

on products that attract the attention of the general public, such as apps and games, e-commerce and social media. In addition to this, Berlin's entrepreneurs closely collaborate with each other and with their investors, which is reflected in the large number of venture capital financed enterprises. Finally, Berlin's start-up scene is also characterised by a very high degree of internationalisation.

In recent years in Berlin, the use of venture capital has increased more than in any other city in Germany. In 2011, venture capital providers invested EUR 116.8 million in new Berlin-based enterprises. Since 2009, investments have in fact more than doubled. No other city in Germany has been able to attract such high amounts of early-stage venture capital.¹⁰⁴

Investments are not only being made in the internet and IT industry, but increasing amounts of resources are also flowing into health care enterprises.¹⁰⁵ The fact that growing numbers of investors are establishing branches in Berlin is further evidence of Berlin's increasing attractiveness.¹⁰⁶

Berlin's start-up boom owes more to social and cultural factors than to exceptionally favourable political-administrative framework conditions. For many years, Berlin has been characterised by its low apartment and commercial real estate rents and its overall low cost of living. Complemented by its rich cultural and recreational offers, the city has developed a strong appeal to artists, university students and, ultimately, founders of high growth potential companies.

In retrospect it can be said that the lack of a broad industrial base and the absence of large corporations – which would compete on the labour market – have also been supporting factors in the unfolding of Berlin's start-up boom. Thus, founders in Berlin do not have to compete with as many as seven DAX companies in attracting qualified staff, as it is the case in Munich. Berlin's labour market, in combination with the four major state-owned universities and a number of other tertiary education institutions, guarantees a continuous flow of well-educated young people.¹⁰⁷ Berlin's international appeal provides the opportunity to hire people from different countries. When compared with other German cities, this makes it easier to establish companies with an international outlook.

Meanwhile, Berlin's start-up boom has created momentum that seems to reinforce itself. Today, renowned internet companies such as Soundcloud, Wooga, 6 Wunderkinder, Zalando, Betterplace, ResearchGate or Rocket Internet have their headquarters in Berlin, which will certainly attract additional numbers of entrepreneurs and capital providers.¹⁰⁸

With its thriving internet and IT scene, the city has a favourable competitive position within the innovative internet economy.¹⁰⁹ For Germany alone, it is expected that the economic output of the internet industry – based on EUR 75 billion in 2010 – will total EUR 118 billion in 2016. The internet sector thus represents an important source of growth.¹¹⁰

Berlin is an example of how the internet economy can generate significant value creation and employment opportunities within a short period of time. The majority of internet businesses employ but a small number of workers, and yet several start-ups have been able to multiply their staff levels over a period of only a few years, thanks to their dynamic growth.¹¹¹ It remains to be seen if this positive trend will continue in the long term.

To foster the positive development of Germany's internet and IT industry, it is particularly important to improve framework conditions for financing growth of new enterprises.¹¹² The Federal Government should create an infrastructure for entrepreneurs and investors with structures that can compete internationally and persist in the long run. The Expert Commission has already presented an outline of the design of such infrastructure in their preceding Annual Reports.¹¹³

CROWDFUNDING

A 5

Crowdfunding is an innovative form of financing for projects or small enterprises, designed to accumulate financial contributions from numerous individuals within a relatively short period of time. Crowdfunding activities are often conducted via the internet, e.g. by the use of social networks and other online platforms. Crowdfunding can take many different forms (cf. Box 5); financial contributions can e.g. be in the form of donations. Due to the large audience

BOX 05

Main crowdfunding business models¹¹⁴

Donations

Donation-based crowdfunding differs from traditional fundraising as internet and online network fundraising is often faster and more cost-effective than traditional approaches. This model often appeals to the users' social or altruistic conscience. Non-monetary incentives, such as long-term donation-based sponsorships, can complement incentives for potential donors to participate in crowdfunding.

Pre-sales

In this crowdfunding model, participants directly contribute to the financing of a project or an enterprise by pre-ordering a particular product or service. This model enables the respective company to gain a first insight into the structure of demand, which proves particularly beneficial for SMEs and start-ups that do not have their own marketing and market research division.

Loans

A crowdfunding loan is quite similar to a bank loan or a micro-credit, the difference being that crowdfunding loans do not generally require collateral deposits. If the business venture proves successful, invested crowdfunding contributions (including interest) are proportionally returned to the participants and, depending on the agreed contract, also partially returned to the crowdfunding platform.

Equity capital investments

This business model, also known as crowdfunding, is similar to business angel financing that provides financing for companies and start-ups in particular. By means of their financial contributions, participants become private investors and risk-sharing stakeholders of a company. In many cases this takes the form of silent partnership or share acquisition.

reach of online campaigns, large sums can be raised even through the contribution of many small amounts. This model was successfully employed by Barack Obama during his first presidential campaign. Another crowdfunding model is the pre-ordering of and the pre-payment for a product in development. In this model, the developer not only raises financial resources for product development, but also acquires valuable information on consumer demand for

the new product. In return for their financial commitment, individuals may profit from a product's financial success, i.e. through interest-based loans or equity participation – and participate in shaping the content of individual projects or even the company's strategic direction. If online audiences' preferences are integrated into the corporate brainstorming and decision-making process, this can be regarded as "active" crowdfunding, which combines crowdfunding with aspects of crowdsourcing.¹¹⁵

For start-up businesses and SMEs in particular, crowdfunding can be an attractive alternative to financing through banks, venture capital firms or business angels. Demand for this financing model has increased considerably – not least because of the recent financial crisis and the associated difficulties in accessing traditional financing. Moreover, online-based fundraising models can also support the marketing activities of start-ups. This is often done via specific online platforms¹¹⁶ that present the business idea or the project to potential investors.

Currently such platforms are largely used for financing projects and enterprises in the cultural and creative industries. To give a recent example: the movie adaptation of the German television series *Stromberg* was partially financed by issuing a "culture share" through the internet. This crowdfunding model combines the donation model with the crowdfunding model.¹¹⁷ The remaining financing gap is to be bridged by public film funds and sponsoring.¹¹⁸ In France, even public cultural institutions make use of crowdfunding: for the purpose of purchasing an Ingres painting, the Lyon Museum of Fine Arts is currently collecting funds which will amount to EUR 750,000.¹¹⁹ Lyon thus follows the example of the *Louvre* in Paris, which managed to purchase a work by Cranach using resources collected through a crowdfunding campaign.

There have also been recent examples of crowdfunding in start-up financing for high-value technologies and knowledge-intensive services. Thus, during the onset of the financial crisis in 2008, British software company trampoline systems used crowdfunding to make up for the sudden cessation of parts of the company's venture capital financing.¹²⁰ The software company managed to collect more than GBP 1 million in the matter of one year. In Germany, nanoparticles manufacturer Particular GmbH, a spin-off

of the Laser Zentrum Hannover eV, secured the financing of marketing and HR measures through an equity-based crowdfunding campaign and collected almost EUR 100,000 within a few days. In the case of Particular GmbH, the funds raised through crowdfunding were supplemented by public funding from the Federal Ministry of Economics' EXIST programme.

It was not until 2011 that the first crowdfunding platforms were launched in Germany. According to figures from an industry association,¹²¹ around 20 crowdfunding platforms were being operated in Germany in 2012; twice as many as in the previous year.¹²² Yet, when compared internationally and when measured against the size of the German economy, the number of crowdfunding platforms is still relatively low. Around 60 percent of the world's crowdfunding platforms are being operated in Anglo-American countries. By mid-2012, France (28 platforms), the Netherlands (29 platforms), and the UK (44 platforms) had launched more crowdfunding platforms than Germany.¹²³ Indications of strong international competition can currently be observed; not only with established financial intermediaries, but also among platforms.¹²⁴

In 2011, there were approximately 200 crowdfunding platforms in Europe, generating a volume of about EUR 300 million in funds. More than half of these crowdfunding platforms employed donation-based or non-profit models. The remaining platforms employed loan and equity-based crowdfunding models, as well as various hybrid models. An average project, or campaign, raised about EUR 500 per donation, about EUR 4,500 per loan-based contribution, and an average of about EUR 50,000 per equity capital investment. In some of the cases, the equity-based crowdfunding model raised amounts that reached the European regulatory limit of EUR 100,000 – especially in such cases where professional investors were involved in financing. According to figures from an industry association, a significant growth in financing volume is expected for the coming years in all crowdfunding models.¹²⁵

At this point in time it is difficult to assess the future role of crowdfunding in Germany as compared with other financing alternatives – and the extent to which this new financing form has already contributed to early-stage financing of innovative start-ups.¹²⁶ The Expert Commission believes that equity-based

crowdfunding could play an increasingly important role particularly in early-stage financing of start-up businesses. To date, this financing phase has been largely characterised by contributions from family members, friends or business angels. The number of potential financiers and the efficient use of internet-generated feedback from users and potential customers are factors that point to the increasing importance of crowdfunding in early-stage financing.

If crowdfunding is to become a successful financing instrument, it will be essential to provide suitable framework conditions. Existing crowdfunding platforms in Germany are still largely unaffected by prudential regulation – despite the fact that equity-based crowdfunding models, which seem to be most relevant in the financing of innovative start-ups, are particularly exposed to legal uncertainty. This is the case because this crowdfunding model borders on professional financial services and investment brokerage. For founders of this type of crowdfunding platforms, it is both time-consuming and costly to fully take account of all the legal issues that may arise. This is one of the reasons why some founders deliberately choose other, less innovation-friendly business models, such as the donation-based crowdfunding model.

When compared with traditional forms of financing, the crowdfunding model has one general disadvantage: the fact that information on the object of financing is disclosed to a large number of potential financiers risks the business idea being imitated. This risk can only be mitigated if IP rights are allocated in advance. To avoid legal issues, many crowdfunding platforms only accept projects and ventures for which potential issues relating to IP have been conclusively clarified.

The German Financial Supervisory Authority (BaFin), the federal regulatory authority in Germany, recently addressed the topic of crowdfunding, concluding that the crowdfunding models currently being used in Germany do not systematically deposit transactions within the meaning of the German Banking Law.¹²⁷ If this were the case, platforms would require a general licence for banking and financial services.¹²⁸ However, participation rights or silent partnerships in crowdfunding ventures are subject to prospectus requirements if they exceed the funding limit of EUR 100,000 per year. This obligation

would apply to the platform operators but rarely to the platform itself. To date, this funding limit has only seldom been reached in the German crowdfunding sector.

At EU level, several directives are under way or in the planning phase, including the Prospectus Directive¹²⁹ and the AIFM Directive. When it comes to implementing these directives at national level, it will have to be ensured that regulations aim to support the development of a crowdfunding industry in Germany as a whole, instead of unilaterally protecting the rights of investors. Nonetheless, it will be difficult to equally accommodate all the different types of crowdfunding with one relevant directive. Here, a specific Crowdfunding Directive might also be worth considering – similar to the provisions for funding portals in the context of the Jumpstart Our Business Start-ups (JOBS) Act 2012, which created a legal basis for crowdfunding in the United States.¹³⁰ The US directive entails raising the ceiling for crowdfunding financing to USD 1 million – a multiple of the limit at which the prospectus requirements in Europe take effect (i.e. EUR 100,000, as described above).

Recommendations

- For start-ups and SMEs, crowdfunding offers an attractive alternative to or supplement for financing by the government, banks, venture capitalist providers or business angels. Crowdfunding thus has the potential to stimulate innovation. Crowdfunding is a very recent phenomenon and still remains under-researched. Outstanding issues include e.g. the question of how the current government funding of start-ups and SMEs can be combined with this new financing form, and the ways in which crowdfunding affects the acquisition of follow-up financing. It is in the interest of all stakeholders to gather comprehensive data to facilitate enhanced transparency regarding the pros and cons of crowdfunding.
- Examples from other European countries suggest that the entrepreneur's chosen legal structure can hinder equity-based crowdfunding activities. In other countries, crowdfunding activities of start-ups that are based on more private-bound legal structures often require notarial formalities, or widely diversified equity is altogether prohibited

in crowdfunding ventures. In contrast, the existing German regulations on silent partnership seem to be a locational advantage and are therefore deemed positive by the Expert Commission.

- The new provisions of the United States' JOBS Act have significantly improved framework conditions for crowdfunding activities in the United States, thereby also improving the environment for innovative SMEs and start-ups. To prevent Europe from falling behind the United States, it is ever more important to harmonise regulations at a European level or at least strengthen coordination of national crowdfunding-related regulations. Among other things, this concerns the monetary ceiling for prospectus requirements.
- It will have to be clarified how, on the one hand, individual investors can be protected and how, on the other hand, platform operators can be protected from fraudulent investors – without government intervention impeding the growth potential of crowdfunding markets in Germany and Europe.¹³¹ Strengthened investor protection could be achieved e.g. by introducing a cap on allowable investment by individual private investors or by demanding explicit involvement of experienced and accredited investors in a financing project.¹³²

EVALUATION OF INNOVATION POLICY MEASURES BASED ON RANDOMISED EXPERIMENTS

A 6

The core of the problem

In Germany, as in many other countries, a variety of policy measures are in place to increase the dynamics of R&D growth. Yet a systematic evaluation of such measures which complies with most recent scientific standards is still lacking. There is still a shortage of solid findings on the causal impact of different policy measures. An area that is particularly under-researched is the extent of windfall profits in comparison with causal effects of innovation policies. As it is paramount that scarce public funds are used both efficiently and effectively, a solid analysis of the causal effects of public R&D policy measures becomes even more compelling. Although in recent years, a number of studies have contributed to improving the evaluation of R&D support measures,