Small Bus Econ (2019) 52:359–374
https://doi.org/10.1007/s11187-018-0096-3

Hidden champions and unicorns: a question of the context of human capital investment

Erik E. Lehmann · Julian Schenkenhofer · Katharine Wirsching

Accepted: 16 August 2018 / Published online: 13 September 2018

Abstract The Silicon Valley model of high-tech entrepreneurship has been placed in the spotlight by academics in the past at the expense of the plenitude of Main Street businesses — businesses beyond the high-tech and ICT sector and the highly scalable platform economy. This study aims at resolving this one-sidedness contributing to unexplained aspects of entrepreneurship theory. Our focus lies on a subgroup of Main Street companies, known as *hidden champions*, as the counterpart of Silicon Valley high-growth firms, the *unicorns*. In spite of a worldwide distribution, just as unicorns are highly skewed to a few countries and regions, so are hidden champions. On a snapshot, it appears that unicorns and hidden champions are substitutes rather than complementary to one another. We illustrate that the emergence and skewed distribution of these two types of firms can be explained by the institutional context, in particular the provision of human capital. In an explorative approach, our line of reasoning puts forward that the centralization (public provision) vs. decentralization (individual investment) in organizing the accumulation of human capital helps to explain the different and path-dependent evolution of both, the Silicon Valley and the Main Street models of entrepreneurship.

Keywords Main street entrepreneurship · Hidden champions · Human capital

JEL classification J24 · L26 · M13

E. E. Lehmann (✉)
Faculty of Business and Economics, University of Augsburg and CCSE (Augsburg/Bergamo, It), Universitaetsstr. 16, 86159 Augsburg, Germany
e-mail: erik.lehmann@wiwi.uni-augsburg.de

J. Schenkenhofer · K. Wirsching
Faculty of Business and Economics, University of Augsburg, Universitaetsstrasse 16, 86159 Augsburg, Germany

J. Schenkenhofer
e-mail: julian.schenkenhofer@wiwi.uni-augsburg.de

K. Wirsching
e-mail: katharine.wirsching@wiwi.uni-augsburg.de

1 Introduction

The American economy is in a constant state of churn, being viewed as one of the world's most entrepreneurial, dynamic, and flexible economies. It changed its focus away from a managed economy toward the direction of an entrepreneurial economy, where knowledge is the main source of competitive advantage (Audretsch and Thurik 2004). In the sense of Schumpeter, this dynamism and flexibility has enabled the US economy to adapt to changing economic circumstances and recover from recessions in a robust manner. In a dynamic economy, firm entry and exit constantly force labor and capital to be put to better uses. The financial crisis of 2007/2008 however revealed that the US economy has become less dynamic since the end of the 1990s. The declining business start-up rates and the resulting diminished role for dynamic, young businesses in the economy illustrate this development (Decker et al. 2016). The year 2008, the end of the financial crisis, marks a turning point in the

entrepreneurial economy. For the first time, the number of firm entries falls below the number of firm exits (U.S. Census Bureau 2017). Since WW2, the US economy has had its slowest economic recovery after a recession (Bonvillian 2017, p. 7), putting the faith in the system at stake.

"Is America encouraging the wrong kind of entrepreneurship?" Litan and Hathaway (2017) ask in a Harvard Business Review article. Have entrepreneurship scholars narrowed their focus just on the benefits of the few high-tech and high-growth firms, like *unicorns* (Acs et al. 2017), while glossing over the costs, such as the crowding out of ordinary business start-ups? Have we been solving problems for the less than 1% of technology start-ups, neglecting the fact that the USA still is a nation of small businesses? To put this in perspective, 99.7% of the ~6 million companies in the USA have less than 500 employees and employ 50% of the 121 million US workers getting a paycheck, and accounted for 65% of the 15 million net new jobs created between 1993 and 2000 (Morelix et al. 2016). Against this backdrop, the question arises why these companies have not been the focus for scholars and the public in the past. Only in the past years, a fruitful and promising research agenda has thus evolved analyzing how contextual variables shape and moderate the evolution of different models of entrepreneurship and business (Welter and Gartner 2016).

This study fits into this stream of literature and explores how the development of firm types and their varying business models are shaped by context, especially different patterns of human capital investment. In the Anglo-Saxon system, the Silicon Valley model of entrepreneurship has become popular as the leading paradigm throughout policy agendas, media news programs, and mindsets of corporate managers (Acs et al. 2009; Audretsch 2009; Audretsch and Keilbach 2004). In the shade of the outstanding success of the Silicon Valley model of entrepreneurship, another type of firm has been evolving in Europe since the 1970s. Both systems succeeded in prime examples of businesses: *unicorns* from Wall Street, next to the *hidden champions* located on Main Street. Hermann Simon coined the term hidden champion in 1990 (Simon 1990). He broadly defines a company as a hidden champion, if they are number 1, 2, or 3 worldwide in their market niches or at least the market leader in their home continent, and are almost hidden, largely unknown by the public, and they post revenues below 4 billion € (Audretsch and Lehmann 2016, pp. 30–35). The second criterion is qualitative, implying that hidden champions are often owner-managed, rarely publicly listed, often operate in B2B markets and are rooted in the (most often rural) regions in which they were established. Unicorns instead are start-up companies valued above $1 billion and thus form a small group of elites within the population of start-ups that is able to scale up their business, often by building a platform on which others can create and exchange value (Acs et al. 2017), such as Airbnb, Uber, Snapchat, Spotify, or Twitter.

We rest our arguments on recent refinements made by Coff and Raffiee (2015), questioning the oversimplifying dichotomy of general and firm-specific human capital and its consequences for investment behavior as initially proposed by Becker (1964) (Nyberg and Wright 2015). We apply their argument to explain how hidden champions have evolved in the last decades and how this has paved the way for their sustained economic success. Our line of reasoning adds to the literature on human capital (Coff and Raffiee 2015) by illustrating that an element of the institutional context, the centralization or decentralization of human capital investment, helps explain the different and path-dependent evolution of both the Silicon Valley (unicorns) and the Main Street model of entrepreneurship (hidden champions).

Our study aims at resolving this one-sidedness contributing to unexplained aspects of entrepreneurship theory. In the remainder of the paper, we first describe the skewed distribution of unicorns and hidden champions (section 2), before section 3 analyzes how different contexts influence human capital investments. After section 4 illustrates the diverse evolvement of both the Silicon and Main Street model of entrepreneurship, section 5 addresses implications of our arguments and discusses opportunities resulting from a combination of both models. Section 6 concludes.

2 The skewed distribution of unicorns and hidden champions

A very small portion of start-up firms in the USA and elsewhere become what have been labeled unicorns. These firms emerge in a very limited number of places around the globe and their distribution is highly skewed, reflecting different institutional contexts are necessary to grow. Table 1 lists the number of unicorns per country

Table 1 Distribution of unicorns around the world

Country	Unicorns
Australia	0
Austria	0
Belgium	0
Brazil	1
Canada	2
China	35
Czech Rep.	1
Denmark	0
Finland	0
France	1
Germany	5
India	7
Israel	2
Italy	0
Japan	0
Luxembourg	0
Netherlands	1
Norway	0
Poland	0
Russia	1
Slovenia	0
Korea	2
Spain	0
Sweden	2
Switzerland	0
Turkey	0
UAE	1
UK	8
USA	101

Data retrieved from http://fortune.com/unicorns/

in the world. Silicon Valley (including cities such as San Francisco, Palo Alto, and Mountain View, but also Greater Los Angeles) is the world leader in high-growth companies, with at least a third (64) of all (170) unicorns globally.[1] With a total of 101 unicorns, more than every second unicorn is hosted in the USA, followed by China with a total of 35 billion dollar start-ups. The UK (including Scotland) hosts 8, and Continental Europe 10. The overwhelming success of the Silicon Valley model of entrepreneurship in generating, financing, and scaling up of unicorns (IT giants like Google (Alphabet), Amazon, or Facebook) is not carved in stone. The underlying business models can sometimes be copied and pasted, as shown by the astonishing success of unicorns in China like Alibaba, Tencent, Baidu, or Didi. These firms are often "twins" to their US originals, competing with their US counterparts worldwide for users, customers, and resources; and like Tencent, they can even surpass their originals (Facebook) in stock market value and revenues.

While scholars have intensively studied high-tech entrepreneurial firms, Main Street companies have only received scarce interest (Audretsch and Lehmann 2016, pp. 30–35; De Massis et al. 2017). Main Street entrepreneurship concentrates on a wide range of self-employed businesses (Morris et al. 2015). We suggest a typology that ranges between the small "mom and pop" businesses, resembling the Kauffman Foundation's definition of Main Street Entrepreneurship, and hidden champions. According to the Kauffman Index of Main Street Entrepreneurship, Morelix et al. (2016, p. 3) define Main Street mom and pop businesses as "one with fewer than fifty employees and in existence for longer than five years". Mom and pop businesses thus consist of the plenitude of ordinary restaurants, hotels, or breweries, among many others. The other end of the Main Street spectrum is marked by companies that are far bigger in size and were made famous by Simon (1990): the hidden champions. Their long-term orientation, firm involvement, and regional embeddedness are characteristics that in general are taken from the "family business" literature (De Massis et al. 2016; Le Breton-Miller and Miller 2006; Zellweger and Sieger 2012), overlooking the complementarity of these items.

The distribution of hidden champions however is highly skewed, too. As they pursue a niche strategy, hidden champions require a unique set of complementary institutional variables. Therefore, the business model of hidden champions centrally revolves around at least three core elements: their specific, knowledge-intensive product; their decentralized organization; and their highly international nature (Audretsch et al. 2018), which all of them call for high and specific human capital. Beyond, these companies are special due to their internal R&D investments, their high product and service quality, their efficiency (total cost of ownership), their export orientation, their long-term orientation, their high profit margin, and last but not least, their almost entirely rural distribution (Audretsch and Lehmann 2016, pp. 30–35).

[1] Source: own calculation based on Fortune's unicorn list (available at http://fortune.com/unicorns). Accessed 07 January 2017.

About 50% of all hidden champions are located in Germany, followed by the USA with 366 (14%), Japan 220 (8%), Austria 116 (4%), and Switzerland 110 (4%) (see Fig. 1). When correcting for country size effects, the picture remains the same, with the distribution of the hidden champions being highly skewed and concentrated in Continental Europe and Scandinavia. A peak can also be found in Asian countries (Japan, South Korea, and China). In contrast, Anglo-Saxon countries rather are underrepresented.

Per definition, hidden champions are market leaders, either on their continent or worldwide, in their respective industries and niches. Being too small to compete only on prices, hidden champions capture their markets by offering highly complex and value-adding goods and services. Quality instead of price leadership leads to a quasi-monopolistic situation, making a company less prone to external shocks, disruption, and business cycles, but this also requires highly skilled labor. This labor workforce, beyond just engineers from universities, requires workers that are well educated and trained both on and off the job, which has almost been neglected in the USA in the past decades (Harhoff and Kane 1997; Lewis 2007; Bosch and Charest 2008).

Compelling evidence suggests that different institutional and cultural contexts (Bradley and Klein 2016; Bruton et al. 2010; Welter and Gartner 2016) result in a skewed distribution of firm characteristics like age, size, location, or industries across countries. The highly skewed distribution of hidden champion companies suggests that country-specific effects, like different law systems underlie (La Porta et al. 1998). A central prediction of this literature is that new ventures on the one hand, and large and public corporations on the other, discriminate against medium-sized firms. This common version is based on the claim that small and medium-sized firms are credit constrained, while large firms are not (Lehmann and Neuberger 2001). Liquid financial markets, like in common law system (Anglo-Saxon) countries, favor equity financing of new ventures and large and established companies (Audretsch and Lehmann 2004; Lehmann and Weigand 2000; Evans and Jovanovic 1989; Holtz-Eakin et al. 1994).

While access to, and costs of, financial capital is an important and scarce resource, this literature almost neglects another important source of capital that is also shaped by different law systems — human capital. Countries not only differ according to their legal rules that shape the costs and provision of financial resources, but also by public funding and access to well-trained and educated human capital. It is undisputed that higher education has become increasingly tied to economic well-being and that continuously advancing in an economy requires an ever-increasing level of technological skill in the workforce (Autor 2014; Goldin and Katz 2009). The production of highly complex, high quality, and value-adding products requires both the ability to obtain capital to invest

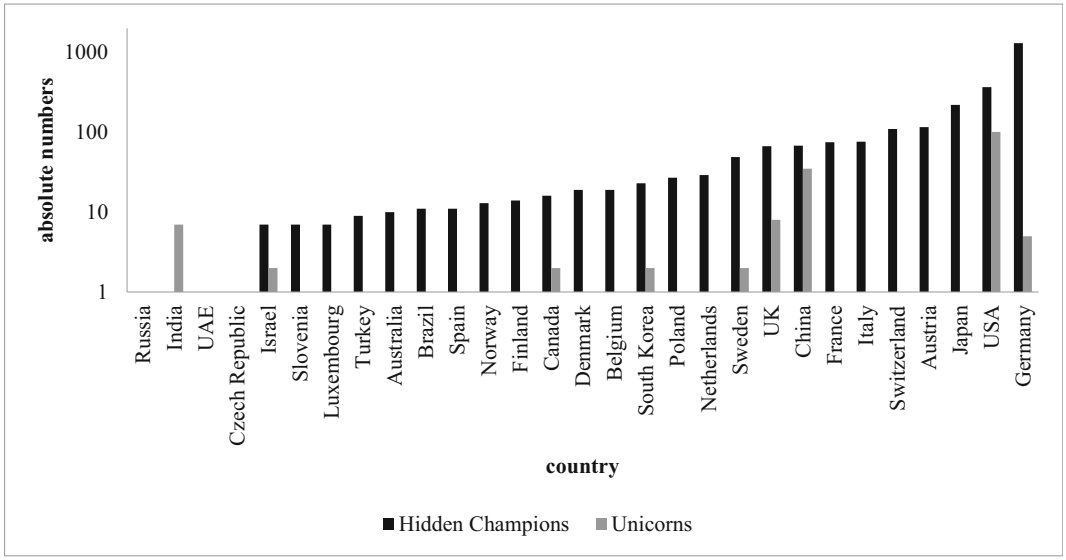

Fig. 1 Hidden champions vs. unicorns worldwide. Data of hidden champions retrieved from Rammer and Spielkamp (2015), data of unicorns from http://fortune.com/unicorns/

in research and development and also in machines and tools, and a high technological skill base that is complementary to the implemented technology. In a technologically advanced economy, the societal skill base curve must stay parallel to and ahead of the technology implementation curve — this requires a system of mass higher education on the firm level.

The skewed distribution of hidden champions should thus be interpreted in this way, too. There are at least two different ways to ensure and guarantee the technological skill base needed, public or private investments. Figure 2 depicts how the public mass education system discriminates according to the distribution of hidden champions. Countries (Table 2) are ranked according their willingness to invest in mass higher education and provide minimum standards for the graduation rate. The rankings are 0, 1, or 2.

At the forefront is Germany, with its worldwide honored model of the dual apprentice system, where duality expresses the combination of practical and theoretical knowledge. The two key features of the dual apprenticeship system are firm-based training programs accompanied by a school-based component in which apprentices acquire upper secondary general education and theoretical knowledge in their training occupation (German Federal Ministry of Education and Research 2018; Kuhlee 2015). Other kinds of dual apprenticeship systems are found in Austria, Switzerland, Denmark, Norway, Luxembourg, and the Netherlands (Hoeckel and Schwartz 2010). Like Germany, these countries also host a high percentage of hidden champions, when corrected for country size effects. To guarantee a level of quality, the vocational education training in these countries is centralized on the state level, organized and controlled by decentralized, semi-public chambers of commerce (Greinert 2005; Jahn 2015). In contrast, Anglo-Saxon countries are characterized by a decentralized education system on the firm level, where public spending in vocational education is kept to a minimum. Interestingly, these countries show a rather low percentage of hidden champions. However, the number of unicorns is highest in these countries, and lowest in Continental Europe. Asian countries, like China, Japan, and South Korea, but also some Scandinavian countries (Sweden) are characterized by centrality of vocational training and education programs and schools,

Table 2 Country overview regarding the centralization of vocational education

Decentralized systems	Mixed systems	Centralized systems
Canada	Australia	Austria
Chile	Belgium	Czech Republic
Japan	Denmark	Finland
New Zealand	Estonia	France
Spain	Greece	Germany
UK	Hungary	Iceland
USA	Ireland	Korea
	Israel	Luxembourg
	Italy	Norway
	Mexico	Poland
	Netherlands	Portugal
	Slovak Republic	Slovenia
		Sweden
		Switzerland
		Turkey

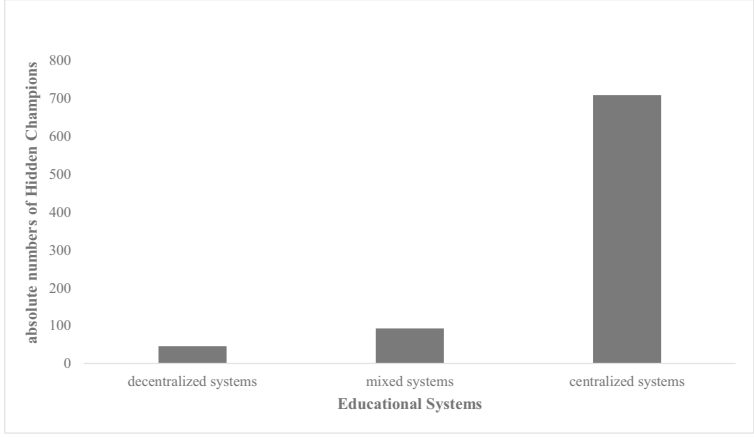

Fig. 2 Hidden champions and the centralization of educational systems

without linking theoretical knowledge and practical applications. At first glance, the organization of vocational education by the centralized vs. decentralized argument may help to explain the distribution of hidden champions and unicorns beyond the traditional law systems. Thus, duality could also be interpreted as a combination of general and firm-specific human capital.

3 A question of the context of human capital investment

3.1 Main street entrepreneurship—the road less traveled?

In the end of the 1970s, the USA developed a new innovation system based on venture capital for entrepreneurial start-up firms, implementing the ICT and biotech innovation waves with Silicon Valley as the role model for an entrepreneurial ecosystem (Bonvillian 2017, p. 2). That venture system has now largely shifted to support software and internet firms, and has abandoned start-ups planning to manufacture hard technologies, fencing off manufacturing firms from its venture-based innovation system. However, manufacturing is a critical element in a country's innovation system, in particular the direct link between innovation and production, where a great array of skills and firms are involved in the lengthy and complex value chain in the production of goods and services. Each full-time equivalent job in manufacturing dedicated to producing value for final demand creates 3.4 full-time equivalent jobs in nonmanufacturing industries — a multiplier far higher than that in any other sector. For every value-added dollar of domestic manufacturing destined for manufactured goods for final demand, another $3.6 of value-added is generated elsewhere in the economy (ibd. 2017, p. 18). Removing the production element in manufacturing, the value chains of connected companies are snapped and face significant disruption. The loss of nearly 6 million jobs in the USA since 2000 has also been damaging the stock of knowledge and human capital in this sector (ibd. 2017, p. 6).

This development contrasts the approach to manufacturing R&D taken by Germany (or Continental Europe), Japan, and China, where the Main Street entrepreneurs have evolved into hidden champions. While companies like Starbucks, Google, Facebook, and Amazon, among others, are by far drivers of innovation and world trade in services, world trade in goods is still four times the amount of trade in services.[2] Thus, success in a highly competitive world rewards regions and nations that produce complex, value-added goods and sell them through international trade — which is why studying hidden champions should be as important, if not more important, as studying unicorns (Welter et al. 2017).

To explain why Main Street entrepreneurship is the road less traveled in the USA in contrast to Continental Europe, we also have to look at what has happened at ground level, where the two roads diverged.

3.2 The paradox in the provision of general and firm-specific human capital

There is broad consensus in the strategy literature that human capital is a main source of sustainable competitive advantage, albeit there is still an open and fruitful discussion about the kind of human capital, i.e., general or firm-specific (Campbell et al. 2012; Coff and Raffiee 2015). Human capital, the stock of knowledge, skills, and abilities acquired by workers by either training or education, adds economic value to enterprises. Human capital could be either general or firm-specific. In the first case, general human capital adds value in different firms and industries, like accounting skills, while firm-specific human capital is considered worthless outside the specific firm, like skills necessary for specific machines (Coff and Raffiee 2015). General and firm-specific human capital are both strongly linked to market imperfections on the demand and supply side (Molloy and Barney 2015). When it comes to the classic investment dilemma articulated by Williamson (1975), the investment decision between firm-specific and general skills is a choice made by the employee and the employer. When the human capital is indispensably linked to the individual, when it is intrinsically part of him, who will or should invest in the individual's human capital or ought to have the responsibility of investing in it or the enjoyment of its benefits? According to Becker (1964), it is irrational for a firm to fund general human capital like employee training schemes, as its inherent value is at risk with agents reneging on the vague promise of relation-specific investments (Fleming 2017). To this effect, employees will be reluctant to

[2] DG Trade Statistical Guide (June 2017). World Trade in Goods, Services, FDI. Available at http://trade.ec.europa.eu/doclib/docs/2013/may/tradoc_151348.pdf.

make investments in firm-specific human capital to avoid a wage penalty from mobility (Campbell et al. 2012), but are willing to invest in general human capital to increase their outside opportunities. On a theoretical basis, this dilemma leads to underinvestment in human capital, with adverse consequences for the whole economy. One way to solve this kind of market imperfection is the provision of a public good — vocational education provided by the government (governmental investments in people's skills), a state-funded tertiary education system. Countries differ worldwide in their ability and willingness to provide general and specific human capital as a public good, and they further differ on whether the provision is organized on a central, state-level, or decentralized on the firm level.

Summing up, public policy has been about divesting in people, in particular in the Anglo-Saxon countries. That is why the Silicon Valley model of entrepreneurship has evolved so successfully on the one hand and the Main Street hidden champions' model on the other hand.

3.3 Historical roots—there is no free lunch

Assuming that academic research in entrepreneurship does not follow a random walk but is more or less path dependent, recent phenomenon requests that the historical context could not be faded out (Wadhwani 2017). So, why have academics narrowed their view to the Silicon Valley model of entrepreneurship? One answer to this question dates back to the 1960s, the hour of birth of modern human capital theory, where an intensive debate had occurred at the University of Chicago, whether the provision of human capital is a public good or not.[3] While other countries kept the model of public investment in education, the USA drastically reduced public investment in education, fostering entrepreneurship and the self-responsibility of individuals to invest in their human capital. Following the argument raised by Friedman (1962) and Becker (1964) mentioned further above, profit-maximizing firms would be reluctant to invest in education and training methods. Hence, public spending on education and training should close this skill gap and enrich the countries skill reserves.

Friedman (1962), an advocate of free market competition, individualism, freedom, and glorifying the self-made entrepreneur, channeled the human capital debate toward a political debate contrasting the entrepreneurial and capitalist US system with the social planning system of Russia (Fleming 2017). Returns on human capital derived from public investment ought to remain in public hands, which resembles the socialist way of thinking. If human capital could not be separated from the individual, then returns from human capital derived from public investment, the individual receives a gift from the taxpayer. In this case, the individual should bear some or all the investment costs of human capital. If the individual is already the owner of his own production technology, his human capital, knowledge, skills, and abilities, then the presumed conflict at the heart of the capitalist labor process logically dissolves — the individual has become a de facto capitalist by the acquisition of knowledge, skills, and abilities. The underlying message of human capital theory turns out to be simple, what Friedman summed up in the catchphrase that "there is no such thing as a free lunch."

Since then, the Anglo-Saxon countries and Continental Europe took different roads, shifting their economies on different paths. Tax incentives continuously channel investments in entrepreneurial firms that in turn increases stock-market liquidity, stimulating IPOs as an exit strategy. With the number of publicly traded domestic companies in the USA growing radically, the share of household wealth going into stocks exploded from about 5% in the 1980s, to some 30% at the end of the 1990s (Zuckerman 1998). Zuckerman (1998, pp. 22–23) comments pointedly that "entrepreneurialism and individual initiative in this country are so widely accepted" and that "the achievements of business in America grew out of a culture that has long valued individualism, entrepreneurialism, pragmatism, and novelty."

Investment and production of human capital has long-lasting and path-dependent historical roots in Continental European and Scandinavian countries. In the fourteenth century, a system of guilds has emerged; a unification of companies and craftsmen for each industry, like jewelry, tailors, smiths, clock builders, or gunmakers. This kind of collusion controlled not only the market entry and the location policy of an urban district, but in particular guaranteed and fostered the investment in general and firm-specific human capital. Since ever, firm- or industry-specific human capital was seen as a strategic competitive advantage and therefore has been protected and kept within the guild. Employee

[3] See Fleming (2017) for a detailed and precise analysis of this human capital controversy in the 1960s.

retention was enforced by legal rules and the extraction of power. Employees in industries with strategic importance for the city or state, like in the production of weapons and arms, are hindered from leaving the company by their live, during that time, investment in firm-specific human capital creating a holdup problem as described in Coff and Raffiee (2015), and mobility was directly linked to wage reduction, in the case of losing its life. The incentive to invest in firm-specific human capital and knowledge is always shaped by the expected net benefits compared to the outside opportunities. Since then, firms invest in training and educating their employees, to guarantee a skill-based workforce. This tradition has survived since the middle age within guilds, but also incorporated in the plenty of firms existing for hundreds of years (Audretsch and Lehmann 2016).

4 Human capital investment and the emergence of the Silicon Valley and Main Street model of entrepreneurship

4.1 The evolvement of the Silicon Valley model of entrepreneurship

The technology push in the ICT sector in the 1970s has led to several spin-offs in the semi-conductor industry from companies like Fairchild or IBM by engineers who felt unsatisfied with their mother companies in applying and fostering these new technological challenges (Almeida and Kogut 1997; Klepper 2011). Like a chain reaction, the number of start-ups exploded in the Silicon Valley, where now large and established firms co-exist with young and entrepreneurial firms evolving an entrepreneurial ecosystem, where scarce resources are efficiently exchanged among the different parties. Mobility of employees not just occurred by moving to rival firms, but also by spin-offs and founding new ventures.

Despite the diversity of firms, the firm-specific knowledge of the first hour, skills in computing and software has evolved to general knowledge. The skill base in the last decade represents a myriad of young people growing up with programming languages and their new applications and their derivatives. Abilities, skills, and knowledge are appropriated by observing peers, freely available instructions on YouTube, and just self-learning by trial-and-error. This generation represents the new "blue collar" workforce, the technological skill base in the workforce needed to support the ever-growing curve of technological advance implemented by platform start-ups, as the unicorns.

The observed high mobility of employees in the start-up scene raises the question of whether the human capital embodied in these employees is firm-specific or rather general. As Coff and Raffiee (2015) point out, employees with firm-specific skills are unlikely to use these skills successfully without the focal firm's complementary assets. Otherwise, the total value associated with their productivity would be lower in the rival firm leading to a wage reduction. The high mobility of employees observed in Silicon Valley (but also in other dense clusters of start-ups) leads to several implications: that the human capital of employees in high-tech firms is less firm-specific than assumed, that the complementary assets of high-tech entrepreneurial firms are less firm-specific, and that neither employees nor entrepreneurial companies think about human capital in terms of firm specificity and its implication on wages and remuneration (Coff and Raffiee 2015).

What drives firm performance in the end is the access to critical resources, as human and financial capital. Investors rationally tend to invest in companies with the highest expected return on their investment. Since firm risk and expected returns are correlated, equity investors[4] tend to invest in new ventures with expected higher profits. Herd behavior among investors and overestimation of future profits lead to the highly skewed distribution of high-tech firms — the unicorns, which receive a market value above $1 billion within a short time after they are founded. This induces a competition for skilled labor, rendering concerns on general or firm-specific knowledge or human capital to a more or less theoretical discussion (Groysberg 2010; Groysberg et al. 2008). Strategic and competitive advantages are less based on how the technological skill base is creating sustainable values to the complementary assets of a firm, but on how the business model could be scaled up on the demand, the customer side.

[4] This directly follows from the famous Stiglitz and Weiss (1981) model on credit rationing. While the expected profits increase with the riskiness of the firm's project, this also leads to adverse selection (high-risk firms) and moral hazard (gambling for resurrection) effects. The equilibrium is an interest rate at a given level of riskiness, which leads to credit rationing for higher risk firms. Since creditors could not benefit from the "upside risk" (when firms overperform) but bear the downside risk (the costs of failure and bankruptcy) they could not trade off these costs and benefits. Equity investors however could trade off the risk and benefits of their investment by increasing their portfolio.

Fascinated by this hype, scholars therefore have focused their research interest toward this entrepreneurial ecosystem, analyzing all aspects ranging from knowledge spillovers to new venture creation and failing, financing and exit decisions, governance aspects, or new business model creation. In such an ecosystem, there would be no place for Main Street entrepreneurship beyond a ground level.

4.2 The evolvement of the Main Street model of entrepreneurship

The European Union, in particular countries like France, Germany, or Italy, have long been trying to copy the Silicon Valley model of entrepreneurship — without great success but not for nothing. While they have been successful in establishing several industry clusters in different regions, they failed in building a Silicon Valley, which works like a perpetual mobile, generating and disgorging new companies, partially by swelling and absorbing the resources set free from the failing forerunners. Why have we observed such a divergence in the development of industries and firms between the USA and Continental Europe since the 1970? The dual apprenticeship in Germany, where half of the hidden champions are located worldwide, serves as an institutional mechanism to overcome the holdup and moral hazard problem generated by the general and firm-specific character of human capital. German apprenticeship training takes place in public vocational schools, teaching theoretical knowledge, and private firms, training apprentices in practical skills, i.e., firm-specific skills and knowledge. Creating graduates with theoretical, general, and practical, firm-specific, knowledge, the German apprenticeship system thus ensures and guarantees a technological skill base in the workforce needed to support the production of high-quality services and products. While firms' participation in the apprenticeship is voluntarily, once deciding to participate, they are subject to the laws of apprenticeship training (Jahn 2015). The Chambers of Commerce and Industry or Crafts first checks whether firms meet the official training standards to train apprentices and, since apprentices have to pass an official job-related exam, guarantee a level of quality in training and education.

Almost half of the hidden champions were founded after World War II, and many of their "birth" dates go back to the mid-1970s (Simon 2009), the time when the first high-tech enterprises like Intel were founded in the Silicon Valley. While the USA started in disinvesting in the provision of public-funded human capital, Continental Europe and Scandinavian countries increased their efforts in public mass education. A focus was put on the provision of general human capital in different levels. Education was seen as a free lunch for the individual benefitting from the costless access to human capital, paid like a gift from the taxpayer. While the government provides general human capital, abilities, and skills, further firm-specific knowledge and skills are needed beyond.

Hidden champions are champions since they outperform their control groups in the growth of market shares (hidden champions 34%, control group 13%), sales (11%, 8%), exports (64%, 34%), or profit margin (Rammer and Spielkamp 2015). Entrepreneurial orientation is inherent; the search for product and process improvements lies in the genes of hidden champions and encompasses all hierarchies. Their strong and long-lasting relationship to key clients and suppliers offers a base for new opportunities in new markets all over the world (Audretsch et al. 2018; Witt and Carr 2014; Yoon 2013). Their innovations often are radical, R&D intensive, specialized, and focused on quality and product-related services, accompanied with an outstanding process and innovation management (Witt and Carr 2014). Hidden champions defend and protect their competitive advantages by their speed in improving processes, products, and services, and less on patenting activities. Their close bi-lateral relationships with key clients are characterized by trust and disclosure (Baker and Mazzarol 2015), a "Nash-equilibrium," where no party has an incentive to change the cooperation or cheat.

Like the first companies in the Valley chose their location on the basis of real estate prices and the closeness to universities like Stanford University or UC Berkeley, most of the hidden champions are founded in rural areas. To overcome this disadvantage, hidden champions invest in long-term relationships with their key stakeholders like banks, suppliers, customers, and their employees. This requires a long-term orientation instead of a short and myopic view. In particular, human capital has become a scarce resource for these companies. Educating, training, and employee retention has thus become a major challenge for the leadership of hidden champions until now. By producing high-quality and value-adding goods and services, they create lock-in effects for customers and suppliers. Complementary to investments in R&D, these companies invest

in superior training and education for their workforce. While these trainings and skills may be perceived as firm-specific, they do not create a holdup or lock-in effect as proposed by theory. The opposite holds: labor mobility for the trained and educated employees exists. While in theory the specificity of knowledge may vary like a *tetta* ranging from "one" (general human capital with infinite outside opportunities) to "zero" (firm-specific with no outside opportunities), reality is far away from the estimated corner solutions of the algebraic optimization problem. Firm-specific skills, abilities, and knowledge (firm-specific human capital) increase outside opportunities and do not restrict them. Competition for key employees is the law not the exception, but usually occurs in a close geographic proximity. Clustering of rivals may increase the competition for key employees, but also offers a larger and more flexible labor market.

As shown in Fig. 3, most of the hidden champions are doing business in industries in the manufacturing and engineering sectors. These industries require a specialized and well-trained workforce, implying that lifelong learning and the development of firm-specific skills and abilities are an "acceptable request and make the investment without hesitance, questioning, or conscious thought" (Coff and Raffiee 2015). These industries are, however the complex, advanced technology and value-added industries, where "the currency of world trade is in" (Bonvillian 2017, p. 8).

4.3 Human capital and the complementary fit of unicorns and hidden champions

Literature of strategic management centrally grounds on the rationale of an underlying fit between strategic choice, organizational design, and context (Hambrick and Fredrickson 2001). It is down to this fit that only a restricted number of coherent patterns result, leading to a rather skewed distribution of unicorns and hidden champions. The evolution of unicorns and hidden champions should thus correspond to predictable relations among the given context and efficient choice variables, resulting in a complementarity of strategy and organizational design (Milgrom and Roberts 1990, 1995). Considering any pair of variables that designers, managers, and policy makers might determine or influence in attempting to realize performance, then two choice variables are complements (substitutes) when "doing more of one of them increases (decreases) the returns to doing more of the other" (Roberts 2004, p. 34). This is the logic of creating strategic advantages induced by the complementarity of assets, tangible or intangible, leading to economies of scale, scope, and core competences.

decentralized systems	mixed systems	centralized systems
Canada	Australia	Austria
Chile	Belgium	Czech Republic
Japan	Denmark	Finland
New Zealand	Estonia	France
Spain	Greece	Germany
United Kingdom	Hungary	Iceland
United States	Ireland	Korea
	Israel	Luxembourg
	Italy	Norway
	Mexico	Poland
	Netherlands	Portugal
	Slovak Republic	Slovenia
		Sweden
		Switzerland
		Turkey

Fig. 3 Distribution of hidden champions across industries (2006–2012). Data of hidden champions retrieved from Rammer and Spielkamp (2015)

The logic of unicorns lies within the speed of scaling their business model, within matching partners on platforms, like consumers and producers of goods and services (Bresnahan et al. 2002). The logic of hidden champions instead is based on flexibility, economies of scope, and core competences, and represents the characteristic "modern manufacturing" model (Roberts 2004). Both the Silicon Valley and Main Street models of entrepreneurship represent two coherent patterns of choice over a very large set of policy and firm-specific variables, where a move of any one element is complementary with the corresponding move on each of the other variables. Table 3 compares key characteristics of both hidden champions and unicorns, and displays them at a glance.

The complementary connection between general but technology-specific human capital (computing and software programming) to new ideas and products has led to scalable business models, requiring complementary equity-based financial resources to realize speed and growth (Brynjolfsson and Hitt 2000). The clustering of new ventures is shaped by spillover effects, where knowledge spills over from firms but is also absorbed by them (Audretsch and Lehmann 2005; Levinthal 1997). Value is created by network effects, matching users by large investments in platform technology and mass communication. Permanently improving the complementarity of choice variables captures value, each additional user and each investment in the technology leverage the level of the whole venture.

Public investment for hidden champions in general and specific human capital is complementary to the ability and training within the firm. Each dollar spent in public education programs increased the marginal return investments in employee training schemes. Empowering workers, worker initiatives, and searching for continuous improvement are complementary with their skill base, implying that employees view the development of firm- and client-specific knowledge and skills as a necessary request for sustainable client relationships. With this in mind, it is easy to understand why employers proactively invest in their own human capital, in turn ensuring a rather flexible production, with short, customer-tailored production runs, a permanent improvement of products and processes generated by long-term and trust-based relationships, in a quasi-monopolistic niche market.

Such tri-lateral relationships, where all parties, the firm, its employees, and the customers, invest in relationship-specific investments, are increasing both the switching costs and the generated value of all parties. The holdup hazard caused by the lock-in effect and opportunistic ex post-negotiation behavior are attenuated by reputation and trust, which has been established by reciprocal behavior in the past. Such lock-in effects are hard to replicate by imitators and generate both strategic advantages and capturing values. Market entries by incumbents occur by spin-offs of employees or by incumbents, taking hidden champion firms over to appropriate the tangible but almost intangible assets.[5]

5 Discussion and implications

In recent years, the old discussion on how and why context matters for entrepreneurship has gained new attention. Scholars are concerned about why entrepreneurship takes different forms and how and why those are shaped by different contexts (Autio et al. 2014; Hoskisson et al. 2013; Welter 2011; Welter and Gartner 2016; Zahra et al. 2014), articulating the multiple dimensions of contexts, like geographical, institutional, technological, industrial, organizational, or social, and the implications for the nature and extent of entrepreneurship and entrepreneurial forms (Wright et al. 2014). Much work has focused on analyzing variations of variables within a close geographical context, like the Silicon Valley, confirming that habits, reactions, expectations, and entrepreneurial orientation are positively shaped by a favorable and creative environment (Aldrich and Martinez 2015; Dalton 2004; Dequech 2013). However, less is known about the dynamic or temporal dimension of contexts, like human capital, its implications for cross-regional and cross-country effects, and how these contexts shape the nature, forms, and extent of entrepreneurship (Landström et al. 2012; Wright et al. 2014).

[5] This is reflected by the takeover waves of hidden champion firms in Germany, France, and Italy in recent years, by Chinese and US companies. The takeover of *Grammer*, a hidden champion in the automotive sector, by TESLA in 2016 drastically reflects the deep roots of the buyer-supplier relationships, when former key clients of the target company are now becoming rivals to the merged company.

Table 3 Unicorns and hidden champions at a glance

	Unicorns	Hidden champions
Location	Metropolitan areas, dense clusters	Rural, small homogenous clusters
Financial capital	Equity based (venture capital, angel investors, equity shares, IPO)	Relationship banking; internal capital markets (cash flows, liquidity)
Human capital	General, technology specific, high turnover rate	Firm and customer specific, low turnover rate
Leadership	Charismatic	Stewardship, patriarchal
Competitive advantage	Ubiquity in matching markets (two-sided markets)	Uniqueness of products and services
Value creation	Mathematical algorithms in two-sided markets	Relationship-specific investment
Competition	Price competition, cost leadership, matching competition	Niche market leadership, quality competition, co-opetition among rivals
Strategy	"Innovate here - produce there," disintegrated value chain, outsourcing (low cost/low tax countries)	"Innovate here - produce here," integrated value chain
Capturing values	(Over-)Investment in platform technologies; cross- and multichannel selling	Lock-in effects of customers
Growth opportunities	High scalable business model	
New market entry	Through copy and paste by reduced transaction costs	Entry by takeovers

5.1 Focus on cross-country and cross-regional differences of entrepreneurial models

One way is to shift the lens away from the Silicon Valley model of entrepreneurship and the "North American 'taken-for-granted' assumptions about what kinds of contexts matter" (Welter and Gartner 2016, p. 5). While cross-regional and cross-country studies have found that although millions of people participate in new venture creation, less is known about why there is such a large variation in start-up rates among countries (Kelley et al. 2011), and how and why both models of entrepreneurship differ so much among countries. The common story that "market-based" countries (Anglo-Saxon countries) and their liquid stock markets are dominating other countries (in particular the Continental European countries and the central planned countries) in fostering and promoting high-tech entrepreneurial firms is only one aspect on why contexts matter. Academic research should thus focus on different contexts on the macro or country level to get more insights about the emergence of entrepreneurial forms, its nature and extent. While the provision of financial capital is obviously an important issue and financial laws are an important context variable, the same attention should also be spent on the provision of human capital and the skewed distribution of general and specific human capital among geographical areas. Since financial assets and human capital are strong complementarities, increasing one choice variable does necessarily require an increase in the other variable, specifically human capital. Entrepreneurship scholars should shift their focus from the financial side of new venture creation to the human capital dimension, combining both critical resources as complementary assets.

While the last decades have brought important financial innovations, reorganizing the financial sector, the reorganization of work and its implication on new venture creation and growth have almost been neglected. The "skill-biased technological change" in the ICT sector favored skilled labor in all countries, but in particular, where the workers used these technologies, and governments invested in public education and training programs like in Continental Europe or China. Consequently, jobs were outsourced and offshored and the new organization of production and work led to a polarization of work, whereby the employment shares of the high- and low-wage jobs have expanded at the expense of the middle-wage jobs (Bonvillian 2017). One instrument to overcome this problem is fostering and promoting new venture creation in rural areas (Korsgaard et al. 2015). Though knowing that entrepreneurs and small and medium-sized firms create economic growth in their communities, little is known about how to build rural economies with entrepreneurship (Welter et al. 2017). While country-level characteristics, like different law systems, often appear stable over time, there are

continuous changes in the endowment of human capital and social and cultural norms that enable and constrain entrepreneurial activity on the local level (McMullen et al. 2016). In this sense, the perception of human capital, either being general or firm-specific, and its implication for public or private investment (Coff and Raffiee 2015), differs across countries and regions and thus may be locally incorporated as a social or cultural norm.

5.2 Combining the Silicon Valley model of entrepreneurship with the Main Street model

The organization of work in advanced and industrialized countries is changing in both manufacturing and ICT technology. Recent innovations illustrate that combining both models of entrepreneurship, linking manufacturing to ICT, will determine the future of manufacturing and production and the competitiveness of countries and regions. Labeled as "Industry 4.0," this fourth industrial revolution characterizes the interplay of production technologies and Internet, mobile, and cloud computing, leading to an exchange of information in real time, decentralized organization of production, and individual- and customer-specific flexible orders and services. Industry 4.0 encompasses all industry sectors and offers a broad field for new venture creation beyond the scalable platform models of unicorns.

For a variety of reasons, the news is that both systems complement and enrich each other. Unicorns and Main Street hidden champions cooperate in input and output markets. As De Massis et al. (2016) argue, such a division of labor not only improves production technology and processes for both types of firms but also leads to the dissemination of knowledge and know-how. High-tech Silicon Valley entrepreneurship and Main Street entrepreneurship should thus be seen as complements, where the first has been overestimated in the literature in the past decades at the expense of the latter. Reviewing the factor analysis Kuratko et al. (1990) ran to assess determinants on developing the ideal climate for entrepreneurial behavior, the similarity of offers and needs regarding the business model of hidden champions is nothing but eye-catching. In this vein, the literature on corporate entrepreneurship quotes management support, organizational structure, and reward and resource availability as core ingredients for staying competitive (Kuratko et al. 1990; Hornsby et al. 2002; Kuratko et al. 2014). Taking a closer look, much of this literature revolves around the concept of entrepreneurial orientation (EO) that, along the three underlying dimensions of innovativeness, risk-taking, and pro-activeness, describes the extent of firms preparing to keep up with strategic renewal (Covin and Slevin 1991; Lumpkin and Dess 1996; Morris et al. 2011). Against this backdrop, we urge future research to reconsider the broad theory of corporate entrepreneurship and to align its concern to the case of hidden champions. In the age of Industry 4.0, the management and leadership of knowledge workers are becoming increasingly important (Hecklau et al. 2016). Unicorns and hidden champions should take opportunities to cooperate and learn from each other, creating value and strengthening their competitive advantages in symbiosis.

6 Conclusion

This study introduced Main Street entrepreneurship as a field of study and is meant to thwart entrepreneurship research from overemphasizing high-tech entrepreneurship. We argue that both models of entrepreneurship, the Silicon Valley as well as the Main Street counterpart, have their shining beacon firms and contribute to large parts of economic growth and welfare. By comparing both models, we point out why the global distribution of hidden champions and unicorns follows systematic patterns. Recognizable and predictable relations exist between the entrepreneurship models on the one hand, and the context, the variables of strategy, and the organization on the other. Arguing that the "entrepreneurial mania" has rooted in a "human capital mania," we show that political decisions made in the 1960s influenced the evolvement of two different models, categorized and distinguished especially by their divergent view on human capital investments.

Both scholars and corporate leaders receive clear messages from this research. The latter are welcomed to learn from the examples of excellence. We invite SMEs, rural companies, family businesses, and exporting mid-sized companies to reevaluate their strategic fit against the mentioned choice variables. Managers and decision makers in companies thus should focus on their internal strengths and keep their eyes open for the opportunities arising from contextual contingencies. Moreover, investment in firm-specific human capital withholds the potential to stimulate both industries and regions, but essentially depends on the institutional

framework. Therefore, policy makers are also in charge of standing in for SMEs and their flagship of hidden champions, hearing their needs so that they are not completely overshadowed by multinationals and unicorns. Following Baker and Welter (2015) that entrepreneurship policy is not the one and only instrument for an economy to become competitive and innovative, we plead for a general rethinking in academia that not just high-tech entrepreneurship's unicorns are worthy of being studied, but that Main Street's hidden champions should finally be coming to the fore.

References

Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics, 32*(1), 15–30.

Acs, Z. J., Stam, E., Audretsch, D. B., & O'Connor, A. (2017). The lineages of the entrepreneurial ecosystem approach. *Small Business Economics, 49*(1), 1–10.

Aldrich, H. E., & Martinez, M. (2015). Why aren't entrepreneurs more creative? Conditions affecting creativity and innovation in entrepreneurial activity. In C. E. Shalley, M. A. Hitt, & J. Zhou (Eds.), *Oxford handbook on creativity, innovation, and entrepreneurship* (pp. 445–456). New York: Oxford University Press.

Almeida, P., & Kogut, B. (1997). The exploration of technological diversity and geographic localization in innovation: start-up firms in the semiconductor industry. *Small Business Economics, 9*(1), 21–31.

Audretsch, D. B. (2009). The entrepreneurial society. *Journal of Technology Transfer, 34*(3), 245–254.

Audretsch, D. B., & Keilbach, M. (2004). Entrepreneurship capital and economic performance. *Regional Studies, 38*(8), 949–959.

Audretsch, D. B., & Lehmann, E. E. (2004). Dept or equity: the role of venture capital in financing high-tech firms in Germany. *Schmalenbach Business Review, 56*, 340–357.

Audretsch, D. B., & Lehmann, E. E. (2005). Does the knowledge spillover theory of entrepreneurship hold for regions? *Research Policy, 34*(8), 1191–1202.

Audretsch, D. B., & Lehmann, E. E. (2016). *The seven secrets of Germany: economic resilience in an era of global turbulence*. New York: Oxford University Press.

Audretsch, D. B., & Thurik, R. (2004). A model of the entrepreneurial economy: papers on entrepreneurship, growth and public policy.

Audretsch, D. B., Lehmann, E. E., & Schenkenhofer, J. (2018). Internationalization strategies of hidden champions: lessons from Germany. *Multinational Business Review, 26*(1), 2–24.

Autio, E., Kenney, M., Mustar, P., Siegel, D., & Wright, M. (2014). Entrepreneurial innovation: the importance of context. *Research Policy, 43*(7), 1097–1108.

Autor, D. H. (2014). Skills, education, and the rise of earnings inequality among the "other 99 percent". *Science, 344*(6186), 843–851.

Baker, S., & Mazzarol, T. (2015). The Australian manufacturing Mittelstand: an initial exploration. Retrieved from http://research-repository.uwa.edu.au/en/publications/the-australian-manufacturing-mittelstand-an-initial-exploration(14bbe27f-dc22-467e-8770-a558d2a35421)/export.html. Accessed 25 July 2017.

Baker, T., & Welter, F. (2015). Bridges to the future of entrepreneurship research. In T. Baker & F. Welter (Eds.), *The Routledge companion to entrepreneurship* (pp. 3–17). London: Routledge.

Becker, G. S. (1964). *Human capital: a theoretical and empirical analysis, with special reference to education*. Chicago: Chicago University Press.

Bonvillian, W. B. (2017). Advanced manufacturing: a new policy challenge. *Annals of Science and Technology Policy, 1*(1), 1–131.

Bosch, G., & Charest, J. (2008). Vocational training and the labour market in liberal and coordinated economies. *Industrial Relations Journal, 39*(5), 428–447.

Bradley, S. W., & Klein, P. (2016). Institutions, economic freedom, and entrepreneurship: the contribution of management scholarship. *The Academy of Management Perspectives, 30*(3), 211–221.

Bresnahan, T. F., Brynjolfsson, E., & Hitt, L. M. (2002). Information technology, workplace organization, and the demand for skilled labor: firm-level evidence. *The Quarterly Journal of Economics, 117*(1), 339–376.

Bruton, G. D., Ahlstrom, D., & Li, H.-L. (2010). Institutional theory and entrepreneurship: where are we now and where do we need to move in the future? *Entrepreneurship Theory and Practice, 34*(3), 421–440.

Brynjolfsson, E., & Hitt, L. M. (2000). Beyond computation: information technology, organizational transformation and business performance. *The Journal of Economic Perspectives, 14*(4), 23–48.

Campbell, B. A., Coff, R., & Kryscynski, D. (2012). Rethinking sustained competitive advantage from human capital. *Academy of Management Review, 37*(3), 376–395.

Coff, R., & Raffiee, J. (2015). Toward a theory of perceived firm-specific human capital. *The Academy of Management Perspectives, 29*(3), 326–341.

Covin, J. G., & Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship: Theory and Practice, 16*(1), 7–24.

Dalton, R. J. (2004). *Democratic challenges, democratic choices*. New York: Oxford University Press.

De Massis, A., Frattini, F., Kotlar, J., Petruzzelli, A. M., & Wright, M. (2016). Innovation through tradition: lessons from innovative family businesses and directions for future research. *The Academy of Management Perspectives, 30*(1), 93–116.

De Massis, A., Audretsch, D. B., Uhlaner, L., & Kammerlander, N. (2017). Innovation with limited resources: management lessons from the German Mittelstand. *Journal of Product Innovation Management, 35*(1), 125–146.

Decker, R. A., Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2016). Where has all the skewness gone? The decline in high-growth (young) firms in the U.S. *European Economic Review, 86*, 4–23.

Dequech, D. (2013). Economic institutions: explanations for conformity and room for deviation. *Journal of Institutional Economics, 9*(1), 81–108.

Evans, D. S., & Jovanovic, B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy, 97*(4), 808–827.

Fleming, P. (2017). The human capital hoax: work, debt and insecurity in the era of Uberization. *Organization Studies, 38*(5), 691–709.

Friedman, M. (1962). *Capitalism and freedom*. Chicago: University of Chicago Press.

German Federal Ministry of Education and Research. (2018). The German vocational training system. Retrieved from https://www.bmbf.de/en/the-german-vocational-training-system-2129.html. Accessed 10 June 2018.

Goldin, C. D., & Katz, L. F. (2009). *The race between education and technology*. Harvard University Press.

Greinert, W.-D. (2005). *Mass vocational education and training in Europe: classical models of the 19th century and training in England, France and Germany during the first half of the 20th*. Office for Official Publications of the European Communities.

Groysberg, B. (2010). *Chasing stars: the myth of talent and the portability of performance*. New Jersey: Princeton University Press.

Groysberg, B., Lee, L.-E., & Nanda, A. (2008). Can they take it with them? The portability of star knowledge workers' performance. *Management Science, 54*(7), 1213–1230.

Hambrick, D. C., & Fredrickson, J. W. (2001). Are you sure you have a strategy? *The Academy of Management Executive, 15*(4), 48–59.

Harhoff, D., & Kane, T. J. (1997). Is the German apprenticeship system a panacea for the US labor market? *Journal of Population Economics, 10*(2), 171–196.

Hecklau, F., Galeitzke, M., Flachs, S., & Kohl, H. (2016). Holistic approach for human resource management in Industry 4.0. *Procedia CIRP, 54*, 1–6.

Hoeckel, K., & Schwartz, R. (2010). Lernen für die Arbeitswelt OECD-Studien zur Berufsbildung.

Holtz-Eakin, D., Joulfaian, D., & Rosen, H. S. (1994). Sticking it out: entrepreneurial survival and liquidity constraints. *Journal of Political Economy, 102*(1), 53–75.

Hornsby, J. S., Kuratko, D. F., & Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: assessing a measurement scale. *Journal of Business Venturing, 17*(3), 49–63.

Hoskisson, R. E., Wright, M., Filatotchev, I., & Peng, M. W. (2013). Emerging multinationals from mid-range economies: the influence of institutions and factor markets. *Journal of Management Studies, 50*(7), 1295–1321.

Jahn, V. (2015). The importance of Mittelstand firms for regional apprenticeship activity: lessons for policy: Diskussionspapier, Helmut-Schmidt-Universität, Fächergruppe Volkswirtschaftslehre.

Kelley, D. J., Bosma, N., & Amorós, J. (2011). Global entrepreneurship monitor: global report 2010. *Global Entrepreneurship Research Association*.

Klepper, S. (2011). Nano-economics, spinoffs, and the wealth of regions. *Small Business Economics, 37*(2), 141.

Korsgaard, S., Müller, S., & Wittorff Tanvig, H. (2015). Rural entrepreneurship or entrepreneurship in the rural—between place and space. *International Journal of Entrepreneurial Behavior & Research, 21*(1), 5–26.

Kuhlee, D. (2015). Federalism and corporatism: on the approaches of policy-making and governance in the dual apprenticeship system in Germany and their functioning today. *Research in Comparative and International Education, 10*(4), 476–492.

Kuratko, D. F., Montagno, R. V., & Hornsby, J. S. (1990). Developing an intrapreneurial assessment instrument for an effective corporate entrepreneurial environment. *Strategic Management Journal, 11*, 49–58.

Kuratko, D. F., Hornsby, J. S., & Covin, J. G. (2014). Diagnosing a firm's internal environment for corporate entrepreneurship. *Business Horizons, 57*(1), 37–47.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy, 106*(6), 1113–1155.

Landström, H., Harirchi, G., & Åström, F. (2012). Entrepreneurship: exploring the knowledge base. *Research Policy, 41*(7), 1154–1181.

Le Breton-Miller, I., & Miller, D. (2006). Why do some family businesses out-compete? Governance, long-term orientations, and sustainable capability. *Entrepreneurship Theory and Practice, 30*(6), 731–746.

Lehmann, E. E., & Neuberger, D. (2001). Do lending relationships matter? Evidence from bank survey data. *Journal of Economic Behavior and Organization, 45*, 339–359.

Lehmann, E. E., & Weigand, J. (2000). Does the governed corporation perform better? Governance structures and corporate performance in Germany. *Review of Finance, 4*(2), 157–195.

Levinthal, D. A. (1997). Adaptation on rugged landscapes. *Management Science, 43*(7), 934–950.

Lewis, T. (2007). The problem of cultural fit—what can we learn from borrowing the German dual system? *Compare, 37*(4), 463–477.

Litan, R. E., & Hathaway, I. (2017). Is America encouraging the wrong kind of entrepreneurship? *Harvard Business Review, Economics Digital Article*. Retrieved from https://hbr.org/2017/06/is-america-encouraging-the-wrong-kind-of-entrepreneurship. Accessed 20 June 2017.

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *The Academy of Management Review, 21*(1), 135–172.

McMullen, J. S., Wood, M. S., & Kier, A. S. (2016). An embedded agency approach to entrepreneurship public policy: managerial position and politics in new venture location decisions. *The Academy of Management Perspectives, 30*(3), 222–246.

Milgrom, P., & Roberts, J. (1990). The economics of modern manufacturing: technology, strategy, and organization. *The American Economic Review, 80*(3), 511–528.

Milgrom, P., & Roberts, J. (1995). Complementarities and fit strategy, structure, and organizational change in manufacturing. *Journal of Accounting and Economics, 19*(2), 179–208.

Molloy, J. C., & Barney, J. B. (2015). Who captures the value created with human capital? A market-based view. *The Academy of Management Perspectives, 29*(3), 309–325.

Morelix, A., Tareque, I., Fairlie, R. W., Russell, J., & Reedy, E. (2016). The Kauffman Index 2016: Main Street entrepreneurship metropolitan area and city trends (November 2016). Retrieved from https://ssrn.com/abstract=2872903.

Morris, M. H., Kuratko, D. F., & Covin, J. G. (2011). *Corporate entrepreneurship & innovation*. Mason: Thomson South-Western.

Morris, M. H., Neumeyer, X., & Kuratko, D. F. (2015). A portfolio perspective on entrepreneurship and economic development. *Small Business Economics, 45*(4), 713–728.

Nyberg, A. J., & Wright, P. M. (2015). 50 years of human capital research: assessing what we know, exploring where we go. *The Academy of Management Perspectives, 29*(3), 287–295.

Rammer, C., & Spielkamp, A. (2015). Hidden champions—driven by innovation: Empirische Befunde auf Basis des Mannheimer Innovationspanels: ZEW-Dokumentation.

Roberts, J. (2004). *The modern firm: organizational design for performance and growth*. Oxford: Oxford University Press.

Simon, H. (1990). Hidden champions: spearheads of the German economy. *Zeitschrift fuer Betriebswirtschaft (ZfB), 60*(9), 875–890.

Simon, H. (2009). *Hidden champions of the 21st century: success strategies of unknown market leaders*. Heidelberg: Springer-Verlag.

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review, 71*(3), 393–410.

U.S. Census Bureau (2017). Business dynamics statistics. Retrieved from https://www.census.gov/ces/dataproducts/bds/overview.html. Accessed 20 June 2017.

Wadhwani, D. R. (2017). Entrepreneurship in historical context: using history to develop theory and understanding process. In F. Welter & W. B. Gartner (Eds.), *A research agenda for entrepreneurship and context* (pp. 65–78). Cheltenham: Edward Elgar Publishing.

Welter, F. (2011). Contextualizing entrepreneurship—conceptual challenges and ways forward. *Entrepreneurship Theory and Practice, 35*(1), 165–184.

Welter, F., & Gartner, W. B. (2016). *A research agenda for entrepreneurship and context*. Cheltenham: Edward Elgar Publishing.

Welter, F., Baker, T., Audretsch, D. B., & Gartner, W. B. (2017). Everyday entrepreneurship—a call for entrepreneurship research to embrace entrepreneurial diversity. *Entrepreneurship Theory and Practice, 41*(3), 311–321.

Williamson, O. E. (1975). *Markets and hierarchies, analysis and antitrust implications*. New York: Simon & Schuster.

Witt, A., & Carr, C. (2014). Success secrets shared: learning from the best Mittelstand and British global niche champions. *Scottish Policy Now, 8*(1).

Wright, P. M., Coff, R., & Moliterno, T. P. (2014). Strategic human capital. *Journal of Management, 40*(2), 353–370.

Yoon, B. (2013). How do hidden champions differ from normal small and medium enterprises (SMEs) in innovation activities. *Journal of Applied Sciences Research, 9*(13), 6257–6263.

Zahra, S. A., Wright, M., & Abdelgawad, S. G. (2014). Contextualization and the advancement of entrepreneurship research. *International Small Business Journal, 32*(5), 479–500.

Zellweger, T. M., & Sieger, P. (2012). Entrepreneurial orientation in long-lived family firms. *Small Business Economics, 38*(1), 67–84.

Zuckerman, M. B. (1998). A second American century. *Foreign Affairs, 77*(3), 18–31.