



**HAL**  
open science

# Bridging the equity gap for young innovative companies : The design of effective government venture capital fund programs

Yan Alperovych, Alexander Groh, Anita Quas

## ► To cite this version:

Yan Alperovych, Alexander Groh, Anita Quas. Bridging the equity gap for young innovative companies : The design of effective government venture capital fund programs. *Research Policy*, 2020, 49 (10), pp.104051. 10.1016/j.respol.2020.104051 . hal-02927529

**HAL Id: hal-02927529**

**<https://hal.science/hal-02927529>**

Submitted on 23 Aug 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

1 **Bridging the Equity Gap for Young Innovative**  
2 **Companies: The Design of Effective**  
3 **Government Venture Capital Fund Programs**

4  
5 Yan Alperovych  
6 **emlyon business school**  
7 alperovych@em-lyon.com

8  
9 Alexander Groh  
10 **emlyon business school**  
11 groh@em-lyon.com

12  
13 Anita Quas  
14 Università degli studi di Milano  
15 [anita.quas@unimi.it](mailto:anita.quas@unimi.it)

16  
17 June 1, 2021

18 **Abstract**

19 Governmental venture capital funds (GVCs) are created by policymakers around the world to  
20 support young innovative companies (YICs) with the aim of “bridging the equity gap”. In this  
21 paper, we study the heterogeneity in the design of GVC programs in Europe and identify the  
22 design features that are most effective in achieving the desired outcomes of this policy.  
23 Specifically, we focus on the probability that GVC-backed companies will receive additional  
24 funds from private venture capital investors and, ultimately, changes in their growth and  
25 innovation outcomes. We find that the choices of location, colocation, syndication and  
26 industry focus of a GVC program substantially influence the extent to which it is able to  
27 achieve such goals. Important policy implications are discussed.

28  
29 **Keywords:** Governmental Venture Capital, Equity Gap, Experience, Regional  
30 Characteristics, Regulatory Capture

31  
32 **JEL Codes:** G24, G38.

1 “...Not only are we faced with a serious investment gap; we are caught in an investment trap.  
2 [...] While investment is taking off in the U.S., Europe is lagging behind. Why? Because  
3 investors lack confidence, credibility and trust. [...]

4 ...What we are going to do is to set up the right system that will use available public money  
5 to leverage additional capital that would have never otherwise been mobilised. Every public  
6 euro mobilised can generate additional investment that would not have happened otherwise.  
7 And it can create jobs...”

8 Jean-Claude Juncker, former President of the European Commission, to the European  
9 Parliament in Strasbourg, France, on 26 November 2014

10

## 11 **1. Introduction**

12 The growth of young innovative companies (YICs) is often constrained by their lack  
13 of financing capabilities. If sufficient external financing is not available, governments can  
14 step in to back them. For example, governments can offer guarantees without actually  
15 deploying capital, or may add financial resources in the form of subsidies, debt, equity, or  
16 combinations thereof. For this purpose, they can establish government venture capital (GVC)  
17 fund policies under which affiliated intermediaries, i.e. GVC funds, provide financing to  
18 YICs. This paper addresses the effectiveness of various typical design features of such  
19 government venture capital (GVC) fund programs.<sup>1</sup>

20 GVC fund policies are in place because of the fundamental economic role of YICs,  
21 which are disproportionately important sources of new jobs, disruptive innovation, growth  
22 and future prosperity (Criscuolo et al., 2014). The establishment and survival of YICs,  
23 however, relies on the resolution of one severe impediment – access to finance (Cressy, 2012,  
24 2002). Given their usually limited internal financing capacities, YICs’ chances to survive,  
25 grow, create jobs, innovate, and provide tax revenues are constrained by their ability to raise  
26 external funds. In the absence of verifiable track records, weak tangible assets that could be

---

<sup>1</sup> Alternatively, policy makers can channel funds to YICs via venture capital fund-of-fund structures. In these programs, governments act as one of the limited partners alongside the private institutional investors of the funds. Typically, the fund managing entities are not government affiliated but private companies. The investments of such fund management vehicles are not the scope of this paper. Such a policy is discussed in Alperovych et al. (2018).

1 pledged as collateral, high degrees of information asymmetry, and the typical uncertainty of  
2 the innovative commercial opportunities, YICs rarely qualify for “traditional” bank loans  
3 (Berger and Udell, 1998; Lerner, 2002). This creates the so-called “funding gap” problem  
4 where the credit market fails to clear the demand for financing (Meza and Webb, 1987;  
5 Stiglitz and Weiss, 1981).

6 Even though this phenomenon was originally discussed in the context of the loan  
7 market, it also affects the supply of equity (Cosh et al., 2009; Cressy, 2002). In fact,  
8 specialized early-stage investors, such as professional venture capital (VC) funds or business  
9 angels (BAs), only back rigorously selected companies. This is due to the own resource  
10 limitations and high return expectations of such investors. Crowdfunding and initial coin  
11 offerings platforms provide new opportunities for YICs to raise early-stage capital  
12 (Belleflamme et al., 2014; Bruton et al., 2015; Chod and Lyandres, 2018; Howell et al.,  
13 2018). However, these funding alternatives are only appropriate for ventures in a handful of  
14 industries favored by “the crowd”. Furthermore, such entrepreneurial projects need to be  
15 easily comprehensible and cannot rely on strategies or technology that should not be  
16 disclosed. As a consequence, many YICs with viable business models may still have serious  
17 problems receiving financial backing. This phenomenon is often referred to as the “equity  
18 gap”.

19 Notably, the shortage in capital may also occur at later stages. In fact, YIC financing  
20 is usually staged and involves a series of funding rounds from smaller seed capital injections,  
21 e.g., by BAs or “the crowd”, moving on to more important capital contributions, e.g., by  
22 professional VCs. This structure is often called the “funding escalator” (Mason, 2016), where  
23 investors generally position themselves in terms of the investment amounts they are willing  
24 to provide. If, for some reason, a venture’s current investors are not able to provide follow-on  
25 financing and the funds needed are below the level of what subsequent investors usually

1 supply, then the funding escalator stalls. This exacerbates the equity gap and may yield a  
2 structural problem of insufficient capital supply for YICs at higher levels of required funding.  
3 This is often called a “second equity gap”, where more mature businesses might face funding  
4 difficulties a second time after having survived through the first equity gap (Wilson et al.,  
5 2018).

6         The equity gap is a strong policy concern around the globe. The existence of the gap  
7 in the US and appropriate measures to bridge it are discussed in Lerner (2002, 1999),  
8 Auerswald and Branscomb (2003), and Link and Scott (2010). Guan and Yam (2015) discuss  
9 the gap and measures in China. McCahery et al. (2015) estimate equity gaps in Europe to  
10 range between 0.7% (for The Netherlands) and 13.05% (for Romania) of the countries’ GDP.  
11 Wilson et al. (2018) assess a first and second equity gap in the UK between £12 and £32  
12 billion annually.

13         If the supply of private capital is insufficient to provide viable YICs with the  
14 necessary funding, then policy response may be appropriate. Although often criticized  
15 (Brown, 2011; Cumming and Macintosh, 2006; Shane, 2009), a variety of indirect and direct  
16 policy measures can be used to improve access to financing for YICs. One such policy is to  
17 inject equity capital into selected ventures via GVCs. While many governments across the  
18 world make use of this device (Lerner, 2009), such initiatives are often found to be  
19 ineffective (Mason, 2016). The success or failure of a given policy, however, is a function of  
20 its design features (Arshed et al., 2014), and there is a strong heterogeneity among GVC  
21 policies, which are set up in different contexts and time periods. However, our understanding  
22 of the link between GVC program design features and their outcomes is mostly theoretical  
23 (Lerner, 2002). The few empirical studies include Bertoni and Tykvová (2015), who compare  
24 technology and development-oriented GVCs in one of their sub-analyses, Lim and Kim  
25 (2015), who study design features for private and public VC funds in South Korea, and

1 Munari and Toschi (2015), who assess the impact of regional characteristics on the  
2 performance of GVC-backed investments in the UK. Evidently, our knowledge about the  
3 efficacy of different design features of GVC programs is still preliminary. This paper aims to  
4 fill this void.

5 Building on the literature and our own analysis of GVC initiatives, we identify three  
6 desired observable outcomes for GVC-backed YICs. The outcomes originate from the broad  
7 goal of such policies to “bridge the equity gap” for innovation and growth. First, GVC funds  
8 are meant to be a direct response to the funding gap and the broken funding escalator  
9 problem described above. Many of the YICs may not be appealing to private investors in  
10 terms of the amount of required capital or their inherent project risks. Supporting such YICs  
11 to render them attractive for private capital is therefore one of the desired outcomes (Mason  
12 and Harrison, 2003). Furthermore, because GVC initiatives usually target YICs for growth  
13 and innovation, these are two natural desired outcomes of a GVC policy (Auerswald and  
14 Branscomb, 2003; Link and Scott, 2010).

15 We also detect three distinct hard-wired design features of GVC policies. First, GVCs  
16 differ with respect to their location and with respect to their geographic investment focus.  
17 They can be placed in peripheral regions or economic hubs and are either constrained to  
18 invest locally or can allocate funds across their country (Heger et al., 2006; Mason and  
19 Pierrakis, 2013; Munari and Toschi, 2015). Second, some GVCs need to coinvest with PVC  
20 investors, while others are allowed to make solo investments. Third, GVCs may be required  
21 to focus on certain industries of strategic interest to policymakers or diversify investments  
22 across a broad spectrum of economic sectors (Lim and Kim, 2015).

23 We analyze the impact of GVCs’ design features on the desired outcomes of YICs in  
24 Europe. The European setting is ideal for our analysis because it presents heterogeneous  
25 GVC design features across countries, regions, and time. Moreover, the European

1 Commission expresses considerable interest in improving access to finance for YICs and has  
2 recently established the “Investment Plan for Europe”<sup>2</sup> whose goal is to close a funding gap  
3 and to foster innovation and growth.

4 Most of the previous literature assesses the impact of GVC by comparing GVC-  
5 backed companies to those that received PVC or no risk capital at all (Alperovych et al.,  
6 2015; Bertoni and Tykvová, 2015; Grilli and Murtinu, 2014; Cosh et al., 2009). In this paper,  
7 however, we elaborate on the cross-sectional variation in GVC design features and their  
8 effectiveness. Accordingly, we do not need to elaborate on the GVC selection process but  
9 have a simple identification strategy. We focus solely on GVC investments and exploit a  
10 sample of 1,230 transactions originated by 72 GVC funds operating in 16 European  
11 countries. This identification strategy cannot be used to compare GVC-backing with other  
12 types of financing. It does, however, allow us to compare the various GVC-backed ventures  
13 contingent on GVC policy design features, which forms the core focus of this paper.

14 The data are retrieved from Thomson One and complemented with the VICO and  
15 Reuters EIKON datasets. We consider the financing rounds with GVC fund participation  
16 originated between 1995 and 2011. We stop sampling investments in 2011 because we need  
17 to track their outcomes until recently. Specifically, we observe investees’ subsequent  
18 development in terms of receiving additional private capital financing from PVC funds  
19 (PVCs) and their asset growth and innovation output. Almost half (595) of the transactions  
20 are syndicated with PVCs in the first round. Syndication with a private investor can be an  
21 endogenous decision that could affect the investment outcome independent of the GVC  
22 program design. Therefore, we run all analyses on the full sample including syndicated  
23 transactions and on the subsample of investments exclusively originated by GVCs (“solo  
24 transactions”).

---

<sup>2</sup> Source: <https://www.consilium.europa.eu/en/policies/investment-plan/>.

1           Our results indicate that GVCs that back ventures in economically lagging regions, or  
2 countries with high perceived corruption are less successful in accomplishing their mission  
3 along the three dimensions considered above: subsequent injection of private capital,  
4 supporting growth, and fostering innovation. If, in addition, GVCs are also located in the  
5 economically lagging regions and predominantly source their transactions locally, then they  
6 are even less successful in reaching their goals. We interpret this as indirect evidence of  
7 collusion and political interference affecting the efficiency of GVC initiatives. We also detect  
8 that GVCs that build up industry-specific expertise and those who previously coinvested with  
9 PVCs are more likely to successfully bridge equity gaps. This highlights the importance of  
10 learning processes for GVCs. Our results provide guidance to politicians for the design of  
11 effective GVC programs and contribute to the literature on how to facilitate access to  
12 financing for YICs with public money (Cortés and Lerner, 2013; Guerini and Quas, 2016;  
13 Martí and Quas, 2018; Meuleman and De Maeseneire, 2012; Ughetto et al., 2017).

14           We perform a series of robustness checks to verify our findings. First, we consider  
15 that the financial resources injected in the GVC round could be sufficient to back the venture  
16 until it turns profitable. In this case, there might be no need for an additional financing round,  
17 and our main measure for success would be flawed. We therefore control for the amount  
18 injected in the GVC round in a subsample for which this information is available. Second, we  
19 recast our models using alternative estimation techniques to account for the time dynamics of  
20 the desired outcomes and for the possible endogeneity of syndication decisions. Third, we  
21 consider different proxies for our main independent variables. All results remain unchanged.

22           We also take into account the heterogeneity of YIC characteristics and replicate our  
23 analyses distinguishing between ventures in high- and low-tech sectors and between those  
24 that received GVC in early and later stages of their lifecycles. We find that the results are  
25 stronger for high-tech and younger ventures. Finally, we explore whether the design features



1 of GVC initiatives and their impact on YICs varied over time. We find that the global 2008  
2 financial crisis was an important turning point for GVCs' *modus operandi* because several  
3 GVC design features had different impacts before and after 2008.

4 In the subsequent section, we review the related literature and develop our theoretical  
5 framework. Section 3 presents the data, methods and measures. Section 4 shows the results of  
6 the main analysis, and section 5 presents additional evidence and robustness checks. Finally,  
7 we summarize the paper, discuss its limitations and discuss the GVC policy implications.

## 8 **2. Overarching framework**

### 9 2.1 *Desired GVC program outcomes*

10 Although heterogeneous in terms of particular remits, GVC initiatives can be  
11 evaluated by considering some largely shared desired outcomes. GVC programs are  
12 principally aimed at solving a market failure – the insufficient supply of capital to promising  
13 YICs.

14 In this context, the role of GVCs is to supply YICs with capital to alleviate financial  
15 constraints (Carpenter and Petersen, 2002) and to support the investee's development. If the  
16 backed YIC requires additional funding later in its lifecycle, then it may be possible to attract  
17 private capital at more favorable deal terms due to the reduced economic uncertainty and  
18 resulting lower investment risk. The receipt of subsequent PVC financing is therefore clear  
19 proof that return-driven investors have faith in the venture's business plan and management  
20 quality. In other words, this event reveals that a GVC fund initially backed a venture with a  
21 potential to evolve into commercially viable company. It most likely would not have survived  
22 or at least would not have developed as successfully without the GVC fund's contribution.  
23 The GVC thus helped the YIC become "investment ready" (Mason and Harrison, 2001). The  
24 GVC's contribution itself, in this context, could also provide a signal to private capital  
25 investors and thus facilitate their investment (Guerini and Quas, 2016; Lerner, 2002; Mueller

1 et al., 2012). We therefore consider the receipt of PVC financing following GVC funding as  
2 proof of a successful equity gap bridge. This success indicator is independent of the number  
3 of GVC rounds the YIC may have received in the meantime. The venture may actually  
4 require several additional GVC contributions prior to a PVC round. However, additional  
5 GVC does not trigger success in our model because, in an attempt to avoid bad media, public  
6 investors might not consistently abandon unsuccessful investments. Follow-on investments of  
7 public funds may nurture “living deads” and may not signal viable business models  
8 (Manigart et al. 2002). Consequently, we regard return-driven private investments as the only  
9 appropriate indicators that an equity gap has been bridged. This success measure is  
10 independent of the overall number of previous GVC financing rounds.

11 This definition, nevertheless, does not correspond to the goals of policymakers *stricto*  
12 *sensu*. In theory, GVC campaigns should improve the emergence and development of YICs  
13 and not solely produce deal flow for investors. It is further possible that a venture matures  
14 without requiring additional capital. For these reasons, we refer to the growth rates and  
15 innovation output of the investees as alternative desired outcomes for successful GVC  
16 investments. The empirical literature suggests that GVC-backed companies grow less in  
17 terms of employment and sales (Cumming et al., 2017; Grilli and Murtinu, 2014) and  
18 generate fewer patents (Bertoni and Tykvová, 2015) compared to PVC-backed ventures. In  
19 this paper, instead, we exclusively focus on GVC-backed companies and reveal the impact of  
20 different GVC program design features on growth and innovations of the investees.

## 21 2.2 *GVC design features*

22 GVC fund programs differ along at least three observable design features that are  
23 defined at initiation.

24 First, policymakers decide on the location and geographic focus of a fund. In a few  
25 cases, GVCs invest nationwide (Lerner, 2009). These GVCs are often located in central

1 regions and/or financial or innovation hubs and invest both locally and at distance. More  
2 frequently, GVCs are regionally focused (Mason and Harrison, 2003). These GVCs are more  
3 likely to be located in less developed peripheral regions and usually have a mandate to  
4 originate transactions locally. The second feature is related to their independence. Some GVC  
5 funds are allowed to act on their own and make transactions without syndicate partners (solo  
6 deals), while others are required to coinvest with PVCs. Third, GVC funds may need to  
7 originate transactions in clearly defined industries which are of particular interest for policy  
8 or society (Mason and Brown, 2013).

9 We label these three policy design features location/colocation constraint, syndication  
10 constraint, and industry focus. In the following, we discuss our expectations about the  
11 effectiveness of these designs for the achievement of the desired GVC policy outcomes.

12 **Location/colocation.** The literature indicates that PVCs and their investments exhibit  
13 a considerable level of spatial concentration in financial centers and high-tech regions (Chen  
14 et al., 2010; Colombo et al., 2019). To compensate for potential equity gaps in economically  
15 lagging areas, governments have often implemented local GVC programs to foster regional  
16 development (Bertoni, Colombo, & Quas, 2017; Bertoni & Tykvová, 2015; Kovner &  
17 Lerner, 2015; Lerner, 1999, 2002). The creation of such regional funds follows the  
18 assumption that there is enough high-quality demand for funding from YICs located in those  
19 regions (Mason, 2016). Recent accounts, however, do not support this argument: peripheral  
20 underdeveloped regions may suffer from a lack of infrastructure, R&D and innovation  
21 intensity, and appropriate quality of entrepreneurial human capital (Munari and Toschi,  
22 2015). These characteristics result in smaller founding rates, lower quality YICs and thus a  
23 lower demand for risk capital (Bernstein et al., 2017; Colombo et al., 2019; Gompers et al.,  
24 2016).

1           Ownership structures and governance principles in peripheral regions can also differ  
2 from those in core centers and financial hubs. For example, we can assume that the presence  
3 and influence of family businesses is larger in peripheral areas. Family firms usually have  
4 high desired levels of control, a focus on wealth concentration, and noneconomic utilities, as  
5 discussed in Worek et al. (2018). Wilson et al. (2019) reveal that family firms probably have  
6 a much lower propensity to solicit and attract VC financing. This might constitute one reason  
7 why PVCs neglect peripheral regions in the first place. Nevertheless, GVC programs are  
8 often located in those areas and have a local investment mandate only.<sup>3</sup>

9           Geographic proximity between investors and investees is generally considered  
10 beneficial because it improves monitoring efficiency (Bernstein et al., 2016). However, the  
11 opposite could be true in the case of GVCs. GVC programs focused and localized in  
12 underdeveloped regions can only pick from a very narrow pool of available investment  
13 opportunities (Mason and Harrison, 2003). Moreover, they face an eventual lack of local  
14 skilled human capital that undermines GVCs' ability to both select the most promising  
15 companies and to effectively support them (Dimov and Shepherd, 2005; Munari and Toschi,  
16 2015). Furthermore, regionally focused programs have difficulties in attracting skilled  
17 investment managers from other regions because of their limited size (Jääskeläinen et al.,  
18 2007). We therefore expect that *GVCs located and investing in underdeveloped regions face  
19 stronger difficulties in attracting private capital and in fostering growth and innovation for  
20 their investees.*

21           Colocation can be detrimental for yet another reason unrelated to the economics of the  
22 region. In fact, the political science literature suggests that geographic proximity between the

---

<sup>3</sup> For example, Mason and Harrison (2003) find a strong deficit of venture capital investments in Northern Ireland during the period 1997-2001. Northern Ireland is also the UK's region that scored the lowest Regional Competitive Index (please refer to section 3.2 for a description). Northern Ireland had particularly low scores in terms of the infrastructure, market size and business sophistication dimensions of the index. It further has a low level of GDP/capita compared to the rest of the UK. In reaction to the perceived difficulties for young ventures to raise capital, the Northern Ireland government established several GVC funds with regional focus.

1 provider of public resources and the beneficiary can be harmful because it facilitates  
2 collusion between the parties. "...As geographical proximity makes it easier for companies to  
3 collaborate in research and innovation, so it makes it easier for companies or other agencies  
4 to collude in their supply of a critical input." (Akehurst, 1987, page 160). GVC policies may  
5 be subject to such collusion and political interferences, as politicians and their representatives  
6 sometimes constitute the majority on GVCs' investment committees (Jääskeläinen et al.,  
7 2007). Bertoni and Quas (2016) show that the timing and investment style of GVCs depends  
8 on election schedules and argue that this is attributable to their political nature. Political  
9 influences can distort GVCs' investment decisions because politicians may favor  
10 entrepreneurs and ventures to which they have a relationship (Becker, 1983; Peltzman, 1976).  
11 Schoenherr (2018) illustrates the negative consequences of political connections and resulting  
12 distortions of public capital allocation in South Korea. Lerner (1999) discusses the situation  
13 when GVCs' managers are personally connected to politicians and influenced by their  
14 political agenda. Faccio and Hsu (2017) provide indirect evidence that politically connected  
15 investors tend to exchange favors with policymakers. Such connections raise the likelihood  
16 that investees receive government grants and contracts. Because GVCs are politically  
17 connected by definition, they are not exempt from such allocative distortion issues. This  
18 should translate into an increased propensity to select investees of particular interest to the  
19 incumbent political party, regardless of their prospects for growth and success. We therefore  
20 expect that *GVC campaigns that require local investments are more likely to be influenced by*  
21 *collusion and, in turn, less effective in bridging equity gaps.*

22       **Syndication.** Syndication is an important characteristic of the VC industry (Bubna et  
23 al., 2019; Hochberg et al., 2007; Lerner, 1994). The literature has emphasized the benefits of  
24 syndication, including obtaining a "second opinion" from a more reputed and experienced  
25 coinvestment partner (Casamatta and Haritchabalet, 2007) and the opportunity to reduce

1 investment risks (Manigart et al., 2006). GVC programs that require systematic syndication  
2 with a private partner may benefit from such advantages. Empirical evidence suggests that  
3 coinvestments between PVC and GVC funds are more likely to be successfully exited in  
4 comparison to solo GVC deals. The investees produce more innovation and achieve higher  
5 growth than isolated PVC-backed and GVC-backed peers (Bertoni and Tykvová, 2015;  
6 Cumming et al., 2017; Grilli and Murtinu, 2015; Kovner and Lerner, 2015). However,  
7 syndicating with PVCs may not only affect the success of a focal deal but also influence the  
8 way GVCs invest in the future. In fact, syndication provides them with the opportunity to  
9 learn from their partners (Clarysse et al. 2013). In this context, Lerner (2002) suggests that  
10 GVC programs should be structured to complement PVC funding, which would allow GVC  
11 fund managers to learn from PVCs. In addition, by syndicating with private investors, GVCs  
12 may enhance their networks of contacts, which should be beneficial for subsequent  
13 investments. We therefore expect *that GVC initiatives that require syndication with PVCs are*  
14 *more successful in bridging the equity gap.*

15 **Industry focus.** GVC policy initiatives are often designed to target specific  
16 industries, most likely high-tech industries, where both R&D cost and time-to-market are  
17 usually substantial. It is also frequently assumed that high-tech ventures are more innovative  
18 and yield higher growth and more economic prosperity (Mason and Harrison, 2003).  
19 However, empirical literature does not support this conjecture (Mason and Brown, 2013), and  
20 public support programs (including GVC) which exclusively target high-tech sectors are  
21 therefore criticized (Brown et al., 2017; Shane, 2009). At the same time, high-tech YICs are  
22 more exposed to potential equity gaps because private capital tends to avoid some high-tech  
23 industries (Bertoni et al., 2015). It therefore seems appropriate that the government steps in  
24 where the lack of private capital is most severe. A high-tech or selected industry focus may,  
25 in fact, be beneficial for an additional reason: Sørensen (2007) asserts a positive relationship

1 between the industry-specific experience of PVC fund managers and investment  
2 performance. He reveals that by accumulating experience, VC managers become better at  
3 selecting portfolio companies and adding value. We therefore hypothesize *that GVC policies*  
4 *that focus on selected industries encourage GVCs' managers to develop industry-specific*  
5 *expertise. This should positively affect their ability to bridge equity gaps.*

### 6 **3. Data and measures**

#### 7 3.1 *Data sources and sampling*

8 Our empirical analysis is based on a sample of European VC investments where a  
9 GVC fund provides financing in a first financing round up to 2011. We use 2011 as the GVC  
10 round cut-off year because we require sufficient time to track these investments afterwards.

11 We first gather a list of GVCs operating in Europe in the Thomson One database. This  
12 data source has some shortfalls, discussed in Bertoni et al. (2015), Da Gbadji et al. (2015),  
13 and Ivanov and Xie (2010). In particular, captive investors might be mischaracterized.  
14 Accordingly, we cross-checked our GVC list with the VICO database ([www.vicoproject.org](http://www.vicoproject.org))  
15 and Reuters EIKON and performed direct internet queries. We identify 92 VC funds for  
16 which the parent company is a government body, and we retrieve the complete investment  
17 history for them from Thomson One. We also identify which of their investees receive  
18 financing by the end of 2014.<sup>4</sup> We exclude investees in the finance and real estate sectors and  
19 obtain a sample of 2,142 companies that were involved in 4,724 investment rounds between  
20 1979 and 2014. GVCs participated in 2,912 of these rounds. We also gather data on investee  
21 characteristics, namely, location, industry sector and the founding year and information on  
22 the financing rounds.

---

<sup>4</sup> We finished the investment data gathering process in May 2015. To verify completeness, we compare our data with the records in the Zephyr database and realize an appropriate match.

1 We drop observations with missing data and those for investees located outside  
2 Europe and finally elaborate on a sample of 1,230 investments by 72 GVCs between 1995  
3 and 2011. For a subset of 861 rounds, we identify the amounts invested. For 1,150 YICs, we  
4 are able to retrieve patenting data until 2016, and for 503 YICs, we gather data on their total  
5 assets for the years 2007 until 2016. Both patents and total assets are sourced from Bureau  
6 Van Dijk's Orbis database.<sup>5</sup>

7 Table 1 shows the distribution of GVC funds by country of origin and reveals that  
8 one-third of the sample GVCs are located in the UK. However, while the number of GVCs  
9 from the UK is large, the UK only accounts for 180 of our sample transactions, i.e., 14.6%.<sup>6</sup>  
10 Table 2 presents the sample transaction distribution by investment year, investee's age and  
11 stage of development at funding, its industry and high-tech sector classification, and its  
12 country. We also show a breakdown of transactions where the GVC round is syndicated or  
13 not. We observe 635 investments (i.e., 51.63%) originated by GVCs in solo transactions and  
14 595 investments (i.e., 48.37%) syndicated with PVCs. The distribution of the investments by  
15 investees' age shows that most of the contributions were made towards young companies.  
16 For 23.82% of the sample transactions, it was younger than 1 year, and for 76.58% of the  
17 transactions, it was younger than 6 years old. In the remaining 23.42% of the transactions, the  
18 investees were 6 years or older at the time of the GVC investment. These older ventures  
19 might therefore not strictly fit the definition "YIC" (not being young anymore) but apparently  
20 faced a second equity gap. The data provider Thomson One classifies VC transactions into  
21 "seed and early-stage" versus "later-stage" deals independently of the age of the investee at  
22 funding. The characterization follows the judgment of the originators of the transactions who  
23 report to the database provider. This classification distinguishes 768 (i.e., 62.44%) seed or

---

<sup>5</sup> The investees were matched between Thomson One and Orbis manually by company names and countries.

<sup>6</sup> In untabulated robustness checks, we i) controlled for GVC location with country dummies and ii) excluded UK-based deals. In both cases we, find similar results, which are available upon request.



1 early-stage from 462 (i.e., 37.56%) later-stage financing rounds. We define high-tech sectors  
2 according to Kile and Phillips (2009) based on 3-digit SIC codes and find that 50.57% of the  
3 GVCs' contributions are made to high-tech ventures.

4 We refer to these sample characteristics in section 5.5, where we address the impact  
5 of the transactions' heterogeneity.

6 [Insert Table 1: Distribution of GVCs by country]

7 [Insert Table 2: Distribution of GVC investments by investment period, age at the time of the  
8 investment, country and industry of the target company]

### 9 3.2 *Measures*

10 **Dependent variables.** We propose three alternative measures to capture a successful  
11 bridge of an equity gap. Our principal dependent variable – “Additional PVC” – is a dummy  
12 equal to one if the focal GVC investment yields a subsequent financing round with PVC  
13 participation. As substitutes, we refer to the growth of an investee's assets and to the number  
14 of patents granted within three years after the capital contribution of a GVC. We measure  
15 sample companies' growth using the difference of “log (total assets)”. Alternatively, we  
16 could consider employment growth. However, employment figures are only available for 418  
17 of our sample YICs. The resulting sample size does not allow us to detect significant and  
18 robust parameter coefficients. Nevertheless, since asset and employment growth are well  
19 correlated characteristics, asset growth qualifies as a substitute for the missing observations  
20 of employment growth. The number of new patents is calculated by comparing the patent  
21 stock over the three-year period. We describe the alternative variables in more detail in the  
22 respective analyses sections of the paper.

23 **Location:** We refer to the EU's “Regional Competitiveness Index” to assess the  
24 impact of regional economic development on the outcome of a GVC fund investment. This  
25 index was computed at regional (i.e., NUTS2 - Nomenclature of Territorial Units for

1 Statistics) levels by the European Commission in 2013 (Annoni and Dijkstra, 2013). The  
2 index builds on several sub-indices that consider the development, efficiency and innovation  
3 capacity of various European regions. To scale the regional competitive index for the  
4 individual sample countries, we create a dummy variable “Underdeveloped region” if the  
5 NUTS2 level’s “Regional Competitiveness Index” is lower than the corresponding national  
6 average. Alternatively, we refer to “regional per capita GDP” at the NUTS2 level from  
7 Eurostat to directly assess different levels of economic development. To test our prediction  
8 on the effect of collusion, we follow an approach commonly used in the literature and assess  
9 the likelihood of regulatory capture with a nationwide indicator of perceived corruption,  
10 referring to the Transparency International Corruption Perceptions Index<sup>7</sup> (Dal Bó, 2006; Dal  
11 Bó and Rossi, 2007). The political science literature also suggests that political campaign  
12 contributions by individuals can be used as an alternative proxy for regulatory capture (Dal  
13 Bó, 2006; de Figueiredo and Edwards, 2007). As a consequence, we obtain information from  
14 the International Monetary Fund database on whether the amount that a donor can contribute  
15 to a candidate of a political party in a certain country is limited. This characteristic is coded  
16 using the dummy variable “No limit on contributions to candidates,” which is equal to 1 if no  
17 limit exists.

18 **Colocation:** Our measure of proximity is based on the location of the investee with  
19 respect to the location of the GVC fund backing it. We use the dummy variable “Local deal”,  
20 which is equal to one if the GVC fund is located in the same geographic region (NUTS2  
21 code) as its investee. We also create important interaction terms using this dummy.

22 **Syndication:** We use a dummy variable “Syndicate” to denote syndicated  
23 transactions. For our measure of a GVC fund’s “Syndication experience”, we refer to the

---

<sup>7</sup> This index assigns higher values to lower levels of perceived corruption. To improve interpretability, we switch the sign of the Corruption Perceptions Index and generate the “Corruption” variable, which assigns higher values to higher levels of perceived corruption.

1 number of previous investments in which the fund syndicated with a PVC partner. As an  
2 alternative, we use the percentage of syndicated deals over total experience and name the  
3 variable “Syndication specialization”.

4 **Industry focus:** We assess the “Industry experience” of a GVC fund by considering  
5 the number of previous transactions of the focal fund in the same industry as the focal  
6 investment. Alternatively, we refer to “Industry specialization” as the experience in a  
7 particular industry relative to total experience.

8 **Control variables:** We use several control variables describing investment  
9 characteristics that may affect a GVC fund’s ability to bridge equity gaps. We include a  
10 “High-tech” dummy and add common controls, e.g., for the target’s age (“Log of company  
11 age”), and industry, year, and country fixed effects, when specified. These dummies should  
12 appropriately capture unobserved characteristics. In separate analyses, we include the  
13 logarithm of the amount injected by VC investors (“Log of amount received”). The amounts  
14 enter the regressions in logs of USD million. In the analysis of total asset growth, we also  
15 include “Log of total assets (t–1)”, which is the logarithm of total assets in the previous year.  
16 In the model for innovative output, we control for the “Patent stock” of each investee prior to  
17 the GVC investment.

### 18 3.3 *Descriptive statistics*

19 All variables are summarized in Table 3, and their correlation matrix is presented in  
20 Table 4. Out of 1,230 GVC investments, 390 (31.71%) subsequently attract private capital.  
21 The average logarithmic growth rates of total assets and patents in the three years following  
22 the initial GVC financing round are 1.244 and 1.360, respectively. This translates into level  
23 growth rates of 124.4% and 136.0%, respectively.

24 [Insert Table 3: Summary statistics]

25 [Insert Table 4: Correlation matrix]

1           Although some of the bivariate correlations are statistically significant (in bold), the  
2 matrix in Table 4 reveals that their economic significance is rather low, with some  
3 predictable exceptions. The corruption and regional competitiveness indicators correlate at  
4  $-0.61$ , and the experience measures at  $0.64$ . Furthermore, the investment amount correlates  
5 with syndication and the ventures' total assets with their age. High correlations among these  
6 indicators suggest not using them simultaneously in the multivariate analyses to avoid  
7 multicollinearity. Therefore, we present regression models in which we carefully alternate  
8 correlating covariates. In parallel, we monitor potential multicollinearity with a variance  
9 inflation factor.

10           Table 5 presents the descriptive statistics of our subsamples of GVC solo and  
11 GVC/PVC-syndicated deals. We also report the significance levels of t-tests on the  
12 differences in means of the variables across the two subsamples. Compared to syndicates,  
13 solo GVC investments are significantly less likely to be successful in bridging the equity gap.  
14 Out of the 635 companies that are initially exclusively backed by GVCs, only 122 (i.e.,  
15 19.21% of them) receive subsequent PVC financing. Out of the 595 companies that initially  
16 receive a GVC/PVC-syndicated investment, 268 (i.e., 45.04%) subsequently obtain  
17 additional PVC financing. Moreover, our alternative measures of successfully bridged equity  
18 gaps, total asset growth and the number of new patents in the first 3 years after the  
19 investment are higher for syndicated deals than for solo deals. GVC-backed companies in  
20 solo deals are located in less competitive regions and in more corrupt countries. They receive  
21 lower amounts of commitments and tend to be larger than ventures that initially receive  
22 GVC/PVC-syndicated funds. Lastly, alone acting GVCs have lower industry experience and  
23 previous PVC syndication experience.

24           [Insert Table 5: Descriptive statistics of the syndicated and nonsyndicated deals]

1 Table 5 demonstrates that solo GVC deals are different from GVC/PVC-syndicated  
2 transactions. We therefore conduct the analyses on the full sample and separately on the  
3 subsample of solo GVC investments.

#### 4 **4. Main results**

##### 5 4.1 *Receipt of subsequent PVC funding*

6 Table 6 presents the regression results of our main analysis on the role of GVC design  
7 features on the ability to bridge equity gaps. The dependent variable is a dummy that is equal  
8 to 1 if the investee received PVC in a subsequent financing round. The appropriate model  
9 specification is a probit. We report robust standard errors.

10 In specification I of Panel A, we regress the dependent variable on our set of basic  
11 controls: industry and time fixed effects, company age, the high-tech dummy and the dummy  
12 denoting syndicated deals. All coefficient estimates are statistically significant at the 1% level  
13 and have the expected signs. The marginal effects indicate that a venture that is one year  
14 older than the median investee (at a median age of 2 years) at the initial GVC financing round  
15 is 1.60% less likely to receive subsequent PVC. This corresponds to a 5.1%  
16 (=1.61%/31.71%, see Table 3) reduction in the unconditional probability of later obtaining  
17 PVC funding. Along the same lines, investments in high-technology companies and  
18 syndicated transactions are 13.89% and 21.97%, respectively, more likely to attract PVC in  
19 later rounds. The positive impact of syndication is strong and could be due to a selection or  
20 treatment effect in syndicated deals. We discuss this in section 5.3.

21 In specifications II and III, we add “Regional competitiveness” and the “Local deal”  
22 dummy. Their coefficient estimates are both significant at the 1% level. The marginal effects  
23 reveal that a one-standard deviation increase in the level of regional competitiveness  
24 enhances the likelihood of future PVC funding by 6.04% for the “average” transaction. More  
25 intuitively, the likelihood of receiving additional funding in Greater London is 6.21%

1 percentage points higher than in Andalucía (in Southern Spain) solely because of the  
2 difference in local development. The marginal effect of “Local deal” reveals that locally  
3 sourced deals are 7.27% less likely than the average transaction to receive follow-on PVC  
4 funding.

5 In specification IV, we substitute the “Regional Competitiveness Index” with the  
6 dummy “Underdeveloped region”, finding that its parameter estimate is not significant. In  
7 specification V, we include the interaction of “Underdeveloped Region” and “Local deal” to  
8 test whether the focus in underdeveloped regions affects GVCs’ ability to bridge the equity  
9 gap. The coefficient estimate is negative and significant at the 1% level. We follow Ai and  
10 Norton (2003) to quantify the economic magnitude of the interaction term and detect that for  
11 companies located in an underdeveloped region, the colocation with a GVC fund reduces the  
12 chances of attracting additional private capital by 14.28%.

13 In specification VI, we drop the interaction term and add our proxy for corruption. We  
14 cannot simultaneously include the variable “Regional competitiveness” because of its  
15 correlation with “Corruption”. However, the “Underdeveloped region” dummy does not  
16 correlate with corruption ( $\rho = -0.0541$ ) and can therefore be kept. The results indicate that  
17 corruption hinders the progress of the investment cycle. A decrease of one standard deviation  
18 in the corruption measure increases the chances to receive additional private capital by  
19 4.53%.

20 Specification VII presents a model in which we add an interaction term between the  
21 level of corruption and the “Local deal” dummy. The parameter estimate is statistically  
22 significant,<sup>8</sup> revealing that the level of corruption in a given country is a stronger inhibitor of

---

<sup>8</sup> The inclusion of the corruption measure and its interaction with locally sourced transactions may lead to multicollinearity problems that could bias the coefficients. Indeed, we notice a jump in the coefficient of the Local deal dummy variable between models VI and VII. To address this problem, we adopt the residual-centering procedure described in Lance (1988), which has been used in more recent studies, for example, by Tiwana (2008). This procedure yields (unreported) comparable results.

1 success if GVCs source their transactions locally. We find that if there is colocation between  
2 a GVC fund and its investee, a one-standard deviation increase in perceived corruption  
3 decreases the probability of subsequent PVC funding by 6.98%. For a better understanding of  
4 the interplay of these variables, we also compute the average marginal effect (AME) of the  
5 GVC and investee colocation interaction term with corruption at different levels of  
6 corruption. The result is depicted in Figure 1. The solid line represents the AMEs, and the  
7 dashed lines represent a 95% confidence band. It turns out that the colocation effect is  
8 indistinguishable from zero at the low corruption levels, while the negative effect of the  
9 colocation is entirely driven by more corrupted regions. In column VIII, we add country fixed  
10 effects and show that our main results do not change substantially compared to those of  
11 specification VII.

12 Specification IX shows the effect of GVCs' industry focus, assessed by "Industry  
13 experience", on their ability to bridge the equity gap, which is not significant. Similarly, in  
14 column X, we include our measure of the "Syndication experience", which also does not  
15 have a statistically significant coefficient estimate.

16 Panel B of Table 6 repeats the analyses of Panel A excluding syndicated GVC  
17 transactions. Even if the sample size shrinks by almost half, the results remain stable.  
18 However, important differences emerge with respect to industry and syndication experience  
19 in specifications IXX and XX. Both parameter coefficients are positive and significant in the  
20 "solo GVC deals". A one-standard deviation increase in "Industry experience" and  
21 "Syndication experience" improves investees' chances to receive additional PVC financing  
22 by 4.31% and 3.75%, respectively. This means that GVCs can benefit from their industry and  
23 syndication experience when they invest alone.

24 [Insert Table 6: Effect of GVC design features on investees' receipt of additional PVC  
25 funding]

1 [Insert Figure 1]

2  
3 4.2 *Growth in total assets*

4 We analyze the drivers of total asset growth in random effects panel regressions  
5 according to Evans (1987), in which investees are observed annually from their initial GVC  
6 investment until 2016. However, we can only gather information on total assets from 2007  
7 onwards and therefore need to discard all investments prior to 2007 from the sample.  
8 Additional transactions need to be dropped due to missing data yielding a sample of 519  
9 deals. Of these, 193 are solo GVC investments, and the remainder are GVC/PVC-syndicated  
10 deals. The dependent variable is “Total assets logarithmic growth”, which is measured as the  
11 difference in the logs of a venture’s total assets between a focal year and the previous year,  
12 winsorized at the 1% level. In addition to the covariates used in the main analyses, we  
13 include “Log of total assets (t–1)”, which is the logarithm of total assets in the previous year.  
14 This equation is a standard specification in the industrial organization literature on firm  
15 growth and was used in the context of GVC, e.g., by Grilli and Murtinu (2014). We also  
16 include the variable “Log of amount received”, which is the logarithm of the additional  
17 outside capital eventually contributed to the investee in a subsequent financing round in the  
18 respective year. This variable captures the jump in total assets caused by the injected capital.

19 Table 7 shows the results of the panel regression analysis. Specifications I to V  
20 elaborate on the full sample, while specifications VI to X exclude syndicated transactions.  
21 We find a negative and significant coefficient for the “High-tech” dummy. This result is  
22 justified because high-technology ventures are often less asset intensive than other ventures.  
23 The coefficient of “Log of amount received” is expectedly positive and significant. We find  
24 that size has a negative impact on growth, which is caused by the principle that small firms  
25 exhibit higher growth rates (Bottazzi et al., 2011). We do not find that syndicated deals



1 perform better than solo GVC investments in terms of asset growth once we control for the  
2 investee size and amounts injected. “Regional competitiveness” positively influences GVC  
3 investees’ total asset growth. Similarly, “Underdeveloped region” has a negative coefficient,  
4 at least in the full sample. However, we cannot conclude that the effect is stronger for  
5 collocated deals because the coefficient estimate of the interaction term with “Local deal” is  
6 not significant. Instead, we find a negative and significant coefficient estimate for the  
7 interaction term of corruption and collocation. We also find that the coefficients of GVC  
8 industry and syndication experience have the expected positive signs and are both significant  
9 in the full sample. The results are similar for the subsample of solo GVC investments  
10 (specifications VI to X), with the exception of the coefficient estimates of high-tech and  
11 syndication experience.

12 [Insert Table 7: Effect of GVC design features on investees’ total asset growth]

### 13 4.3 *Innovation output*

14 Fostering innovation is usually an important policy goal in GVC initiatives. We  
15 therefore refer to the innovation output as a second alternative measure for bridging an equity  
16 gap. Using the variable “Number of new patents” as the dependent variable, we study the  
17 impact of GVC design features on the innovation output of investees. This variable represents  
18 the number of all patents that were granted to the ventures in the first three years after the  
19 GVC financing round. We retrieve data on 1,050 of our sample transactions from Orbis and  
20 apply negative binomial regressions. The regression model is appropriate if a dependent  
21 count variable is overdispersed. This is the case for “Number of new patents”. As it is  
22 common in analyses on innovative output (e.g., Bertoni and Tykvová, 2015), we control for  
23 the “Patent stock” of each investee prior to the GVC investment.

24 Table 8 reveals that high-tech companies backed in solo GVC transactions are more  
25 innovative (specifications VI-X). A venture’s age has no significant impact on patent output,

1 while “patent stock” has positive coefficients, as expected. The findings confirm that  
2 GVC/PVC-syndicated deals yield a higher innovative productivity (Bertoni and Tykvová,  
3 2015) and the importance of regional competitiveness for innovation. We surprisingly find a  
4 positive coefficient of “Underdeveloped regions”. This could be driven by selection decisions  
5 of GVCs that operate in the lagging regions of their countries. These GVCs tend to invest in  
6 ventures with a larger patent stock because it serves them as a signal for innovation capacity.  
7 However, ventures with higher patent stocks continue to produce more innovations, as  
8 revealed in the regressions. Nevertheless, we find that ventures located in underdeveloped  
9 regions and backed by local GVCs are less likely to file patents in both the full sample  
10 (specification I) and in solo GVC deals (specification VI). Corruption decreases the  
11 probability of generating innovation, and this effect is driven by locally sourced transactions  
12 (specifications II and III). We do not find an effect of GVC industry or syndication  
13 experience on the innovation capacity of the investees.

14 [Insert Table 8: Effect of GVC design features on investees’ patenting activities]

## 15 **5. Additional evidence and robustness checks**

16 In this section, we conduct several robustness checks to verify our results with respect  
17 to our primary measure for GVC financing success, which is the subsequent receipt of private  
18 capital. In particular, we control for the amount injected, use an alternative model  
19 specification, control for the potential endogeneity of syndication, apply substitutes for some  
20 covariates, and finally analyze the detected effects in split samples.

### 21 *5.1 Controlling for the resources injected*

22 Thus far, we have neglected that the capital contribution in the GVC round could be  
23 sufficient to completely cover the financing requirements of an investee until it breaks even  
24 and hence subsequent funding would not be required. In this case, our main success measure  
25 would be flawed. Therefore, the GVC round financing volume could itself be a predictor of

1 the likelihood of a subsequent financing round. The variable “Log of amount received”  
2 captures this effect. However, the data are only available for a subset of 861 deals (of which  
3 376 solo deals), as shown in Table 3. For this reason, we do not include the variable in all of  
4 our analyses. The results are reported in Table 9 and reveal that the effect of the amount  
5 injected in the GVC round is positive, in contrast to the expectation. The coefficient estimate  
6 is significant at the 1% level in the full sample (specifications I-V) and at the 10% level in  
7 three solo deals regressions (specifications VII, IX, and X). The marginal effect in  
8 specification I is such that receiving an additional 1 million USD over the median GVC  
9 round financing volume improves the chances to receive additional PVC financing by 2.10%.  
10 This finding is contrary to our expectation but points to an important characteristic of GVC  
11 activity. If they invest higher amounts, they do not decrease the likelihood of a subsequent  
12 funding round. Importantly, our main results remain unaffected. Nevertheless, the statistical  
13 significance decreases for some parameter estimates due to the reduced number of  
14 observations.

15 [Insert Table 9: Effect of GVC design features on investees’ receipt of additional PVC  
16 funding: controlling for the amount injected]

## 17 5.2 *Alternative model specification*

18 The analyses in Table 6 only consider the event of an additional financing round with  
19 PVC participation. These analyses do not take into account how much time it takes until the  
20 event. A proportional hazard Cox (1972) model captures the joint effect of the likelihood of  
21 the event and the elapsed time. This model is applied to the VC context in Bertoni and Groh  
22 (2014), Chang (2004), Giot and Schwenbacher (2007) and Guerini and Quas (2016). We use  
23 it to model the receipt of additional PVC based on the hazard rates, i.e., the probability that  
24 an event occurs at a certain time, contingent on it not having occurred before. In our setting,  
25 the elapsed time between the initial and the subsequent financing round determines the

1 hazard rate. If a particular investee never receives subsequent funding, we refer to the elapsed  
2 time between the initial transaction and the cut-off year 2014. The successful event  
3 “Additional PVC” follows, on average, 1.84 years after the initial GVC round. Table 10  
4 presents the results of the Cox regressions and reveals that our general findings hold.  
5 However, some coefficient estimates have higher standard errors and thus lower significance  
6 levels than those in the probit models. The results are robust for both the full sample,  
7 including syndicated transactions, and the sample of transactions sourced by GVC funds  
8 only. In this analysis, we also find that GVC syndication experience has a weakly significant  
9 effect in the full sample (specification V).

10 [Insert Table 10: Effect of GVC design features on investees’ receipt of additional PVC  
11 funding: Cox (1972) regressions]

### 12 5.3 *Potential endogeneity of syndication*

13 Table 6 indicates that the likelihood that a GVC-backed company will receive follow-  
14 on capital from a PVC is greater if the initial round is syndicated. It is possible that this result  
15 is driven by unobserved factors explaining both the syndication decisions and the receipt of  
16 subsequent PVC financing. For example, the quality of a deal is unobservable to us but is  
17 observable by the investors. High-quality investments are more likely to be syndicated and to  
18 receive follow-up on funding. To control for this potential endogeneity of the “Syndicate”  
19 variable, we resort to recursive bivariate probit models (see Greene, 2011, pp. 778-785 for  
20 details). These allow us to simultaneously estimate the conditional likelihood that the initial  
21 GVC round is a syndicated transaction and that the focal target company receives subsequent  
22 PVC financing. In the outcome regression, the dependent variable remains “additional PVC”.  
23 The dependent variable of the selection model is “Syndication”. We refer to the target’s age,  
24 high-tech status, GVC syndication experience and a new variable “Number of active PVC  
25 investors” as explanatory variables. “Number of active PVC investors” is defined as the

1 number of PVC funds with investment activity in the focal investee country and in the focal  
2 year. It captures the availability of potential private syndication partners for GVCs.

3 Table 11 presents the bivariate probit results. Expectedly, GVCs with greater  
4 syndication experience and those having deeper pools of potential syndication partners are  
5 more likely to syndicate. Furthermore, syndicates have a higher propensity to target high-tech  
6 investees. Table 11 confirms our previous results on the receipt of additional PVC. We also  
7 observe that the decision to syndicate is indeed affected by some unobserved heterogeneity.  
8 This is captured by the correlation coefficients ( $\rho$ ) between the error terms of the selection  
9 and outcome equations. These correlations are negative and significant in all specifications.  
10 This result indicates that unobserved factors that affect both the likelihood of syndication and  
11 additional PVC funding are negatively correlated. A failure to control for this should result in  
12 downward biased parameter estimates of the Syndication variable. This is exactly what we  
13 observe by comparing the results in Table 11 and in Table 6. We conclude that even if the  
14 decision to syndicate is endogenous, it will not affect the previously presented evidence on  
15 the impact of GVC program design features on the ability to bridge equity gaps.

16 [Insert Table 11: Effect of GVC design features on investees' receipt of additional PVC  
17 funding: bivariate probit model]

#### 18 5.4 *Alternative measures for underdeveloped regions, room for regulatory capture,* 19 *industry and syndication experience*

20 Table 12 reproduces the previous analyses using alternative measures of regional  
21 development, room for regulatory capture, industry focus, and syndicating tendency.

22 To measure regional development, we use the per capita GDP at the local (NUTS2)  
23 level instead of the “Regional Competitiveness Index”. The advantage of per capita GDP is  
24 that it varies over time. However, the disadvantage is that important pillars of the “Regional  
25 Competitiveness Index”, such as education or innovation scores, are ignored. Furthermore,

1 the variable has missing values because it is not reported for some regions, which results in a  
2 smaller sample size. Specifications I and III of Table 12 reveal that regional per capita GDP  
3 positively affects the chance of investees to raise PVC in a subsequent round. In  
4 specifications II and IV, we refer to underdeveloped regions as those where per capita GDP is  
5 lower than the national average using the variable “Underdeveloped Region (GDP)”. The  
6 specifications confirm that GVCs located and simultaneously investing in those  
7 underdeveloped regions are less likely to bridge equity gaps.

8 In specifications V and VI, we use an alternative measure of corruption that allows the  
9 inclusion of the “Regional Competitiveness Index” as a covariate. The variable “No limit on  
10 contributions to candidates” correlates only moderately (0.28) with the “Regional  
11 Competitiveness Index”. The specifications reveal that the joint effect of the higher  
12 likelihood of collusion in locally sourced transactions remains even after controlling for the  
13 competitiveness of the investee firm’s location.

14 Furthermore, we substitute “Industry experience” and “Syndication experience” with  
15 “Industry specialization” and “Syndication specialization”. These indicators are calculated  
16 using the respective experience measures but divided by the total number of deals of a  
17 particular GVC until the time of a focal transaction. In other terms, these new variables  
18 present percentages of investments carried out in a particular industry or together with a  
19 private syndicate partner. The specifications VII-X demonstrate the positive effect of both  
20 experience measures on the probability of bridging equity gaps.

21 [Insert Table 12: Effect of GVC design features on investees’ receipt of additional  
22 PVC funding: alternative measures for underdeveloped regions, regulatory capture, industry  
23 focus and syndication tendency.]

## 24 5.5 *Sample split*

1 In this section, we analyze the impact of the heterogeneity of our sample transactions  
2 on the ability of GVCs to bridge equity gaps. In the first step, we split high-tech and low-tech  
3 ventures. These investees are more strongly affected by information asymmetries (e.g., Martí  
4 and Quas, 2018) and have higher perceived investment risks. The task of GVCs to bridge  
5 equity gaps is therefore more important for this sector.

6 Table 13 presents the results. We find a strong negative impact of age for high-tech  
7 companies. “Syndicate” and “Regional competitiveness” have a positive impact of the same  
8 magnitude in the two subsamples. The negative influence of colocation is more severe in low  
9 technology transactions. Colocation is harmful in underdeveloped regions in both  
10 subsamples. Lastly, we find that GVC industry and syndication experience matter only in  
11 high-technology deals.

12 [Insert Table 13: Effect of GVC design features on investees’ receipt of additional PVC  
13 funding: high-tech sectors vs other sectors]

14 In the next step, we differentiate “seed and early-stage” from “later-stage” deals  
15 according to the judgements made by the providers of the sample data.<sup>9</sup> The probit regression  
16 results are presented in Table 14. The positive impact of syndicates and regional  
17 competitiveness is strong and significant across all specifications. However, the investee’s  
18 age and high-technology orientation are significant in early-stage transactions only. More  
19 importantly, the negative effect of colocation in underdeveloped regions, or in corrupted  
20 countries, and the positive impact of GVC industry and syndication experience are also  
21 driven by early-stage transactions.

22 [Insert Table 14: Effect of GVC design features on investees’ receipt of additional PVC  
23 funding: seed and early stages vs later stages]

---

<sup>9</sup> We also use the age of the firm at the time of the investment, with 6 years or older as a cutoff instead of the stage of development in an unreported robustness check. This classification splits our sample less evenly and reveals that the results are even stronger for the younger companies.





1 Murtinu (2014) find that GVC financing does not spur sales or employee growth of European  
2 YICs and argue that public interventions should focus on the creation of a favorable  
3 environment via indirect forms of support rather than by adopting a ‘hands-on-approach’.

4 GVC fund initiatives nevertheless exist and continuously grow in investment volume,  
5 especially in Europe. European market data reveal that 29% of the funds provided to back  
6 YICs come from government agencies.<sup>10</sup> The recent implementation of the European Fund  
7 for Strategic Investments (EFSI), whose official goal is to “close the investment gap caused  
8 by the financial and economic crisis”,<sup>11</sup> signals that this type of public intervention will  
9 sustain for some time.

10 For this reason, we focus on typical design features of GVC initiatives and the  
11 efficacy thereof. We analyze the impact of the location/colocation, syndication and industry  
12 focus design features on three success measures for 1230 GVC investments in 16 European  
13 countries. We find that GVC is less likely to accomplish its mission of “bridging the equity  
14 gap” if the investees are older and are located in economically lagging regions. Furthermore,  
15 GVC policies are less successful if targets are sourced locally. The negative effect is even  
16 stronger if the GVCs and the ventures are collocated in underdeveloped regions or in  
17 countries with higher perceived corruption. Syndication with private capital investors  
18 improves the chances of achieving the “bridging the gap” goals. Moreover, GVCs improve  
19 their skills by accumulating industry-specific knowledge and syndication experience. Our  
20 results hold regardless of the success measure we employ (the target’s receipt of an additional  
21 PVC funding, total asset growth, and innovation output). In addition, we verify our results  
22 with several robustness checks, including the analysis of the endogenous nature of  
23 syndication decisions.

---

<sup>10</sup> Invest Europe: European Private Equity Activity Report 2017, <https://www.investeurope.eu>.

<sup>11</sup> [https://ec.europa.eu/commission/sites/beta-political/files/juncker-plan-factsheet-july2018\\_en.pdf](https://ec.europa.eu/commission/sites/beta-political/files/juncker-plan-factsheet-july2018_en.pdf).

1           Our paper therefore contributes to the debate on how GVC initiatives can more  
2 effectively accomplish their goals. It is advised that future policy consider the detected  
3 strengths and weaknesses of some of the typical design features. While GVCs are the  
4 category of VC investors which is more likely to invest nearby (Bertoni et al., 2015), our first  
5 recommendation for policymakers is not to restrict GVCs to local investments, especially in  
6 underdeveloped regions. Localizing GVCs in underdeveloped regions limits their access to  
7 private capital investors, who are often not locally available and who are difficult to attract  
8 from more developed areas. Instead, promising YICs in underdeveloped regions should be  
9 supported by national GVC policies, which obviously can more easily exploit scale and  
10 learning effects, and can better link with private capital investors. Regardless of the level of  
11 local development, local GVC investments are more likely to be exposed to collusion and  
12 inefficiencies due to the political nature of GVCs (Bertoni and Quas, 2016; Liben-Nowell et  
13 al., 2005). Again, we recommend incentivizing geographically distant and diversified  
14 investments, which are less likely to be affected by regulatory capture. In sum, while  
15 geographical distance has a negative effect on PVC investments (e.g., Cumming and Dai,  
16 2010), we reveal that it may be beneficial for GVCs.

17           Our second recommendation to policymakers is to request GVCs to syndicate with  
18 PVCs whenever this is possible. Ample evidence has shown that syndicated PVC-GVC deals  
19 outperform solo GVC investments (e.g., Bertoni and Tykvová, 2015; Cumming et al., 2017).  
20 We extend our understanding by showing that the benefits of GVC/PVC syndication persist  
21 over the life of a GVC fund. GVCs benefit from their private partners' experience and  
22 improve their own selection and investment skills, which they can then use even when they  
23 invest alone to achieve investment success.

24           Third, and perhaps in contrast with the recommendation of other studies that address  
25 similar issues (Brown et al., 2017; Shane, 2009), we support the establishment of GVC funds

1 with a precise industry focus. We find that GVCs can and do learn from their own industry-  
2 specific experience and should therefore specialize rather than invest across many sectors.

3         The limitations of our analyses are mostly caused by the availability of the data, but  
4 they pave the way to interesting avenues for future research. First, we do not include  
5 information on other measures of success for our sample companies, such as their revenue,  
6 profits, or number of employees. Such measures would be relevant to assess whether GVCs  
7 are able to achieve their mission of supporting growth but are, unfortunately, difficult to  
8 collect for startups. Along the same line, it would be interesting to differentiate the  
9 commercial activities and innovativeness of the business plans of the GVC-backed ventures  
10 to sort out the selection and treatment effects of GVCs with different design features. We are  
11 further lacking qualitative data that could help assess the ability and the impact of  
12 entrepreneurs or GVC fund managers. Such data could allow us to test if GVC funds located  
13 in underdeveloped regions could also have difficulties in attracting skilled human capital.  
14 Additionally, there is heterogeneity among GVC programs and the funds themselves that are  
15 not captured by our data. It is possible, for example, that using different incentive schemes to  
16 attract fund managers affect the individual GVCs' achieved results. We are unable to control  
17 for these aspects but recognize them as interesting avenues for future research. Another  
18 important limitation is the European focus of our dataset. GVC programs targeted to YICs  
19 have been created elsewhere, such as in the US (Lerner, 2010), Canada (Cumming, 2007) and  
20 even China (Guan and Yam, 2015). Expanding the analysis of the design features of GVC  
21 programs to an international sample would certainly bear interesting results.

22         Further work is also warranted on some specific aspects linked with the design of  
23 GVCs. For instance, future studies could deepen our understanding of how precisely political  
24 distortions influence GVCs' investment decisions, especially in local deals. We contribute to  
25 the empirical evidence on the consequences of the PVC-GVC syndication, but further

1 analysis should tackle the drivers of such phenomena, specifically addressing the free-riding  
2 mechanisms and agency problems that may influence the relationship between public and  
3 private actors. Finally, while we only observe realized GVC investments, it would be  
4 interesting to have information on the actual demand for external equity from YICs and  
5 understand whether GVC funds step in after investees already solicited capital elsewhere but  
6 have been rejected or if they directly compete with the private sector. If they back ventures  
7 that failed to convince private investors but are able to raise private capital after the GVC  
8 contribution, then GVCs have a truly meaningful role to bridge such equity gaps.  
9

## 1 Bibliography

- 2 Ai, C., Norton, E.C., 2003. Interaction terms in logit and probit models. *Econ. Lett.* 80, 123–  
3 129. [https://doi.org/10.1016/S0165-1765\(03\)00032-6](https://doi.org/10.1016/S0165-1765(03)00032-6)
- 4 Akehurst, G., 1987. The Economics of Services: An Introduction, *The Service Industries*  
5 *Journal*. <https://doi.org/10.1080/02642068700000056>
- 6 Alperovych Y., Quas A., Standaert T., 2018. Direct and indirect Government Venture Capital  
7 investments in Europe. *Economics Bulletin*, 38(2), 1219-1230.
- 8 Alperovych, Y., Hübner, G., Lobet, F., 2015. How does Governmental versus Private  
9 Venture Capital Backing Affect a Firm's Efficiency? Evidence from Belgium. *J. Bus.*  
10 *Ventur.* 30, 508–525. <https://doi.org/10.1016/j.jbusvent.2014.11.001>
- 11 Annoni, P., Dijkstra, L., 2013. EU Regional Competitiveness Index - RCI 2013.  
12 <https://doi.org/10.2788/61698>
- 13 Arshed, N., Carter, S., Mason, C.M., 2014. The ineffectiveness of entrepreneurship policy: is  
14 policy formulation to blame? *Small Bus. Econ.* 43, 639–659.  
15 <https://doi.org/10.1007/s11187-014-9554-8>
- 16 Auerswald, P.E., Branscomb, L.M., 2003. Valleys of Death and Darwinian Seas: Financing  
17 the Invention to Innovation Transition in the United States. *J. Technol. Transf.* 28, 227–  
18 239. <https://doi.org/10.1023/A:1024980525678>
- 19 Becker, G.S., 1983. A Theory of Competition Among Pressure Groups for Political  
20 Influence. *Q. J. Econ.* 98, 371. <https://doi.org/10.2307/1886017>
- 21 Belleflamme, P., Lambert, T., Schwienbacher, A., 2014. Crowdfunding: Tapping the right  
22 crowd. *J. Bus. Ventur.* 29, 585–609. <https://doi.org/10.1016/j.jbusvent.2013.07.003>
- 23 Berger, A.N., Udell, G.F., 1998. The Economics of Small Business Finance: The Roles of  
24 Private Equity and Debt Markets in the Financial Growth Cycle. *J. Bank. Financ.* 22,  
25 613–673. [https://doi.org/10.1016/S0378-4266\(98\)00038-7](https://doi.org/10.1016/S0378-4266(98)00038-7)
- 26 Bernstein, S., Giroud, X., Townsend, R., 2016. The Impact of Venture Capital Monitoring. *J.*  
27 *Finance* 71, 1591–1622. <https://doi.org/10.1111/jofi.12370>
- 28 Bernstein, S., Korteweg, A., Laws, K., 2017. Attracting Early-Stage Investors: Evidence from  
29 a Randomized Field Experiment. *J. Finance* 72, 509–538.  
30 <https://doi.org/10.1111/jofi.12470>
- 31 Bertoni, F., Colombo, M.G., Quas, A., 2017. The Role of Governmental Venture Capital in  
32 the Venture Capital Ecosystem: An Organizational Ecology Perspective. *Entrep. Theory*  
33 *Pract.* In press, 1–19. <https://doi.org/10.1177/1042258717735303>
- 34 Bertoni, F., Colombo, M.G., Quas, A., 2015. The patterns of venture capital investment in  
35 Europe. *Small Bus. Econ.* 45, 543–560. <https://doi.org/10.1007/s11187-015-9662-0>
- 36 Bertoni, F., Groh, A.P., 2014. Cross-Border Investments and Venture Capital Exits in  
37 Europe. *Corp. Gov. An Int. Rev.* 22, 84–99. <https://doi.org/10.1111/corg.12056>
- 38 Bertoni, F., Quas, A., 2016. The Electoral Cycle of Government Venture Capital  
39 Investments. *SSRN Electron. J.* 1–39. <https://doi.org/10.2139/ssrn.2777169>
- 40 Bertoni, F., Tykvová, T., 2015. Does Governmental Venture Capital Spur Invention and  
41 Innovation? Evidence from Young European Biotech Companies. *Res. Policy* 44, 925–

- 1 935. <https://doi.org/10.1016/j.respol.2015.02.002>
- 2 Block, J.H., De Vries, G., Sandner, P., 2010. Venture capital and the financial crisis: an  
3 empirical study across industries and countries. *Handb. Ventur. Cap.*
- 4 Bottazzi, G., Coad, A., Jacoby, N., Secchi, A., 2011. Corporate growth and industrial  
5 dynamics: evidence from French manufacturing. *Appl. Econ.* 43, 103–116.  
6 <https://doi.org/10.1080/00036840802400454>
- 7 Brown, H., 2011. Marriage, BMI, and wages: a double selection approach. *Scott. J. Polit.*  
8 *Econ.* 58, 347–77.
- 9 Brown, R., Mawson, S., Mason, C.M., 2017. Myth-busting and entrepreneurship policy: the  
10 case of high growth firms. *Entrep. Reg. Dev.* 29, 414–443.  
11 <https://doi.org/10.1080/08985626.2017.1291762>
- 12 Bruton, G., Khavul, S., Siegel, D., Wright, M., 2015. New Financial Alternatives in Seeding  
13 Entrepreneurship: Microfinance, Crowdfunding, and Peer-to-Peer Innovations. *Entrep.*  
14 *Theory Pract.* 39, 9–26. <https://doi.org/10.1111/etap.12143>
- 15 Bubna, A., Das, S.R., Prabhala, N., 2019. Venture Capital Communities. *J. Financ. Quant.*  
16 *Anal.* 1–73. <https://doi.org/10.1017/S002210901900005X>
- 17 Carpenter, R.E., Petersen, B.C., 2002. Capital Market Imperfections, High-Tech Investment,  
18 and New Equity Financing. *Econ. J.* 112, F54–F72. [https://doi.org/10.1111/1468-](https://doi.org/10.1111/1468-0297.00683)  
19 [0297.00683](https://doi.org/10.1111/1468-0297.00683)
- 20 Casamatta, C., Haritchabalet, C., 2007. Experience, screening and syndication in venture  
21 capital investments. *J. Financ. Intermediation* 16, 368–398.  
22 <https://doi.org/10.1016/j.jfi.2007.03.003>
- 23 Chang, S.J., 2004. Venture capital financing, strategic alliances, and the initial public  
24 offerings of Internet startups. *J. Bus. Ventur.* 19, 721–741.  
25 <https://doi.org/10.1016/j.jbusvent.2003.03.002>
- 26 Chen, H., Gompers, P.A., Kovner, A., Lerner, J., 2010. Buy local? The geography of venture  
27 capital. *J. Urban Econ.* 67, 90–102. <https://doi.org/10.1016/j.jue.2009.09.013>
- 28 Chod, J., Lyandres, E., 2018. A Theory of ICOs: Diversification, Agency, and Information  
29 Asymmetry. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.3159528>
- 30 Clarysse, B., Bobelyn, A., del Aguirre, I.P., 2013. Learning from own and others' previous  
31 experience: The contribution of the venture capital firm to the likelihood of a portfolio  
32 company's trade sale. *Small Bus. Econ.* 40, 575–590. [https://doi.org/10.1007/s11187-](https://doi.org/10.1007/s11187-011-9381-0)  
33 [011-9381-0](https://doi.org/10.1007/s11187-011-9381-0)
- 34 Colombo, M.G., D'Adda, D., Quas, A., 2019. The geography of venture capital and  
35 entrepreneurial ventures' demand for external equity. *Res. Policy*, Unpublished  
36 manuscript 48, 1150–1170. <https://doi.org/10.1016/j.respol.2018.12.004>
- 37 Cortés, K.R., Lerner, J., 2013. Bridging the Gap? Government Subsidized Lending and  
38 Access to Capital. *Rev. Corp. Financ. Stud.* 2, 98–128.  
39 <https://doi.org/10.1093/rcfs/cft002>
- 40 Cosh, A., Cumming, D.J., Hughes, A., 2009. Outside Entrepreneurial Capital. *Econ. J.* 119,  
41 494–533. <https://doi.org/10.1111/j.1468-0297.2009.02270.x>
- 42 Cox, D., 1972. Regression models and life-tables. *J. R. Stat. Soc.* 34, 187–220.

- 1 Cressy, R., 2012. Funding gaps, in: Cumming, D. (Ed.), *The Oxford Handbook of*  
2 *Entrepreneurial Finance*. Oxford University Press, pp. 255–307.
- 3 Cressy, R., 2002. Funding gaps: a symposium. *Econ. J.* 112, F1–F16.  
4 <https://doi.org/10.1111/1468-0297.00680>
- 5 Criscuolo, C., Gal, P.N., Menon, C., 2014. The dynamics of employment growth: New  
6 evidence from 18 countries. *OECD Sci. Technol. Ind. Policy Pap. No. 14*, OE.  
7 <https://doi.org/10.1787/5jz417hj6hg6-en>
- 8 Cumming, D.J., 2007. Government policy towards entrepreneurial finance: Innovation  
9 investment funds. *J. Bus. Ventur.* 22, 193–235.  
10 <https://doi.org/10.1016/j.jbusvent.2005.12.002>
- 11 Cumming, D.J., Dai, N., 2010. Local bias in venture capital investments. *J. Empir. Financ.*  
12 17, 362–380. <https://doi.org/10.1016/j.jempfin.2009.11.001>
- 13 Cumming, D.J., Grilli, L., Murtinu, S., 2017. Governmental and independent venture capital  
14 investments in Europe: A firm-level performance analysis. *J. Corp. Financ.* 42, 439–459.  
15 <https://doi.org/10.1016/j.jcorpfin.2014.10.016>
- 16 Cumming, D.J., Macintosh, J.G., 2006. Crowding out private equity: Canadian evidence. *J.*  
17 *Bus. Ventur.* 21, 569–609. <https://doi.org/10.1016/j.jbusvent.2005.06.002>
- 18 Da Gbadji, L., Gailly, B., Schwienbacher, A., 2015. International Analysis of Venture Capital  
19 Programs of Large Corporations and Financial Institutions. *Entrep. Theory Pract.* 39,  
20 1213–1245. <https://doi.org/doi:10.1111/etap.12105>
- 21 Dal Bó, E., 2006. Regulatory Capture: A Review. *Oxford Rev. Econ. Policy* 22, 203–225.  
22 <https://doi.org/10.1093/oxrep/grj013>
- 23 Dal Bó, E., Rossi, M.A., 2007. Corruption and inefficiency: Theory and evidence from  
24 electric utilities. *J. Public Econ.* 91, 939–962.  
25 <https://doi.org/10.1016/j.jpubeco.2006.11.005>
- 26 de Figueiredo, R.J.P., Edwards, G., 2007. Does Private Money Buy Public Policy? Campaign  
27 Contributions and Regulatory Outcomes in Telecommunications. *J. Econ. Manag.*  
28 *Strateg.* 16, 547–576. <https://doi.org/10.1111/j.1530-9134.2007.00150.x>
- 29 Dimov, D.P., Shepherd, D.A., 2005. Human capital theory and venture capital firms:  
30 Exploring “home runs” and “strike outs.” *J. Bus. Ventur.* 20, 1–21.  
31 <https://doi.org/10.1016/j.jbusvent.2003.12.007>
- 32 Evans, D.S., 1987. The relationship between firm growth, size, and age: estimates for 100  
33 manufacturing industries. *J. Ind. Econ.* 35, 567–581.
- 34 Faccio, M., Hsu, H.C., 2017. Politically Connected Private Equity and Employment. *J.*  
35 *Finance* 72, 539–574. <https://doi.org/10.1111/jofi.12483>
- 36 Giot, P., Schwienbacher, A., 2007. IPOs, trade sales and liquidations: Modelling venture  
37 capital exits using survival analysis. *J. Bank. Financ.* 31, 679–702.  
38 <https://doi.org/10.1016/j.jbankfin.2006.06.010>
- 39 Gompers, P., Gornall, W., Kaplan, S., Strebulaev, I., 2016. How Do Venture Capitalists  
40 Make Decisions? Cambridge, MA. <https://doi.org/10.3386/w22587>
- 41 Greene, W.H., 2011. *Econometric Analysis*, 7 editirio. ed. Pearson.

- 1 Grilli, L., Murtinu, S., 2015. New Technology-Based Firms in Europe: Market Penetration,  
2 Public Venture Capital, and Timing of Investment. *Ind. Corp. Chang.* 24, 1109–1148.  
3 <https://doi.org/10.1093/icc/dtu025>
- 4 Grilli, L., Murtinu, S., 2014. Government, Venture Capital and the Growth of European  
5 High-tech Entrepreneurial Firms. *Res. Policy* 43, 1523–1543.  
6 <https://doi.org/10.1016/j.respol.2014.04.002>
- 7 Guan, J., Yam, R.C.M., 2015. Effects of government financial incentives on firms’  
8 innovation performance in China: Evidences from Beijing in the 1990s. *Res. Policy* 44,  
9 273–282. <https://doi.org/10.1016/J.RESPOL.2014.09.001>
- 10 Guerini, M., Quas, A., 2016. Governmental venture capital in Europe: Screening and  
11 certification. *J. Bus. Ventur.* 31, 175–195.  
12 <https://doi.org/10.1016/j.jbusvent.2015.10.001>
- 13 Heger, D., Fier, A., Murray, G.C., 2006. Review Essay: Regional Venture Capital Policy: UK  
14 and Germany Compared1. *Ventur. Cap.*
- 15 Hochberg, Y. V., Ljungqvist, A., Lu, Y., 2007. Whom you know matters: Venture capital  
16 networks and investment performance. *J. Finance* 62, 251–301.  
17 <https://doi.org/10.1111/j.1540-6261.2007.01207.x>
- 18 Howell, S., Niessner, M., Yermack, D., 2018. Initial Coin Offerings: Financing Growth with  
19 Cryptocurrency Token Sales. *SSRN Electron. J.* <https://doi.org/10.3386/w24774>
- 20 Ivanov, V.I., Xie, F., 2010. Do Corporate Venture Capitalists Add Value to Start-Up Firms?  
21 Evidence from IPOs and Acquisitions of VC-Backed Companies. *Financ. Manag.* 39,  
22 129–152. <https://doi.org/10.1111/j.1755-053X.2009.01068.x>
- 23 Jääskeläinen, M., Maula, M.V.J., Murray, G.C., 2007. Profit distribution and compensation  
24 structures in publicly and privately funded hybrid venture capital funds. *Res. Policy* 36,  
25 913–929. <https://doi.org/10.1016/j.respol.2007.02.021>
- 26 Kile, C.O., Phillips, M.E., 2009. Using Industry Classification Codes to Sample High-  
27 Technology Firms: Analysis and Recommendations. *J. Accounting, Audit. Financ.* 24,  
28 35–58. <https://doi.org/10.1177/0148558X0902400104>
- 29 Kovner, A., Lerner, J., 2015. Doing Well by Doing Good? Community Development Venture  
30 Capital. *J. Econ. Manag. Strateg.* 24, 643–663. <https://doi.org/10.1111/jems.12100>
- 31 Lance, C.E., 1988. Residual Centering, Exploratory and Confirmatory Moderator Analysis,  
32 and Decomposition of Effects in Path Models Containing Interactions. *Appl. Psychol.*  
33 *Meas.* 12, 163–175. <https://doi.org/10.1177/014662168801200205>
- 34 Lerner, J., 2010. The future of public efforts to boost entrepreneurship and venture capital.  
35 *Small Bus. Econ.* 35, 255–264. <https://doi.org/10.1007/s11187-010-9298-z>
- 36 Lerner, J., 2009. Boulevard of broken dreams: why public efforts to boost entrepreneurship  
37 and venture capital have failed--and what to do about it. Princeton University Press.
- 38 Lerner, J., 2002. When Bureaucrats Meet Entrepreneurs: The Design of Effective “Public  
39 Venture Capital” Programmes. *Econ. J.* 112, F73–F84. <https://doi.org/10.1111/1468-0297.00684>
- 40
- 41 Lerner, J., 1999. The Government as Venture Capitalist: The Long-Run Impact of the SBIR  
42 Program. *J. Bus.* 72, 285–318. <https://doi.org/10.3905/jpe.2000.319960>



- 1 Lerner, J., 1994. The Syndication of Venture Capital Investments. *Financ. Manag.* 23, 16–27.
- 2 Liben-Nowell, D., Novak, J., Kumar, R., Raghavan, P., Tomkins, A., 2005. Geographic  
3 routing in social networks. *Proc. Natl. Acad. Sci. U. S. A.* 102, 11623–8.  
4 <https://doi.org/10.1073/pnas.0503018102>
- 5 Lim, S., Kim, Y., 2015. How to Design Public Venture Capital Funds: Empirical Evidence  
6 from South Korea. *J. Small Bus. Manag.* 53, 843–867.  
7 <https://doi.org/10.1111/jsbm.12109>
- 8 Link, A.N., Scott, J.T., 2010. Government as entrepreneur: Evaluating the commercialization  
9 success of SBIR projects. *Res. Policy* 39, 589–601.  
10 <https://doi.org/10.1016/j.respol.2010.02.006>
- 11 Manigart S., Baeyens K., Van Hyfte, W., 2002. The survival of venture capital backed  
12 companies. *Venture Capital*, 4(2), 103-124.
- 13 Manigart, S., Lockett, A., Meuleman, M., Wright, M., Landstrom, H., Bruining, H.,  
14 Desbrieres, P., Hommel, U., 2006. Venture Capitalists' Decision to Syndicate. *Entrep.*  
15 *Theory Pract.* 30, 131–153. <https://doi.org/10.1111/j.1540-6520.2006.00115.x>
- 16 Martí, J., Quas, A., 2018. A beacon in the night: government certification of SMEs towards  
17 banks. *Small Bus. Econ.* 50, 397–413. <https://doi.org/10.1007/s11187-016-9828-4>
- 18 Mason, C., Brown, R., 2013. Creating good public policy to support high-growth firms.  
19 *Small Bus. Econ.* 40, 211–225. <https://doi.org/10.1007/s11187-011-9369-9>
- 20 Mason, C.M., 2016. Promoting high-growth entrepreneurship in peripheral regions: a critique  
21 of government sponsored venture capital funds. *Welsh Econ. Rev.* 24, 36–41.
- 22 Mason, C.M., Harrison, R.T., 2003. Closing the Regional Equity Gap? A Critique of the  
23 Department of Trade and Industry's Regional Venture Capital Funds Initiative. *Reg.*  
24 *Stud.* 37, 855–868. <https://doi.org/10.1080/0034340032000128767>
- 25 Mason, C.M., Harrison, R.T., 2001. "Investment Readiness": A Critique of Government  
26 Proposals to Increase the Demand for Venture Capital. *Reg. Stud.* 35, 663–668.  
27 <https://doi.org/10.1080/00343400120075939>
- 28 Mason, C.M., Pierrakis, Y., 2013. Venture Capital, the Regions and Public Policy: The  
29 United Kingdom since the Post-2000 Technology Crash. *Reg. Stud.* 47, 1156–1171.  
30 <https://doi.org/10.1080/00343404.2011.588203>
- 31 Mc Cahery, J., de Silanes, F.L., Schoenmaker, D., Staniscic, D., 2015. The European capital  
32 markets study: Estimating the financing gaps of SMEs. *Duisenb. Sch. Financ.* 1, 1–179.
- 33 Meuleman, M., De Maeseneire, W., 2012. Do R&D Subsidies Affect SMEs' Access to  
34 External Financing? *Res. Policy* 41, 580–591.  
35 <https://doi.org/10.1016/j.respol.2012.01.001>
- 36 Meza, D. De, Webb, D.C., 1987. Too Much Investment: A Problem of Asymmetric  
37 Information. *Q. J. Econ.* 102, 281. <https://doi.org/10.2307/1885064>
- 38 Mueller, C., Westhead, P., Wright, M., 2012. Formal venture capital acquisition: Can  
39 entrepreneurs compensate for the spatial proximity benefits of South East England and  
40 "star" golden-triangle universities? *Environ. Plan. A* 44, 281–296.  
41 <https://doi.org/10.1068/a44268>
- 42 Munari, F., Toschi, L., 2015. Assessing the impact of public venture capital programmes in

- 1 the United Kingdom: Do regional characteristics matter? *J. Bus. Ventur.* 30, 205–226.  
2 <https://doi.org/10.1016/j.jbusvent.2014.07.009>
- 3 Peltzman, S., 1976. Toward a more general theory of regulation. *J. Law Econ.* 19, 211–240.  
4 <https://doi.org/10.3386/w0133>
- 5 Schoenherr, D., 2018. Rise of a Network - Political Connections and Allocative Distortions.  
6 *J. Finance Forthcomin.* <https://doi.org/10.2139/ssrn.2480261>
- 7 Shane, S., 2009. Why encouraging more people to become entrepreneurs is bad public policy.  
8 *Small Bus. Econ.* 33, 141–149. <https://doi.org/10.1007/s11187-009-9215-5>
- 9 Sørensen, M., 2007. How Smart Is Smart Money? A Two-Sided Matching Model of Venture  
10 Capital. *J. Finance* 62, 2725–2762. <https://doi.org/10.1111/j.1540-6261.2007.01291.x>
- 11 Stiglitz, J.E., Weiss, A., 1981. Credit Rationing in Markets with imperfect Information. *Am.*  
12 *Econ. Rev.* 71, 393–409.
- 13 Tiwana, A., 2008. Does Interfirm Modularity Complement Ignorance? A Field Study of  
14 Software Outsourcing Alliances. *Strateg. Manag. J.* 29, 1241–1252.  
15 <https://doi.org/10.2307/20142093>
- 16 Ughetto, E., Scellato, G., Cowling, M., 2017. Cost of capital and public loan guarantees to  
17 small firms. *Small Bus. Econ.* 1–19. <https://doi.org/10.1007/s11187-017-9845-y>
- 18 Wilson, N., Wright, M., Kacer, M., 2018. The equity gap and knowledge-based fi rms. *J.*  
19 *Corp. Financ.* 50, 626–649. <https://doi.org/10.1016/j.jcorpfin.2017.12.008>
- 20 Wilson, N., Kacer, M., Wright, M., 2019. Understanding regional variations in equity and  
21 growth finance: An analysis of the demand and supply of equity finance in the UK  
22 regions. Unpublished working paper, available at SSRN:  
23 <https://ssrn.com/abstract=3252346>.
- 24 Worek, M., De Massis, A., Wright, M., Veider, V., 2018. Acquisitions, disclosed goals and  
25 firm characteristics: A content analysis of family and nonfamily firms. *Journal of Family*  
26 *Business Strategy*, 9(4), 250-267.

27

28

1 **Tables**

2

**Table 1: Distribution of GVCs by country**

<b>GVC country</b>	<b>N</b>	<b>%</b>
Austria	4	5.56
Belgium	6	8.33
Denmark	2	2.78
Estonia	1	1.39
Finland	1	1.39
France	5	6.94
Germany	5	6.94
Ireland	3	4.17
Italy	3	4.17
Netherlands	2	2.78
Norway	1	1.39
Poland	1	1.39
Portugal	1	1.39
Spain	6	8.33
Sweden	7	9.72
United Kingdom	24	33.33
<i>Total</i>	<i>72</i>	<i>100.00</i>

3

1 **Table 2: Distribution of GVC investments by investment period, age at the time of the investment,**  
 2 **country and industry of the target company**

<b>Investment year</b>	<b>N</b>	<b>%</b>	<b>Age at the time of the investment</b>	<b>N</b>	<b>%</b>
1995	4	0.33	0 years	293	23.82
1996-1997	14	1.14	1 year	233	18.94
1998-1999	32	2.60	2-3 years	280	22.76
2000-2001	92	7.48	4-5 years	136	11.06
2002-2003	150	12.20	6 years and older	288	23.42
2004-2005	237	19.27			
2006-2007	195	15.85			
2008-2009	226	18.37			
2010-2011	280	22.76			
<i>Total</i>	<i>1,230</i>	<i>100.00</i>	<i>Total</i>	<i>1,230</i>	<i>100.00</i>
<b>Stage of development</b>			<b>High-tech sectors</b>		
Seed and early stage	768	62.44	Yes	622	50.57
Later stages	462	37.56	No	608	49.43
<i>Total</i>	<i>1,230</i>	<i>100.00</i>	<i>Total</i>	<i>1,230</i>	<i>100.00</i>
<b>Company industry</b>		<b>N</b>	<b>%</b>	<b>Company country</b>	
Construction and Mining	63	5.12	Austria	22	1.79
Chemical Products	54	4.39	Belgium	74	6.02
Electric and Electronica	165	13.41	Denmark	94	7.64
Instruments	94	7.64	Estonia	11	0.89
Machinery	51	4.15	Finland	76	6.18
Pharmaceuticals	63	5.12	France	62	5.04
Other Manufacturing	111	9.02	Germany	230	18.70
Computer-related Services	235	19.11	Ireland	70	5.69
Engineering and R&D Services	135	10.98	Italy	36	2.93
Trade	48	3.90	Netherlands	62	5.04
Public Utilities	49	3.98	Poland	13	1.06
Other Business Services	92	7.48	Portugal	107	8.70
Other Services	70	5.69	Spain	66	5.37
			Sweden	127	10.33
			United Kingdom	180	14.63
<i>Total</i>	<i>1,230</i>	<i>100.00</i>	<i>Total</i>	<i>1,230</i>	<i>100.00</i>
<b>Presence of a PVC</b>		<b>N</b>	<b>%</b>		
Yes (Syndicated investment)	595	48.37			
No (GVC solo investment)	635	51.63			
<i>Total</i>	<i>1,230</i>	<i>100.00</i>			

3

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11

**Table 3: Summary statistics**

Time t refers to the year of the focal investment.

Variable	N	Mean	Median	Std Dev	Min	Max
Additional PVC	1230	0.317	0.000	0.466	0.000	1.000
Log of total asset growth (from t to t+3)	528	1.244	0.964	1.567	-4.074	7.992
Number of new patents (from t to t+3)	1150	1.360	0.000	3.797	0.000	54.000
High-tech	1230	0.506	1.000	0.500	0.000	1.000
Log of company age	1230	1.242	1.099	1.043	0.000	4.779
Regional competitiveness	1230	0.462	0.522	0.519	-0.858	1.192
Syndicate	1230	0.484	0.000	0.500	0.000	1.000
Local deal	1230	0.456	0.000	0.498	0.000	1.000
Corruption	1230	-7.878	-7.900	1.246	-9.700	-3.400
Syndication experience	1230	22.794	8.000	32.724	0.000	141.000
Industry experience	1230	6.202	2.000	10.911	0.000	67.000
Log of amount received (t)	861	1.253	1.008	1.053	0.001	5.612
Log of total assets (t-1)	528	6.269	6.092	2.261	0.000	14.754
Patent stock (t-1)	1150	0.710	0.000	4.670	0.000	96.000

**Table 4: Correlation matrix**

The correlation coefficients are computed using the maximum number of observations available. The bolded coefficients are significant at least at the 5% level. Time t refers to the year of the focal investment.

Variable	1	2	3	4	5	6	7	8	10	12
1 High-tech	1.00									
2 Log of company age	-0.14	1.00								
3 Regional competitiveness	<b>0.18</b>	<b>-0.11</b>	1.00							
4 Syndicate	<b>0.30</b>	-0.05	<b>0.14</b>	1.00						
5 Local deal	<b>-0.07</b>	0.05	<b>0.11</b>	-0.04	1.00					
6 Corruption	<b>-0.18</b>	<b>0.16</b>	<b>-0.61</b>	<b>-0.13</b>	-0.05	1.00				
7 Syndication experience	<b>0.16</b>	<b>-0.12</b>	<b>0.18</b>	<b>0.22</b>	<b>-0.11</b>	<b>-0.21</b>	1.00			
8 Industry experience	<b>0.19</b>	<b>-0.06</b>	-0.01	0.05	<b>-0.07</b>	-0.03	<b>0.64</b>	1.00		
10 Log of amount received (t)	<b>0.23</b>	<b>0.11</b>	<b>0.08</b>	<b>0.47</b>	-0.05	0.03	<b>0.07</b>	-0.03	1.00	
12 Log of total assets (t-1)	<b>-0.29</b>	<b>0.59</b>	<b>-0.26</b>	<b>-0.22</b>	0.06	<b>0.30</b>	<b>-0.19</b>	<b>-0.10</b>	<b>0.23</b>	1.00
14 Patent stock (t-1)	0.00	<b>0.18</b>	0.02	0.00	-0.04	0.00	-0.01	-0.03	0.06	<b>0.23</b>

1

**Table 5: Descriptive statistics of the syndicated and nonsyndicated deals**

2

The significance levels are \*:  $p < 0.10$ ; \*\*:  $p < 0.05$ ; and \*\*\*:  $p < 0.01$ . Time  $t$  refers to the year of the focal investment.

3

	Solo GVC investments			Syndicated investments			Difference T-test	
	Mean	Std Dev	N	Mean	Std Dev	N		
Additional PVC	0.192	0.394	635	0.450	0.498	595	0.258	***
Log of total asset growth (from $t$ to $t+3$ )	1.022	1.273	266	1.471	1.792	262	0.449	***
Number of new patents (from $t$ to $t+3$ )	0.697	2.257	590	2.059	4.828	560	1.362	***
Log of company age	1.289	1.183	635	1.191	0.868	595	-0.097	
High-tech	0.359	0.480	635	0.662	0.473	595	0.303	***
Regional competitiveness	0.390	0.576	635	0.539	0.437	595	0.149	***
Local deal	0.477	0.500	635	0.434	0.496	595	-0.044	
Corruption	-7.716	1.456	635	-8.051	0.943	595	-0.335	***
Industry experience	5.643	10.493	635	6.798	11.319	595	1.156	*
Syndication experience	15.729	26.149	635	30.333	37.088	595	14.604	***
Log of amount received ( $t$ )	0.689	0.756	376	1.690	1.044	0.689	0.756	***
Log of total assets ( $t-1$ )	6.758	2.331	266	5.773	2.076	262	-0.984	***
Patent stock ( $t-1$ )	0.705	5.488	590	0.716	3.618	560	0.011	

4

5

**Table 6: Effect of GVC design features on investees' receipt of additional PVC funding**

This table reports the coefficients and robust standard errors (in brackets) of probit regressions of our dependent variable "Additional PVC" on different sets of independent variables and controls. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01. Panel A includes all deals (1230 observations), while Panel B includes only solo GVC deals (635 observations). The average variance inflation factor (VIF) is always below the threshold of 5 except for the interaction models reported in columns VII, VIII, XVII and XVIII.

	I	II	III	IV	V	VI	VII	VIII	IX	X
Syndicated deals	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
<b>Panel A: all GVC deals</b>										
Log of company age	-0.190 *** (0.043)	-0.184 *** (0.043)	-0.172 *** (0.043)	-0.184 *** (0.043)	-0.196 *** (0.044)	-0.176 *** (0.043)	-0.177 *** (0.044)	-0.156 *** (0.045)	-0.167 *** (0.043)	-0.162 *** (0.043)
High-tech	0.474 *** (0.151)	0.473 *** (0.154)	0.489 *** (0.153)	0.482 *** (0.150)	0.500 *** (0.151)	0.475 *** (0.150)	0.477 *** (0.151)	0.432 *** (0.157)	0.496 *** (0.154)	0.501 *** (0.154)
Syndicate	0.750 *** (0.092)	0.745 *** (0.093)	0.754 *** (0.093)	0.757 *** (0.092)	0.743 *** (0.092)	0.742 *** (0.092)	0.743 *** (0.093)	0.662 *** (0.098)	0.762 *** (0.093)	0.742 *** (0.093)
Regional competitiveness		0.404 *** (0.085)	0.459 *** (0.090)						0.458 *** (0.090)	0.436 *** (0.091)
Local deal			-0.254 *** (0.088)	-0.187 ** (0.087)	-0.001 (0.105)	-0.223 ** (0.087)	-1.418 ** (0.588)	-2.022 *** (0.778)	-0.248 *** (0.088)	-0.243 *** (0.088)
Underdeveloped region				-0.051 (0.087)	0.164 (0.110)	-0.076 (0.087)	-0.051 (0.088)	-0.057 (0.104)		
Underdeveloped region * Local deal					-0.721 *** (0.197)					
Corruption						-0.126 *** (0.036)	-0.057 (0.049)	0.203 (0.173)		
Corruption * Local deal							-0.149 ** (0.072)	-0.230 ** (0.093)		
Industry experience									0.007 (0.004)	
Syndication experience										0.003 (0.002)
Constant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	No	No	Yes	No	No
N of observations	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230
Pseudo R <sup>2</sup>	0.173	0.186	0.192	0.176	0.184	0.183	0.185	0.208	0.193	0.194
Log pseudolikelihood	-635.03	-625.29	-621.11	-632.81	-626.62	-627.63	-625.82	-608.13	-619.91	-619.64

**Table 6: Effect of GVC design features on investees' receipt of additional PVC funding (continues)**

	XI Excluded	XII Excluded	XIII Excluded	XIV Excluded	XV Excluded	XVI Excluded	XVII Excluded	XVIII Excluded	IXX Excluded	XX Excluded
<b>Panel B: solo GVC deals</b>										
Log of company age	-0.163 *** (0.057)	-0.156 *** (0.057)	-0.144 ** (0.057)	-0.157 *** (0.057)	-0.158 *** (0.057)	-0.136 ** (0.057)	-0.135 ** (0.057)	-0.129 ** (0.060)	-0.127 ** (0.056)	-0.127 ** (0.057)
High-tech	0.421 ** (0.210)	0.391 * (0.214)	0.408 * (0.210)	0.435 ** (0.207)	0.437 ** (0.208)	0.399 * (0.208)	0.393 * (0.209)	0.317 (0.216)	0.426 ** (0.213)	0.411 * (0.212)
Regional competitiveness		0.396 *** (0.116)	0.500 *** (0.128)						0.518 *** (0.128)	0.464 *** (0.131)
Local deal			-0.360 *** (0.136)	-0.230 * (0.127)	-0.011 (0.157)	-0.297 ** (0.129)	-1.134 (0.740)	-1.872 * (0.981)	-0.332 ** (0.137)	-0.328 ** (0.138)
Underdeveloped region				0.007 (0.128)	0.273 (0.170)	-0.051 (0.129)	-0.026 (0.130)	0.003 (0.162)		
Underdeveloped region * Local deal					-0.823 *** (0.282)					
Corruption						-0.138 *** (0.044)	-0.092 (0.060)	0.066 (0.318)		
Corruption * Local deal							-0.105 (0.090)	-0.200 * (0.118)		
Industry experience									0.018 *** (0.006)	
Syndication experience										0.005 ** (0.003)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	No	No	Yes	No	No
N of observations	635	635	635	635	635	635	635	635	635	635
Pseudo R <sup>2</sup>	0.152	0.166	0.177	0.157	0.168	0.168	0.17	0.191	0.188	0.183
Log pseudolikelihood	-263.55	259.21	-255.84	-261.99	258.39	-258.49	-257.95	251.38	-252.30	-253.99



**Table 7: Effect of GVC design features on investees' total asset growth**

This table reports the coefficients and robust standard errors (in brackets) of the random effect panel regressions of the dependent variable “Log of total asset growth” on different sets of independent variables and controls. Standard errors are clustered around VC names. Industry, time and country fixed effects, as well as a constant term, are included in all estimates. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01.

	I	II	III	IV	V	VI	VII	VIII	IX	X
	Included	Included	Included	Included	Included	Excluded	Excluded	Excluded	Excluded	Excluded
Syndicated deals										
Log of company age	-0.036 (0.041)	-0.033 (0.042)	-0.039 (0.042)	-0.016 (0.039)	0.003 (0.039)	-0.027 (0.056)	-0.025 (0.055)	-0.031 (0.054)	-0.013 (0.050)	-0.011 (0.051)
High-tech	-0.174 ** (0.078)	-0.182 ** (0.077)	-0.193 ** (0.075)	-0.165 ** (0.077)	-0.156 ** (0.076)	-0.039 (0.082)	-0.043 (0.082)	-0.063 (0.081)	-0.024 (0.082)	-0.031 (0.081)
Log of amount received (t)	0.164 *** (0.016)	0.163 *** (0.016)	0.162 *** (0.016)	0.162 *** (0.017)	0.162 *** (0.017)	0.111 ** (0.052)	0.110 ** (0.052)	0.110 ** (0.052)	0.106 ** (0.052)	0.106 ** (0.051)
Log total assets (t-1)	-0.204 *** (0.043)	-0.204 *** (0.043)	-0.204 *** (0.043)	-0.206 *** (0.044)	-0.205 *** (0.043)	-0.172 *** (0.046)	-0.171 *** (0.045)	-0.173 *** (0.045)	-0.169 *** (0.045)	-0.168 *** (0.044)
Syndicate	-0.032 (0.047)	-0.032 (0.048)	-0.030 (0.048)	-0.038 (0.048)	-0.052 (0.045)					
Regional competitiveness				0.172 *** (0.052)	0.163 *** (0.047)				0.135 * (0.075)	0.124 * (0.066)
Local deal	-0.060 (0.059)	-0.024 (0.052)	-0.692 *** (0.236)	-0.046 (0.058)	-0.034 (0.054)	-0.095 (0.081)	-0.081 (0.064)	-0.731 *** (0.272)	-0.097 * (0.054)	-0.084 (0.055)
Underdeveloped region	-0.111 * (0.057)	-0.082 * (0.043)	-0.076 * (0.044)			-0.038 (0.068)	-0.026 (0.061)	-0.003 (0.063)		
Underdeveloped region * Local deal	0.150 (0.093)					0.067 (0.151)				
Corruption		-0.021 (0.073)	0.025 (0.080)				-0.005 (0.064)	0.039 (0.070)		
Corruption * Local deal			-0.085 *** (0.031)					-0.083 ** (0.038)		
Industry experience				0.006 *** (0.001)					0.005 ** (0.002)	
Syndication experience					0.003 *** (0.001)					0.001 (0.001)
N of observations	3041	3041	3041	3041	3041	1166	1166	1166	1166	1166
N of companies	519	519	519	519	519	193	193	193	193	193
R <sup>2</sup>	0.156	0.155	0.156	0.16	0.164	0.186	0.186	0.189	0.192	0.19

**Table 8: Effect of GVC design features on investees' patenting activities**

This table reports the coefficients and robust standard errors (in brackets) of the negative binomial regressions of the dependent variable "Number of new patents" on different sets of independent variables and controls. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01. Industry and time fixed effects, as well as a constant term, are included in all estimates.

	I	II	III	IV	V	VI	VII	VIII	IX	X
Syndicated deals	Included	Included	Included	Included	Included	Excluded	Excluded	Excluded	Excluded	Excluded
Log of company age	-0.078 (0.070)	-0.029 (0.071)	-0.041 (0.071)	-0.057 (0.069)	-0.066 (0.068)	0.009 (0.098)	0.076 (0.099)	0.072 (0.099)	0.014 (0.102)	0.007 (0.101)
High-tech	0.108 (0.209)	0.152 (0.207)	0.149 (0.208)	0.107 (0.203)	0.107 (0.203)	0.638 ** (0.286)	0.709 *** (0.272)	0.697 ** (0.275)	0.596 ** (0.274)	0.619 ** (0.272)
Patent stock	0.118 *** (0.030)	0.110 *** (0.028)	0.109 *** (0.029)	0.118 *** (0.030)	0.118 *** (0.031)	0.092 *** (0.033)	0.089 *** (0.034)	0.088 *** (0.033)	0.095 ** (0.039)	0.097 ** (0.040)
Syndicate	0.908 *** (0.138)	0.894 *** (0.139)	0.893 *** (0.138)	0.906 *** (0.137)	0.928 *** (0.136)					
Regional competitiveness				0.346 ** (0.136)	0.366 *** (0.137)				0.501 ** (0.198)	0.538 *** (0.202)
Local deal	0.067 (0.166)	-0.175 (0.136)	-1.775 * (0.939)	-0.294 ** (0.132)	-0.307 ** (0.133)	-0.022 (0.250)	-0.466 ** (0.207)	-1.169 (1.167)	-0.542 *** (0.208)	-0.559 *** (0.211)
Underdeveloped region	0.468 *** (0.178)	0.241 * (0.140)	0.270 * (0.143)			0.665 *** (0.256)	0.175 (0.202)	0.202 (0.212)		
Underdeveloped region * Local deal	-0.645 ** (0.265)					-1.102 ** (0.441)				
Corruption		-0.171 *** (0.058)	-0.087 (0.083)				-0.242 *** (0.070)	-0.204 ** (0.098)		
Corruption * Local deal			-0.201 * (0.116)					-0.089 (0.143)		
Industry experience				-0.007 (0.010)					-0.018 (0.012)	
Syndication experience					-0.004 (0.003)					-0.004 (0.004)
ln $\alpha$	1.014 *** (0.093)	1.008 *** (0.093)	0.999 *** (0.093)	1.021 *** (0.092)	1.018 *** (0.091)	1.082 *** (0.155)	1.058 *** (0.154)	1.053 *** (0.155)	1.099 *** (0.148)	1.103 *** (0.147)
N of observations	1150	1150	1150	1150	1150	590	590	590	590	590
Pseudo R <sup>2</sup>	0.085	0.087	0.088	0.085	0.085	0.098	0.101	0.102	0.098	0.097
Log likelihood	-1445.872	-1443.697	-1441.995	-1446.581	-1446.004	-524.121	-522.22	-522.039	-524.063	-524.63

**Table 9: Effect of GVC design features on investees' receipt of additional PVC funding: controlling for the amount injected in the GVC round**

This table reports the coefficients and robust standard errors (in brackets) of the probit regressions of our dependent variable “Additional PVC” on different sets of independent variables and controls. Industry and time fixed effects, as well as a constant term, are included in all models. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01. Columns 1-VI include all deals, while columns VII-X include only solo GVC deals. The average VIF is always below the threshold of 5 in all models.

	I	II	III	IV	V	VI	VII	VIII	IX	X
	Included	Included	Included	Included	Included	Excluded	Excluded	Excluded	Excluded	Excluded
Syndicated deals										
Log of company age	-0.228 *** (0.054)	-0.213 *** (0.054)	-0.215 *** (0.055)	-0.211 *** (0.054)	-0.213 *** (0.054)	-0.160 ** (0.075)	-0.137 * (0.077)	-0.137 * (0.077)	-0.141 * (0.078)	-0.138 * (0.078)
High-tech	0.482 *** (0.187)	0.446 ** (0.186)	0.449 ** (0.187)	0.460 ** (0.188)	0.458 ** (0.187)	0.489 * (0.263)	0.407 (0.265)	0.405 (0.265)	0.430 (0.268)	0.410 (0.269)
Regional competitiveness				0.395 *** (0.101)	0.391 *** (0.103)				0.525 *** (0.150)	0.475 *** (0.155)
Log of amount received	0.209 *** (0.055)	0.231 *** (0.055)	0.228 *** (0.055)	0.214 *** (0.054)	0.212 *** (0.054)	0.140 (0.111)	0.185 * (0.111)	0.178 (0.112)	0.198 * (0.112)	0.197 * (0.110)
Syndicate	0.331 *** (0.117)	0.309 *** (0.117)	0.317 *** (0.118)	0.347 *** (0.117)	0.341 *** (0.117)					
Local deal	0.068 (0.123)	-0.180 * (0.102)	-1.435 ** (0.699)	-0.224 ** (0.100)	-0.225 ** (0.100)	0.087 (0.200)	-0.305 * (0.161)	-1.096 (1.002)	-0.289 * (0.168)	-0.281 * (0.169)
Underdeveloped region	0.291 ** (0.135)	0.007 (0.106)	0.036 (0.107)			0.368 (0.224)	-0.153 (0.166)	-0.118 (0.172)		
Underdeveloped region * Local deal	-0.872 *** (0.235)					-1.552 *** (0.404)				
Corruption		-0.138 *** (0.043)	-0.059 (0.065)				-0.197 *** (0.060)	-0.146 (0.094)		
Corruption * Local deal			-0.156 * (0.086)					-0.099 (0.123)		
Industry experience				0.005 (0.005)					0.014 * (0.007)	
Syndication experience					0.001 (0.002)					0.005 * (0.003)
N of observations	861	861	861	861	861	376	376	376	376	376
Pseudo R <sup>2</sup>	0.186	0.182	0.185	0.187	0.186	0.189	0.178	0.179	0.186	0.183
Log pseudolikelihood	-466.80	-468.78	-467.25	-466.13	-466.47	-172.42	-174.76	-174.44	-173.06	-173.55

**Table 10: Effect of GVC design features on investees' receipt of additional PVC funding: Cox (1972) regressions**

This table reports the estimated coefficients and the robust standard errors (in brackets) of Cox (1972) event history-type models. The dependent variable is always "Additional PVC." The time until the event is defined by the number of days since the seed-financing round. Industry and time fixed effects are included in all models. We use Efron's (1977) correction for ties. The significance levels are \*:  $p < 0.10$ ; \*\*:  $p < 0.05$ ; and \*\*\*:  $p < 0.01$ .

	I	II	III	IV	V	VI	VII	VIII	IX	X
	Included	Included	Included	Included	Included	Excluded	Excluded	Excluded	Excluded	Excluded
Syndicated deals										
Log of company age	-0.279 *** (0.057)	-0.259 *** (0.058)	-0.260 *** (0.058)	-0.247 *** (0.057)	-0.243 *** (0.058)	-0.291 *** (0.093)	-0.264 *** (0.095)	-0.264 *** (0.095)	-0.251 *** (0.092)	-0.256 *** (0.093)
High-tech	0.534 ** (0.210)	0.485 ** (0.201)	0.482 ** (0.200)	0.538 *** (0.207)	0.539 *** (0.206)	0.552 * (0.313)	0.491 (0.310)	0.478 (0.306)	0.591 * (0.310)	0.569 * (0.314)
Regional competitiveness				0.610 *** (0.122)	0.588 *** (0.124)				0.788 *** (0.208)	0.722 *** (0.211)
Local deal	0.016 (0.133)	-0.257 ** (0.110)	-1.841 ** (0.795)	-0.323 *** (0.112)	-0.318 *** (0.112)	0.018 (0.247)	-0.373 * (0.199)	-2.451 * (1.307)	-0.464 ** (0.209)	-0.458 ** (0.209)
Syndicate	0.951 *** (0.130)	0.959 *** (0.128)	0.956 *** (0.128)	0.970 *** (0.129)	0.953 *** (0.129)					
Underdeveloped region	0.238 * (0.138)	-0.034 (0.111)	-0.003 (0.113)			0.394 (0.249)	-0.036 (0.202)	0.029 (0.204)		
Underdeveloped region * Local deal	-0.895 *** (0.279)					-1.105 ** (0.479)				
Corruption		-0.187 *** (0.046)	-0.097 (0.064)				-0.219 *** (0.071)	-0.116 (0.089)		
Corruption * Local deal			-0.194 ** (0.096)					-0.252 (0.154)		
Industry experience				0.010 (0.006)					0.026 *** (0.008)	
Syndication experience					0.004 * (0.002)					0.008 ** (0.004)
N of observations	1,230	1,230	1,230	1,230	1,230	635	635	635	635	635
Pseudo R <sup>2</sup>	0.054	0.054	0.055	0.057	0.057	0.073	0.074	0.076	0.083	0.081
Log pseudolikelihood	-2536.6	-2535.3	-2533.5	-2528.1	-2527.8	-712.8	-711.6	-710.3	-705.0	-706.6

**Table 11: Effect of GVC design features on investees' receipt of additional PVC funding: bivariate probit model**

This table reports the coefficients and robust standard errors (in brackets) of the bivariate probit regressions of the dependent variables "Syndicate" and "Additional PVC" on different sets of independent variables and controls. Industry and time fixed effects, as well as a constant term, are included in all models. The analysis includes the full sample of 1,230 observations. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01.

	I	II	III	IV	V
<b>Dependent variable: Syndicate</b>					
Company age (log)	0.053 (0.039)	0.051 (0.039)	0.052 (0.039)	0.053 (0.039)	0.053 (0.039)
High-tech	0.683 *** (0.154)	0.689 *** (0.154)	0.691 *** (0.154)	0.695 *** (0.154)	0.695 *** (0.154)
Number of active PVC investors	0.004 *** (0.001)	0.004 *** (0.001)	0.004 *** (0.001)	0.004 *** (0.001)	0.004 *** (0.001)
Syndication experience	0.006 *** (0.001)	0.006 *** (0.001)	0.006 *** (0.001)	0.006 *** (0.002)	0.006 *** (0.002)
<b>Dependent variable: Additional PVC</b>					
Company age (log)	-0.173 *** (0.040)	-0.156 *** (0.040)	-0.157 *** (0.040)	-0.158 *** (0.041)	-0.157 *** (0.041)
High-tech	0.134 (0.161)	0.108 (0.160)	0.117 (0.163)	0.201 (0.188)	0.197 (0.190)
Regional competitiveness				0.381 *** (0.089)	0.375 *** (0.088)
Local deal	0.049 (0.090)	-0.142 * (0.077)	-1.035 ** (0.521)	-0.180 ** (0.083)	-0.178 ** (0.083)
Syndicates	1.782 *** (0.155)	1.790 *** (0.158)	1.778 *** (0.169)	1.647 *** (0.267)	1.651 *** (0.269)
Underdeveloped region	0.120 (0.094)	-0.088 (0.075)	-0.070 (0.076)		
Underdeveloped regions * Local deal	-0.628 *** (0.173)				
Corruption		-0.110 *** (0.032)	-0.058 (0.044)		
Corruption * Local deal			-0.111 * (0.064)		
Industry experience				0.002 (0.005)	
Syndication experience					0.001 (0.002)
Chi2 of the significance of Rho	14.91 ***	13.78 ***	12.17 ***	5.38 **	5.40 **
N	1230	1230	1230	1230	1230
Log pseudolikelihood	-1322.07	-1323.14	-1321.82	-1318.88	-1318.97

**Table 12: Effect of GVC design features on investees' receipt of additional PVC funding: alternative measures for underdeveloped regions, regulatory capture, industry focus and syndication tendency**

This table reports the coefficients and robust standard errors (in brackets) of the probit regressions of our dependent variable "Additional PVC" on different sets of independent variables and controls. Industry and time fixed effects, as well as a constant term, are included in all models. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01.

	I	II	III	IV	V	VI	VII	VIII	IX	X
	Included	Included	Excluded	Excluded	Included	Excluded	Included	Excluded	Included	Excluded
Syndicated deals										
Company age (log)	-0.188 *** (0.046)	-0.189 *** (0.046)	-0.139 ** (0.060)	-0.127 ** (0.059)	-0.174 *** (0.043)	-0.145 ** (0.057)	-0.173 *** (0.043)	-0.152 *** (0.057)	-0.179 *** (0.044)	-0.142 ** (0.057)
High-tech	0.489 *** (0.159)	0.499 *** (0.160)	0.471 ** (0.219)	0.462 ** (0.219)	0.478 *** (0.154)	0.368 * (0.214)	0.465 *** (0.154)	0.387 * (0.213)	0.469 *** (0.153)	0.381 * (0.210)
Local per capita GDP	0.013 *** (0.003)		0.012 ** (0.005)							
Local deal	-0.316 *** (0.096)	-0.019 (0.119)	-0.331 ** (0.143)	-0.020 (0.192)	0.057 (0.158)	0.166 (0.240)	-0.263 *** (0.088)	-0.363 *** (0.136)	-0.283 *** (0.090)	-0.361 *** (0.137)
Syndicates	0.743 *** (0.095)	0.737 *** (0.096)			0.749 *** (0.093)		0.768 *** (0.093)		0.654 *** (0.095)	
Underdeveloped region (GDP)		-0.048 (0.112)		0.120 (0.170)						
Underdeveloped region (GDP) *		-0.492 *** (0.181)		-0.447 * (0.265)						
Local deal										
Regional competitiveness					0.433 *** (0.093)	0.476 *** (0.132)	0.475 *** (0.090)	0.504 *** (0.130)	0.449 *** (0.092)	0.446 *** (0.133)
No limit on contributions to candidates					0.256 * (0.139)	0.290 (0.211)				
No limit on contributions * Local deal					-0.451 ** (0.188)	-0.789 *** (0.283)				
Industry specialization							0.613 ** (0.255)	0.670 * (0.387)		
Syndicating specialization									0.624 *** (0.142)	0.407 * (0.227)
N of observations	1149	1149	584	584	1230	635	1230	635	1230	635
Pseudo R <sup>2</sup>	0.183	0.182	0.155	0.152	0.195	0.189	0.195	0.181	0.204	0.182
Log pseudolikelihood	-587.27	-588.32	-238.89	-239.62	-618.28	-251.92	-618.67	-254.60	-611.65	-254.27

**Table 13: Effect of GVC design features on investees' receipt of additional PVC funding: high-tech sectors vs other sectors**

This table reports the coefficients and robust standard errors (in brackets) of the probit regressions of our dependent variable “Additional PVC” on different sets of independent variables and controls. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01. Columns I-IV include deals in high-tech sectors, while columns V-VIII include deals in other sectors. Industry and time fixed effects, as well as a constant term, are included in all estimates.

Sample	I High-tech	II High-tech	III High-tech	IV High-tech	V Others	VI Others	VII Others	VIII Others
Company age (log)	-0.365 *** (0.073)	-0.365 *** (0.073)	-0.330 *** (0.072)	-0.340 *** (0.072)	-0.099 * (0.053)	-0.066 (0.054)	-0.060 (0.054)	-0.052 (0.054)
Syndicates	0.766 *** (0.126)	0.766 *** (0.128)	0.773 *** (0.129)	0.758 *** (0.129)	0.691 *** (0.150)	0.687 *** (0.149)	0.692 *** (0.148)	0.676 *** (0.148)
Regional competitiveness			0.381 *** (0.140)	0.395 *** (0.140)			0.477 *** (0.125)	0.461 *** (0.129)
Local deal	0.200 (0.140)	-1.312 (1.043)	-0.098 (0.121)	-0.113 (0.120)	-0.157 (0.160)	-1.291 * (0.727)	-0.345 ** (0.140)	-0.346 ** (0.139)
Underdeveloped regions	0.386 *** (0.144)	0.169 (0.120)			-0.079 (0.180)	-0.341 ** (0.143)		
Underdeveloped regions * Local deal	-0.817 *** (0.269)				-0.792 ** (0.342)			
Corruption		-0.040 (0.085)				-0.093 (0.062)		
Corruption * Local deal		-0.157 (0.127)				-0.114 (0.091)		
Industry experience			0.014 *** (0.005)				-0.001 (0.011)	
Syndication experience				0.003 * (0.002)				0.002 (0.003)
N of observations	622	622	622	622	608	608	608	608
Pseudo R <sup>2</sup>	0.17	0.165	0.177	0.172	0.175	0.181	0.179	0.18
Log likelihood	-354.77	-356.77	-351.41	-353.60	-242.18	-240.41	-240.83	-240.58

**Table 14: Effect of GVC design features on investees' receipt of additional PVC funding: seed and early stages vs later stages**

This table reports the coefficients and robust standard errors (in brackets) of the probit regressions of our dependent variable “Additional PVC” on different sets of independent variables and controls. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01. Columns I-IV include deals in the early stages of development, while columns V-VIII include deals in the later stages of development. Industry and time fixed effects, as well as a constant term, are included in all estimates.

Sample	I Early stage	II Early stage	III Early stage	IV Early stage	V Later stage	VI Later stage	VII Later stage	VIII Later stage
Company age (log)	-0.245 *** (0.077)	-0.236 *** (0.078)	-0.212 *** (0.075)	-0.209 *** (0.076)	-0.095 (0.062)	-0.067 (0.062)	-0.089 (0.063)	-0.098 (0.063)
High-tech	0.585 *** (0.194)	0.523 *** (0.193)	0.571 *** (0.194)	0.591 *** (0.196)	0.270 (0.270)	0.272 (0.275)	0.255 (0.273)	0.250 (0.273)
Syndicates	0.800 *** (0.113)	0.809 *** (0.115)	0.815 *** (0.114)	0.786 *** (0.115)	0.698 *** (0.172)	0.679 *** (0.171)	0.738 *** (0.173)	0.764 *** (0.177)
Regional competitiveness			0.407 *** (0.119)	0.369 *** (0.121)			0.570 *** (0.139)	0.590 *** (0.139)
Local deal	0.103 (0.131)	-2.139 ** (0.856)	-0.192 * (0.113)	-0.174 (0.112)	-0.148 (0.191)	-0.578 (0.864)	-0.282 * (0.158)	-0.263 * (0.155)
Underdeveloped regions	0.302 ** (0.131)	0.070 (0.110)			-0.155 (0.229)	-0.280 * (0.166)		
Underdeveloped regions * Local deal	-0.947 *** (0.252)				-0.253 (0.344)			
Corruption		-0.016 (0.068)				-0.154 * (0.083)		
Corruption * Local deal		-0.244 ** (0.105)				-0.037 (0.109)		
Industry experience			0.009 * (0.005)				-0.002 (0.011)	
Syndication experience				0.005 ** (0.002)				-0.004 (0.004)
N of observations	768	768	768	768	462	462	462	462
Pseudo R <sup>2</sup>	0.177	0.175	0.179	0.182	0.213	0.227	0.235	0.237
Log likelihood	-418.35	-419.629	-417.729	-416.211	-190.925	-187.56	-185.613	-185.01



**Table 15: Effect of GVC design features on investees' receipt of additional PVC funding: before vs after the global financial crisis**

This table reports the coefficients and robust standard errors (in brackets) of the probit regressions of our dependent variable "Additional PVC" on different sets of independent variables and controls. The significance levels are \*: p<0.10; \*\*: p<0.05; and \*\*\*: p<0.01. Columns I-IV include deals carried out before 2008, while columns V-VIII include deals carried out since 2008. Industry and time fixed effects, as well as a constant term, are included in all estimates.

Sample	I Before 2008	II Before 2008	III Before 2008	IV Before 2008	V Since 2008	VI Since 2008	VII Since 2008	VIII Since 2008
Company age (log)	-0.132 ** (0.053)	-0.112 ** (0.054)	-0.119 ** (0.054)	-0.115 ** (0.053)	-0.318 *** (0.077)	-0.334 *** (0.078)	-0.277 *** (0.077)	-0.270 *** (0.078)
High-tech	0.607 *** (0.188)	0.568 *** (0.190)	0.586 *** (0.190)	0.578 *** (0.189)	0.136 (0.292)	0.178 (0.285)	0.209 (0.293)	0.203 (0.290)
Syndicates	0.727 *** (0.117)	0.713 *** (0.117)	0.754 *** (0.117)	0.738 *** (0.116)	0.642 *** (0.138)	0.628 *** (0.139)	0.622 *** (0.138)	0.605 *** (0.138)
Regional competitiveness			0.505 *** (0.107)	0.482 *** (0.108)			0.168 (0.145)	0.155 (0.149)
Local deal	0.032 (0.134)	-1.112 (0.733)	-0.174 (0.113)	-0.162 (0.115)	0.075 (0.161)	-1.828 * (1.027)	-0.234 * (0.133)	-0.226 * (0.135)
Underdeveloped regions	-0.024 (0.160)	-0.300 ** (0.122)			0.461 *** (0.153)	0.272 ** (0.132)		
Underdeveloped regions * Local deal	-0.491 * (0.256)				-0.889 *** (0.333)			
Corruption		-0.188 *** (0.067)				0.163 ** (0.078)		
Corruption * Local deal		-0.112 (0.090)				-0.214 * (0.130)		
Industry experience			0.014 (0.010)				0.006 (0.005)	
Syndication experience				0.001 (0.004)				0.002 (0.002)
N of observations	724	724	724	724	506	506	506	506
Pseudo R <sup>2</sup>	0.22	0.245	0.233	0.231	0.134	0.129	0.122	0.121
Log likelihood	-353.22	-341.84	-347.19	-348.25	-273.38	-275.00	-277.22	-277.40

**Figure 1: AME of the local deals for different levels of corruption and a 95% confidence interval**

