

# **Entrepreneurial culture and start-ups**

## **Could a cultural shift in favour of entrepreneurship lead to more innovative start-ups?**

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## Executive summary

Europe is lagging behind the United States and Israel in the number of successful start-ups. Highly innovative start-ups that grow to become global companies the size of Google or Amazon within just a few years are not being founded here. Many of Europe's countries and regions are experiencing persistent low growth with high unemployment, which is something a boom in new companies implementing new creative ideas could help alleviate. Even in Germany, which has a much better macroeconomic performance, the number of companies being founded has been falling for several years.

There are strong indicators that Europe's aforementioned weakness when it comes to the starting of new companies may also have a cultural dimension. Regions which are seeing particularly strong numbers of innovative start-ups being founded appear to have a strong entrepreneurial spirit. This policy paper will therefore examine what defines the entrepreneurial culture of successful start-up regions and to what extent different entrepreneurial cultures contribute to the differences in entrepreneurial activity between large areas of continental Europe and other highly developed economies, especially the United States, the United Kingdom, and Israel. This paper will examine both the societal and institutional framework that exists in an entrepreneurial culture and the personality structure of successful entrepreneurs. Following an international comparison of enterprise birth rates, this paper will review the different start-up systems in Europe, the United States, and Israel, which are also expected to have a connection to differences in the availability of venture capital. Finally, this paper considers the role of the education system in transferring business knowledge and entrepreneurship. This is followed by a conclusion in which recommendations are given regarding how to develop an entrepreneurial culture and a willingness to take risks.

## 1. Introduction

Europe is lagging behind the United States and Israel in the number of successful start-ups. Highly innovative start-ups that grow to become global companies the size of Google or Amazon within just a few years are not being founded here. The number of innovative and high-growth start-ups in Europe as a whole is quite small, even though there are successful start-up clusters in major cities such as London or Berlin, or economic centres such as Stockholm and Munich (EY, 2015). The number of companies being founded in Germany has also been falling in general for several years. It is not only the number of new solo-project businesses that is falling; there has also been a drop in the number of larger and innovation-focused start-ups (Piegeler & Röhl, 2015). This is partly due to the strong improvement in labour market conditions that have made the alternative of working in an established company more attractive and more accessible to both low-skilled workers and skilled workers alike. Now there has been a reduction in both categories, we have already seen a shift from necessity-driven, previously unemployed entrepreneurs towards opportunity-driven entrepreneurs who want to transform their idea into a business. But this argument cannot be applied on the European level: High unemployment rates should act as a push factor, increasing entrepreneurial activities (see Chapter 4).

There are strong indicators that Europe's aforementioned weakness when it comes to the founding of new businesses also has a cultural dimension. Regions which are seeing particularly high numbers of new companies being founded appear to have a strong entrepreneurial spirit – this applies to more than just the legendary Silicon Valley, which attracts the best entrepreneurs from all over the United States and beyond and is therefore able to project a positively skewed image. Start-up scenes have also become established in New York, Boston, and Tel Aviv – where a strong “can-do” attitude is combined with technical expertise and a start-up-friendly environment. This applies to a much lesser degree in Germany's start-up hotspots, Berlin and Munich. On the global level, only London is among the internationally leading start-up centres.

In order to explore this clear difference in the founding of start-ups between Europe and the United States, this policy paper will focus on the cultural and institutional conditions experienced by start-ups, as well as the personal attributes of successful entrepreneurs. This paper will also examine the status of the market economy and entrepreneurship in the education system and society in general, while exploring to what extent the treatment of failed entrepreneurs could contribute to the outlined differences. It is often stated that the start-up hotspots in the United States possess a “culture of second chances”, where once-failed entrepreneurs can quite easily attract

financing for a new business idea. In Germany, however, not so much attention is paid to the experience the entrepreneur has gained in founding their first company; instead, a stigmatisation effect closes the door to financing for new entrepreneurial ideas. This could contribute to the international differences in the ease of entrepreneurship.

## **2. What defines an entrepreneurial culture and how does it develop?**

### **2.1 Regional differentiation**

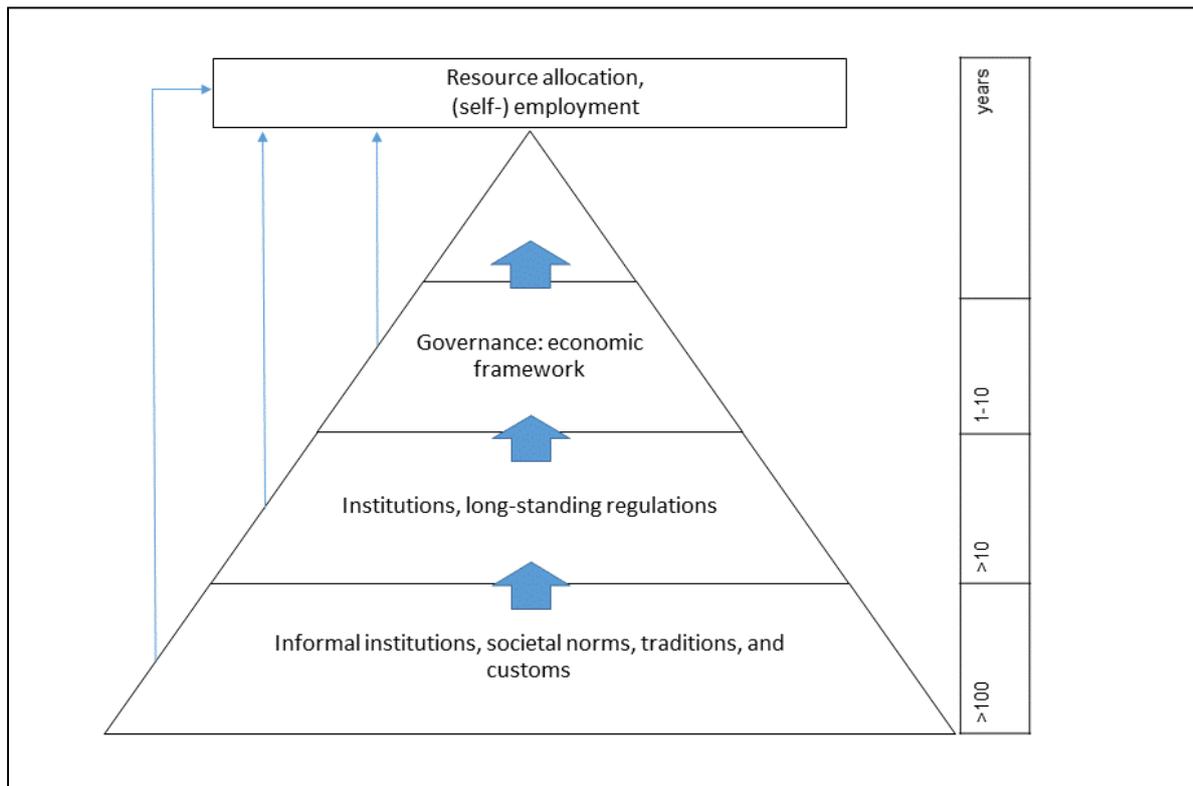
There are not only large differences in the numbers of new businesses founded between countries, but also between regions within the same country. These differences are indicative of different conditions, and possibly cultural differences, between geographical areas with similar legal and linguistic structures and shared history and traditions. Regional differences in entrepreneurial behaviour can be very constant over time (Andersson, 2013; Foremen-Peck & Zhou, 2010). A study by Fritsch and Wyrwich (2012) shows that German regions with a high number of self-employed individuals in 2005 in most cases already had a lot of self-employed people back in 1925. This even applies to regions in East Germany, although 40 years of socialism in the former GDR made self-employment a very unattractive and rarely chosen option in the meantime.

Even regions within the same country that have similarly strong entrepreneurial activity over a period of time, like Silicon Valley or Boston in the United States, can differ in terms of the paths they take, because a sufficiently large number of highly qualified individuals have a different assessment of the desirability of working for an existing business as opposed to founding one's own company (Andersson, 2013; Saxenian, 1994). It appears there are some locally anchored values and attitudes which affect entrepreneurial activity and the associated innovations. If the entrepreneurs bring pioneering innovations in the Schumpeterian sense to the market, which then displace existing companies or create entirely new markets, then their companies may grow quickly and generate additional spin-off companies. Their success also makes them a role model for other entrepreneurs in the region, who will go on to pursue the same path.

The following figure (Figure 1) shows the influence of cultural factors on the allocation of resources and employment, including the tendency towards entrepreneurship and self-employment. Informal institutions and norms, as well as traditions and needs, often develop and persist over very long periods of time – even

centuries. They lead to the formation of long-standing regulations and formal institutions that endure for decades. Ultimately, these two aspects define the economic policy framework and governance, which have a short- and medium-term effect on resource allocation, self-employment, and employment levels (Andersson, 2013, 7ff.; Williamson, 2000).

**Figure 1: Institutions, standards, and traditions influence start-up culture**



Source: Created by author, based on Andersson, 2013, 8

Other regional factors influence start-up activity. In the econometric estimate used by Andersson (2013), the **influence of regional unemployment** and the income level on entrepreneurial activity is in both cases negative, albeit not significantly. The only slightly negative influence of unemployment on entrepreneurial activity can be seen as an indicator of the significance of “necessity-driven entrepreneurship”, i.e. companies founded as a result of unemployment and due to a lack of sufficient alternative sources of income. According to the Global Entrepreneurship Monitor, the proportion of necessity-driven enterprises in relation to the total number of companies being founded lies between 5 and 50 per cent, depending on the country (GEM, 2015). In the United States in 2014 this was 13.4 per cent, as opposed to 23 per cent in Germany. In addition to cultural and personal differences, the regional employment situation also defines the proportion of necessity-driven entrepreneurs.

Income levels on the other hand indicate whether there are good employment options available as an alternative to self-employment. The fact that the effect overall is only slight and insignificant could be due to the offsetting effect of the reasons why unemployment is high in the affected regions. Weak development of the regional economy and structural problems also reduce the opportunities for success for opportunity-focused entrepreneurs, and therefore have a negative effect on entrepreneurial activity. In contrast, the general level of education, the size of the market, and the proportion of services in the region all have a positive effect on the number of companies being founded. These variables are associated with a higher degree of urbanisation. In Germany, too, city centres are more start-up-friendly than rural or (previously) highly industrialised regions (Brixy, Sternberg & Stüber, 2008; Sternberg & Hundt, 2007). According to the study by Anderson (2013), this applies even when the effect of a location in metropolitan regions is measured separately via a dummy variable. These results from Sweden are supported by Barreneche García (2014), who determined in an analysis of data from 184 European cities that the size of the city, the existing self-employment rate, and the proportion of the population with tertiary education are all drivers of entrepreneurial activity.

## 2.2 Self-amplifying feedback effects

Andersson (2013) shows in his study of entrepreneurial activity in Sweden that there is a strong persistence of existing interregional differences: The regions that showed the most entrepreneurship in 2007 mostly had an above-average number of start-ups in 1987. Using multivariate analysis, it was seen that half of the variance in the number of companies being founded in different regions of Sweden can be explained by the regional level of entrepreneurial activity 20 years prior (Andersson, 2013, 6). It may be possible to trace back the persistence of regional differences to self-amplifying effects, which are based on cultural differences and perpetuate or even intensify these regional differences. A historical event – like the foundation of the Stanford Industrial Park near Stanford University in California's Silicon Valley in 1951 (Röhl, 2001, 105) – can be a trigger for a new development path, which attracts entrepreneurs from elsewhere and other local players through the examples set by successful entrepreneurs, and the potential associated with having personal contact with entrepreneurs.

**Positive feedback.** Positive feedback plays a key role in embedding entrepreneurial activities in the regional culture. This leads to rising self-employment and a situation where the founding of start-ups is no longer being seen as something exotic, but normal behaviour (for that region). Students at universities in the region may, for example, take internships at innovative start-ups rather than in large, established

companies, and this may, in turn, influence their own career planning. “Feedback effects help to sustain and develop an entrepreneurship culture, providing an enduring advantage in particular for regions that have had high start-up rates in the past” (Andersson, 2013, 11). Successful examples of entrepreneurs become part of the regional culture and therefore encourage a continued above-average level of entrepreneurial activity; however, this is not emulated in other regions – even neighbouring ones – because of their different development paths.

The **importance of role models** to entrepreneurship and entrepreneurial behaviour in particular has been analysed in greater depth by Bosma et al. (2012). Their results from interviews with Dutch entrepreneurs show that role models are very important in the decision to found a company: 54 per cent of those interviewed said that they had an entrepreneurial role model, while one third said in their own words that they would not have dared to become self-employed without a role model. Role models can at least partially make up for a lack of entrepreneurial experience, and their effect can be observed in four ways (Bosma et al., 2012):

- Example function: Successful entrepreneurs provide an example which potential entrepreneurs (in the region) can emulate.
- Support function: Successful entrepreneurs provide their knowledge to other entrepreneurs, even up to the point of becoming a business angel and providing capital.
- Entrepreneurial confidence: Role models can enhance entrepreneurs’ belief in their own abilities. Psychologists speak of “self-efficacy” in this context; this refers to the expectation of being able to succeed in business on the basis of their own previously acquired skills (Bandura, 1976; Bandura, 1997).
- Inspiration and motivation for subsequent entrepreneurs.

Entrepreneurial role models can partially compensate for the entrepreneurs’ lack of experience. On the other hand, exceptionally successful entrepreneurs behind start-ups which dominate media coverage are rarely seen as role models worthy of emulation by the majority of people interested in founding a company due to the unusualness of their personal and business situations (Caliendo & Kritikos, 2011, 6). Entrepreneurs and business owners from one’s own personal and social environment are much more significant role models or mentors for people implementing their own business idea. This relationship also underlines the regional or local character of a successful entrepreneurial culture.

### 2.3 Innovative milieus as seedbeds for entrepreneurship

Self-reinforcing effects within a region with a strong entrepreneurship culture are found in “innovative milieus”, the foundations of which have been defined and described by French and Italian economists such as Roberto Camagni and Olivier Crevoisier (see below) since the 1990s. The milieu approach highlights both the role of formal and informal institutions and actors in business, administration, and research as a basis for innovations which are often developed by new companies, or at least brought to market by such companies. The significance of socio-economic conditions and a “culture of collaborative and cooperative learning” (Sternberg, 1995a, 199) in the region are also emphasised (Röhl, 2001, 121). Network effects, which are closely connected to the “knowledge” factor, are crucial in this process. Successful implementation and connection of all these elements can also help a previously structurally weak region to recover and develop an entrepreneurial culture. However, even in the milieu approach, feedback effects mean that it is easier for successful regions with a thriving start-up scene and young companies to maintain their position than it is for regions that currently have fewer new companies being founded to develop an entrepreneurial culture.

Despite the relevance of agglomeration effects (Camagni, 1995, 319), the innovative milieu is more determined by culture than it is by geography (Hahne & Stackelberg, 1994, 84). It emphasises the presence of a common basic understanding in relation to “socio-economic problems and model solutions” and the “consistency between the production system, culture, and major actors” (Crevoisier & Maillat, 1991, 19). The innovative milieus analysed in the literature include thriving high-tech start-up regions like Silicon Valley in California and the greater Boston region, as well as the M4 corridor leading across the UK and into London, Sophia Antipolis in southern France, Grenoble, the “Cité Scientifique” near Paris and the greater Munich region (Bresnahan et al., 2001; Preer, 1992; Saxenian, 1994; Scott, 1990; Scott, 1993; Sternberg, 1995a; Sternberg, 1996).

The interaction of individuals, companies, and institutions plays a central role in the generation of **network effects**. These have a significant influence on the initial emergence of strong start-up regions and innovative milieus (see Bergman et al. 1991; Kamann & Strijker, 1991; Tödtling, 1995). The variety of forms of entrepreneurial cooperation and the involvement of universities and public institutions lead networks to become a decisive force of change in innovative regions (Gordon, 1991; Sternberg, 1995b).

While market-focused economic theory traditionally draws its conclusions based on the identity of the stakeholders, it is the knowledge of transaction partners and **trust** in their abilities that form the central components of networks. In an ideal market, supply and demand for homogenous goods are drawn together by anonymous market participants (Williamson, 1979, 236). The individual transactions in the network are often specified without great detail, in contrast to these classic market transactions. The risks of the “soft contract system” (Ochsenbauer, 1989, 211ff., 269ff.) in networks are compensated by the rules and norms accepted by the participants, together with the long-term stability of relations. Soft contracts reduce incurred ex ante transaction costs, but run the risk of higher ex post costs in the event of opportunistic behaviour. The fact that this rarely occurs can be explained by the high cost of building a network where the dissolution of the relationship would result in irreversible sunk costs (Fritsch, 1992, 95ff.; Williamson, 1985, 69 ff.). Entrepreneurs must trust the established players in the networks and also quickly acquire trust themselves if they want to succeed. “The willingness to trust others and to act in a reciprocal way could be interpreted as an essential prerequisite for the development of social interaction and networks” (Caliendo & Kritikos, 2011, 5). A conflict with the postulated egoism of entrepreneurs in the Schumpeterian sense may arise here (Schumpeter, 1911). This point will be discussed in more detail in the following section, which examines the personality structure of successful entrepreneurs more closely.

### 3. What defines the entrepreneurial personality

An entrepreneurial culture emerges both as a result of general conditions and regional or national cultural characteristics and the personal characteristics of the players involved (Caliendo, Kritikos, 2011). However, the environment and general conditions can influence a person with a natural affinity for entrepreneurship to actually found a company. A special issue of the *Journal of Economic Psychology* in 2012 focused on the question of which personality traits are conducive to entrepreneurship. The following six points were highlighted:

**Desire for autonomy.** An important drive behind the pursuit of self-employment that is more paramount than the appeal of running a successful business seems to be a desire for autonomy. It is not surprising that people with no or limited alternative sources of employment strive to found a company. But many entrepreneurs are well-qualified and go into self-employment not only accepting the greater income insecurity along with a heavier workload; they also prefer to become entrepreneurs even when their income will, in all likelihood, be lower than it would be in a

conventional employment relationship, for what could be either a shorter or longer period of time. Croson and Minniti (2012) can explain this behaviour through the value of the increased autonomy offered by self-employment in comparison to working under instruction within a company or for a government entity. Entrepreneurs are reluctant to get involved in corporate hierarchies and prefer the independence that comes with their self-employment (Carter et al., 2003; Caliendo & Kritikos, 2011, 3).

Croson and Minniti (2012), expanding on the work of Gelderen and Jansen (2006), model the decision to go self-employed as a two-stage process that comprises both a “general” appreciation for autonomy in the form of freedom or independence and a preference for self-employment as a means to an end. This also includes motives such as leaving an unpleasant corporate hierarchy and working without supervisors. The ability to set one’s own work-related goals can also improve an individual’s wellbeing and increase the desire for self-employment in spite of the associated uncertainty of income (Breugh, 1999).

**Desire for profit.** Arora and Nandkumar (2009) believe that a desire for profit is the decisive force behind the decision to become self-employed. They even go so far as to question the survival rate as a measure of achievement for start-ups, because the most successful start-ups are sold quickly and then lose their autonomy. A cash out is the goal of many entrepreneurs, at least in high-growth, innovative industries.

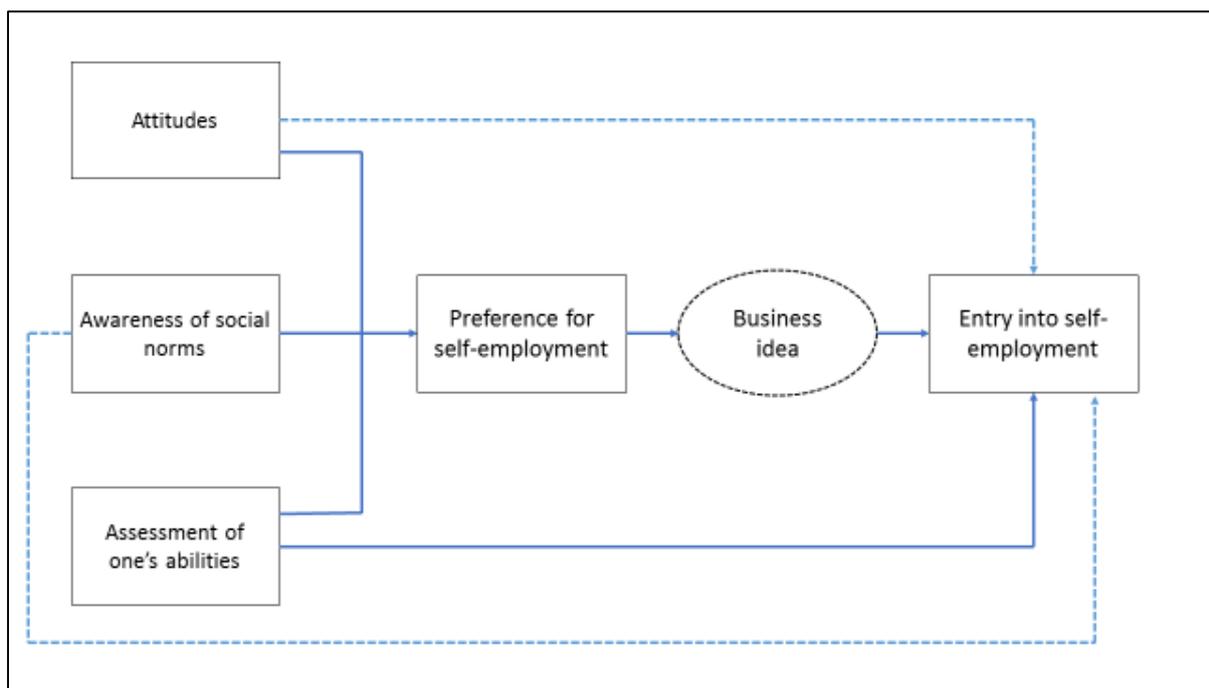
**Risk tolerance.** Entrepreneurs are generally perceived as very risk-tolerant in public (Caliendo & Kritikos, 2011, 2). But research is divided over whether entrepreneurs are really very tolerant of risk. While entrepreneurs are less risk-averse than employees, Caliendo, Fossen and Kritikos (2010) found evidence of a non-linear relationship between risk tolerance and entrepreneurial success in an empirical study, i.e. that too much willingness to take risks is harmful. Successful entrepreneurs seem to have a high awareness of emerging risks, which they can then address in good time (Willebrands et al., 2012). It is not necessarily a high tolerance for risk or even a delight in risk taking, but rather the desire for greater autonomy that can explain the willingness to accept an expected reduction in income along with a simultaneous increase in uncertainty that come with founding a company (see above). However, it appears that risk aversion is different in individuals who are interested in starting a company compared to individuals who prefer standard employment. Thus, the combination of a desire for autonomy and profit, together with a high level of professional skills, could lead people with a typical founder personality to view the risks associated with their new enterprise as less serious and, above all, manageable. One important reason could be their ability to

successfully manage risks associated with building their company – or at least their self-assessment of whether they have this ability (Fairlie & Holleran, 2012).

**Social capital.** Integration into social networks and the social ties from an individual (as opposed to regional) perspective also determine the likelihood of founding a company. The variety and strength of social connections not only increases the likelihood that someone will found a company, but also the chances that company has for success (Piegeler, 2015, 20). Social capital also includes family background and status. Parents in self-employment positively influences the likelihood of being self-employed, which can also be explained through their role model function (see above). But social capital goes a lot further than this and includes the individual's ability to take advantage of networks, social contacts, and role models.

The influence of personal attitudes and characteristics, social norms, and a person's estimation of their own relevant skills for self-employment on the preference for and actual initiation of a new enterprise are illustrated in Figure 2.

**Figure 2: Attitudes and social norms influence the decision to start a company**



Source: Created by author, based on Verheul et al., 2012, p. 327

Personal attitudes, the perception of standards, as well as a person's self-assessment all have an effect on their structure of preferences, which in turn has an effect on the development of a new enterprise and ultimately influences the step into self-employment. The three underlying factors can also have a direct influence on the decision to found a company. A person's positive assessment of their own abilities in

a start-up-friendly environment can directly encourage them to start their own company, while in a milieu dominated by traditional employment this is more likely to have an indirect influence on someone's preferences towards self-employment.

**Trust.** Caliendo, Fossen and Kritikos (2012) examine the extent to which trust – in relation to business partners, general conditions, and also one's faith in one's own abilities – is a key personality trait of entrepreneurs. Networks that play a prominent role in regions with strong innovation and entrepreneurial activity (see above) are critically dependent on the trust that exists between the actors involved in them. Stable, trust-based relationships between entrepreneurs, investors, customers and suppliers are influenced by reciprocity in both a positive and negative sense (Caliendo, Fossen & Kritikos, 2012). According to the studies by these three authors, negative reciprocity quickly had an inhibitory effect on successful entrepreneurship: Those who constantly seek “payback” in response to every abuse of trust quickly lose sight of their own business objectives and end up hurting themselves. The more likely response to negative experiences of betrayed trust will therefore be to place a limit on the business relationship to minimise losses and actively search for a new partner. The speed at which trust is built is very important to the success of new companies. Regional culture also comes into play here: Trust develops more quickly in innovative milieus like Silicon Valley than it does in regions where start-ups are more of a rare occurrence. The slow building of trust-based relationships can therefore pose a problem in regions that have previously shown little affinity for entrepreneurship.

**Optimism.** Trust is a positive force within the entrepreneurial personality that often comes hand-in-hand with optimism. Optimism allows entrepreneurs willing to put in a lot of work in exchange for (initially) meagre income, because they believe in the potential of their idea and their ability to make it a reality. Entrepreneurial personalities pursue personal advantage, or the objectives of their company. However, they usually avoid harming others in the process. “Creative destruction” according to Schumpeter (1911) should therefore be seen as more a form of collateral damage in the process of building a new business model, and the destruction of the previously successful business models of other companies is not usually a goal of entrepreneurs (Caliendo & Kritikos, 2011, 4).

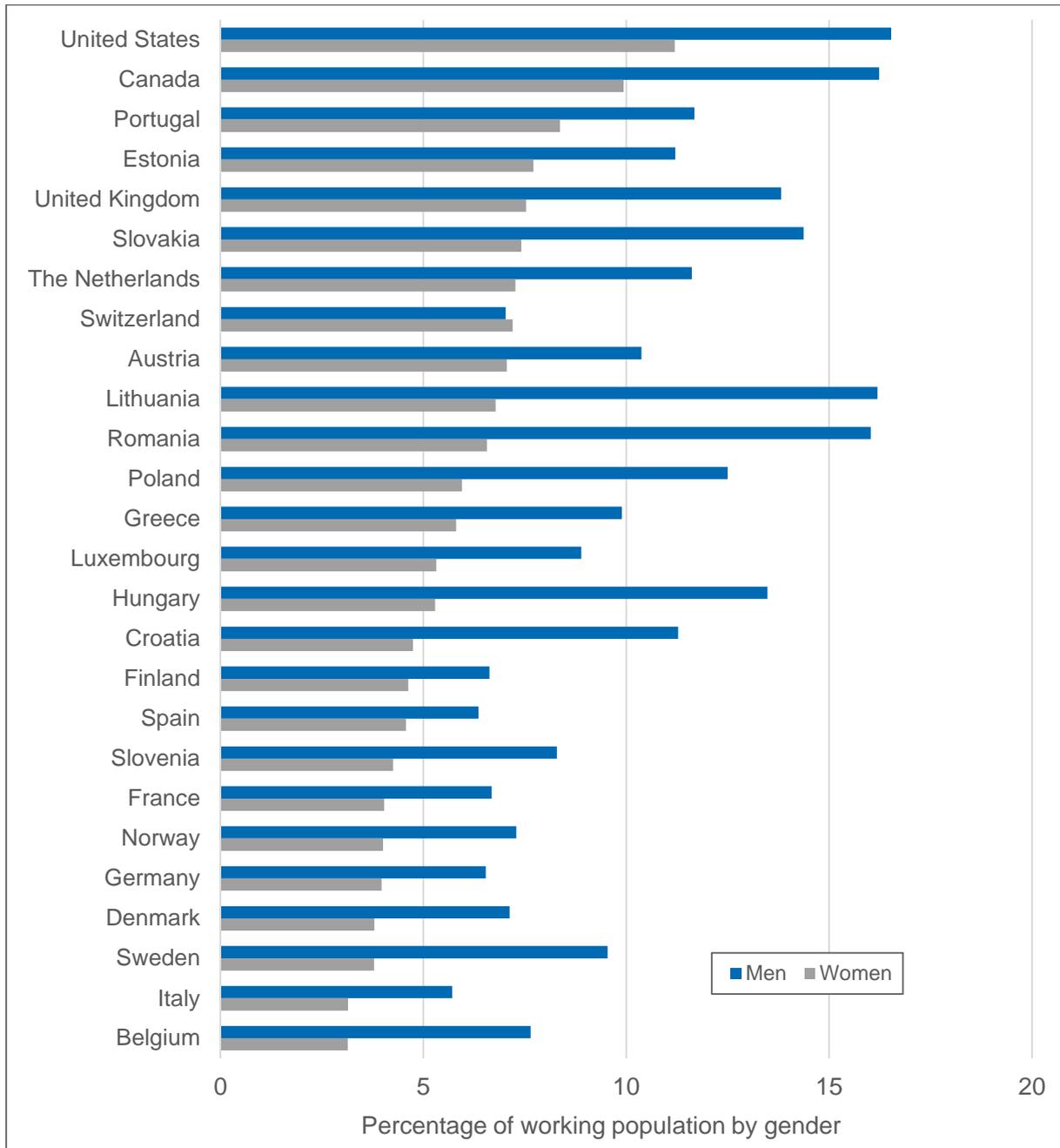
### **Gender-specific behaviour in entrepreneurship**

Entrepreneurship still has a predominantly male face. Entrepreneurial behaviour differs greatly between the sexes, while these differences themselves are very consistent. Women found only around 35 per cent of all new companies, and the companies they found tend to be significantly smaller and more concentrated on the personal services sector (Röhl, 2014a; Kelley et al., 2013). “The total entrepreneurial

activity (TEA) among women is 4 per cent, based on the total female population aged between 15 and 64. Compared to a rate of 6.5 per cent among the male population [...], women are less involved in entrepreneurial activities” (Piegeler & Röhl, 2015, 5; see also Brixy et al., 2015). The proportion of women is even lower among start-ups. Capital-intensive high-tech start-ups in particular are rarely founded by women. There is also evidence that it is even rarer for female entrepreneurs with high capital requirements to be granted the necessary capital and that they are charged higher interest rates than their male counterparts (Burt, 2015; Plimmer, 2015).

This gender gap in entrepreneurial behaviour exists in varying degrees across nearly all countries, as is demonstrated by the international comparative studies of the Global Entrepreneurship Monitor (Singer et al., 2015; Sternberg et al., 2015). The following figure (Figure 3) shows the differences in TEA between Europe and North America. With a rate of over 11 per cent, the United States has the highest TEA, followed by Canada and Portugal. Italy and Belgium are at the bottom of the ranking with rates just over 3 per cent. Together with Lithuania and Romania, the United States and Canada possess the highest TEA rates for men, too. Switzerland is the only country where the number of female entrepreneurs is (slightly) higher, while every other country examined has tended to reveal a significantly higher proportion of young companies founded by men. Germany has 100 male entrepreneurs for every 61 female entrepreneurs, as is also the case in France. Scandinavian countries stand out with an even larger gender gap: in Sweden, there are 40 female entrepreneurs to every 100 male entrepreneurs, and 53 to 100 in Denmark. Developing and emerging countries also have similarly large gaps to those found in highly developed countries (Singer et al., 2015).

**Figure 3: Comparison of the percentage of entrepreneurs among the workforce**  
Europe, United States, and Canada, 2014



TEA – Total Entrepreneurial Activity: People who are currently involved in starting a company or have established a company in the past three years

Source: GEM, 2015

The gender differences in entrepreneurial behaviour may on the one hand be explained by different preferences – e.g. different degrees of risk aversion – or gender-specific barriers on the other – such as the difficulty in reconciling parenthood and self-employment (Kelley et al., 2013). Caliendo and Kritikos (2011, 2) found

evidence to support both theories, which could explain the large and persistent gender gap in the number of new companies being founded. Verheul et al. (2012) find in a two-stage estimation model that the gender gap in actually entering self-employment is even greater than what would correspond to the role played by risk aversion in one's preference structure. This relationship suggests there are further obstacles that prevent women from founding companies and becoming self-employed in addition to a greater level of risk aversion. In addition to the aforementioned problems in balancing family and a career, which also leads to women being more likely to found smaller companies and adapt their involvement in the company to suit their personal needs, there is also evidence of discrimination in access to finance, and sector-specific obstacles in industry- and technology-focused sectors, which are still heavily dominated by men (Burt, 2015; Plimmer, 2015).

#### 4. Start-ups in Europe

The strength of entrepreneurial activity in Europe varies widely between countries, as already illustrated in the section on gender differences (see Figure 3). This applies not only to the number of companies being founded or the total entrepreneurial activity in relation to the population, but also to the size and economic significance of the companies being founded. While the economies of southern Europe are often characterised by small family businesses and there are also more small businesses in general being opened and closed in these countries, especially in services and gastronomy, the situation in Scandinavian countries is the exact opposite. Only a relatively small proportion of the workforce is self-employed here. In Denmark this is only 7.6 per cent, for example, and there are few small businesses and gastronomy enterprises being founded (see Figure 3, Table 1). Nevertheless, these countries play a greater role when it comes to innovative start-ups (GP Bullhound, 2015). Thus, Sweden comes right after the United Kingdom as one of the top locations in Europe for so-called “unicorns” – start-ups that achieve a market capitalisation of more than one billion US dollars just a few years after being founded (GP Bullhound, 2015; Köhler, 2015). The Swedish capital in particular, Stockholm, is considered one of Europe's top start-up hubs.

Table 1 shows the number of start-ups per 1,000 people in the working-age population for selected European countries – EU countries that provided data, Norway and Switzerland – in 2013. In absolute terms, France comes top with 411,000 new enterprises in industry, construction, and services – including information and communication technology. It is followed by the United Kingdom with 376,000, and Italy with 301,000. Germany only came in at fourth place with 276,000

new companies. If one examines the enterprise birth rate on the basis of the number of companies founded per 1,000 population between 18 and 64, then Lithuania comes top with 20.1, followed by Portugal (18.5) and Slovenia (14). The Baltic states, Eastern European countries and the Netherlands all had above-average values of greater than 10. However, the relationship between economic power and the enterprise birth rate is on average negative; Switzerland comes bottom with only 2.2 companies being founded per 1,000 population of working age, just behind Belgium (2.9). The figures for Germany (4.5) and Austria (3.9) were also far below average.

**Table 1: Start-ups in Europe**

Number of new companies per 1,000 population of working age in 2013 and the change in the number of companies founded compared to 2008 as a percentage

Countries	Enterprise birth rate 2013	Percentage change between 2013 and 2008
Latvia	13.0	53.0
Cyprus	5.6	45.0
Slovenia	14.0	35.5
United Kingdom	8.0	10.9
Luxembourg	8.9	5.6
Spain	8.6	3.3
Switzerland	2.2	2.7
The Netherlands	12.4	2.4
Italy	7.2	-2.3
Finland	8.5	-6.9
Norway	9.8	-10.5
Austria	3.9	-10.7
Bulgaria	8.1	-14.2
France	9.1	-15.4
Portugal	18.5	-16.6
Germany	4.5	-18.0
Czech Republic	10.8	-23.6
Slovakia	10.4	-24.9
Belgium	2.9	-28.4
Hungary	6.3	-32.0

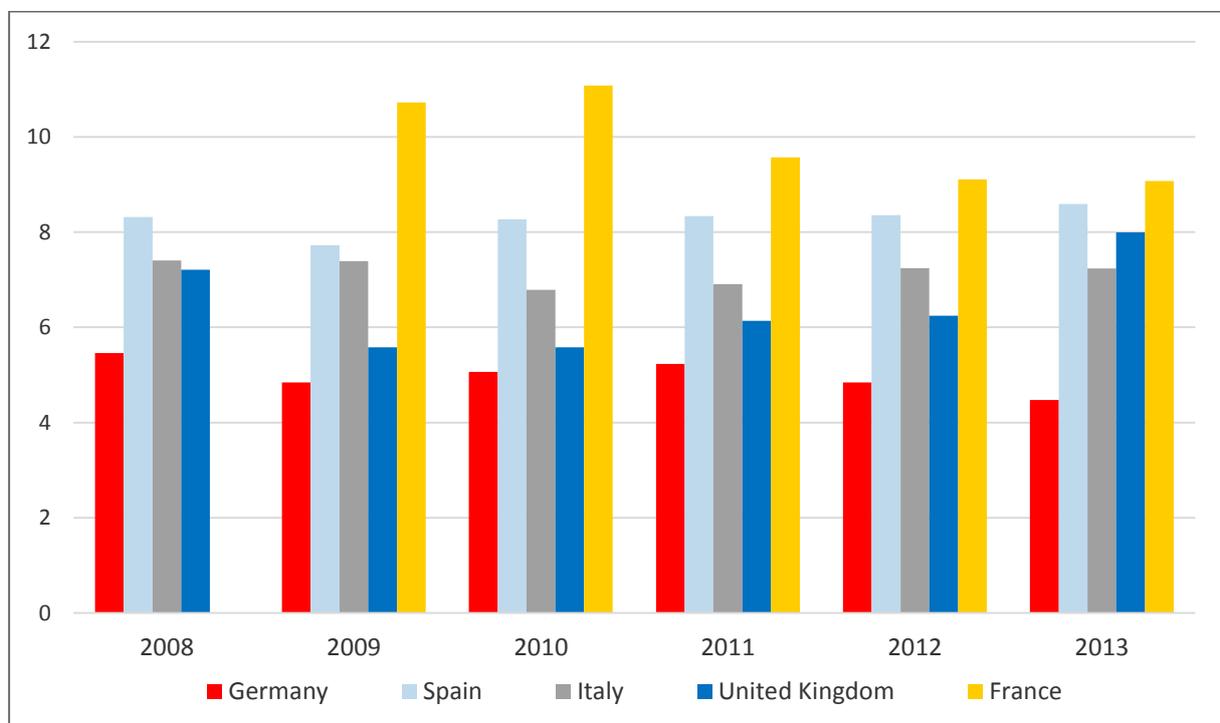
The list of countries was constrained by a lack of data; the percentage change for France, Switzerland and the Czech Republic are based on a comparison with 2009.

Source: Eurostat

Comparing the intensity of entrepreneurial activity in the five largest European economies between 2008 and 2013, France is a clear leader with its 9 to 11 start-ups per 1,000 people of working age (see Figure 4). That said, the intensity of entrepreneurial activity in France has decreased over recent years, while the highest value was achieved in 2010. Spain, on the other hand, despite or even as a result of

how strongly it was affected by the financial crisis and the European debt crisis, experienced a small increase in the enterprise birth rate and recently achieved 8.6 new companies per 1,000 population. Like Germany, the United Kingdom quickly moved on from the negative effects of the crisis, but, by contrast the United Kingdom recorded a sharp rise in the number of companies being founded – reaching 8 per 1,000 people of working age in 2013. Germany had its highest rate in 2011 with just 5.2, while this fell to just 4.5 new companies per 1,000 people of working age in 2013. Italy will be discussed below.

**Figure 4: The enterprise birth rate in the five largest European economies**  
 Companies founded in industry, construction, services, IT and communications technology per 1,000 residents of working age



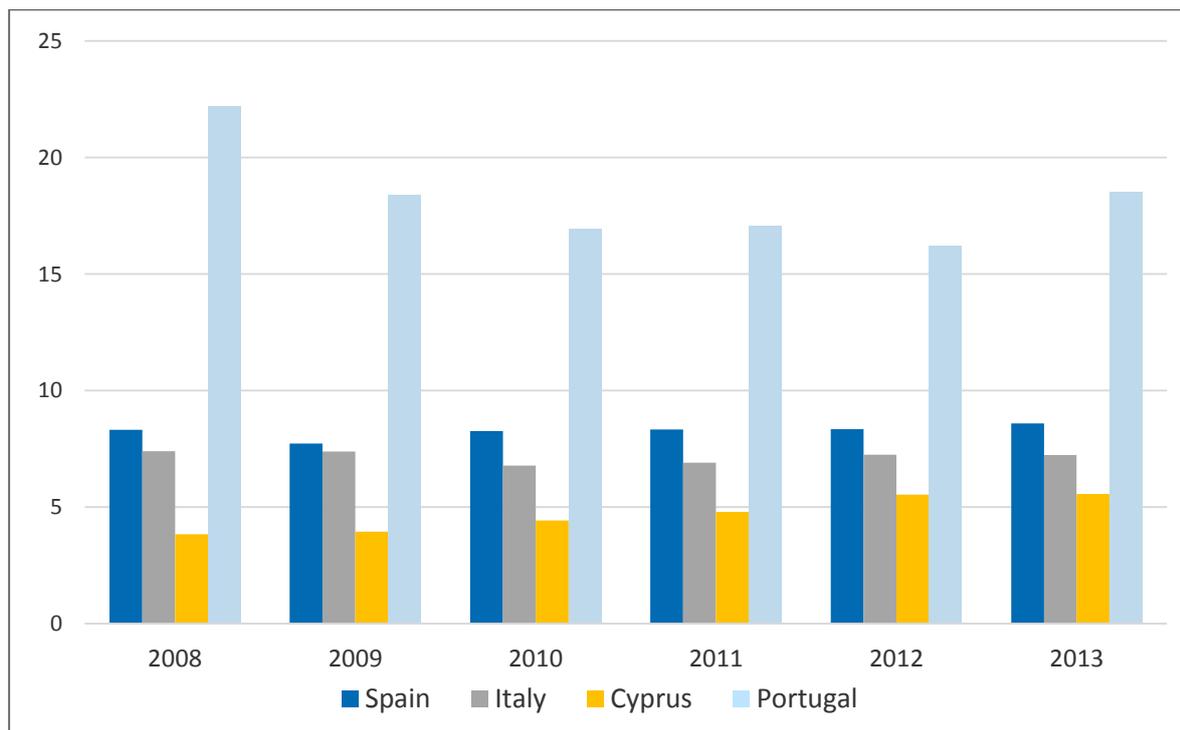
Source: Eurostat

The statistical data from Eurostat on the actual numbers of enterprises born – in contrast to the interview-based GEM survey, which is more inclusive and focuses not so much on the concept of the “company”, but the entrepreneurs themselves – confirms Portugal’s lead among southern European economies (Figure 5). Compared to the final pre-crisis year, 2008, when 22 companies were founded per 1,000 people of working age, there was a fall to just 16 in 2012. In 2013, however, there was a recovery. Italy only hit its low point a year after the recession of 2009; but with figures showing between 6.7 and 7.5 companies founded per 1,000 people of working age, the level of entrepreneurial activity in Italy is very low for southern Europe and relatively stable. Spain has only a slightly higher enterprise birth rate than its eastern neighbour, with a low point of 7.7 in 2009. Entrepreneurial activity then recovered

slightly, although Spain was severely affected by the European debt crisis due to the bursting of the local property bubble. Starting from an exceptionally low level of entrepreneurship, Cyprus exhibits a stable and crisis-resistant growth over time. The most recent figure was 5.6 companies founded per 1,000 working population, which is far below the level of neighbouring countries.

**Figure 5: The enterprise birth rate in the European crisis countries**

Companies founded in industry, construction, services, IT and communications technology per 1,000 residents of working age.



Countries that have been especially affected by the crisis; no data for Greece or Ireland  
 Source: Eurostat

European entrepreneurial activity has been declining overall in the years following the crisis, with positive exceptions being the United Kingdom and some smaller states such as Latvia, Cyprus and Slovenia. Despite – or even as a result of – the strong effects the crisis has had in Spain, the country has seen only a very small decline in entrepreneurial activity. The number of companies being founded in Germany was down, even though the country recovered faster from the recession than most of its neighbours. Thus, the picture for Europe as a whole is far from uniform. In addition to the different economic structures and entrepreneurial cultures, this could also be due to the opposing effects that a weak economy and rising unemployment have on entrepreneurial activity (see above).

## 5. Digital start-ups – the result of a specific culture?

### 5.1 Start-ups in Europe

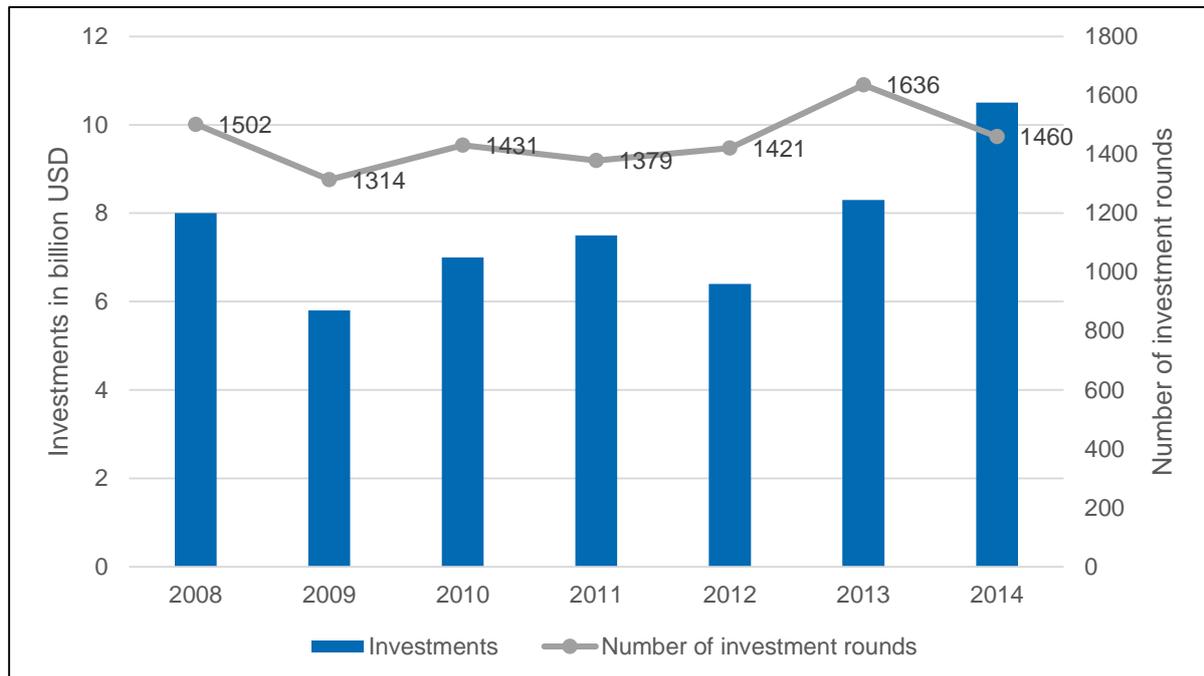
Only a small proportion of companies founded in Europe are innovative start-ups in high-tech industries and in the digital economy, but these are particularly significant to the dynamics of an economy due to their high growth potential and impact on other sectors. In this context, start-ups are defined as companies which

- are less than ten years old,
- are developing (highly) innovative technologies and/or highly innovative business models, and
- are aiming for significant growth in their revenue and number of employees (Ripsas & Tröger, 2015, 4).

Highly innovative start-ups are often capital-intensive and high-growth companies, but do not have sufficient collateral to fund their often very substantial initial investments and further growth through bank loans. Instead, these companies, which are important for structural transformation, are dependent on equity financing in the form of venture capital (VC), which is more appropriate to their risk profile than borrowed capital (Schefczyk, 2015; Röhl, 2014b). However, European countries are quite behind the United States and Israel when it comes to venture capital and high-growth start-ups, as is shown in various studies as well as empirical comparative data from the OECD (2014) (see Axelson & Martinovic, 2013; EY, 2015b; Startup Compass, 2015).

The figure below shows the development of the European venture capital market since 2008. While 8 billion US dollars were invested in the first year – which was not limited to first-round financing and also included later expansion phases of young companies – the total invested in the 2009 crisis year came to almost 6 billion US dollars. After a recovery period, there was another drop in 2012, although this was then followed by a sharp rise in investment volumes – hitting 10.5 billion US dollars in 2014 (EY, 2015, 4). In the same year, the venture capital investment volumes in the United States came to 52 billion US dollars (see Figure 7) – a figure which certainly puts the European figure into perspective. Venture finance volumes worldwide rose to a record value of 87 billion US dollars in 2014, of which only 12 per cent went to Europe, and 60 per cent to the United States alone (EY, 2015b, 3). There is no clear trend to the number of times VC-financing was approved in Europe; starting with 1,500 investments in 2008, there was a decline in 2009, which was then quickly compensated.

**Figure 6: Venture capital investments in Europe since 2008**



Source: EY, 2015b

Much of the investment relates to start-ups in the digital economy. The digital economy and the use of digital technologies for new business models in both young and established markets – like the accommodation sector – feature almost unlimited scalability on account of the technology used, which has made the rapid growth of successful start-ups like Airbnb, Skype, Whatsapp or Uber possible. Many of the consumer-focused new business models are based on elements of the sharing economy (Demary, 2014). The approach behind these models, which is based on the shared use of resources, is currently a strong trend contributing to the high growth rates of successful start-ups. Compared to the initial investment, the market valuation of the large-scale start-ups in Europe studied by GP Bullhound (2015) increased 67-fold in the consumer sector, and 14-fold in the business-to-business sector (GP Bullhound, 2015, 18). Company valuations can achieve these levels even just a few years after their foundation. That said, only very few start-ups grow to become “unicorns” valued in the billions (see above). A recent study by the information platform Crunchbase found that there are a total of 153 such start-ups worldwide with a combined value of 530 billion US dollars, of which two thirds are based in the United States (Köhler, 2015). However, the low interest rates in the United States and Europe are likely to have led to exaggerated valuations; doubts regarding the company’s prospects may therefore lead to drastic corrections (Köhler, 2015).

The leading European location for start-ups valued at least one billion US dollars is the United Kingdom, which is home to 17 unicorns with a combined value of more than 40 billion US dollars. Sweden comes in second place with six unicorns with a combined value of 26.5 billion US dollars (GP Bulhound, 2015, 6). The start-ups attributed to Sweden include Skype – Europe’s most valuable start-up, which was bought by Microsoft for 8.5 billion US dollars in May 2011. The software on which Skype services are based was however not developed in Sweden, but by Estonian developers in Tallinn, and the company is legally headquartered in Luxembourg. Germany comes in at third place with only four large start-ups with a combined value of 18 billion US dollars. Three of the four start-ups only recently joined the billion-dollar club, while Berlin-based start-ups Rocket Internet and Zalando have a capitalisation of 15 billion US dollars. Russia comes in fourth, followed by France in fifth place. The start-up scene is very regionally concentrated within the countries; for example, most of the British unicorns are based around London. All four German start-ups valued in the billions are based in Berlin, which is underlined by the city’s rapid climb in international start-up rankings – for example, it is at ninth place in the latest Global Startup Ecosystem Ranking, after ranking at 15<sup>th</sup> place last year (Bundesregierung, 2015; Startup Compass, 2015) (see Röhl, 2014b). A study by the management consulting firm Dow Jones in fact showed Berlin to be top in Europe in terms of invested venture capital – with 2.24 billion US dollars, the city beat London to first place (Richters, 2015).

**Internationalisation of the start-up scene:** As already shown by the example of Skype, the start-up scene is highly internationalised in its business models in spite of a tendency towards regional concentration. According to a business survey published in the Deutscher Startup Monitor (Ripsas & Tröger, 2015), with only two thirds of employees coming from Germany, but over a fifth from within the EU and almost a tenth from elsewhere, the Berlin start-up scene is more international than other German cities with a high level of start-up activity. 73 per cent of employees come from Germany in Munich, 84 per cent in the Rhine-Ruhr region, and 88 per cent in Hamburg. The proportion of entrepreneurs in Berlin with roots abroad is also particularly high. This indicates that the start-up scene in the German capital has become detached from specifically German factors. Berlin start-ups’ methods of acquiring capital are also increasingly internationalised, thus overcoming the narrow limits and capital restrictions on the German venture capital market (McKinsey, 2013, 33; Schefczyk, 2015; Röhl, 2014b). Working in internationally mixed teams and the ability to quickly expand business models to international markets that this supports are among the characteristics of fast-growth start-ups supported by venture capital that have a chance to become a unicorn. Rocket Internet, the highest-valued German start-up and second in Europe (see above), forms a kind of accelerator for digital business models and their fast scaling to new markets. Zalando also arose from this

business model. The company is now active in 110 countries and requires a correspondingly large international workforce, which it is able to find and retain in Berlin.

## 5.2 Start-ups in the United States and Israel

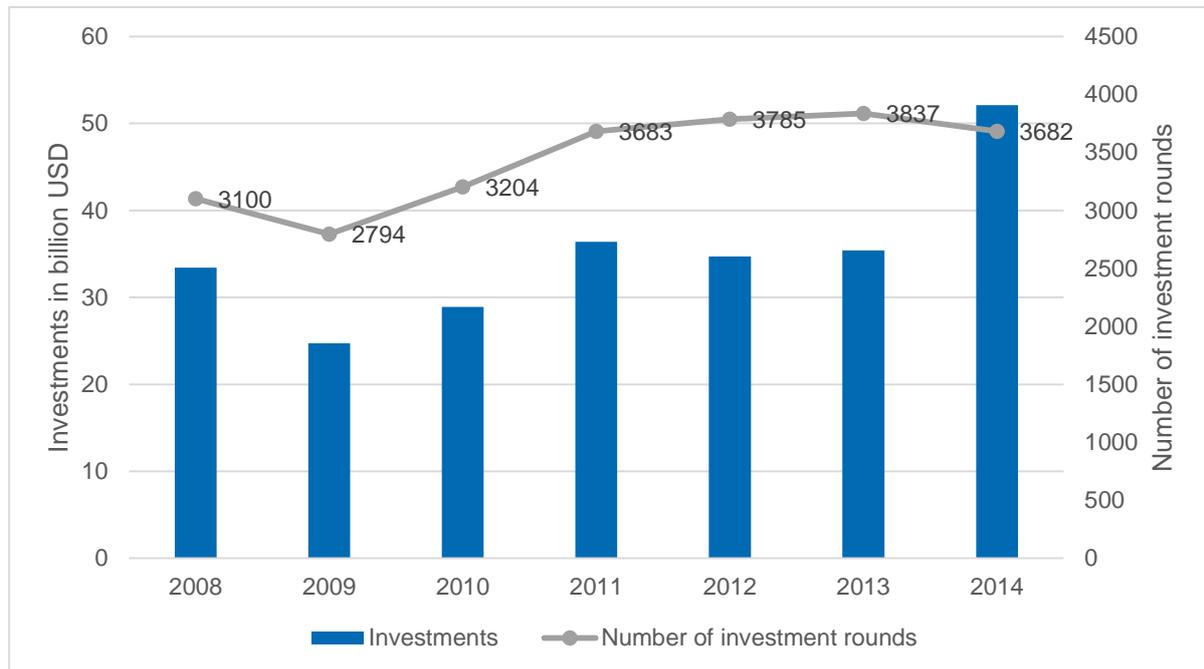
The United States and Israel have a well-developed start-up culture, which has brought both countries an internationally leading position, particularly in the area of innovative and high-growth start-ups (Axelson & Martinovic, 2013; EY, 2015b; Witzler, 2014). While the United States has developed and asserted a leading role in entrepreneurship for the entire post-war period, Israel has only recently become a start-up centre (Röhl, 2014b; Startup Compass, 2015). Entrepreneurial activities in the high-tech segment are highly concentrated in specific regions in both of these countries, which can be an indicator of local cultural characteristics which further enhance the effect of national attitudes and conditions.

### United States of America

The United States is by far the leading country worldwide when it comes to having an entrepreneurial culture favourable to start-ups and venture capital, while there is a strong physical concentration of these in Silicon Valley and, to a significantly lesser degree, the areas around Boston and New York City. Over half of all venture capital granted worldwide is granted in the United States and approximately 500 billion US dollars of venture capital have been invested in the United States since the year 2000 (Röhl, 2014b). Looking to Europe as an economic area of similar size for comparison, such investments have only amounted to 88 to 175 billion US dollars depending on boundaries used and source (Axelson & Martinovic, 2013).

The following graph shows the evolution of venture capital investment in the United States since 2008. After a low point in the 2009 crisis year, venture capital investments recovered up until 2011, which was then followed by two years of stagnation, and then an increase to 52 billion US dollars in 2014. The number of loans granted fell in 2014, while the average sum of each investment rose significantly (EY, 2015b, 4).

**Figure 7: Venture capital investments in the United States since 2008**



Source: EY, 2015b

There was little change to the United States' strong dominance in venture capital for start-ups over recent decades, in spite of the emergence of new players like Israel or China; 6 out of every 10 US dollars of all venture capital worldwide are invested in US-based companies (EY, 2015b). California's Silicon Valley remains uncontested in its position as the world's biggest location for start-ups. One reason for this may also be the very high market capitalisation of successful technology companies like Facebook, Google, or Apple, which themselves were start-ups just a few years or decades ago, and whose founders, managers and early investors have become a source of financially powerful business angels and investors who provide venture capital to entrepreneurs in their networks: Apple was valued at 740 billion US dollars in May 2015, Facebook at 230 billion (GBP Bullhound, 2015). If early investors were to liquidate even small shares in such highly valued companies, this would be enough to provide capital to many new start-ups. The high level of expertise of the entrepreneurs and business angels in Silicon Valley means that more and more start-ups are being founded in the area, and the promising business models find providers of capital both during the launch phase and later funding rounds.

### Israel

Despite its small size and unfavourable geographic location between hostile and underdeveloped neighbours, Israel has grown to become one of the leading start-up locations worldwide. The greater area of Tel Aviv, where approximately 40 per cent of the population live, has seen a spectacular rise to become a hotspot for high-tech

start-ups (Röhl, 2014b). With a share of about 0.3 per cent of the gross domestic product, venture capital investments play the greatest economic role in Israel among all developed countries, even coming before the United States with its 0.2 per cent (OECD, 2014). A special Israeli entrepreneurial culture has emerged in the meantime, which combines speed of action and willingness to take risks with a high confidence in one's own abilities, careful planning, and professional competence. The entrepreneurial culture and technological affinity are partly based on the guiding principles and training provided by the Israeli army, in which nearly all Israeli entrepreneurs have served for three years (Schmiechen, 2015). A positive start-up financing culture is ensured by the close connection to the United States venture capital market, but also by public subsidies and preferential treatment of high tech industries (Röhl, 2014b).

The geographical structure of the country, with a concentration of around 60 per cent of economic activity and over 40 per cent of the population in the Tel Aviv metropolitan region is conducive to the development of a high-tech cluster and a start-up scene that is focused on the information and communications, software, defence and health technology industries. Even Jerusalem, Israel's largest city and administrative centre, is just one hour away, and can therefore be considered part of Tel Aviv's extended metropolitan area.

### **5.3 Differences between the United States, Israel, China, and Europe**

As analysis of the available data on venture capital funding has shown, despite the strength of the United Kingdom and the promising beginnings found in Berlin, Stockholm, or Paris, Europe continues to be far behind the United States when it comes to the development of a strong start-up culture and the mobilisation of venture capital. Giving greater pause for thought is the fact that, as well as Israel, locations in Asia such as China or Singapore are becoming even more significant spots for digital start-ups, and now threaten to overshadow Europe (see EY, 2015b; Startup Compass, 2015). While the high degree of technical affinity among the population, coupled with a willingness to take risks and investments in the defence industry are drivers of development in the Israeli start-up scene, in China, the size of the home market – with over 1.4 billion consumers – and the country's long-standing export-driven growth play a decisive role in the emergence of a strong start-up scene and venture capital market. The Huawei group, founded in 1987, is one of the world's leading smartphone providers and is building mobile networks worldwide. The online trading platform Alibaba now has more users than its United States counterpart, Amazon, and is gearing up to compete with the American online merchant and the eBay trading platform on the global market. More than 20 billion US dollars of capital

were procured with its initial public offering in autumn 2014, meaning that further expansion is now financially secure (Berberich & Castritius, 2014).

The comparison of entrepreneurial activity in Europe, the United States and Israel shows that the “old continent” is considerably behind in regards to start-ups in new growth sectors such as the digital economy. Government support measures and tax advantages can certainly lead to improved conditions for entrepreneurship, but they cannot lead to any radical improvement of the situation on their own (Piegeler & Röhl, 2015). Efforts to achieve greater entrepreneurship in all sectors and especially the high-tech sector and growth areas like the digital economy must start earlier in order to inspire a change of thinking in society and greater openness to new ideas. “Starting early” in concrete terms means allowing more creativity in schools, but also raising economic literacy and the readiness to become an entrepreneur. Approaches and steps that can be taken to strengthen the entrepreneurial culture in education will be expanded on in the next section.

## **6. Fostering an entrepreneurial culture in the education system – the situation in Germany**

Germany scores rather unfavourably in international surveys like the Global Entrepreneurship Monitor (Brixy et al., 2015). A high level of regulation for companies and the miles of bureaucratic red tape that entrepreneurs must fight their way through are seen as very cumbersome, while people are insufficiently aware of the assistance available through public advisory services, such as through chambers of industry and commerce (Piegeler & Röhl, 2015). Much of the population appears to be vaguely fearful of the obstacles and risks associated with founding a company, even without having examined the actual opportunities and problems linked to self-employment in any great detail. This sets the course towards a preference for salaried employment at a very early stage, in that the teaching of entrepreneurship, or indeed general teaching in economics in schools, is very rudimentary – if there is any coverage of the topic at all.

That said, economic policy in Germany has taken on the task of nurturing and intensifying the country’s entrepreneurial culture; Piegeler and Röhl (2015) provide an overview of the supportive measures. As part of the German Entrepreneurship Week, local and regional cooperation partners are invited to presentations, workshops, seminars and business simulation games on the topic of entrepreneurship. The German Entrepreneurship Week is part of the Global Entrepreneurship Week, which now takes place in more than 120 countries. Most

recently in Germany this comprised more than 920 partners, 1,650 events and 45,000 participants (BMW, 2013). Competitions like the German Founder's Prize, which is awarded to successful new companies, aim to cultivate a start-up-friendly atmosphere. However, the overall impact of these measures is limited, because they only reach those who are already interested in the idea of founding a company.

Initiatives to illustrate the diversity of entrepreneurial opportunities to large sections of the population and inspire greater desire for entrepreneurship are thus required to strengthen the underdeveloped entrepreneurial culture (Piegeler & Röhl, 2015). The effect of initiatives to promote entrepreneurship through training has been further investigated by Fairlie and Holleran (2012). Through their analysis of an entrepreneurship support programme in the United States, they reached the conclusion that groups that are disadvantaged on the labour market, such as migrants and those with gaps in their career, are more risk tolerant, and therefore may stand to benefit more significantly from entrepreneurship advice and support initiatives than highly risk-averse individuals with good opportunities on the labour market. Participants in the analysed programme were chosen at random, which ensured that positive self-selection could only occur in terms of refusal to participate despite receiving an invitation. Activities to promote independent entrepreneurial initiative with a long-term focus are particularly suitable – such as the establishment of entrepreneurship education in schools and universities (see BJDW, 2014).

The JUNIOR programme is an important instrument for the establishment of entrepreneurship in German schools. This programme sponsored by the Federal Ministry of Economics encourages young people to form “student companies”, assisting them in the process. More than 90,000 pupils have taken part in JUNIOR over the past 20 years, while the annual number of participants grows year on year – most recently reaching 9,100 (IW Köln, 2015). Under the umbrella of Junior Achievement Worldwide, the programme teaches entrepreneurial thinking to young people in more than 120 countries. Over the course of a one-year student company project, students found a real company: They develop a business idea, analyse the market, find investors, and then sell their product or services. The students also manage the various activities associated with running a company for themselves, such as bookkeeping or holding shareholders' meetings. Participants can also take part in a five-day founder camp as part of the programme, where they learn the basics of entrepreneurship (Röhl, 2015). Participating students have founded approximately 6,800 companies since the start of the programme back in 1994. They are often guided by mentors from the business community. These mentors serve as role models and pass on their knowledge; there have been more than 3,000 voluntary mentors involved in the JUNIOR programme to date. Even more than the participants themselves, the teachers reported that participation in the programme

significantly helped the students to learn how to work independently and to take personal responsibility as a society member, enabling them to later contribute to an active civil society (IW JUNIOR, 2015). Nevertheless, 44 per cent of the students come from families where at least one parent is self-employed (IW JUNIOR, 2015), which certainly contributes to the participants' strong affinity for entrepreneurship. This also shows that JUNIOR has reached a significantly above-average proportion of students who are already familiar with entrepreneurship through their personal environment, as the self-employment rate in Germany is only 10 per cent. Therefore, in spite of the growing numbers of participants, the broader impact of the JUNIOR programme is limited. The result is that this successful programme cannot serve as an alternative to integrating entrepreneurship into the curriculum; there is still much to be done here (Klein, 2011).

## 7. Conclusion and recommendations

### 7.1 Cultural obstacles to greater entrepreneurship in Germany and Europe

The obstacles discussed in the literature and by experts which are preventing the development of a more entrepreneur-friendly cultural environment in Germany, and standing in the way of more new companies being founded, are summarised again below.

**The lack of a “can do” attitude** in many European countries including Germany. Confidence in one's own (entrepreneurial) abilities is generally lower than in English-speaking countries and Israel (European Commission, 2012). Within Europe, a positive self-assessment of one's business-related skills can be found among people in the United Kingdom and to some degree in Ireland and Scandinavia, which is reflected accordingly in a higher number of innovative start-ups. There is also a trend towards positive self-assessment of one's ability to start a company and related skills in the start-up hotspots of Berlin and Munich (Ripsas & Tröger, 2015). However, spill-over effects to other German regions are still rare.

**A high level of risk-aversion** among broad segments of the population. New technology as well as the concept of self-employment are primarily seen as a source of danger or risk, while inadequate attention is paid to the opportunities provided. The uncertainty associated with founding a company is therefore seen very negatively by many people.

**Underdevelopment of the culture of second chances.** Failed entrepreneurs are often labelled as losers and can only obtain capital again with great difficulty, while in

the United States more attention is paid to the experience gained and there is confidence that an insolvent entrepreneur can benefit from the learning effects and thus be more successful in their second attempt (OECD, 2013, 7). This behaviour can possibly be explained by a desire for self-affirmation on the part of the critics of failed entrepreneurs: these people do not themselves dare to go self-employed, and so it is seen as an affirmation of their own behaviour when entrepreneurs fail. Insolvency law also plays a role here, as rapid debt relief is a necessity for failed entrepreneurs to be able to start again in business. A “culture of failure” like this, which allows more people to go on to found a second company and that takes advantage if the expertise gained by failed entrepreneurs, is currently developing in a similar fashion to the United States in Germany’s start-up hotspots: according to a recent study, an increasing proportion of second and third companies are being registered in these regions (Ripsas & Tröger, 2015, 26).

**Strong trust in the state.** In the United States and United Kingdom, strong emphasis is placed on individual responsibility and the state only plays a minimal role in the economic sphere – the state concentrates on providing fertile conditions for the private sector rather than actively managing the economy, especially in the United States where there is only a limited welfare state. In contrast, continental European countries rely more on a strong state in both the economy and social policy. In creating a dynamic economy through the strengthening of entrepreneurial activity, the Anglo Saxon model seems to have proven more successful overall.

**Underdevelopment of economic and entrepreneurship-related education.** The German education system has thus far neglected the teaching of economics-related issues. Economic topics in school textbooks focus mainly on the welfare state, the activities of trade unions, and economic policy. The formative role of small and medium-sized enterprises and the great importance of new and young companies in a dynamic economy are not presented adequately.

## 7.2 Recommendations

The number of persons with a migrant background is currently rising fast in Germany. **Immigrants** from Eastern Europe, as well as asylum-seekers and refugees fleeing civil war **represent great potential for more self-employment** through the founding of new companies (Niemann & Schmidt, 2015; Weltermann & Stadler, 2015). Meanwhile, almost a fifth of all people who attend consultations at German chambers of commerce and industry have a migrant background (DIHK, 2015). The opportunities for rapid integration into the labour market still seem to be far from

exhausted, as indicated by the overall decline in the numbers of companies being founded and people who are self-employed (see above).

**Use of massive open online courses to teach entrepreneurship** at all levels from beginners to college and university: The approximately 130 entrepreneurship and entrepreneurship research professorships in Germany (see Piegeler & Röhl, 2015) cannot bring about any real change in the entrepreneurial culture given the high number of immigrants and the 2.8 million students who are already studying at colleges and universities. Online entrepreneurship courses on the other hand could reach many more people who are interested in founding a company. This applies especially to the generally young refugees from Syria and Iraq, who come from a culture which is characterised by high numbers of self-employed people, and yet rarely possess the formal qualifications they would need to quickly find their feet as a salaried worker on the German labour market.

A first step in this direction has been made in the form of the online course “Ready for Study” from the Bundesagentur für Arbeit (2015), which should pave the way for the integration of refugees into the German higher education system. The modular design of online courses could be used both to teach basic knowledge of economics as well as courses with specialised content for innovative start-ups. These online courses could be offered both in German and in English and English-language courses for people with a migrant background who are interested in founding a company could be combined with German courses that cover the language they need to help them in founding a company.

**Strengthen entrepreneurial culture in schools.** A cultural change should also begin with initiatives that start at an early stage in the education system (Piegeler & Röhl, 2015). Only long-term success can be expected here, but these could then generate significant multiplier effects through role models and peer-group influences (Sternberg et al., 2015, 6). Initiatives such as the JUNIOR student company programme (see above) should be expanded in order to familiarise students with the idea of self-employment and entrepreneurship early on. This must come as part of a broader reform of teaching materials for business at large and individual companies, where more attention is paid to the positive effects of the market economy and the opportunities offered by entrepreneurship as part of a freedom-based value system.

Evaluations of school textbooks and lesson plans show that entrepreneurship has not yet found its way into the classroom (Klein, 2011). An improvement in education to better promote a culture of entrepreneurship is therefore desirable in order to achieve a change in attitudes.

**Encourage the unemployed to start companies.** The important role played by companies being founded out of necessity by people without an alternative source of employment has reduced along with the strong improvement in the labour market. At the same time, support for unemployed people looking to start a company has been massively cut back (Piegeler & Röhl, 2015, 14), even though the provision of start-up grants was evaluated as being a successful measure with a long-term effect (Bernhard, Evers & Grüttner, 2015). However, the number of long-term unemployed has remained at approximately one million for quite some time now (Bruckmeier et al., 2015), meaning that there may still be some unexhausted potential for people to start companies in order to avoid long-term unemployment. The study by Fairlie and Holleran (2012) showed that entrepreneurship training for disadvantaged groups, who are also significantly represented among the long-term unemployed, generates above-average benefits. A combination of training and a renewed increase in financial support could better exploit the potential for entrepreneurs among the unemployed and simultaneously enhance the entrepreneurial culture in regions with high unemployment – these primarily include urban areas with structural problems, such as the Ruhr area or Bremen.

**Strengthening of regional initiatives to promote entrepreneurship** to build a culture of entrepreneurship. The strong regional character of an entrepreneurial culture that results from networks and personal contact with role models means that initiatives to strengthen entrepreneurial culture should also be focused on regional circumstances. These include training in entrepreneurship for young people in areas with social problems, mentorship programmes, building connections with successful regions and local and national educational institutions, and the establishment of business incubators.

**Drive connections between the emerging German start-up scene and SME industry** through digital applications for industry 4.0. The number of innovative companies being founded is increasing in Germany, particularly in the start-up hotspot of Berlin, which however has little in the way of industry. By contrast, the industrial clusters are located in the south, south-west, and west of Germany (Röhl, 2013). Closer networking of activities would be beneficial to both parties and should be sought in order to develop the ideas generated by start-ups into industry 4.0 applications and transfer these to the SME sector.

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