small firms. In the information technology or biotechnology sectors this dynamic has been essential to industrial development.

The size and evolution of technology licensing markets is difficult to measure. Accounting rules do not require firms to disclose patent licensing revenues as a separate item in corporate reports, and although most OECD countries have regulatory requirements for reporting licensing contracts, these are mostly related to cross-border transactions, and data are published only at an aggregate level. Even though disclosure of information on licensing revenues has been shown to have a positive effect on investors, most firms choose not to make such information public. At the national level, indicators of technology licensing show significant increases.

The Flash Eurobarometer 394, *The role of public support in the commercialisation of innovations*<sup>1</sup>, was conducted at the request of the Directorate-General for Enterprise and Industry in the 28 EU Member States as well as in Switzerland and the United States. It was designed to benchmark innovation activities in a range of areas, as well as explore barriers to

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<sup>1</sup> The document is available at: <[http://ec.europa.eu/public\\_opinion/flash/fl\\_394\\_en.pdf](http://ec.europa.eu/public_opinion/flash/fl_394_en.pdf)>.

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commercialisation, and the role of public funding in innovation. The survey<sup>2</sup> covered the following areas:

- profiles of companies that develop innovations, including the most common areas where innovations have occurred since January 2011;
- the impact of innovations on turnover;
- actors involved in the development of ideas for innovation;
- types of public support received for innovation activities and its importance for innovation;
- barriers to commercialisation of both innovative and non-innovative goods or services;
- the role innovation plays in public procurement.

Here are some of the most interesting facts and data:

1. Around three in ten companies have introduced innovations in each of the areas asked about since January 2011. Companies are most likely to have introduced new or significantly improved services (38%) or goods (37%). One third have introduced new or significantly improved marketing strategies (33%), while 30% have introduced new or improved organisational structures and 29% new or improved processes. Overall two thirds of companies (66%) have introduced at least one innovation in one of these areas since January 2011.
2. Just over one in five companies have carried out R&D activities since January 2011 – either in-house or via subcontractors. In contrast, fewer than one in ten have applied for one or more patents or trademarks (7%). Almost half of companies (48%) say that they do not have any innovation to commercialize, while a third (33%) have innovations and also commercialise them.
3. Companies were asked about the role of various actors in developing ideas for the company's innovations since 2011. More than three quarters of companies say management (87%) and employees (78%) contributed to the development of ideas for innovations. Just over half (54%) say other companies contributed to the development of ideas for innovations, while 45% say individual consumers contributed. One in five (20%) say the same for public sector organisations, while 17% say universities or research organisations made a contribution.
4. Most companies say they have not received public financial support for R&D or other innovation activities since January 2011 (91%). Fewer than one in twenty (4%) have

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<sup>2</sup> The survey was carried out by TNS Political & Social network in the 28 Member States of the European Union between 22 January and 11 February 2014. Some 11.206 respondents from different social and demographic groups were interviewed via telephone (landline and mobile phone) in their mother tongue on behalf of the European Commission, DG Enterprise and Industry.



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received local or regional government assistance, 3% received national government assistance and 3% assistance from the EU.

5. Just over one third of the companies that have introduced new or significantly improved goods or services since January 2011 have collaborated with partner companies or external consultants to market, distribute or promote innovative goods or services (35%). One third has collaborated with client companies or individual consumers (33%). Collaboration with competitors (12%) or public sector organisations (9%) to market, distribute or promote innovative goods or services is less common.
6. Companies that have developed innovative goods or services since January 2011 were asked what kinds of financial or non-financial support they had received from government or administration to commercialise their innovations. Just over one in twenty have received support in training staff how to promote innovative goods or services (6%), while 4% had assistance meeting regulations or standards. Support in market testing, prototype development, marketing plan development or selling in export markets was received only by 2% of companies. Just 1% received support in applying for or managing intellectual property rights.
7. Companies who have developed innovative goods or services since January 2011 were asked what barriers they had encountered when trying to commercialise them. More than two thirds (68%) say a lack of financial resources has been a problem, while 64% mention a market dominated by established competitors and 62% the cost or complexity of meeting regulations or standards.
8. Almost three quarters of companies that have introduced innovative goods or services say other companies are important for the sale of these goods or services in 2013 (73%). At least six out of ten say individual consumers are important (63%), while one third (33%) say public sector companies are important for the sale of their innovative goods or services.

The European Commission recognizes the vital role innovation plays in Europe's ability to compete in the global economy, and is involved in guiding and implementing policies and programmes that support the development of innovation. The importance of innovation is highlighted by the Europe 2020 flagship initiative *Innovation Union*, with the key goal of helping Europe to increase investment in R&D, and to better translate research results into improved goods or services.



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