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Abstract

Over the past decade, new types of business incubation have been developed. One particularly prominent example is company builders, which use their own resources to build up companies, establishing numerous companies in a series. In doing so, this investor type facilitates internal and external business ideas. It offers a new organizational solution that combines both the innovative capacity of founders and the financial resources of a large company with the desire for long-term employment and corporate affiliation. This article examines the economic impact of company builders in Germany compared with other venture capital (VC) investor types on the basis of employment trends in the portfolio companies from 2011 to 2015. It is shown that company builders promote more dynamic employment growth than do other types of investors. This finding suggests that this type of investor is particularly well positioned to take advantage of the institutional deficiency in the German VC market. The results are also discussed in the context of the growth of the Berlin-based VC and start-up ecosystem.

Keywords: venture capital; company builder; incubation; employment; Germany

JEL classifications: G24; M13; L22; R12

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1 Introduction

Traditionally, business incubation has been associated with government-provided support for start-ups based on a combination of finance, knowledge and infrastructure (Allen and McKluskey 1990; Phan, Mian, and Lamine 2016). Over the last ten years, new forms of private incubators have emerged that combine these elements in new ways (Hansen et al. 2000; Bendig, Evers, and Knirsch 2013; Dee et al. 2015). At least two major trends can be identified that have laid the foundation for a new player in incubation finance – the so-called company builder. The first trend is related to programs launched by accelerators that provided support to start-ups for a limited amount of time. Examples of internationally recognized accelerators are Y Combinator, TechStars, Seedcamp and Startupbootcamp. A second trend is the serialization and institutionalization of support activities for forming new firms, including such diverse contributions as software programming, human resources and marketing. This phenomenon has been referred to as “start-up studio”, “start-up factory” or “venture builder” (Szigeti 2016); however, we refer to these players as company builders. Although the concept of company builders was pioneered in the United States (e.g. the Idealab, founded in 1996), these types of incubators appear to be gaining traction outside the US (Szigeti 2015).

The performance of various types of venture capital (VC) investors has been relatively well documented, yet few studies have addressed the role of company builders in particular. An important reason for the lack of empirical results concerning company builders may be related to data restrictions. For both classic and public VC firms and start-ups, there are incentives to make information regarding equity investment decisions available to the public. In part, such decisions are made public owing to regulatory requirements, as a part of the disclosure requirements to investors or as a signal to competition. At the same time, start-ups represent independent ventures about which information is reported in a range of databases. However, with respect to company builders, the financing and growth of start-ups take place within an overarching corporation that may bundle various start-ups under one roof. Often financial information is reported only in consolidated financial statements, which is why information about individual start-up firms is not available. This lack of disclosure tends to change as start-ups grow, raise additional external finance and prepare to exit, at which time the company builder’s equity stakes are reduced.

Company builders seem to be particularly well established in the German VC market. In part, this result may be attributed to the success of Rocket Internet, the largest company builder worldwide. On the one hand, Rocket Internet has engaged in several successful and large exits; on the other hand, several former Rocket employees launched their own company builder after leaving the firm. Their business model was also imitated by other investors. Against this backdrop, we compared the corporate performance of company builder–backed start-ups with the performance of start-ups that received financing from other types of investors. Given the political and economic importance of employment in young ventures, we used the growth of these firms as the benchmark in measuring their performance.

This study is structured as follow. First, in section 2, we discuss company builders as a new investor type. Section 3 provides an overview of company builder activity in Germany, and on this basis, we derived hypotheses as described in section 4. In sections 5 and 6, respectively, the data sources are introduced and the descriptive and regression results are reported. In section 7, we summarize our findings and draw some conclusions.

2 The Development of Business Incubation

Business incubation refers to institutionalized support for new ventures in which support for new firms may bundle various different activities (Allen and McCluskey 1990, 62; Aernoudt 2004, 128; Hackett and Dilts 2004, 57, 79). This broad definition thus includes such varied organizations as business incubators, technology parks and co-working spaces; however, we use a more narrow definition of business incubation that distinguishes between different types of incubators. Here, we refer to business incubation as a form of VC finance that comprises four functions (Engelmann 2000, 331–332; Brettel, Rudolf and Witt 2005, 136–137): (1) non-financial support is provided (office spaces and commercial facilities, communication infrastructure); (2) advice is provided in specific fields, including management, legal affairs, taxes, software, human resources and technological development; (3) start-ups benefit from the company builder's network of suppliers and customers' investors ; and (4) new ventures receive equity finance from company builders.

This definition clearly distinguishes company builders from the more traditional types of VC finance, because the latter provide only limited consulting and brokerage services. Also, business angels are not subsumed under this definition, because these players tend to concentrate on providing consulting and brokerage activities. Moreover, classic technology parks that focus on providing office space and commercial sites are also exempt from this definition, because they typically do not engage in the financing of new ventures. Although business incubation is a reaction to the high level of complexity associated with the process of creating and growing new firms (OECD 1999), the provision of additional finance becomes necessary only under specific circumstances. Typically, this includes fast-cycle industry environments characterized by rapid technological advancement in which traditional finance is not appropriate. Business incubation is most promising in environments where time is the major constraining factor, and thus first-mover advantages play an important role. In these situations, business incubation may allow start-ups to rapidly progress along the learning curve, enabling them to considerably reduce the time to market.

The concept business incubation originated in the publicly financed science and technology parks in the US (Mian 2016, 6) for which such funding augmented the classic support functions in terms of infrastructure, consulting and brokerage. The first noteworthy number of private incubators was reported in the 1970s; later, corporations adopted the practice of business incubation in the form of corporate incubation. In the 1990s, the information and communication sector attracted major levels of funding. First and foremost, this sector comprised internet-based services that provided network

goods associated with particularly high first-mover advantages. With the emergence of the New Economy between 1995 and 2001, a new investor type gained traction, the so-called “networked incubators” (Hansen et al. 2000; Bøllingtoft and Ulhøi 2005; Bruneel et al. 2012, 112). Hansen et al. (2000, 76) showed that these investors focused in particular on internet-based services and central locations, which enabled these start-ups to access internal and external networks. A novel element associated with the networked incubator was the more comprehensive internalization of business functions. The investors supported start-ups in recruitment, controlling and marketing and also provided financial resources in these areas. The success of this institutional innovation led to the first substantial increase in the number of private incubators (Leblebici and Shah 2004, 368). These investors were also observed in Germany (Achleitner and Engel 2001). As a late adopter of this investment model, Germany was under considerable pressure during the crash of the Neuer Markt, a high-tech segment of the stock exchange that had been launched in Germany in 1997. As a consequence, the number of incubators, as well as the funds and support functions they provided, decreased considerably in the years that followed (Witt and Zilmer 2002; Brettel, Rudolf, and Witt 2005).

The decline in these new investors was also discernible in other countries. Starting in 2004, stabilization of the information and communications technology (ICT) market (Web 2.0) led to a renewed surge in incubators, while at the same time they learned from past blunders. Accelerators place a strong emphasis on specific contents over a relatively short time frame. The support provided to start-ups in the form of business and technical consulting is highly structured and standardized and is limited to a period of a few weeks or months. With respect to finance, seed financing of no more than a few thousand US dollars is commonly provided (Miller and Bound 2011, 9). Accelerators often structure their programs to include selection procedures, courses with a limited number of participants and a final presentation with potential investors (“Demo Day”). Additional support activities that are available first and foremost in established start-up hubs include, among other things, seminars that cover new firm formation, start-up weekends and founder’s roundtables.

Compared with accelerators, company builders provide start-ups with a considerably more extensive portfolio of services. These investors make available a substantially larger amount of resources for the growth of firms and deploy these resources to various start-ups simultaneously (Rao 2013). The experience of successful entrepreneurs becomes institutionalized within these organizations, thus enabling the founders to progress more rapidly along the learning curve. Learning takes place not only between the company-builder team and the start-ups, but also between the portfolio firms within the organization. Because this approach to supporting the growth of young firms is associated with high costs, company builders seek comprehensive control of the start-up process, which is often achieved in the form of majority stakes. The term “start-up studios” refers to film studios and illustrates that both proprietary projects and projects brought into the organization from the outside may be pursued using the existing infrastructure. However, company builders launch more business ideas and strategies internally than do other types of investors. Copycat strategies represent an ex-

treme form of this phenomenon and include the cloning of existing business models aimed at increasing performance.

Thus, the strategies of both accelerators and company builders minimize the typical problem of information asymmetry and moral hazard associated with the launch of new firms, albeit in different ways. In the accelerator model, uncertainty and risk remain on the side of the start-up owing to the relatively small investments. Accelerators reduce some of the uncertainty within the start-up process by passing it on to the investor in the next phase. By contrast, company builders accept a much greater risk (or even the entire risk) while at the same time assuming full control of the start-up-process. Between these extremes, there are additional investors. Often such investors offer a broader portfolio of support activities than do regular VC firms, such as providing the premises for the start-up; however, they tend not to engage in capital-intensive functions to finance the expansion of young firms. These (empirically rare) investors are referred to as "traditional incubators" and will be compared with company builders, accelerators and classic VC investors (see Table 1).

The first wave of the different types of incubation finance sketched out here was pioneered in the 1990s and after 2005 in the United States. However, after 2010 at the latest, incubation finance began to expand internationally. At the same time, however, the launch of incubator firms stagnated in the United States (Miller and Bound 2011; Szigeti 2015). Against this backdrop, it is necessary to clarify which institutional context is most appropriate for incubation finance.

Table 1: Different Types of Incubation Funding, as compared with Classic Venture Capital Investors

	Venture Capital	**Incubation Funding**		
		Accelerator	Traditional Incubator	Company Builder
Conception	Finance and know-how	Training camp	Comprehensive support, including business premises	Internal control or majority stake in new venture
Duration	Life of fund	Days to months	Several years	Several years
Compensation	Equity	Fee or equity	Equity	Majority stake or complete internalization
Support financing	√	√	√	√
Coaching	√	√	√	√
Network integration	√	√	√	√
Business premises			√	√
ICT infrastructure			√	√
IT and programming				√
Marketing				√
Recruitment				√
Objective for exit	Next investment phase	Presentation to potential investors	Long-term ownership (strategic investor, IPO)	Long-term ownership (strategic investor, IPO)

IPO = initial public offering; IT = information technology.

Source: Author.

Hansen et al. (2000, 84) refer to “networked incubators” as a novel and superior organizational form because they combine the resources of large corporations with the agility of start-ups. It is thus expected that accelerators and company builders represent successful institutional innovations in the networked society (Leblebici and Shah 2004, 369). In contrast to previous organizational forms, incubation finance not only includes the support of business ideas but also is associated with serializing the launch of new firms (Bendig, Evers, and Knirsch 2013, 81). In doing so, the new venture creation process becomes replicable based on standardized modules. Although accelerators tend to provide the general tools for the start-up process, company builders engage in the strategic development of a company. The business idea is thus the scarce resource, which illustrates the limits related to incubation finance. With the entry of company builders, entrepreneurs must cede control of much of their venture. It may thus be assumed that company builders are more attractive to founders within ecosystems where financial and entrepreneurial resources are not widely available and where technological change is rapid. By contrast, if such resources are not lacking, traditional VC investments that have a considerably more nimble service portfolio may be more appropriate. Company builders may thus be expected to be more effective in specific innovation systems and sectoral contexts.

3 Company Building in Germany

An assessment of the different forms of incubation finance that are sketched out here is available only in the form of explorative studies (Miller and Bound 2011; Salido, Sabás, and Freixas 2013; Szigeti 2015). These studies link the high rates of new-firm formation to incubation finance in Europe in the years 2010 and 2013. Germany also experienced a boom during these two years with respect to the availability of VC finance and the formation of incubators (Heimlich 2013; Bendig, Evers, and Knirsch 2013, 80–87; Garbs 2014; Kahl and Scheuplein 2016, 31–33). In the year 2013, which marks a peak in this development, established firms increasingly engaged in incubation finance by launching their own corporate accelerators, and this trend is ongoing (Kawohl, Rack, and Strniste 2015).

The surge in private company builder activity is strongly associated with the formation of Rocket Internet in the year 2007. The history of this particular company builder may be traced back to the year 1999 (Kaczmarek 2014; Schimoroszik 2015, 117–120). As a consequence of the rapid growth of selected start-ups, as well as of several successful exits, other company builders were formed, including Team Europe (2008), HitFox (2011), Rheingau Founders (2011), M Cube (2011) and Project A Ventures (2012). In this context, local knowledge transfer, as well as direct linkages among and continuities of personnel, have played an important role. In Munich, Hamburg and Cologne, a smaller number of new company builders were also formed. However, in 2013, the company builder business model faced its first crisis, when several company builders had to narrow their portfolios or adjust their strategies (Hofmann 2013; Kroker 2014). Although Rocket Internet, which had strongly emphasized a copycat strategy (Rooney 2012), was adversely affected by such turbulence, this firm was able to continue its development towards becoming a major global internet concern (Kaczmarek 2014, 265–321).

Subsequently, company building activity stabilized. In addition, further company builders were created with a focus on particular sectors (e.g. financial technology ["fintech"]). In 2016, a total of 20 company builders were identified in Germany.

The growth of company builders occurred against the backdrop of a weak VC market in Germany (Kulicke 2012; Röhl 2014). The descriptive results reported here show that the publicly available VC funding attributable to company builders (i.e. Rocket Internet in particular) amounted to €1.2bn. The VC funding invested by company builders was thus twice as high as the amount attributable to private investors (InvestEurope/PEREP Analytics 2016). Compared with the US, the catch-up process of Germany's VC market seems to be closely tied to company builders, and some characteristics of this business model seem to be particularly well suited to well-known elements of the German innovation system (Keck 1993; Allen 2010; Schmoch, Rammer, and Legler 2010), as follows:

- In Germany, innovation tends to be implemented by methods that involve incremental change. Such strengths – including a detail-orientated, collaborative and rapid approach – may be deployed in applying innovations derived from the information and communication sector to different industries.
- The method-based approach prevalent in the German innovation system facilitates the sequential reproduction of business models. From this perspective, the copycat strategy seems to be particularly promising.
- Highly qualified individuals willing to cede some of their entrepreneurial self-determination are essential for the company builder business model. The high prestige afforded to long-term employment and large corporations seems to benefit company builders as well.

All these factors indicate that among the various alternatives for launching and funding new firms (Kulicke 2012, 27–33), company builders seem to be particularly promising.

4 Current State of Research and Hypotheses

Assessing the employment effects of VC investments is a well-developed field of inquiry (e.g. Da Rin, Hellmann, and Puri 2013: 633pp.). Both microeconomic effects (Engel 2002; Achleitner and Kloeckner 2005) and macroeconomic effects (Belke, Fehn, and Foster 2006; Feldmann 2010) associated with VC investments have been reported for the German labour market. The investment strategies of different types of VC investors have also been compared (Bertoni, Colombo, and Grilli 2013; Bertoni, Colombo, and Quas 2015). The initial studies dealt with business incubation in a general sense (Grimaldi and Grandi 2005; Stokan, Thompson, and Mahu 2015; Mian 2016, 12–17), whereas the specific type of incubation funding examined here has not (to our knowledge) been investigated in any previous study.

In our study, we focused on the two extremes of incubation funding, combining the accelerators with the empirically few cases of traditional incubation.

As company builders provide a substantially more comprehensive set of support activities to their portfolio firms, we expect more dynamic employment growth among these firms compared with companies that did not receive such funding (Hypothesis 1).

Given the considerably higher amount of financial resources used in company builders to facilitate the development of their portfolio firms, as compared with accelerators, we would expect company builder firms to exhibit considerably higher employment growth rates than the latter types of VC investors (Hypothesis 2).

Over the past five years, Berlin has witnessed rapid growth in the availability of VC finance, becoming the most important hub for VC in Germany (Scheuplein, Görtz, and Henke 2014). We tested whether firms operating in Berlin generally exhibited higher growth rates compared with firms outside Berlin, or whether firms in company builders grew more dynamically. We expected Berlin-based start-ups in company builders to be positively associated with firm growth, whereas no such relationship would be observed for firms that did not receive funding from a Berlin-based company builder (Hypothesis 3).

Although VC and incubation activity is observed in various industries, investors tend to favour specific industries. In the time period of our study, VC and incubation funding concentrated on the digital economy, in which the first-mover advantages sketched out above are of substantial importance. The acquisition of finance could thus play a decisive role for the employment growth of start-ups. Therefore, we expected the information and communication industry, as well as electronic commerce (e-commerce), to be particularly well-suited targets for company building activities, which is why we expected the firms operating in these industries to be positively associated with growth (i.e. exhibiting the highest growth rates) (Hypothesis 4).

5 Methods

5.1 Data

The empirical analysis is based on the mergers and acquisitions (M&A) database Zephyr (Bureau van Dijk) and Deal News (Majunke Consulting). Both databases were integrated and extended by the deal monitor of VentureCapital Magazin (an industry magazine reporting on German and European VC activity and deals). Information on VC activity in the years 2011 to 2015, as well as German portfolio firms and investors, was retrieved from these sources. In total, 1,236 portfolio firms were identified in these years. Additional information regarding the VC-backed firms (number of employees, German industry code, location) was accessed via the Markus database, which is operated by Creditreform and the Bureau van Dijk. Using this database, we also determined whether the portfolio firms were active. In total, 322 portfolio firms were identified. Exits in the form of insolvencies, takeovers and IPOs were documented as well. In order to classify the different types of investors, we used the Zephyr database as well as the Fund Manager Profiles database operated by Preqin. This allowed us to distinguish four types of investors: company

builder, private accelerators, public VC firms and private VC firms. The empirically rare public accelerators were subsumed under the category public VC firms. While the first three types of investors were distinguished on the basis of a positive list, the fourth category of private VC includes classic VC firms and VC subsidiaries of investment banks as well as corporate VC firms, family offices and business angels.

5.2 Regression Model

The determinants of employment growth in VC-backed firms and in start-ups that received incubation funding were examined on the basis of four regression models. For the dependent variable in models 1 and 2, we used employment growth (EMPL_GROW) of VC-backed firms and those firms that received incubation finance. We gauged employment growth as the log growth over the initial funding in the years between 2011 and 2014 (EMPLOYt0) compared with the number of employees in 2015 (EMPLOYt1). In regression models 3 and 4, we examined employment growth (EV_GROWTH) on the basis of work by Evans (1987), where EMPLOYt1 relates to the number of employees in 2015 and EMPLOYt0 relates to the number of employees in the year of the initial funding. Thus, t1−t0 computes the number of years between the initial year of funding and the reporting year 2015.

$$Y^1 = x^1+x^2+ x^3+x^4+ x^6+x^7 +x^8+ x^9 + x^{10}+x^{11}+x^{12}+x^{13} \quad (1)$$

$$Y^1 = x^1+x^2+ x^3+x^4+ x^6+x^8+ x^{10}+x^{11}+x^{12}+x^{13} +x^{14} \quad (2)$$

$$Y^2 = x^1+x^2+ x^3+x^4+ x^6+x^7 +x^8+ x^9 + x^{10} \quad (3)$$

$$Y^2 = x^1+x^2+ x^3+x^4+ x^6+x^8+ x^{10}+ x^{14} \quad (4)$$

Y^1:EMPL_GROW	Log ($EMPLOY_{t1}-EMPLOY_{t0}$)
Y^2:EV_GROWTH	Log ($EMPLOY_{t1}/EMPLOY_{t0}$)/(t_1-t_0)
X^1:BERLIN	Located in Berlin (1/0)
X^2:MUNICH	Located in Munich (1/0)
X^3:ICT	Portfolio firm is active in the information and communication industry (1/0)
X^4:ECOMMERCE	Portfolio firm is active in wholesale, retail or e-commerce (1/0)
X^5:FINANCE	Portfolio firm is active in financial services (1/0)
X^6:BIOTECH	Portfolio firm is active in the life sciences (1/0)
X^7:PUBLIC_VC	Portfolio firm received investment from at least one public VC firm (1/0)

X^{8}:PRIVATE_ACCE	Portfolio firm received investment from at least one private accelerator (1/0)
X^{9}:COMP_BUILD	Portfolio firm received investment from at least one company builder (1/0)
X^{10}:LOG_FIRM_SIZE	Number of employees in the year of initial financing
X^{11}:YEAR_2013	Initial year of financing (2013) (1/0)
X^{12}:YEAR_2012	Initial year of financing (2012) (1/0)
X^{13}: YEAR_2011	Initial year of financing (2011) (1/0)
$X^{14:}$ BERLIN_CO_BU	BERLIN_COMPANY_BUILDER

N=322

To test whether portfolio firms in Berlin and Munich, the two most important centres for VC in Germany, exhibited higher employment growth rates than firms outside of these clusters, the independent variables BERLIN and MUNICH were used. In cases where the portfolio firms were located in either Berlin or Munich, a 0 was assigned. If the firms were headquartered outside of Berlin or Munich, a 1 was coded. Four binary independent variables that tested for the effect of the industry in which the respective firms are operating were used. We examined whether there was a differential effect on employment growth rates across industries among information and communication technology firms (ICT); wholesale, retail and e-commerce firms (ECOMMERCE); financial services firms (FINANCE) and life sciences and biotechnology firms (BIOTECH). The classification of the portfolio firms draws on the work of Rammer et al. (2013) and is based on the industry codes reported for each firm (ICT services 58,2; 61 and 62; 63,01; 63,02; and 95,1; e-commerce 46 and 47; financial services 64 to 66; Life Sciences 21; 26.3; 26.6; 32.50.1; 32.50.3; 71.2; 72.11; 72.19; 86.10.1; and 86.10.3).

In order to test for the effect of different types of investors on employment growth rates, four independent variables were used. More specifically, four binary variables were introduced that tested whether the portfolio firm had re-ceived finance from a company builder (COMP_BUILD), a private accelerator (PRIVATE_ACCE) or a public VC firm (PUBLIC_VC). To gauge the impact of Berlin-based company builders on firm growth, the interaction term between BERLIN and COMP_BUILD was computed (BERLIN_CO_BU). Due to multicollinearity between COMP_BUILD and BERLIN_CO_BU, two separate models were estimated that contained only one of the two variables.

Several controls were used. In all models, we controlled for log firm size in the initial year of finance (LOG_FIRM_SIZE). In the first two models, the year of the initial financing was employed, that is, the years 2013, 2012, and 2011 (YEAR _2013, YEAR_2012, YEAR_2011); the year 2014 was excluded. Because the year of the initial financing forms part of the dependent variable in

models 3 and 4 for the dependent variable EV_GROWTH, we did not control for the initial year of financing in these models.

6 Results

6.1 Descriptives

For the dependent variables EMPLOY_GROW and EV_GROWTH, the respective median values were 2.46 and 1.13, with respective standard deviations of 1.39 and 0.86. For the four types of investors, we found varying median values, which provided an overview of these investors' activity in the German VC market. At 53%, more than half the firms in the sample had received at least one financing round by a public VC firm in the years 2014 to 2011, and 8% of the portfolio firms received financing from a company builder, whereas private accelerators were invested in only 2% of the firms in the sample. For 6% of the firms in the sample, a Berlin-based company builder was reported to be an investor. The number of initial financing rounds is relatively evenly spread across the years 2013 to 2011, in that 25% of the initial financing rounds were observed in 2013, 24% in 2012 and 29% in 2011. The remaining 22% were documented in the year 2014.

VC activity was strongly concentrated in selected metropolitan regions in that 40% of the firms in the sample were headquartered in Berlin, whereas 16% were located in Munich. Moreover, VC activity was also heavily concentrated in certain industry sectors. With 40% of the firms in the sample operating in the information and communication industry, this particular industry is clearly dominant. Whereas 12% of the portfolio firms belonged to the wholesale and retail (i.e. e-commerce) industry, life science and biotechnology firms accounted for 10%. Financial services represented only 1.2% of the firms in the sample.

Table 2. Descriptives and Correlations (Models 1 and 2)

	Mean	STD	Y^1	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}
Y^1: EMPLOY_GROW	2.46	1.39	1	0.16**	-0.18	0.02	0.22**	0.03	-0.10*	-0.20**	-0.02	0.24**	0.43**	-0.06	0.13*	0.09	0.22*
X^1: BERLIN	0.39	0.48	0.16**	1	-0.34**	0.23**	0.10**	0.02	-0.16**	-0.11*	0.10**	0.21*	0.05	0.01	0.03	-0.09	0.31**
X^2:MUNICH	0.16	0.36	-0.18	0.34**	1	-0.12*	0.03	-0.01	0.01	0.01	0.01	-0.02	-0.05	0.02	0.01	-0.01	-0.10
X^3:ICT	0.36	0.48	0.02	0.23**	-0.12*	1	-0.26**	-0.08	-0.26**	-0.12	0.11*	0.09	-0.12*	0.09	-0.07	-0.02	0.11*
X^4:ECOMMERCE	0.11	0.31	0.22**	0.10	0.03	-0.26**	1	-0.04	-0.12*	-0.11*	-0.04	0.11*	0.24**	-0.01	0.06	-0.01	0.11*
X^5:FINANCE	0.01	0.11	0.03	0.02	-0.04	-0.08	-0.04	1	-0.04	-0.06	0.21**	-0.03	-0.02	0.01	0.01	-0.07	-0.02
X^6:BIOTECH	0.11	0.31	-0.10*	-0.16**	-0.01	-0.26**	-0.12*	-0.04	1	-0.13*	-0.04	-0.06	0.03	-0.04	0.02	0.05	-0.04
X^7:PUBLIC_VC	0.53	0.50	-0.20**	-0.11*	0.01	-0.12*	-0.11*	-0.06	0.13*	1	-0.08	-0.19**	-0.16**	-0.03	0.04	0.05	-0.16**
X^8:PRIVATE_ACCE	0.02	0.12	-0.02	0.10	0.01	0.11*	-0.04	0.21**	-0.04	-0.08	1	-0.03	-0.06	0.04	-0.01	-0.02	-0.03
X^9:COMPANY_BUILD	0.08	0.26	0.24**	0.21**	-0.02	0.09	0.11*	-0.03	-0.06	-0.19**	-0.03	1	0.13*	-0.06	0.08	-0.03	
X^{10}:LOG_FIRM_SIZE	2.12	1.49	0.43**	0.05	-0.05	-0.12*	0.22**	-0.02	0.03	-0.16**	-0.06	0.13*	1	-0.14*	0.05	0.11*	0.19**
X^{11}:YEAR_2013	0.25	0.43	-0.06	0.01	0.02	0.09	-0.01	0.01	-0.04	-0.03	0.04	-0.06	-0.14*	1	-0.32**	-0.37**	-0.05
X^{12}:YEAR_2012	0.24	0.42	0.13*	0.03	0.01	-0.07	0.06	0.01	0.02	0.04	-0.01	0.08	0.05	-0.32**	1	-0.36**	0.04
X^{13}:YEAR_2011	0.29	0.45	0.09	-0.09	-0.01	-0.02	-0.01	-0.07	0.05	0.05	-0.02	-0.03	0.11**	-0.37**	-0.36**	1	-0.04
X^{14}: BERLIN_CO_BU	0.06	0.23	0.22**	0.31**	-0.10	0.11*	0.11*	-0.02	-0.04	-0.16**	-0.03		0.19**	-0.05	.0.04	-0.04	1

*p < 0.05; **p < 0.01

N=322

Table 3. Descriptives and Correlations (Models 3 and 4)

	Mean	STD	Y^{1}	X^{1}	X^{2}	X^{3}	X^{4}	X^{5}	X^{6}	X^{7}	X^{8}	X^{9}	X^{10}	X^{14}
Y^{2}: EV_GROWTH	1.13	0.86	1	0.18**	-0.01	-0.01	0.15**	0.10	-0.11*	-0.18**	-0.01	0.19**	0.29**	0.23*
X^{1}: BERLIN	0.39	0.48	0.18**	1	-0.34**	0.23**	0.10**	0.02	-0.16**	-0.11*	0.10**	0.21*	0.05	0.31*
X^{2} :MUNICH	0.16	0.36	-0.01	0.34**	1	-0.12*	0.03	-0.01	0.01	0.01	0.01	-0.02	-0.05	-0.10
X^{3}:ICT	0.36	0.48	-0.01	0.23**	-0.12*	1	-0.26**	-0.08	-0.26**	-0.12	0.11*	0.09	-0.12*	0.11*
X^{4}:ECOMMERCE	0.11	0.31	0.5**	0.10	0.3	-0.26**	1	-0.04	-0.12*	-0.11*	-0.04	0.11*	0.24**	0.11*
X^{5}:FINANCE	0.01	0.11	0.10	0.02	-0.04	-0.08	-0.04	1	-0.04	-0.06	0.21**	-0.03	-0.02	-0.02
X^{6}:BIOTECH	0.11	0.31	-0.11*	-0.16**	-0.01	-0.26**	-0.12*	-0.04	1	-0.13*	-0.04	-006	0.03	-0.04
X^{7}:PUBLIC_VC	0.53	0.50	-0.18**	-0.11*	0.01	-0.12*	-0.11*	-0.06	0.13*	1	-0.08	-0.19**	-0.16**	-0.16**
X^{8}:PRIVATE_ACCE	0.02	0.12	-0.01	0.10	0.01	0.11*	-0.04	0.21**	-0.04	-0.08	1	-0.03	-0.06	-0.03
X^{9}:COMPANY_BUILD	0.08	0.26	0.19**	0.21**	-0.02	0.09	0.11*	-0.03	-0.06	-0.19**	-0.03	1	0.13*	
X^{10}:LOG_FIRM_SIZE	2.12	1.49	0.29**	0.05	-0.05	-0.12*	0.22**	-0.02	0.03	-0.16**	-0.06	0.13*	1	0.19**
X^{14}: BERLIN_CO_BU	0.06	0.23	0.23**	0.31**	-0.10	0.11*	-0.11*	-0.02	-0.04	-0.16**	-0.03		0.19**	1

*p < 0.05; **p < 0.01

N =322

6.2 Regression Results

The regression results provide support for Hypothesis 1, predicting a positive relationship between portfolio firms that were backed by company builders as compared with firms that did not receive such funding. Models 1 and 3 exhibited a positive and significant relationship between COMP_BUILD and employment growth rates. At the same time, models 1, 3 and 4 indicated a negative and significant impact of public VC funding on firm growth, albeit model 2 did not provide support for this relationship. The negative impact observed here may be due to policy considerations regarding the provision of finance to young firms, particularly those in the early stages of development, as well as in fields where the risk of product development is particularly high. At the same time, this seems to suggest that publicly-backed firms that do not succeed at attracting private or company builder funding exhibit less dynamic employment growth. However, more research will be needed to provide more concise answers to this matter.

Table 4. Regression Results

Variable	Model 1	Model 2	Model 3	Model 4
			Regression coefficients (standard error)	
CONST	1.09 (0.22)***	1.11 (0.22)***	0.77 (0.12)***	0.79 (0.12)***
X^1: BERLIN	0.28 (0.15)*	0.27 (0.15)*	0.26 (0.10)**	0.23 (0.10)**
X^2: MUNICH	0.15 (0.19)	0.17 (0.19)	0.13 (0.13)	0.14 (0.13)
X^3: ICT	0.17 (0.16)	0.17 (0.16)	-0.02 (0.10)	-0.03 (0.10)
X^4: ECOMMERCE	0.45 (0.23)**	0.46 (0.23)**	0.12 (0.15)	0.12 (0.15)
X^5: FINANCE	0.92 (0.62)	0.91 (0.62)	0.84 (0.42)**	0.84 (0.41)**
X^6: BIOTECH	-0.28 (0.22)	-0.29 (0.22)	-0.20 (0.15)	-0.21 (0.15)
X^7: PUBLIC_VC	-0.27 (0.14)*	-0.30 (0.14)*	-0.15 (0.09)	-0.15 (0.09)*
X^8: PRIVATE_ACCE	-0.36 (0.,55)	-0.38 (0.56)	-0.21 (0.37)	-0.20 (0.37)
X^9: COMP_BUILD	0.66 (0.26)**		0.32 (0.17)*	
X^{10}: LOG_FIRM_SIZE	0.34 (0.04)***	0.34 (0.04)***	0.14 (0.03)***	0.13 (0.03)***
X^{11}: YEAR_2013	0.47 (0.19)**	0.47 (0.19)**		
X^{12}: YEAR_2012	0.77 (0.19)***	0.80 (0.19)***		
X^{13}: YEAR_2011	0.69 (0.19)***	0.70 (0.19)***		
X^{14}: BERLIN_CO_BU		0.59 (0.30)**		0.47 (0,20)**
N	322	322	322	322
R^2	30.9%	30.3%	16.1%	16.6%
Corrected R^2	28.0%	27.4%	13.4%	14.0%

*p < 0.10; **p < 0.05; ***p < 0.01

The regression results also provide support for Hypothesis 2 focusing on the differential effectiveness of private accelerators and company builders. While we report a positive and significant relationship between the involvement of company builders and employment growth in models 1 and 3, no such significant effect is reported for private accelerators.

We predicted Berlin-based company builders to have a stronger impact on employment growth on their portfolio firms than other (Berlin-based) VC-backed start-ups. Both in model 2 and model 4 we report a positive and significant relationship between Berlin-based company builders and employment growth. The results suggest that portfolio firms backed by Berlin-based company builder exhibited higher growth rates than other VC-backed firms in general as well as Berlin-based firms in particular. While we observe a positive and significant effect between firm growth and being located in Berlin (so-called cluster effect), the company builder effect (0.47**) is greater than the cluster effect (0.23**). The results thus provide support for Hypothesis 3 suggesting that the company builder business model more effectively puts to use the resources and locational advantages available in Berlin including the relatively low commercial, real estate prices and labour costs, the availability of qualified and young personnel as well a lack of company headquarters and classic financial intermediaries.

Hypothesis 4 predicted a positive relationship between firms in the information and communication industry as well as in e-commerce. Our results do not provide support for this hypothesis as we find no significant relationship between the information and communication industry and employment growth. While we document a positive and significant effect of e-commerce on employment growth rates in models 1 and 2, models 3 and 4 do not support this finding. By contrast, in models 3 and 4 a positive and significant relationship is observed between financial services and employment growth. As the industry affiliation is not stable across the different models, Hypothesis 4 must be rejected. While industry affiliation per se does not seem to be sufficient to explain differential employment growth rates, the types of investors involved in the financing of portfolio firms seem to provide a more meaningful explanation.

7 Conclusion

Over the course of the past ten years, private incubation financing has gained traction in Germany. On the one hand, as of 2010 private accelerators have become more widespread, which is also a result of increasing activities by strategic firms migrating into incubation finance. On the other hand, a boom in the number of company builders has been observed over the last years. An overview of the existing literature on company builders suggests that these investors developed in line with the structure of the financing and innovation system in the respective nations. Against this backdrop, this study examined the determinants of employment growth among VC-backed firms with a particular focus on company builders as these investors are particularly

prominent in the German VC market. 20 company builders in total were documented and we estimate that funding by these investors amounted to 1.2 billion euros, doubling the investments by private VC investors in 2015. In order to gauge the impact of different types of investors on the employment growth of their portfolio firms as well as the role of the industry affiliation and location of the portfolio firms, four different regression models with 322 firms were estimated. The results indicate a positive and significant effect between the employment growth rates of firms backed by company builders (Hypothesis 1). By contrast, no such effect is observed for private accelerators (Hypothesis 2). As company builder activity in the German VC market is strongly concentrated on Berlin, we tested the relationship between Berlin-based company builders and employment growth rates (Hypothesis 3). We report a positive and significant effect of these company builders on firm growth exceeding the cluster effect, which we observe among Berlin-based firms. As the number of VC firms and supporting organizations surged in parallel with the establishment and the increasing activity of Berlin-based company builders, company builders seem to represent an important driver of the growth dynamic observed in Berlin's start-up ecosystem. With respect to industry affiliation, we do not observe stable results that allow us to support our Hypothesis 4. While the first two models suggest a positive and significant impact of e-commerce firms and employment growth, the models 3 and 4 suggest such a relationship between financial services firms.

It remains to be seen whether the success of company builders in Germany will spread internationally. The relatively low number of such investors in United States, in which they originated, does not seem to support this view. By contrast, we expect company builders to flourish and to be particularly effective in finance and innovation systems characterized by particular deficiencies. Many studies have shown the relative weakness of the German financial system compared to liberal market economies such as the United States and the United Kingdom. However, the German financial system has been undergoing a catch-up process over the last years in which company builders seem to be an important element. The German innovation system has been associated with an aversion for risk, excelling at incremental innovation and providing workers with long-term employment perspectives. As an institution, company builders reduce the risk for external investors as well as for entrepreneurs. At the same time, the company builders' broad service portfolio including e.g. in IT-programming, marketing and recruitment proves to be highly effective in facilitating the serial formation of new ventures. Compared to more classic VC investors, company builders also allow firms to rapidly move along learning curves thus reducing time to market considerably. In light of these findings, it seems likely that company builders will have a place in the German innovation system in the future.

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