

# Funding growth and innovation in Austria – financing conditions for SMEs and start-ups

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*In Austria, like in most European countries, small and medium-sized enterprises (SMEs) rely on bank funding as their primary source of external finance. Using ECB survey data, we analyze the availability of bank credit for SMEs in Austria in comparison to SMEs in the euro area. Overall, we find that bank lending has been rather stable over the past few years, and the lending conditions did not discourage many potential borrowers. Creditors and investors treat small, young firms that engage in innovation differently due to their elevated risk profile and the high share of intangible capital in their assets. We discuss the financial life cycle of these start-ups and the appropriate funding in each stage, including policy actions that have been taken to encourage a favorable ecosystem for start-ups in Austria. Whereas public support for these firms is well established, the private market for venture capital is rather small in Austria, especially in comparison with European innovation leaders.*

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Small and medium-sized enterprises (SMEs) make up the overwhelming majority of enterprises in Austria, like in all EU Member States; therefore, their ability to finance investments is highly relevant for economic growth. The financial crisis and its consequences for the banking system have raised questions about credit constraints for SMEs and about their access to funding from other sources. The access to funding for young, innovative SMEs has been much debated because, on the one hand, these firms are seen as important contributors to technological progress and structural change; on the other hand, their risk profile and their capital structure require different financing approaches compared to funding for traditional SMEs. In Austria, several policy measures have been implemented in the recent past to improve the ecosystem for these start-ups. This paper gives an overview of the current situation and is structured as follows: Section 1 presents the main features of SMEs in Austria and compares them to data from European peers. In section 2, we discuss the funding choices of SMEs and start-ups and contrast these considerations with empirical findings. Section 3 focuses on bank lending to SMEs, and section 4 discusses the funding needs of start-ups over their life cycle and briefly presents relevant policy initiatives; finally, section 5 concludes.

## 1 Some stylized facts on SMEs in Austria

The European Commission defines SMEs as “enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million”.<sup>2</sup> SMEs account for most of the economic activity in Austria; in fact, the overwhelming majority of Austrian enterprises are SMEs. This is by no means a peculiarity of the Austrian economy: in all EU Member States, more than 99% of enterprises are small or medium-sized; in the U.S.A., too, SMEs make up more than 99% of all

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<sup>2</sup> Commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. For further details, see <http://ec.europa.eu/DocsRoom/documents/15582/attachments/1/translations>.

enterprises. The fact that almost everywhere almost all enterprises actually are categorized as SMEs might contest the analytical rigor of the category itself.

According to the European Commission (2017), there were 325,428 SMEs in the nonfinancial business economy in Austria in 2017, and they employed 1.9 million people. Austrian SMEs employed 68.7% of the workforce in the private sector, which was roughly the same level as the EU average (66.6%). While productivity is generally lower in SMEs than in large firms, the productivity of Austrian SMEs is higher than the average EU SME productivity: the percentage of value added by SMEs was 62% in Austria compared to an EU average of 56.8%. Lower productivity is also reflected in lower wages. Labor costs in SMEs are only 56% of the total labor costs in the nonfinancial business sector. Within the EU, the share of SMEs in total value added varied from 51.8% in the U.K. to 82% in Malta.

Austrian SMEs tend to employ more people than European SMEs on average: only 0.9% of all EU firms are medium-sized, i.e. they employ between 50 and 249 persons, whereas 1.6% of Austrian firms belong to this size class. In comparison, 87.3% of Austrian firms have 9 or fewer employees and thus are labeled micro firms, while EU-wide, on average, 93% of enterprises are micro firms.

SMEs contribute significantly to economic growth and employment in Austria. From 2011 to 2016, value added in the nonfinancial business sector increased by 15.2% in Austria; but while the growth rate for large firms with 250 employees or more was 10.3%, it was 18.2% for SMEs. Over the same period, employment in SMEs expanded by 7.6% compared to 3.3% in large firms.

Growth rates among SMEs vary quite significantly: while many remain rather constant in size over time, others see strong increases in turnover and employment. The growth path very much depends on the chosen business model and technology. Local service providers like bakers or barber shops are rarely in a position to exploit economies of scale that would support strong growth. Eurostat defines firms with more than 10 employees and an annual growth rate of more than 10% as high-growth firms (HGFs). EU-wide these HGFs accounted for about 9.9% of all firms in 2016, whereas in Austria, their share was 6.8%; only Greece and Romania had relatively fewer HGFs. Additionally, HGFs in Austria were significantly smaller, with an average of 59 employees compared to an average of 85 employees in the EU in aggregate.

Due to Austria's lackluster performance in the field of HGFs, there is recurring doubt whether SMEs' growth is constrained by obstacles in their financing of new investments. Deleveraging in the aftermath of the financial crisis or new bank regulations have been named as potential causes of such financial constraints. The existence of the SME-supporting factor in the Capital Requirements Regulation<sup>3</sup> is testament to the very importance that policymakers in all EU countries, not only Austria, attribute to SMEs' access to finance.

A special case in the group of fast-growing SMEs are so called start-ups. Start-ups are defined as firms that are less than 10 years old, aim at significant growth in revenue and/or employment (often by exploiting economies of scale) and introduce a technological innovation or operate on an innovative business model. The Austrian Institute for SME Research (KMU Forschung Austria) estimates that between 500

<sup>3</sup> This factor was introduced in January 2014 and it allows for lower capital requirements on bank loans to SMEs; for more details, see European Banking Authority (2016).

and 1,000 start-ups are founded in Austria each year. Despite the fact that job creation and technology diffusion by newly founded firms have been a focus of innovation policy and economic research for decades (see, for example, Schibany et al., 2013), start-up entrepreneurs and their social networks have managed to create a certain hype around their activities. Although there is strong public interest in start-ups, reliable data on their activities are not available so far.

## 2 The funding structure of SMEs

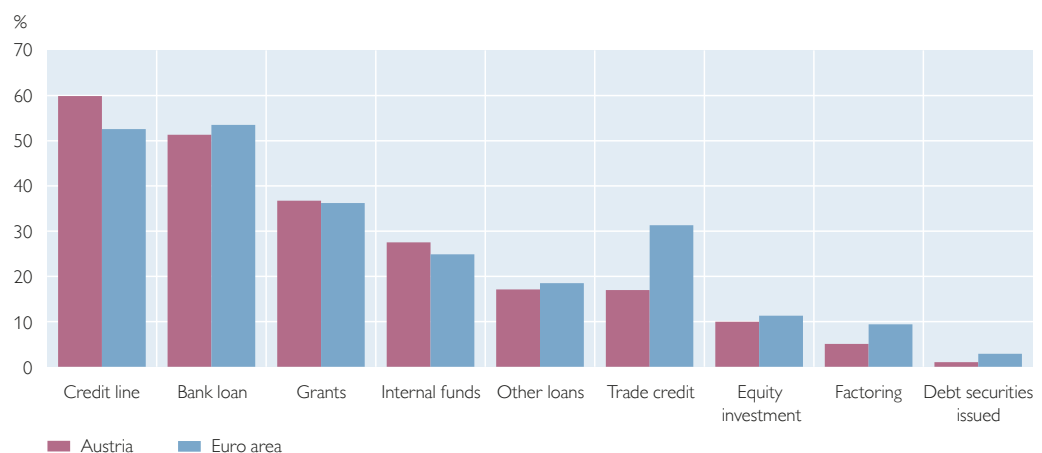
Austrian SMEs finance their assets mostly by debt; their equity ratio was 30.4% on average in 2016<sup>4</sup>. The equity ratio is positively correlated with size: micro firms, small firms and medium-sized firms have average equity ratios of 23%, 28% and 33%, respectively. Differences according to economic sectors are less pronounced, with the one exception of tourism: whereas SMEs in most sectors report equity ratios of 30% or more, SMEs in the tourism industry have a mean equity ratio of only 20%. Among the credit components of the balance sheet, bank financing (overdrafts and loans) are the most prominent ones, with bank loans representing 28.6% of all liabilities.

The demand for credit and equity by firms has been modeled by Myers and Majluf (1984) in a “pecking order” generated by asymmetric information. Firms prefer funding their operations by retained earnings to funding by credit, and they prefer funding by credit to funding by equity. Managers of firms<sup>5</sup> have better information about the returns on investment of their operations than outside investors. Therefore, outside investors demand a risk premium which is higher for equity because the risk of equity funding is higher, whereas internal funding by retained earnings has no risk premium attached.

A company’s ability to rely on retained earnings clearly depends on its recent cash flows, which were negatively affected by the financial and economic crisis

Chart 1

### Funding sources used by SMEs



Source: ECB SAFE.

<sup>4</sup> Data on the balance sheets of SMEs were taken from a recent report by *Wirtschaftskammer Österreich* (2018).

<sup>5</sup> *Myers and Majluf (1984)* also examine possible conflicts of interest between managers, old shareholders and new shareholders; for many Austrian SMEs, it is fair to assume that managers and old shareholders are identical.

after 2008, but have improved over the last years. Therefore, even if firms preferred to use internal funds for their funding, they would have to use external sources to a higher degree. Chart 1 presents the latest results from the Survey on the Access to Finance of Enterprises (SAFE), which is conducted semiannually by the ECB and the European Commission among European firms. The data for chart 1 stem from the survey round that was conducted in March and April 2018. More than 50% of responding SMEs in Austria and the euro area said that credit lines and bank loans were relevant to their enterprises,<sup>6</sup> whereas only about 3% of euro area SMEs and 1% of Austrian SMEs considered debt securities as relevant.

The problem of asymmetric information is more severe for SMEs than for larger enterprises because they are usually less obliged to report firm-specific information depending on their legal form of incorporation. The lack of reliable timely information about the state of an SME affects not only investment decisions, it also raises the monitoring costs for potential investors after they have provided funding to an SME.

One way to overcome the problem of asymmetric information for SMEs is to establish a lasting relationship with their main bank. Over time, the bank will be in a better position to assess a firm's characteristics that are decisive in lending but usually unobservable, like, for instance, management quality. While this kind of relationship lending can increase the flow of bank credit toward SMEs, too much proximity between bank managers and their business debtors might also erode credit standards, as Haselmann et al. (2018) have shown for southern Germany.

Beside the information and monitoring issues, the higher risk premia of SMEs compared to larger firms can also be explained by higher default risk. Equity ratios in firms rise with the size of their balance sheets, and SMEs by definition have smaller balance sheets than large firms. Therefore, negative economic shocks pose a more severe risk to SMEs and their investors. Bärnthaler et al. (2018) show that banks' ratios of nonperforming loans (NPLs) to total loans to SMEs are higher than the NPL ratio for loans to large firms. Credit guarantees by the public sector can increase banks' willingness to provide loans to SMEs as they transfer the associated risk.

Debt funding directly via the capital market by issuing bonds or commercial paper is not accessible to most SMEs, again due to economies of scale because tapping the bond market involves significant transaction costs. Before a bond can be issued, the issuer has to meet regulatory requirements, publish a prospectus and pay legal fees and other expenses. Moreover, once the bond has been issued, the issuing firm has to engage in investor relations, which also consumes resources. Equity funding via the stock market is subject to similar concerns.

The size of their financing needs also makes SMEs unattractive to institutional investors like pension funds or insurance companies, which dominate capital markets. These investors often manage assets up to billions of euro and tend to look for single investment opportunities where they would place at least EUR 5 million to EUR 10 million; and this would exceed the funding needs of most SMEs by far.

<sup>6</sup> The question asked in the SAFE is: "Are the following sources of financing relevant to your enterprise, that is, have you used them in the past or considered using them in the future?" It should be noted that the category "credit line" in chart 1 combines funding from credit lines, bank overdrafts or credit card overdrafts.

SMEs often refrain from equity funding in general, not only via the stock market, because they are concerned about loss of control. Equity investors acquire a stake in the firm and this usually also gives them a form of participation in decision-making. In many cases, SMEs are run by their owners, who want to keep making their own decisions without interference from external investors.

For innovative SMEs or start-ups, the funding choices are different. They are less interested in bank loans (which they are also less likely to receive, as we will see later) because, in general, loans come with prespecified repayment schedules, maturities and interest rates regardless of whether an enterprise is successful or not. The business models of these firms are risky, therefore they tend to look for risk capital or venture capital (VC) in the form of equity stakes. VC investors are willing to bear the risk and, in return, they participate in the potential gains to come. Furthermore, their role exceeds the mere financing function of regular investors, as we will see in section 4.

To get a picture of the economic situation of SMEs, the SAFE survey asks firms what their most pressing problems are. Participants in the survey can choose their answer from the following list: finding customers, competition, access to finance, cost of production and labor, availability of skilled staff or experienced managers, regulation, or other. Interestingly, access to finance seems to be a lesser concern to Austrian SMEs, with only 6.2% of domestic respondents naming this as their most pressing problem; each one of the other possible answers was chosen by more SMEs in the survey.<sup>7</sup> For most SMEs in Austria, the availability of skilled staff or experienced managers is the most pressing problem in their current operations, followed by difficulties to find customers.

The European Investment Bank (EIB) also examined access to finance in its annual Investment Survey (EIBIS); the results from the most recent wave of this survey are presented in EIB (2017). The EIBIS asks firms to rank obstacles in their investment decisions. Additionally, the EIBIS classifies firms into different categories according to their innovation profile: basic firms (i.e. firms that do not engage in any innovation activities), adopting firms, developers, incremental innovators and leading innovators. Again, for Austrian firms surveyed in the EIBIS, availability of staff with the right skills is the most prominent obstacle, with more than 90% of leading innovators and developers naming this as the most important investment obstacle. In contrast, availability of finance is one of the least important obstacles to investment for all Austrian firms in the survey, regardless of their innovation profile; only the availability of adequate transport infrastructure is even less of a problem to them.

### 3 The availability of bank credit to SMEs

In the aftermath of the financial crisis, bank lending to SMEs<sup>8</sup> in the euro area has dropped significantly. Wehinger (2014) offers an overview over the impairment of bank lending to SMEs during the financial crisis and policy responses to facilitate SME access to financing. Total bank loans to SMEs in the euro area declined from

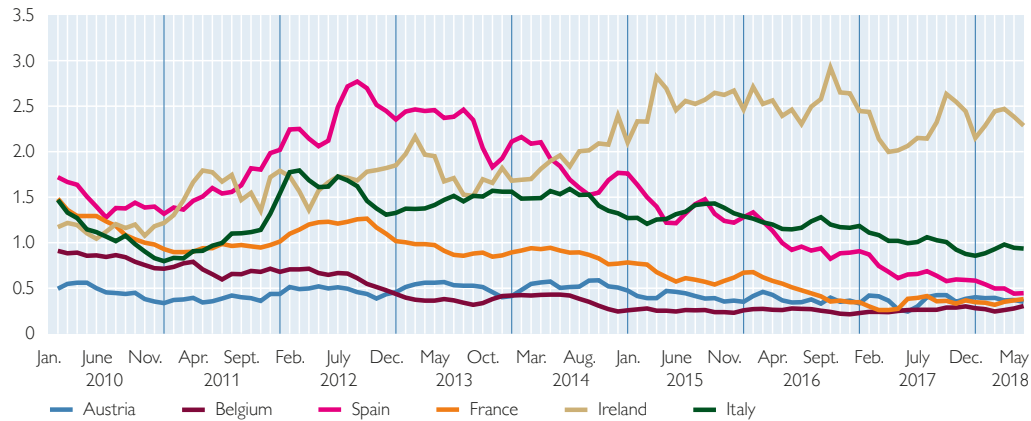
<sup>7</sup> This compares fairly well to Greece, where 20.5% of surveyed SMEs named access to finance as their most pressing problem.

<sup>8</sup> SME credit is proxied by loans to nonfinancial corporations up to and including EUR 1 million from the ECB's MFI statistics.

Chart 2

### Interest rate spreads between bank loans to SMEs and bank loans to large firms

Three-month moving average in percentage points



Source: ECB.

an average pre-crisis level of EUR 85 billion per month in 2008 by 36% to EUR 54 billion in 2013 and has not recovered yet; in the first half of 2018, the monthly average had reached EUR 65 billion.

### 3.1 SME lending patterns of Austrian banks

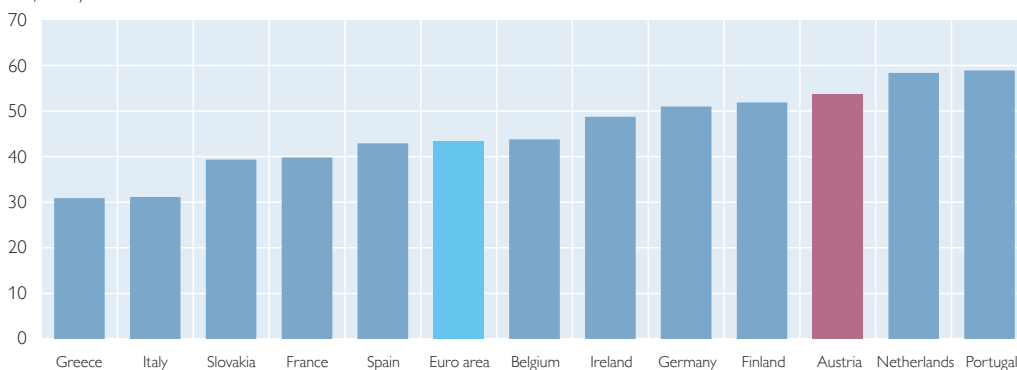
In Austria, bank lending to SMEs has been much more resilient. It did not decline during the crisis and dipped only briefly in 2013 just to recover by 2016, when it had already reached pre-crisis levels again. In June 2018, the amount of loans other than revolving loans and overdrafts as well as convenience and extended credit card debt from the Austrian banking sector to SMEs totaled EUR 1.16 billion, which was exactly the monthly average in 2008.

Banks' interest rates for SME loans have been declining since the end of 2011 in Austria and amounted to 1.77% in June 2018. The spread between SME loans and loans to large firms has been rather stable over the last years and averaged

Chart 3a

### SMEs that did not apply for bank loans because of sufficient internal funds

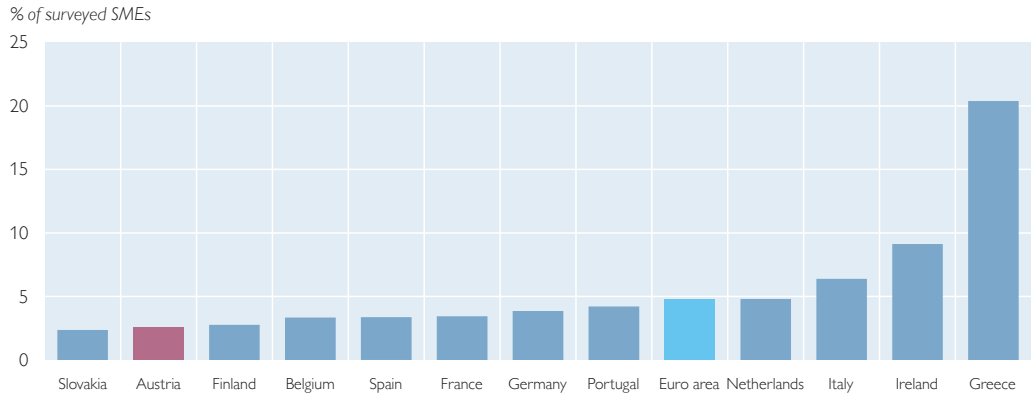
% of surveyed SMEs



Source: ECB SAFE.

Chart 3b

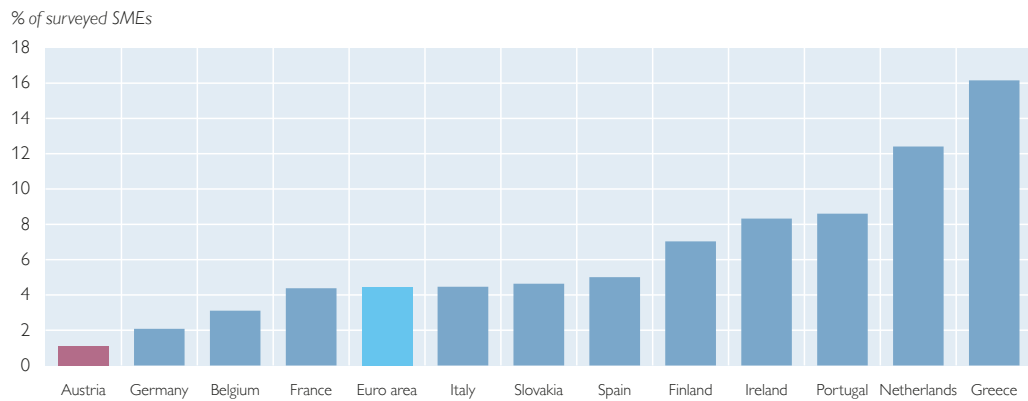
### SMEs that did not apply for bank loans because of possible rejection



Source: ECB SAFE.

Chart 3c

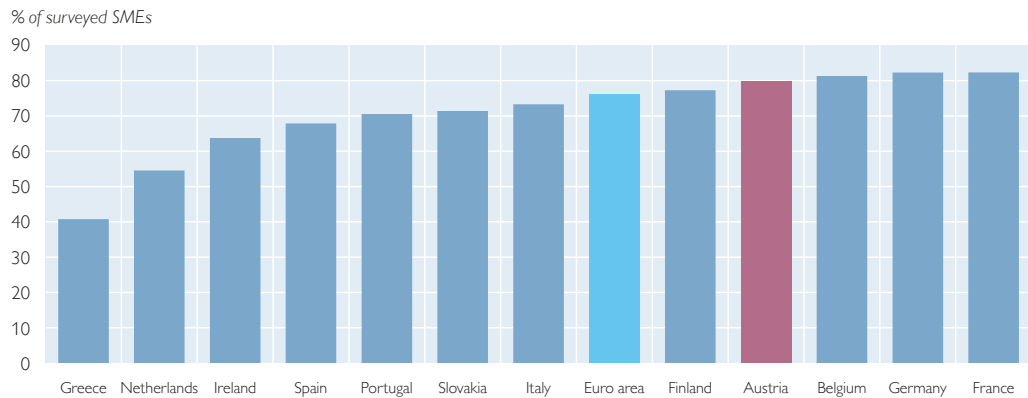
### SMEs that applied for bank loans but whose applications were rejected



Source: ECB SAFE.

Chart 3d

### SMEs that applied for bank loans and got the total amount they applied for



Source: ECB SAFE.



38 basis points during the first half of 2018. There are only a few euro area countries where SMEs would find more favorable credit conditions for the time being. In some countries, the spread for SME loans has increased significantly (as can be seen in chart 2), thereby impeding the transmission of expansive monetary policy impulses in the aftermath of the financial crisis for a large part of the business sector.

According to the latest SAFE wave (which refers to the second half of 2017), 53% of Austrian SMEs had not applied for bank loans because they had sufficient internal funds at their disposal, and only 2.6% of SMEs had not applied for a bank loan because they feared their application would be rejected. Of those SMEs that had applied for bank loans, only 1% was rejected by the banks, whereas 79.8% received the full amount they had applied for. These numbers compare quite favorably to other euro area countries, as can be seen in charts 3a to 3d. Like in most countries, the rejection rate peaked in 2009 and rose again in 2014, but declined swiftly thereafter.

As we have seen in chart 1, credit lines, bank overdrafts or credit card overdrafts represent an important part of SME funding in Austria. The SAFE data allow us to trace back the path of interest rates charged on these funding instruments. The average interest rate on credit lines or bank overdrafts was 1.95% in Austria in the second half of 2017, which was the second lowest rate in the euro area next to rates in Finland. Interest rates have come down by 140 basis points since 2014 in Austria and 250 basis points in the euro area on average. The decline in euro area rates was mostly driven by lower rates in Portugal, Spain and Italy, where the interest rate had exceeded 6% in 2014 (compared to 3.3% in Austria).

In its annual report “Financing SMEs and Entrepreneurs,” the OECD also analyzes the credit conditions for SMEs. In a comparison of SME loans to total new business loans up to 2016, they find that the share of SME loans has increased in Austria, mostly due to a decline in the loans to larger firms. This is interpreted as the result of large firms’ strategy to resort to forms of funding other than bank loans. As we have shown in section 2, alternative forms of funding, like e.g. funding via capital markets, are not easily available to many SMEs. The OECD report also analyzes data on loan maturities and finds that in Austria, the share of short-term loans (defined as loans with a maturity of less than one year) in all SME loans declined from 60% to 40% between 2009 and 2016. Short-term funding is usually sought by firms to finance working capital, whereas long-term borrowing funds investments. Therefore, the relative reduction in the share of short-term loans to Austrian SMEs coincides well with the current upswing of the investment cycle in Austria (see Fenz et al., 2018). Survey data on bank lending in Austria as presented by Hubmann (2018) also show that SMEs have continuously increased their credit demand since the end of 2016, and credit standards of banks have remained neutral over this period.



### 3.2 Bank lending to innovative SMEs and start-ups

Access to bank loans is more difficult for innovative, technology-intensive SMEs or start-ups for a number of reasons. First, innovative firms hold a substantial part of their capital in the form of intangible assets. Intangible assets are defined by the OECD (2018) as “identifiable non-monetary assets without physical substance” that in most cases represent intellectual property such as patents, brands, copyrights or software. This asset class is challenging to use as collateral for several reasons. The valuation of intangible assets often suffers from the lack of standardized approaches, especially when it comes to innovative intellectual property rights for which no market has been established yet. A bank that should lend money against this collateral and the creators of the intellectual property may differ quite significantly in their assessment of a fair price for intangible assets and the future cash flows to be expected from innovations.

Another problem with intangible assets like innovative intellectual property rights is their restricted range for redeployment outside the original business environment in which they have been created. Physical capital like machines or vessels can be deployed in many different production processes, and often there is a liquid secondary market for used capital goods. Innovations are by definition new to the market; hence, if the borrower defaults on their loan, the bank might repossess the intangible asset but will find it difficult to resell it. Due to this kind of transaction risk, a bank would offer a loan against innovative intangible collateral only after applying a severe haircut (if at all).

The repossession of intangible assets poses a risk in itself because property rights in technologies or innovative processes are more difficult to uphold than the ownership of tangible assets. Even if innovative processes are protected by patents or copyrights, the original innovators might deploy them in new applications and it might become rather difficult for the new owners to prove misappropriation or infringement. Again, these considerations induce banks to abstain from accepting intangible assets as collateral.

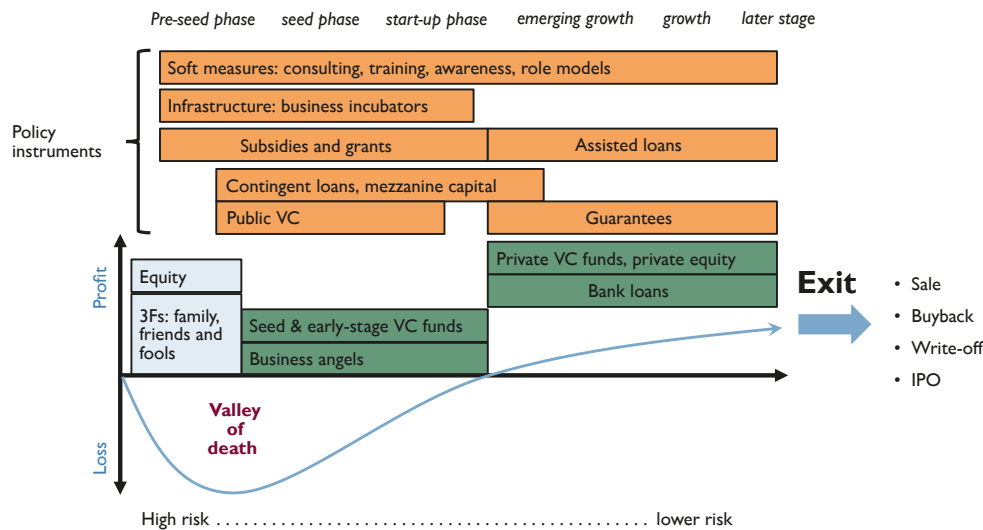
Young firms in general have more restricted access to funding because they had less time to accumulate retained revenues and therefore have lower equity ratios. The lower equity ratio makes marginal investment in these firms relatively riskier for external investors. Another reason for the lower propensity of creditors to provide loans to young firms is their missing track record. With young firms, investors cannot judge whether management is capable of running the business or whether the business model itself is sustainable. Older firms that have already mastered this test of the markets are more likely to receive loans or equity investments. In its recent Investment Report, the EIB writes: “Young SMEs with radical innovative projects are the most credit-constrained category of firms” (EIB, 2017, p. 339).

## 4 The funding of start-ups

As we have seen so far, start-ups do not really have sufficient access to bank credits or traditional capital markets, so they usually rely on alternative forms of funding. In this context, the start-up’s current stage in its life cycle plays a significant role: for each different stage, different financing conditions and instruments apply.

Chart 4

### Start-up life cycle stages and financing



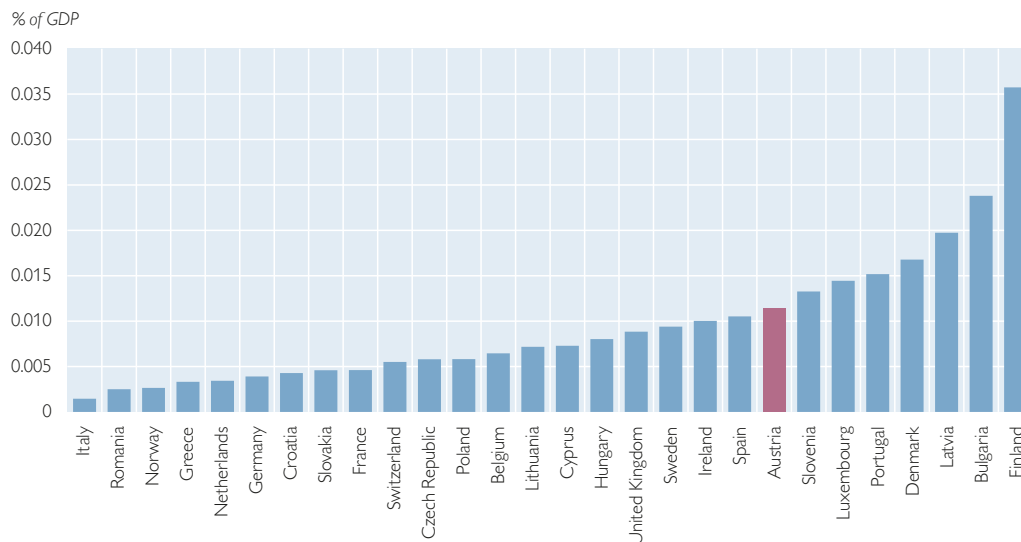
Source: Authors' compilation based on Darcy et al. (2009).

This holds true especially for innovative start-ups which may still need long (and potentially costly) R&D processes before they can deliver their first products and, eventually, scale up production. Chart 4 highlights this relationship.

In the very first stage (“seed”) in the start-up life cycle, the costs of setting up the firm, the costs of R&D necessary to develop or refine the business idea (e.g. proof of concept, prototype development, product refinement, etc.) lead to rather high operating costs. These costs are not yet matched by corresponding market revenues; revenues are likely to be negligible. At this stage, start-ups face a great risk of running out of funds (“burning cash”), hence the notion of the “valley of death,” which indicates that many innovative start-ups eventually fail right there. Early financing often relies on the founder’s own funds, the so called “3Fs” (families, friends and fools) and maybe on a business angel who specializes in the very early stages of business creation and might bring to the start-up not only funding but also much needed business and market know-how. Additionally, funding via “crowdfunding” is rising in importance as well. External financing in the form of bank loans is basically excluded at this stage, for reasons we have mentioned before. The public sector might support start-ups during this phase with a variety of different instruments, ranging from “soft measures” like the provision of specialized know-how, training, infrastructure (e.g. incubator centers) to direct monetary support by grants or the provision of public capital (e.g. via public VC funds). According to Leitner et al. (2018), the most important funding sources are founders’ own capital resources (with about 81% of all start-ups reportedly using this source) followed by public subsidies and allowances (reported by 55% of all start-ups). Interestingly, business angels take third place, with about 33% of start-ups reporting to have some sort of financial backup by business angels. Only 21.8% of the surveyed start-ups had received bank loans, compared to 51.3% of SMEs according to the SAFE data.

Chart 5

### Business angel investments in 2016 and 2017



Source: EBAN, Eurostat.

However, reliable statistical data on funding by business angels are rather scarce, there is no official reporting and many business angels prefer not to disclose their activities. We used data from the European Business Angels Network (EBAN) that are published annually to compare the role of business angels in Austria with that in other European countries. Chart 5 shows the disclosed amounts invested by business angels in 2016 and 2017,<sup>9</sup> measured as a percentage of GDP. In total, business angels invested EUR 20 million in Austrian firms in 2017. The largest business angel market in the EU is the U.K. with 8,000 active business angels and a total investment sum of EUR 107 million in 2017. Interestingly, the average investment sum of EUR 500,000 per business angel is quite high in Austria,<sup>10</sup> indicating that this form of investment is conducted mostly by rather wealthy individuals.

Crowdfunding is a relatively new form of alternative financing based on online platforms that directly match creditors and debtors. It is the most immediate form of financial intermediation without any risk transformation or maturity transformation provided by the intermediary. In Austria, it gained traction in 2015, when a new regulatory framework was enacted; for more details, see Pointner and Rauning (2018). In 2017, crowdfunding accounted for investment flows of about EUR 25 million according to CrowdCircus market statistics. By mid-2018, crowdfunding had already surpassed more than 2/3 of the previous year's volume. Despite the rapid growth of this new market, it should be noted that most of these investments are channelled into real estate and not into start-ups. According to

<sup>9</sup> We dropped Estonia from the chart, as its share was more than double that of Finland. Non-EU countries Switzerland and Norway are included because their general degree of capital deepening is comparable to Austria's.

<sup>10</sup> The average sum is only surpassed by Portugal (EUR 590,000) and amounts to EUR 400,000 in Germany and approximately EUR 250,000 in Sweden, Finland and Spain, respectively; other countries' averages are lower.

Leitner et al. (2018), about 10% of start-ups have received funding via crowd-investing.

After the seed phase, start-ups enter the early growth phase, when they slowly build up a track record and – as a result of previous funding by different investors – accumulate assets (physical and intangible), which could partially serve as collateral for bank loans. At the same time, the companies are now also attractive to more “traditional” VC funds. As an additional economic policy instrument, loan guarantees and interest-based loans (assisted loans) can now also be used.

During the growth phase, when the estimated company value increases, the exit question comes into play. Early-stage VC funds usually have a time horizon of approximately five years; this is the period for which shares of a portfolio company are typically held. Typical forms of exits are sales to large companies in the same sector (“trade sale”), sales to other VC funds (“secondary investments”), a buyback of shares by the start-up founders as well as the sale of company shares on the stock exchange in the form of an initial public offering (IPO). It should be noted that the latter exit channel in Austria is extremely rare among start-up companies due to the shallowness of the Austrian capital market.

#### 4.1 Policy initiatives to support start-ups

The public sector is also active in funding innovative SMEs and start-ups in Austria. At the federal level, the main agencies responsible for stimulating the establishment of new businesses in general and innovative start-ups in particular are aws (austria wirtschaftsservice GmbH) and FFG (Austrian Research Promotion Agency). FFG’s funding portfolio ranges from support programs for applied research in very early stages of the innovative process to grants for the development of marketable products. Besides direct support at the individual firm level, FFG also funds so-called structural programs that aim at improving the framework for innovation by supporting cooperation between science and industry. FFG runs a start-up funding program which covers up to 70% of all costs in technically risky and economically interesting projects of young innovative SMEs; the funding consists of a mix of nonrepayable subsidies and low-interest loans. Markt.Start is another FFG program for small companies. Its objective is to provide financial assistance during the start-up phase or the emerging-growth phase (see chart 4), when innovative SMEs introduce new products or processes to the market.

The agency aws acts as a public bank (with its own bank license), supporting start-ups with a wide variety of instruments. Indeed, aws covers a start-up’s complete life cycle as shown in chart 4 with specific instruments which are specifically geared to the different stages or phases of the life cycle. The most important measures are:

- Grants: pre-seed and seed financing (specific grants for setting up and developing an innovative high-tech start-up company); specific grants for the creative industries sector; grants for innovative services (in practice mainly IT).
- Direct and indirect provision of public risk capital: aws Gründerfonds (public VC fund which invests directly in innovative start-ups), aws Mittelstandsfonds (public fund which invests directly in growth-oriented SMEs), aws Venture Capital Initiative (indirect stimulus via public investment in private VC funds), aws business angel fund (syndicating investments of certified business angels in conjunction with the European business angel fund).

- Guarantees: aws guarantees for loans for young firms or SMEs that were founded no more than six years ago; double equity (guarantees for loans for young firms or SMEs which have also equity capital).
- Infrastructure: AplusB Scale-up (support for specific incubator centers specifically geared toward mentoring, assisting and supporting innovative start-ups).
- Soft measures: aws business angel exchange (matchmaking between business angels and start-ups); various awareness, consulting and training measures.

Box 1

### Policy in action: the start-up package

In 2016, the Austrian government agreed upon a so-called start-up package to strengthen the domestic start-up economy and help to create a supportive ecosystem for start-ups in Austria. The whole bundle of measures and initiatives was worth EUR 185 million and aimed at the creation of an additional 50,000 enterprises by 2020. The package consisted of the following main policy actions:

**Reduction of non-wage labor costs:** The public purse subsidizes the employer's contribution to social security for the first three employees and for a period of three years.

**Risk capital premium:** 20% of annual investments in a start-up are reimbursed (up to EUR 250,000) with public funds.

**Public funds for start-up support:** The financial endowment of the aws business angels funds and aws seed funding was increased.

**New private investment funds:** a new legal form of investment funds (“Mittelstandsfinanzierungsgesellschaft”) that focuses entirely on risk capital for SMEs and carries tax advantages was created.

**Digital one-stop-shop for business founders:** All the necessary information and documents for starting an enterprise are made available online.

In its SBA Fact Sheet Austria, the European Commission called the start-up package a “remarkably broad set of innovative measures” and expressed its interest in the implementation of the package. More generally, the public funding of start-ups does not seem to be the problem in Austria; the European Startup Monitor (2017) ranks Austria as the country leading in governmental funding of start-ups.<sup>1</sup>

<sup>1</sup> In the 2017 European Startup Monitor (ESM) survey, 55.4% of Austrian start-ups stated that they had received government subsidies, compared to 35.5% of German start-ups (in 2<sup>nd</sup> place) and 25% of Spanish start-ups (in 3<sup>rd</sup> place); the survey does not quantify the amount of these subsidies.

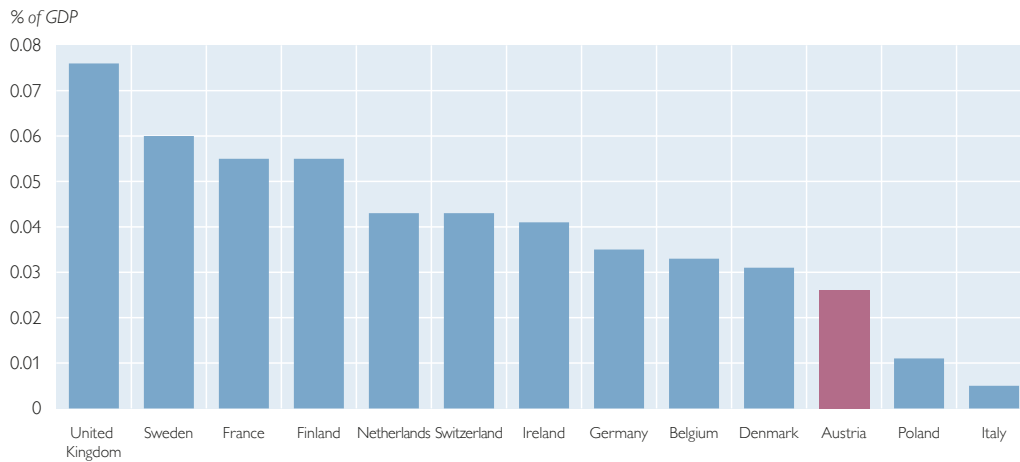
## 4.2 Recent trends in the Austrian venture capital market

The development of the VC market in Austria has always been considered to be a particular weakness of the Austrian innovation system; for an extensive analysis, see Jud et al. (2013). Despite various policy approaches to stimulate the capital market, it is still in an “infant stage,” especially compared with the much more developed markets of some Nordic countries (e.g. Finland, Sweden), the Netherlands, Switzerland, France or the U.K. (see chart 6). Nevertheless, Austria has gained some ground on Germany, which has a comparable economic structure and institutional set-up (i.e. a traditional focus on financing via bank loans).

Even during past hypes (e.g. the boom of the so-called “new economy” of the 1990s) and times of strong economic growth like the years before the global financial crisis, the risk capital market in Austria was less dynamic than in other countries. It was nearly drying up after the financial and economic crisis in 2008 and the following years. Important institutional actors such as banks, insurers and pension funds even left the market altogether, as documented by Gassler and Sellner (2015).

Chart 6

### Investment in risk capital in 2017



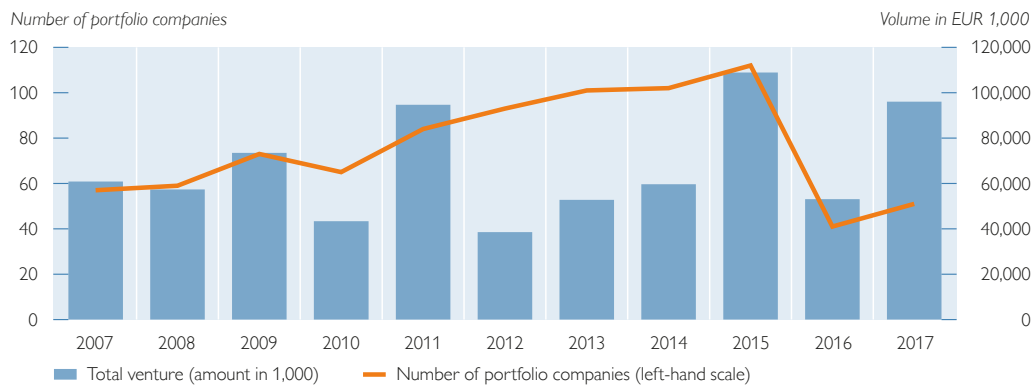
Source: Invest Europe, Eurostat.

Recent anecdotal evidence (based on interviews with various fund managers) and media reports suggest an increased activity of VC firms in Austria. Some fund managers even raised the question of whether there might be “enough” interesting start-up projects around that are able to absorb the “flood” of new VC coming to Austria. Indeed, the history of some genuine VC firms shows that they had no problem at all to raise new VC money for their second round (after their first fund has already been successful). Of course, a series of extremely successful exits (at least under the conditions of the Austrian VC market) resulted in a much higher propensity to supply relevant risk capital available from potential investors. Besides, the still low interest rate environment is an important push factor as well. However, official data from the relevant organisation (“Invest Europe”) show ups and downs and no clear trend toward an ever increasing market size (see chart 7).

Apart from considering the amount of available VC funds, it is also worth looking at the number of start-ups which were able to attract VC investments, i.e. which became portfolio companies of VC funds. If we compare these numbers and

Chart 7

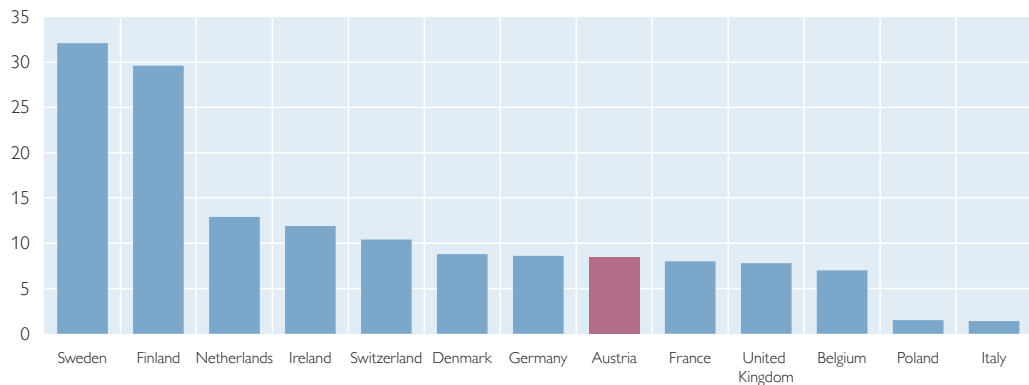
### Venture capital investment and number of portfolio companies in Austria



Source: Invest Europe.

### Start-up density in selected countries

Number of portfolio companies per million inhabitants



Source: Invest Europe.

control for the size of the country (measured by population as a proxy for the potential of business founders), we get a metric for the “density” of start-ups in a given economy. The resulting pattern for selected European countries is shown in chart 8. Again, two Nordic countries (Sweden and Finland) are at the top, well ahead of countries like the Netherlands, Ireland and Switzerland and, eventually, Austria. Interestingly, the differences between these countries are relatively small.

There are some notable differences regarding the ranking (in comparison to the ranking of VC per GDP). In the start-up density ranking, Austria is close to Germany and even ahead of France and the U.K. Even though the latter two do have a higher VC-to-GDP ratio, their start-up density is lower than in Austria. Hence, their average VC investment per start-up (portfolio company) must be remarkably higher. This might be a hint that Austrian start-ups start from a rather modest level given the small size of their initial market whereas French and U.K. start-ups can start with an initial (national) market almost ten times the size of the Austrian one. Additionally, the technological specialization of start-ups might play a role here as well, since e.g. start-ups in the life sciences do need much more VC than start-ups in the IT/telecom sector.

Indeed, in interviews VC fund managers have stated that the available funds for the relatively small initial investments in new start-ups do not constitute a bottleneck anymore. Together with public subsidies for the very early stage, the available VC funds cover these stages in an appropriate way. This coincides with Wilson (2015), who finds that “as public funding has increased, there is a growing concern regarding the shortage of innovative entrepreneurs, a lack of entrepreneurial skills and capabilities and low quality of investment projects.”

However, additional investment rounds in follow-up stages seem to be the bottleneck today. Investments per start-up of EUR 0.5 million or more still present a problem for the typically small-scaled VC funds active in Austria. Financing the scaling up of initially successful start-ups is much more capital intensive, and this is the area where Austria’s VC market is still lagging behind. Thus, there is in fact a danger that Austria might lose some of its successful start-ups (e.g. by relocating to other markets) in the very phase in which success might be just around the corner.



## 5 Concluding remarks

More than 99% of Austrian firms are SMEs; therefore, their funding conditions are an important concern to policymakers and the public. We have seen that the dominance of SMEs is not a particular feature of Austria's economic structure but owes more to the definition of SMEs as specified by the European Commission. Austrian SMEs on average fund 30% of their assets with equity. With respect to debt funding, Austrian banks have been more resilient in the crisis than banks in other countries regarding the provision of loans to SMEs. Credit conditions in terms of interest rates or rejected loan application are also rather favorable in Austria. Hence, we do not find any indication of the Austrian banking sector restricting credit for SMEs.

Start-ups are new SMEs that operate with innovative technologies and business models that aim at rapid growth. Their operations, especially in the early stages of their life cycle, are rather risky, and therefore start-ups prefer venture capital and other alternative forms of funding from investors that are willing and able to bear some risk. Banks are understandably reluctant to grant loans to firms with no proven track record and a balance sheet that mainly consists of intangible assets. Whereas Austrian SMEs in general have good access to bank loans, start-ups are credit constrained in this respect.

While we find that in the early stages of their life cycle, Austrian start-ups seem to have sufficient access to finance, or at least they are not lagging behind their European peers in this respect, in later stages – when the volume of desired investments has increased significantly – they seem to experience some funding constraints. Economic policymakers have addressed these problems by launching several initiatives and providing public assistance, which has been positively acknowledged at the international level. It is important to keep in mind that it takes time until these initiatives become fully operational and effective. Therefore, policymakers should maintain their support for some years and refrain from erratic changes. Furthermore, given that the public funds reserved for this policy area are quite substantial, an evaluation of measures is warranted.

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