

# **Creating Innovation Markets: Government Venture Capital in Europe**

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## Abstract

*Under what circumstances do government venture capital programmes (GVCs) successfully catalyse the growth of entrepreneurial ecosystems?* Debates have long raged in political science and economics on the role of the state in innovation. The rise of GVC introduces new data points and examples on the effectiveness of industrial policy. Through four case studies, this thesis looks in depth at what models of GVC have or have not worked in the European setting, which has been one of the most active laboratories for trialling such policies. It argues that GVC in continental Europe has been most effective when the state invested public resources to *create innovation markets*. These government agencies, it is argued, take on the role of a “Market Creator State,” which is a highly interventionist approach, but one which does not “pick the winners” nor directs top-down public investment towards “missions.” Instead, the Market Creator State invests alongside private actors, with a focus on developing horizontal innovation capabilities. This theory thus introduces a new model of state intervention. It argues that this industrial policy in Europe *has not sought to create technologies* to be exploited by existing market forces, but rather *has created institutions* to make innovation markets work. This “third model” transcends the dichotomy in the literature between a neoliberal “laissez faire” approach relying on existing comparative advantages and traditional industrial policies where states picked winners and target industries. This theory of the state as Market Creator thus has practical implications for policymakers, both for designing effective GVC programmes and for envisioning the role states can have in tackling the grand technological challenges that Europe faces.

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## Chapter 1 Introduction

“I want France to be a start-up nation” declared Emmanuel Macron in 2017.<sup>1</sup> Two years later, he announced a pledge of five billion euros in government financing for venture capital and start-ups. That same year, the British government proposed a new national fund to close a four billion pounds funding gap for early-stage businesses to “help cutting-edge British start-ups become world-leading unicorns.”<sup>2</sup> The Spanish government introduced the High Commissioner for Spain Entrepreneurial Nation and Italy launched a National Innovation Fund, with the minister claiming that public venture capital “should go from being a niche, to becoming central to industrial policies.”<sup>3</sup> This quotation is indeed a good summary of the trend in Europe in the decade since the Global Financial Crisis. Innovation and start-ups have gained prominence across Europe and quickly gathered increasing attention from policymakers. As the Covid-19 crisis hit, governments have responded by further scaling up their pledges of support to growing European entrepreneurial ecosystems.<sup>4</sup> Between 2010 and 2020, the governments of major European economies have cumulatively invested over seven billion euros directly into the continent’s start-ups (Invest Europe data); at least as many public resources have reached the ecosystem indirectly via private venture capitalists (PVCs).

However, the question of whether these Government Venture Capital (GVC) efforts to grow entrepreneurial ecosystems are effective has been hotly debated in the literature and in policy circles. Taking stock of the impressive developments in European ecosystems and policymaking in the decade to the pandemic, this research investigates how European GVC policymaking has evolved. It analyses the political process and the designs of the programmes to understand the circumstances that led to better outcomes as well as identifies the recurring challenges that policymakers have sought to overcome. In so doing, it conceptualises a new model of European innovation policy that is distinct from existing categories of state intervention. I call this the Market Creator State.

There are at least three reasons why this research is needed and timely. First, these European innovation policies emerged during a time of widespread scepticism around GVC. The events related to the dot.com years generated ample policy failure examples, which fed into an emerging academic literature that found successful GVCs to be rare exceptions against a majority of disastrous attempts (Lerner 2009). This sentiment was compounded by the neoliberal consensus that interpreted Silicon Valley as proof of the superiority of free-market capitalism over state intervention. All in all, in the mid-2000s it seemed all but unthinkable that Europe could replicate the American start-up ecosystem, and even less so that public policy could make a real difference (Casper 2007). If academic research should help

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<sup>1</sup> Dreyfuss, Joel. “French President Emmanuel Macron wants France to become start-up nation.” *CNBC*, November 27 2017. and Dillet, Romain. “Macron announces €5 billion late-stage investment pledge from institutional investors.” *Techcrunch*, September 17, 2019.

<sup>2</sup> Cox, Josie. “Government proposes new fund to support UK startups after Brexit.” *Independent*, August 1, 2017.

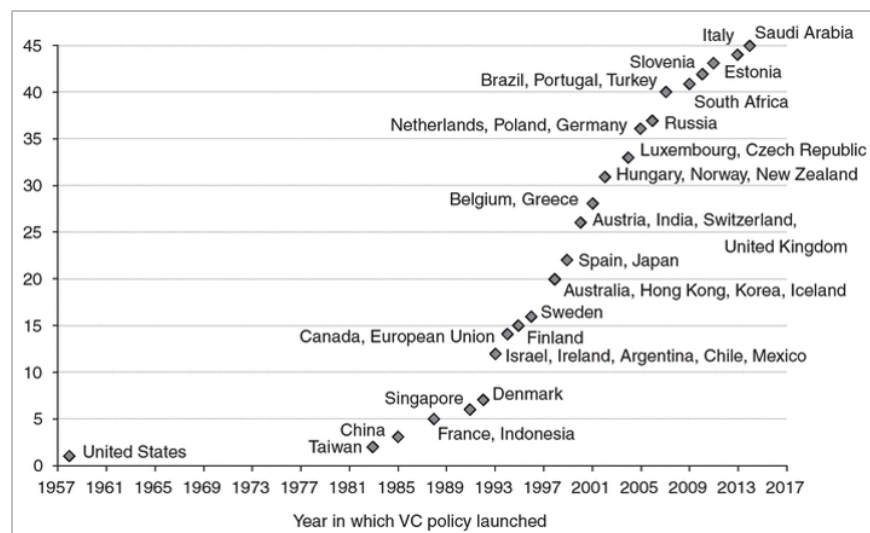
<sup>3</sup> For Spain, see: Tucker, Charlotte. “‘The Strategy sets out to make Spain an Entrepreneurial Nation by 2030’: Interview with the High Commissioner for Spain’s Entrepreneurial Nation, Francisco Polo.” *EU-Startups*. March 24 2021. For Italy, see: “Innovazione, Di Maio presenta il fondo da 1 miliardo: da team di nicchia va portata al centro delle politiche industriali.” *IlFattoQuotidiano*, March 4, 2019 and De Biase, Luca. “Venture Capital e startup: Di Maio Lancia il Fondo innovazione.” *IlSole24Ore*, March 4, 2019.

<sup>4</sup> For responses to covid-19, see: “Europe Races to Rescue Its Tech Industry as Start-Ups Fight for Survival” (Browne 2020) and “UK Gov Announces 'Future Fund', Pledging £250M Match Funding for Startups Impacted by Coronavirus” (O’Hear 2020).

explain puzzles and surprising events, the story of the European entrepreneurial ecosystem and the policies that propelled it certainly ticks this box.

Second, innovation policies are becoming increasingly relevant as the policy world is experiencing a resurgence of interest in industrial policy. Concerns about technological “strategic autonomy” in a geopolitically unstable world are increasing, and the role of innovation in enabling transitions to new economic models is becoming clearer. Governments are thus reviewing the available armoury of state intervention in the economy to foster innovation and gain technological advantage. In this context, government VC policies have been proliferating (figure 1). On a theoretical level, this drive for state intervention in innovation has recently found validation in the concept of the “entrepreneurial state” (Mazzucato 2013). However, both the modalities of intervention by these supposedly “entrepreneurial states,” and the determinants of their success, remain a matter of ample debate (Breznitz et al. 2018; Wennberg et al. 2022; Kattel, Drechsler, and Karo 2022). GVCs offer a tangible and topical opportunity to test these concepts.

**Figure 1.1: Cumulative count of VC policy efforts across advanced economies**



Source: From *The Venture Capital State: The Silicon Valley Model in East Asia*, by Robyn Klingler-Vidra, published by Cornell University Press. Copyright (c) 2018 by Cornell University. Included by permission of the publisher. Data includes analysis of all OECD, G-20, BRICS and Asian Tiger countries

Finally, the focus of this thesis is timely given the impressive and surprising rise of the European technology and entrepreneurial ecosystem. Both the raw statistics as well as verbal insights from actors in the industry point to two different worlds when comparing the European tech scene in the early 2000s compared to the early 2020s. According to Dealroom, yearly VC investments rose from below 1.5 billion to over 34 billion euros in the 15 years to 2020. By then, the continent had minted 200 “unicorns”—private companies valued at over one billion dollars, and the overall technology ecosystem came to employ close to one million people.<sup>5</sup> The ecosystem’s expansion has also been accompanied by an improvement in the venture capital asset class, which was close to non-existent and underperforming until the global financial

<sup>5</sup> Invest Europe, Europe’s venture capital association, reported 900,000 people employed by the ecosystem by 2021 (Invest Europe 2023).

crisis. By the early 2020s, instead, European VC funds had been delivering better financial returns than their American counterparts over 5- and 10-year time horizons (Invest Europe 2023; Nicol-Schwarz 2023). Most importantly, and in contrast to the dot.com years, the European ecosystem has proven relatively resilient to shocks. Despite the Covid-19 pandemic, the war in Ukraine, and the energy crisis, by 2023 European investment amounts in 2023 were still higher than pre-pandemic (while the same figure was lower in the United States) and indeed growing as a share of global VC (Dealroom data). In the first nine months of the year, Europe also continued to create start-ups at a higher pace than the American ecosystem (14,000 versus 13,000, respectively). There are also indicators that the continent's ecosystem is maturing, with successful companies breeding new start-ups via "talent recycling" of their employees, who are becoming founders and top management at younger ventures.<sup>6</sup> All in all, as of the early 2020s Europe can claim a healthy high-tech entrepreneurial ecosystem, something few people would have bet on after the dot.com collapse. Of course, the continent still lags far behind the United States on many metrics. But something has radically changed, and for academics of innovation and political economy to ignore this would be a grave oversight.

The following pages therefore take a deep dive into these two decades of European technology revival. Specifically, it focuses on the contribution of public policy, which has, like industry itself, also greatly evolved. No claim is made that policy interventions were the sole driver of ecosystem development, but the in-depth analysis shows that there is abundant evidence that its role cannot be dismissed. This thesis thus provide an important update to the literature on innovation policy and GVC. In short, the thesis shows that, starting from very different political economic institutions, some European countries were able to replicate Silicon Valley-like innovation ecosystem thanks to a new model of state investment in innovation. This model is drastically more interventionist than the orthodox economics literature would expect, but also distinct from the precepts of the "entrepreneurial state." In this model, the state does not use public funding to promote R&D and specific technologies, but instead intervenes to proactively create the institutions that Silicon Valley-like innovation markets need to function, in particular venture capital and high-growth focused entrepreneurial talent.

The thesis looks at examples of European countries with different Varieties of Capitalism (Hall and Soskice 2001). In so doing, it finds that the politics and processes behind the emergence of this model differed, reflecting the specific challenges and institutional constraints of each national political economy. However, the variation in specific policy design and actors involved should not distract from the clear conclusion that in Europe a coherent model of GVC has emerged. Its principles are broadly reflected in the cases where policies were successful and missing where outcomes fell short of expectations.

A lot has been written and can still be said about innovation policy. It is therefore important to identify what this research is and is not about. The analytical effort of this work does not aim, like most entrepreneurial finance literature, to estimate an average effect of GVC on total venture capital flows or on company outcomes. It utilises neither the methodologies nor offers the observational variation that could provide robust answers to this question. Besides, this approach has already been covered in the literature, offering mixed results, which vary depending on context and timeframe (Da Rin et al. 2013 for

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<sup>6</sup> All data in the paragraph from Atomico 2023, "The State of European Tech" [report](#), and [The Economist](#), "Partying like it's 2023," December 7 2023.

an overview). Instead, this research offers in-depth comparisons to explain how European GVCs worked and why they were structured in a certain way. Similarly, this thesis does not aim to compare between different innovation models. In other words, it does not ask *whether* promoting a Silicon Valley-like innovation ecosystem is a good policy choice. Innovation can indeed take several different forms and “systems of innovation” are an important topic in the literature (Lundvall 1992, Edquist 1997). Instead, this works helps understand what the options for policymakers are *if* they have a strategic aim to promote high-growth high-tech entrepreneurship of the kind seen in the United States or Israel. While this is only one possible model, right or wrongly it is one that policymakers all over the world continue to seek to emulate (see figure 1). By choosing this focus, the thesis indeed highlights what this model can and cannot achieve. Its insights can thus help future analyses and reflections about which other policies can complement it.

For policymakers in Europe, this view is particularly valuable in the context of the revival of industrial policy. The thesis puts the spotlight on GVC as one of the most obvious examples of interventionist industrial policy in the EU since the creation of the single market. In the EU, the concept of industrial policy was almost antithetical to the neoliberal principles underpinning the European project, and the practice was constrained by European regulation, in particular by rules limiting “state-aid” (Fligstein and Mara-Drita 1996; Jabko 2006; Hasanov and Cherif 2019; McNamara 2022, Di Carlo and Schmitz 2023). But this research shows that a proactive public role in economic development does not need to coincide with a runaway dirigiste state that imposes on the market its preferences for target industries or specific companies. Instead, this research demonstrates the value of industrial policy as a proactive public action to build capabilities and competences. Successful GVC programmes in Europe found a compromise: they focused on creating the institutions necessary for a robust private VC industry and channelled capital to any company with high-growth potential that could contribute talent and value creation to the ecosystem. The ambition for setting technological priorities was instead limited: policymakers largely preferred to “follow the market” in choosing where capital should be allocated, helping with direct investments only where it was most needed. In so doing they found a model that transcends the dichotomy between “picking winners” versus “laissez faire.” This theoretical insight has important implications for policymakers in Europe as they think of future innovation policies and broader industrial policy. This is especially true at a moment when Europe is facing the “Twin” or “Double Transition” of accelerating the green transition and gaining technological independence on strategic technologies (McNamara 2022).

This research nonetheless points to important limitations of these GVC policies. First, the research exposes the limits of venture capital. It transpires that VC is particularly effective at supporting a certain type of innovation but not necessarily all types. This is an important cautionary message for policymakers, who might see innovation policy as an opportunity for regional and place-based development but risk being disappointed by it.<sup>7</sup> Similarly, in these policies room is limited for the state to identify and prioritise strategic technologies, since a deep integration with private actors means finding a compromise over what sectors and technologies should be the recipients of public investment (see Griffith-Jones and Naqvi on this trade-off between “policy steer” and “financial leverage;” Griffith-Jones and Naqvi 2021). My theory

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<sup>7</sup> For a recent discussion of these trade-offs and an analysis of other innovation models, see Breznitz (2021): *Innovation in Real Places*.

## Chapter 1: Introduction

thus claims that European-style GVC has been surprisingly effective at developing the capabilities for entrepreneurial ecosystems but, at least alone, is unlikely to be the right type of policy to address more specific technological or social challenges, such as the green transition or the battle for strategic autonomy in key industrial sectors.

The broader insight for policymakers in navigating the revival of industrial policy is that the right type of intervention depends on how well-defined the technology objectives are and whether that technology has already been developed elsewhere or remains embryonic. GVC policies like those adopted in Europe, with a strong focus on general capabilities building rather than specific technologies and sectors, are most appropriate when countries are trying to compete at the technology frontier and aiming for general productivity-improving inventions—all but impossible to identify *ex-ante*. These policies rely on the efficiency of the private sector to recognize in which sectors and model of productions new opportunities lie. Conversely, however, when the direction is clear—for instance when countries are trying to catch up on specific technologies or have a well-defined strategic technological objective—the state might need to resort to more prescriptive policies that direct both public and private finance and resources. It seems, therefore, that GVC programmes should be just one item on the innovation policy menu. They will need to be combined with other interventions, potentially borrowing from other policy examples that enabled states to make technological leaps in the past. In other words, in GVC public policy, Europe has dipped its toes in industrial policy waters. But, given the scale of the technological challenges ahead, there is every reason to believe that it might need to start swimming.

The thesis is structured as follows. The next chapter (two) reviews the literature and introduces the Market Creator State as a new conceptualisation of state intervention that seeks to explain the role the state has played in European innovation. Chapter three tests the theory in France and finds that the country's new public development bank, Bpifrance, represents the closest-to-ideal example of the Market Creator State. Chapter four recounts the history of GVC in Germany and shows how the country was eventually able to reflect the same tenets, although the federal coordinated nature of its political economy posed specific challenges. Chapter five takes the analysis to Southern Europe and shows how different forces in Italy and Spain yielded divergent outcomes, impeding the emergence of a Market Creator State in Italy, at least until the very end of the observation period. Chapter six concludes, expanding on the theoretical implications of the research and its value for policymakers in Europe and beyond.

## **Chapter 2 Creating innovation markets: a theory of government venture capital as a modern industrial policy in Europe**

### **2.1 Introduction**

This thesis proposes a new theory to explain the role of the state in innovation in Europe, particularly in the emergence of Silicon Valley-like entrepreneurial ecosystems of disruptive start-ups. It argues that in Europe, policymakers have developed a “third model” of government venture capital, which I call the “Market Creator State.” This model transcends the historical dichotomy, present in both policy circles and in the literature, between a highly interventionist “Entrepreneurial State” and an orthodox, hands-off *laissez faire* approach focused on “setting the table” or improving “enabling conditions.”<sup>8</sup> The developments that Europe experienced in the twenty years since the dot.com bubble indeed fit neither of these views. Instead, they provide important new evidence for updating one of the longest-lasting intellectual debates in political science and economics: what makes government intervention in innovation successful? This thesis argues that European governments were able to support the growth of entrepreneurial ecosystems by, on the one hand, structuring agencies that could invest hand in hand with private venture capitalists, and—on the other—embracing a broad concept of innovation, allowing for public investments in all kinds of high-growth innovative firms. By so doing, they did not simply “fund inventions” but instead “created innovation markets.” In offering an interpretation of these events and a model to explain them, the theory proposed in this research thus contributes to a multidisciplinary literature, spanning from institutionalist political science to entrepreneurial finance, to recent debates about modern forms of industrial policy.

### **2.2 Innovation and the state: a recurring and divisive question across disciplines**

The role of the state in fostering innovation is highly debated within and across the political science and economics disciplines. While sceptics focus on the many failed programmes, proponents highlight that no success case of entrepreneurial ecosystem has emerged without substantial state involvement. However, neither of the analyses provides conclusive answers, nor does it offer a policy approach that can explain the developments in Europe.

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<sup>8</sup> For a recent example of this debate, see two books published in 2022: *How to Make the Entrepreneurial State Work* (Kattel, Drechsler, and Karo 2022) and *Questioning the Entrepreneurial State* (Wennberg and Sandström 2022).

### 2.2.1 Sceptics: countries have structurally different propensities to innovate and state policy is ineffective or distortive

Scepticism towards the state's direct involvement in innovation markets stems from broadly two types of criticisms: 1) entrepreneurial propensity is a cultural and institutional feature unlikely to be affected by policy; and 2) government intervention creates more negative externalities than positive ones, due to incorrect programme design, state capture, or poor implementation. The conclusion is that investing directly in innovation is the last of public policy priorities and governments should instead focus on improving structural and enabling conditions.

The political science and political economy traditions focus mostly on the first, structural, type of criticism. The Varieties of Capitalism (VoC) literature predicts that the institutional complementarities of different models of capitalism render some countries intrinsically more prone to disruptive innovation (liberal market economies, LMEs) while others structurally unsuited (coordinated market economies, CMEs) (Hall and Soskice 2001).<sup>9</sup> In this view, public policy should focus on favouring each model's institutional comparative advantage rather than attempt to modify it (Hall and Soskice 2001; Casper 2007). This institutional focus and path-dependency approach leaves very little explanatory power to policy action: public venture capital programmes in CMEs are likely to fail because the original institutional framework underneath is not conducive to entrepreneurial ecosystems (Casper 2007).

A complementary argument appears in AnnaLee Saxenian's seminal work on the institutional underpinnings of innovation, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. The author stresses the uniqueness of local business culture in the Silicon Valley—flat-hierarchy and informality within companies, the intensity of cooperation between firms, and the proactive role of labour and business associations in engaging with each other and with government—to explain its superiority vis-à-vis the East Coast of the USA with regard to generating innovative companies. By arguing that “capacity of adaptation,” via innovation, is “overwhelmingly a function of organizational structure” of the local industry, this literature also dismisses the importance of direct public intervention (Saxenian 1996).

Similarly, some works focussed on successful ICT clusters in emerging economies have downplayed the role of direct government intervention. Bresnahan and Gambardella's *Building High Tech Clusters* (2004) argues that in the cases of Ireland, Israel, Taiwan, and India “even where policy had a direct role, the case for government leadership cannot be made ... Particularly worrisome are direct, top down policies that would direct at a level of detail such as picking the specific industries or technologies to be sponsored.” They find that cluster formation was instead due to a combination of forces from the so-called “new economy” (external effects and agglomeration economies, see Fujita et al. 1994) and “old-economy” (firm-building capabilities, connection to markets and demand, supply of skills) (Bresnahan and Gambardella 2004). Note that these conclusions contrast with those of other analyses of the same case studies (see, for instance, Breznitz 2007).

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<sup>9</sup> The distinction between LMEs and CMEs is the most fundamental one provided by the original VoC literature. As the tradition evolved, several variations emerged. A particularly useful one for my thesis is the one offered by Amable (2003). He considers five models of capitalism: Neoliberal (Anglo-Saxon countries), Asian, Continental European (France and Germany), Southern European (Italy and Spain), and Social-Democratic (Nordics).

## Chapter 2: Theory

The second type of scepticism emerges mostly from finance and economics literature. Looking at GVC from a “market failure vs government failure” perspective, many authors conclude that the risks of the latter are generally greater.<sup>10</sup> Intrinsically, this analytical approach allows little space for appreciating the potential long-term benefits of government investment (Mazzucato and Penna 2016). Instead, authors tend to evaluate GVC only through short-term observable indicators of innovation and entrepreneurship.<sup>11</sup> The empirical findings from these, typically large-N, studies offer mixed results (Da Rin et al. 2013). A study of the Canadian market in the late nineties found minimal or negative association between GVC funding and change in innovation performance metrics (Brander et al. 2010b). Later work by some of the same authors, however, found that companies invested by syndicates of GVC and private venture capital (PVC) outperform those with only PVC backers (Brander et al. 2015). At an aggregate level, a particularly contentious issue within this economics literature is whether GVC *crowds in* or *crowds out* PVC. Theory could support both arguments and the evidence is again mixed. Sceptics predict that GVC would compete with private investors for the same assets, resulting in an increase in price and a reduction of the returns that would discourage, rather than foster, the development of a private and sustainable VC industry.<sup>12</sup> Cumming and MacIntosh (2006) and Brander et al. (2010a) find evidence of such crowding-out in the case of the Canadian LSVCC programme, and Armour and Cumming (2006) and Da Rin et al. (2006) find analogous results with data sets expanding to all of North America and Europe, respectively.

The various angles of this second type of scepticism are well-summarised in the most prominent survey work specifically on government venture capital programmes, Josh Lerner’s *Boulevard of Broken Dreams* (2009). By looking at a variety of cross-geographical examples, Lerner argues that governments are generally ill-equipped to design programmes that are aligned to the dynamics of the innovation industry. He extrapolates a series of common conceptual or implementation mistakes policymakers tend to make and that render successful GVCs the exception rather than the rule. He argues that, more often than not, governments design programmes wrongly—because they do not understand high-growth entrepreneurship or try to impose too many policy requirements, and implement them poorly—because of bad incentives, low competences, and/or state capture dynamics. However, even the conclusions of this frequently cited book are controversial, especially in light of emerging evidence of wide variation in success and failures (Bai et al. 2021).

According to this literature, therefore, government direct investment in innovation markets is likely to be ineffective or counterproductive. This is largely because government venture capital does not address those underlying institutional and cultural features of the economy that authors argue matter most for entrepreneurship. Consequently, the theoretical and policy implication is that governments should prioritise reforms that improve the “enabling conditions” and “set the table” to unleash market forces, letting the private sector allocate capital to the right ventures.

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<sup>10</sup> Relevant market failures include: information asymmetries, pro-cyclical markets, public goods sub-provision and negative externalities.

<sup>11</sup> Performance of GVC’s portfolio companies, increase in private venture capital flows, increase in patent filings

<sup>12</sup> Detractors of GVC believe that this dynamic is particularly likely to occur, since government funds tend not to have the same return requirements and strict Limited Partners’ expectations as private funds. They can therefore easily outbid PVCs, offering a higher price, and thus accepting a lower return. Note: In the private equity industry, Limited Partners are the investors, typically institutions or high net worth individuals, who invest in closed funds (the traditional structure of a PE or VC fund). These investors expect the fund managers (called General Partner, GP) to utilise their capital to generate a return that is attractive even after adjusting for the higher market and liquidity risk of venture capital and private equity investments (usually mid-teens percent).

### 2.2.2 Proponents: innovation needs the state

Despite the internal logic of the sceptics' arguments, important historical evidence cautions against dismissing state investment's contribution to innovation. The state played a substantial role in facilitating large technological shifts (from the first industrial revolutions to the development of internet) but also in the emergence of some of the most successful entrepreneurial ecosystems such as the Silicon Valley and Israel (Breznitz 2007, Colli and Corrocher 2013, Janeway 2012, Mazzucato 2013, Perez 2002).

Within the economics and finance literature, authors have pointed to evidence that moderates concerns about crowding out. They argue, instead, that GVC can complement PVCs: it can fill the "capital gap" arising from not enough investors with sufficient funds to meet the entrepreneurs' demand for financing. This market failure may be due to issues of illiquidity, excess risk, information asymmetries, or agency problems (Cumming 2014). In addition, government programmes may crowd in private investment through signalling, by providing a "quality certification" of the companies they finance. Such "stamp of approval" can reduce the transaction cost for PVC, making their investment cheaper and less risky (Guerini and Quas 2016, Armanios 2015). Evidence of such virtuous cycles emerges from work on the Australian Innovation Investment Fund (Cumming 2007), on European programmes (Cumming 2014, Leleux and Surlemont 2003), and even on worldwide data (Brander et al. 2015). Econometric analyses by the European Investment Fund (EIF) also show a positive relationship between public funding and ecosystem growth—in terms of private VC investment and start-ups creation (Kraemer-Eis, Signore and Principe 2016). The nature of the underlying mechanisms of such virtuous cycles, however, remains unclear and largely unexplored in the literature.

The strongest arguments in favour of the state's role in innovation come from heterodox and evolutionary economics and political economy. Bill Janeway, a heterodox economist and practitioner venture capitalist, has argued that, in fact, the state is in a unique position to support innovation through mission-oriented investments (e.g., military spending) that create knowledge and infrastructure platforms (e.g., the internet, or basic biochemical research), that the private sector then exploits (Janeway 2012). Similarly, and most notably, Marianna Mazzucato has rehabilitated the idea of an interventionist state by arguing that public investments have been pivotal in promoting disruptive innovations and that it is not true that the state is worse than private actors at "picking winners" (Mazzucato 2013). She takes on a more comprehensive criticism of orthodox economic theories, arguing that market failure-focused approaches are intrinsically unable to explain the role of governments in innovation (Mazzucato and Penna 2016). This is because they employ dependent variables that are insufficient indicators of the underlying, evolutionary dynamics of innovation. Instead, she claims that state agencies can be (and have been) fundamental for innovation-led growth and development.<sup>13</sup> She is not shy of arguing that the state can and should "pick winners" and "missions." This is because the public can have different, longer term, objectives from the private sector and, importantly, can be more risk prone because short-term failures

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<sup>13</sup> Among SIBs' main roles she lists "direct investment in innovative and R&D-heavy companies" and "investment targeted at solving complex societal problems."

maybe be offset by longer-term positive externalities. She builds her argument in favour of such an *entrepreneurial state* on the basis of the theoretical insights from some of the most prominent political economists (Schumpeter, Minsky, Keynes), evolutionary economists (Freeman, Dosi) and from the *developmental state* literature (Johnson 1982, Wade 1990, Woo 1991, Evans 1995).

The developmental state school had indeed provided an important contribution to explaining the causal role on development of proactive state industrial policy. The original models however described mostly a traditional Weberian bureaucracy that mobilised financial and industrial resources, top-down, to achieve catch-up development and industrialisation through an export-led model (Johnson 1982, Wade 1990, Woo 1991, Amsden 2001, and Kohli 2004). Authors of the neo-developmental school (e.g., Evans 1995 and O’Riain 2004) explained how that state model applied only to a specific type of context and industrial strategy.<sup>14</sup> In other geographies, or as countries approach the technological frontier, this approach did not work as well. In their models, these authors allow for greater variation in the specific types of state bureaucracy and point to the need for a greater degree of integration (or *embeddedness*) with market actors. Breznitz (2007), for instance, showed how different types of relationships between states and the private sector enabled certain emerging economies to “leapfrog” and specialise in some innovative sectors (ICT), rather than merely catch up. Still, this work focuses on particular countries—Israel, Ireland, and Taiwan—at a different stage of development from Europe (at the time), which limits the applicability of the findings to large European countries today.

Attempts to apply similar frameworks to today’s advanced economies are circumscribed Klingler-Vidra’s work on the “entrepreneurial developmental state” (Klingler-Vidra 2018 and Klingler-Vidra and Pardo 2019), which addresses GVC directly but returns the discussion to Asia (South Korea, Hong Kong, Taiwan), and to the Mazzucato’s already mentioned “entrepreneurial state.” While her original work largely focused on the United States, more recent contributions have looked more globally and started to substantiate the theoretical and empirical arguments, trying to uncover what such a state may have looked like in practice (Breznitz et al. 2018; Kattel, Drechsler, and Karo 2022).

The literature therefore comprises also strong proponents of state intervention. The latest and most prominent arguments in favour of the government as a venture capitalist—the *entrepreneurial state*—claim that public agencies can be uniquely placed for promoting innovation and “picking winners.” They stress the ability of the state to be more forward looking than the private sector and thus be able to invest in those paradigm-shifting technologies that may have low short-term returns but high long-term positive externalities. As this research uncovers, however, this is not the role the state has played in Europe.

### 2.2.3 Gaps in the literature: explaining Europe

In this context, Europe is a particularly insightful place to test theories about state intervention in innovation. Previous political economy literature showed that Europe was institutionally ill-structured for disruptive innovation and offered ample evidence that public policies were failing at changing these

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<sup>14</sup> Other terms for broadly the same theory include “flexible developmental state,” “developmental network state,” and “networked polity,” among others.

characteristics (Casper 2007, Lerner 2009, OECD 1997a and 2004b, Lelarge et al. 2011). Moreover, the concept of interventionist industrial policy was historically tabu in the European Union, due to the neoliberal values and rules that underpinned the European single market project (Fligstein and Mara-Drita 1996, Jabko 2006, Hasanov and Cherif 2019, McNamara 2022, Di Carlo and Schmitz 2023). However, in the two decades since the mid two-thousands, certain European countries found ways to deploy significant public capital towards innovation via GVC. This ambitious experiment at European industrial policy for innovation coincided with impressive growth of entrepreneurial ecosystems in the continent. This evolution in European innovation policies thus poses a puzzle that neither side of the debate described above can fully explain.

Table 2.1 summarises, in a highly stylised version, the competing theories above and their limited explanatory power for the European cases analysed in this research. Arguments on the sceptic front are particularly challenged by the evidence. First, the 15 years to 2020 have witnessed an impressive growth in entrepreneurial ecosystems in Europe. This is particularly problematic for those structural and institutionalist arguments that held that European business culture or European countries' models of capitalism were intrinsically uncondusive to high-tech entrepreneurship. These theories are unfit to explain change over time within the same institutional or cultural context. The most "crucial case" (Eckstein 1975) on this front is Germany, a country with economic institutions and a business culture considered at the antipodes of Silicon Valley's liberal model (Hall and Soskice 2001, Casper 2007), but that became the first and largest entrepreneurial ecosystem in Europe in the late 2000s. Second, the evidence also fails to meet the predictions of those who argue for a hands-off, reform-based approach to public policy for innovation. This thesis shows very clearly that this is not the model Europe followed. Instead, entrepreneurial ecosystem growth occurred as government interventionism increased, rather than retrenched. The case of France is the most evident, where the creation of the new public bank and a renewed drive for state intervention coincided with a fast acceleration in all metrics of ecosystem development. The limits of "setting the table" clearly emerge also in the comparison between Italy and Spain. The former passed pioneering reforms and fiscal incentives to improve "enabling conditions" for start-ups. Yet, its ecosystem was leapfrogged by its Southern-European competitor, which was less ambitious with reforms but deployed more interventionist policies.

Interestingly, the evidence does not support existing arguments on the proponents' front either. While it is true that the least interventionist country (Italy) saw the slowest development, the in-depth analysis of the other countries' GVC strategy and activities shows that they did not align with the precepts of an entrepreneurial state. Their effectiveness was not built around the ability of state agencies to autonomously pursue disruptive R&D but rather from a deep partnership with private venture capital. In addition, European GVCs never really picked winners or missions, and rarely even targeted specific technologies. Instead, they focused on supporting the development of general innovation capabilities in the entrepreneurial labour market and in the private venture capital industry. In this sense, the proposed theory builds on insights from the neo-developmental state and the networked developmental state. However, it evolves these concepts to apply them to a very different context—rich countries at the technological frontier, rather than emerging economies—and to a specific target of industrial policy: start-up based entrepreneurial ecosystems. In so doing, it revisits the theories on the so-called "competition

state” (Cerny 1990, 1995, 1997; Jessop 2002; Hay 2004) and introduces a new model, which I call the Market Creator State, explained in the next section.

**Table 2.1: European ecosystems: explanatory power of Market Creator State compared to existing theories**

		Cases:	France	Germany	Italy	Spain
		Empirical Outcomes:	From failure to success	From failure to success	Laggard ecosystem	Up-and-coming ecosystem
Sceptics	<b>Market / Government Failure Theories</b>	<i>Theories' Implications for GVC</i> <i>GVC failures, because of bad design or implementation; focusing on market enabling reforms is more effective</i>	✗	✓	✗	✗
	<b>Varieties of Capitalism</b>	<i>No over-time change, as public policy is unlikely to modify countries institutional bias towards/against entrepreneurship</i>	✗	✗	✓	✓
	<b>Culture-based Explanations</b>	<i>Cross-country changes, not over-time, as cultural differences predict outcomes in high-tech entrepreneurship</i>	✗	✗	✓	✗
Proponents	<b>Entrepreneurial State</b>	<i>Successful GVCs take leading role in investing in paradigm-shifting technologies too risky for privates</i>	✗	✗	✓	✗
	<b>(Neo) developmental State</b>	<i>GVCs is effective as a tool for emerging economies to catch up or leapfrog in innovation-based markets</i>	✗	✗	✗	✗
<b>Market Creator State</b>		<i>GVCs are successful when they partner with private VCs and focus on capabilities building over target technologies</i>	✓	✓	✓	✓

Legend: ✗ Evidence does not match predictions      ✓ Evidence partially matches predictions      ✓ Evidence matches predictions

## 2.3 A “third model” in Europe: The Market Creator State

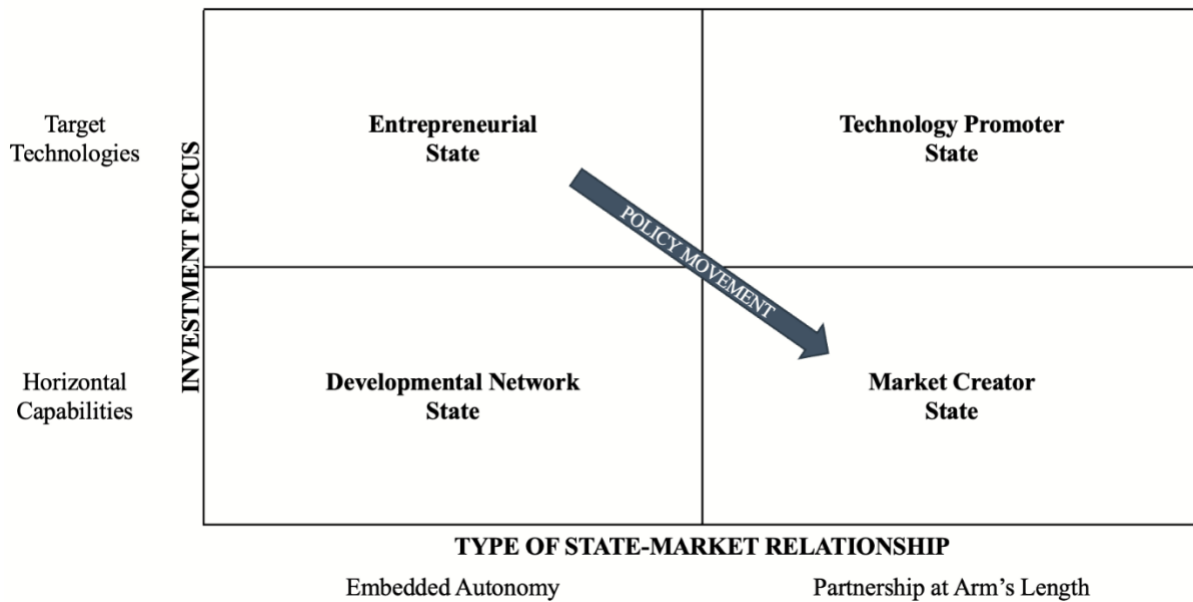
### 2.3.1 Theorising the Market Creator State

This thesis therefore introduces a “third model,” which transcends the policy choice dichotomy outlined above between an entrepreneurial state that “picks the winners” and the neoliberal “laissez faire” approach that shuns industrial policy. I draw the attention to “what kind” of government intervention in innovation works. I argue that the contrasting evidence about government venture capital can be explained by focussing on *how* such programmes are structured and operated, building on insights from the neo-developmental state literature and the competition state, while complementing recent innovation literature

that identifies typologies of state agencies (Breznitz et al. 2018).<sup>15</sup> The theory holds that GVC was a successful industrial policy in Europe when it used public investments to “create innovation markets.” It was a highly interventionist approach but one that focused on horizontal capabilities, rather than on specific target industries or technologies, and one where the state played a novel role within private markets, which I call Partnership at Arm’s Length (PAL).

The theoretical framework is summarised in the two-by-two matrix in Figure 2.1, which highlights the characteristics of successful European GVC as compared to other models of state intervention. The framework shows the two key independent variables: Type of State-Market Relationship and Investment Focus.

**Figure 2.1: The innovation policies framework**



Type of state-market relationship refers to the degree to which the agency that implements the industrial policy—in this case GVC—is integrated with private actors (knows them, collaborates with them, and supports their development) but also independent in its investment decisions (neither influenced by particular private interests nor by political interference). The vertical dimension—investment focus—refers to whether the agency’s industrial policy strategy is primarily aimed at supporting specific, strategic technologies or instead at developing broader innovation competences and capabilities, using a broad definition of innovation. The four quadrants of the framework derive from the interaction of these two variables and define four archetypal approaches to state intervention in innovation, covering also concepts from existing literature (O’Riain 2000 and 2004, Breznitz 2007, Mazzucato 2013).

I argue that countries can theoretically run GVC programmes falling in any of these quadrants—indeed elsewhere there have been successful examples across types—but that successful ones in Europe

<sup>15</sup> The complementarity is due to the fact that Breznitz et al. (2018) analyse similar variables but provide typologies of agencies focused on new technology and R&D creation, rather than start-up financing. Although there is some overlap in the typologies with the activities described in this research, none neatly applies to the cases discussed here.

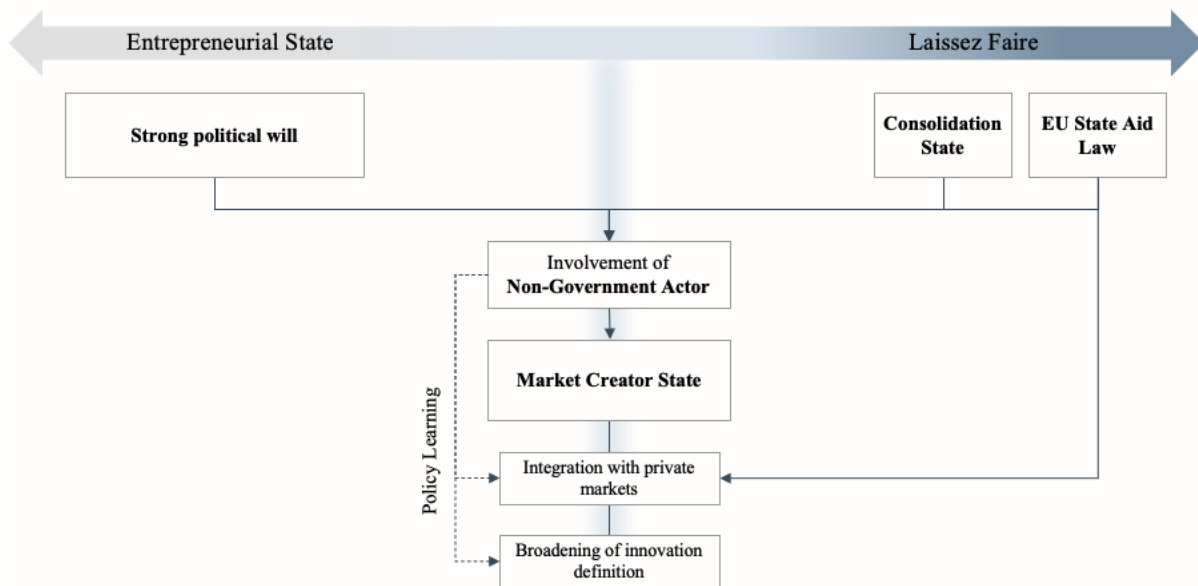
tended to fall in the bottom right category. This is because the Market Creator State is more suitable for building the specific institutions that European political economies were missing: a private VC industry and mobile entrepreneurial talent. The VC industry development was catalysed by the Partnership at Arm's Length (PAL) approach: a particular form of state intervention, implemented outside of state bureaucracies and in which the state collaborates with private VCs as an “influential peer,” rather than a dominant actor. In this PAL relationship, the state never autonomously “picks the winners” but rather co-invests with the private sector to provide enough capital to promising companies. Mobile entrepreneurial talent was supported by European GVCs' technology agnostic approach, which prioritised the development of horizontal capabilities and entrepreneurial competences through funding high-growth firms, over the ambition to identify and invest in specific technological challenges or industries. The research shows how, although there have been attempts to also promote specific technologies (leaning towards the top right quadrant), these were constrained by European policies' reliance on private finance and Public Development Institutions (PDIs). This highlights a trade-off between the state's ability to leverage the private sector and retain a complete policy autonomy (Griffith-Jones and Naqvi 2021) as well as a broader trend away from a “strategic” conception of industrial policy towards one focused on increasing the broader country's competitiveness (Cerny 1997).

The prediction of the theory, therefore, is that European programmes failed as long as they simply tried to fund disruptive technologies by copying foreign models of GVC or by using traditional European policy tools (e.g., credit and grants). GVC policy succeeded instead once countries recognised their deep institutional gaps and made the leap towards the Market Creator State. This is therefore also a story of policy learning and convergence. Different European countries, despite different institutional frameworks and histories of industrial policy, converged towards a similar model, because it addressed the core institutional gaps that separate European countries from liberal-market-economies. The learning path was different for each country, and highly dependent on its specific model of capitalism but—beyond the details—a clear trend emerges of a new common model of European industrial policy for innovation. Importantly, it is clear that this model is distinctly European and, as such, markedly different from the American one.

The thesis explains *how* European countries arrived at this model. In short, it argues that the Market Creator State emerged as a compromise between forces pulling in opposite directions, as represented in Figure 2.2 below. On the one hand (left side of figure), when interest of politicians for innovation policies increases, they tend to push towards highly visible, and thus interventionist, approaches. These, compounded by the practices of traditional bureaucratic agencies, would translate into “entrepreneurial state” models of GVC. On the other hand, two fundamental European Union's rules and precepts that consolidated in the two-thousands pull towards a very low-touch, “laissez faire” approach to industrial policy (right side of figure). First, the principles of the single market have led Europeans to agree to a strict set of “state-aid” rules that significantly bound a member state's ability to intervene in the market (Buch-Hansen and Wigger 2010; EU Regulation no. 651/2014 and previous). In practice, these rules mean that governments are very restricted in the ways they can fund start-ups—little money for each company and mostly for the very early stages of development. Larger public interventions instead require independent private co-investment. Second, EU countries committed to rules of fiscal austerity that

prioritised balancing the budget in the short term over investing to expand the economy’s long-term growth potential (see Streeck 2015’s concept of the “consolidation state”). This further limits the amount of public money countries can use towards interventionist industrial policy. In Europe, thus, the interaction between these scope conditions and the fluctuation in political will for innovation intervention yielded the Market Creator State as a net result. The limits on what the state could do “alone” led to increasing collaborations with private actors and the involvement of para-public actors (PDIs in particular), which facilitated the learning process that ultimately produced the Market Creator State GVC.

**Figure 2.2: Scope conditions and contrasting forces leading to the Market Creator State in Europe**



In summary, thus, the argument is that outcome success in European countries was associated with a “policy movement” from the top left—funding inventions—to the bottom right—creating the market—of the framework in Figure 2.1. This movement took place as the contrasting forces in Europe created the space for a policy learning that allowed European policymakers to come up with their own, distinctive model that met both the politicians’ ambitions and the EU institutional constraints. In section five I expand on the causal mechanisms that explain this movement and underpin the theory.

*2.3.2 Contributions of the theory: advancing the debate on modern industrial policy in Europe beyond “picking winners” vs “laissez faire”*

The theory can explain the variation observable in the outcome of innovation policies of some key countries in Europe for which existing theories cannot account (see Table 2.1). Germany and France both exhibit stark within-country change over time, contradicting the predictions of deeply institutional accounts that described continental Europe as structurally inhospitable to disruptive innovation or of those who see GVC as doomed to fail. Policy, instead, can make a difference: as these countries’ initiatives moved towards the bottom right of the framework, entrepreneurial ecosystems emerged. The case of Italy,

then, provides complementary cross-case variation that strengthens the argument about the importance of the policy approach. As several European countries witnessed their ecosystems flourish, Italy's lagged significantly behind. Although it would be tempting to explain this by referencing again the differences between Southern and Continental European models of capitalism and state capacity (Amable 2003), the contrast with Spain refutes this explanation. Spain and Italy's paths started to diverge when Spain adopted a Market Creator State approach, while Italy focused on reforms to improve the "enabling conditions" and tried policies fitting in the other quadrants.

The main theoretical contribution of this work, therefore, is to explain and conceptualise how European states were able to intervene in innovation markets, offering a model which is both more accurate and more nuanced than the "picking the winners" or "laissez faire" archetypes. In so doing, the theory advances the broader debate on the forms that modern industrial policies can take in Europe. By investigating variables of state capacity (state-market relationship) and policy design (investment focus), I show that the outcomes of industrial policies are highly dependent on political-economy factors. *How* the state has invested and *what* it invested in are fundamental to understand the role of GVCs in Europe, with implications for future European industrial policy at large. In this way, the research engages with a variety of scholarly traditions, which by themselves do not provide satisfying answers to the question this research poses, but offer important complementary inputs.

First, the research speaks directly to the literature in heterodox economics that focuses on the role of the state in innovation (Dosi 1982, Janeway 2012, Mazzucato 2013, Mazzucato and Penna 2016). In their 2016 influential paper "Beyond Market Failure," Mazzucato and Penna criticised the traditional orthodox analysis of state intervention and drew attention to the role of PDIs, proposing a new research agenda around these institutions. My research directly addresses their call for new work focused on "analysing, theorising, and constructively criticising what's being done in [PDIs]" (Mazzucato and Penna 2016). More specifically, the empirical work in this thesis responds to two explicit areas that Mazzucato and Penna suggested required further investigation and theoretical depth: 1) "Cross-comparison of different [PDIs] and their model of operation" and 2) "In-depth case studies of a single [PDIs] or a single [PDI] program... to identify structures, tools and policies that increase the effectiveness of [PDIs]" (Mazzucato and Penna 2016). The empirical analysis in this research uncovers that the role of PDIs in European innovation has been different from that hypothesised by these authors. Mazzucato and Penna, similarly to other authors such as Janeway (2012), emphasise PDIs' potential to be "visionary" investors—institutions funding paradigm-shifting technologies that the private sector would shun because too risky, and setting "missions and challenges" to address societal concerns that the market does not price in (Mazzucato and Penna 2016). My theory proposes a different reading, one that emphasises PDIs' role in structuring private markets and working together with private investors, not acting in isolation from them. The theory speaks to Mazzucato and Penna's idea of PDIs "creating markets" but in a different way from how they intend it. They refer to the state's ability to create new technological fields, while I propose a more Polanyian view of the state intervening to create the necessary institutions for "innovation markets" to work (Polanyi 1944 [2001]). While the role my theory assigns to PDIs may appear less ambitious, I would argue that from a theoretical point of view it is quite the opposite. There is more agreement in the literature that the positive externalities from innovation justify long-term public R&D investments due to

traditional market failure considerations (Metcalf 1995). Janeway (2012), for instance, had already described a symbiotic relationship between the state and private investors to explain the rise of the Silicon Valley: the state invested in high-risk, strategic technologies (e.g., military and space-related R&D), while venture capitalists and entrepreneurs “free rode” on these public investments, exploiting the commercial applications of the technologies. This view *assumes that the necessary market institutions exist*, while state intervention is needed for technology creation. The theoretical development I introduce flips around this logic. In Europe, state intervention did not play this “technology-creating” role but instead was necessary to build the market institutions for effective commercial exploitation to take place, because these were historically missing in the continent’s political economy. The research, thus, clearly shows that the *European model was not the same as that behind the Silicon Valley* because it was facing different institutional challenges in the first place.

In this sense, my contribution returns to a foundational debate within the political economy literature. The institutionalist tradition originally centred around the very idea that “governments make markets.” This argument, which can be traced back all the way to Karl Polanyi’s point that “laissez-faire was planned” (Polanyi 2001), was elaborated in seminal works that analysed how different political configurations contributed to structuring institutions that favoured and harnessed market forces. Peter Katzenstein’s analysis of small European states framed industrial policy as a dominant characteristic of how corporatist systems managed changes in the world economy to benefit from them. More generally, in the author’s point of view advanced economies differ for the *type* of industrial strategy they chose, while the general importance of the state is implicit but never questioned (Katzenstein 1985). In the same time frame, Peter Hall’s *Governing the Economy* offered an analysis that explicitly described state action as necessary to create those ancillary institutions that make markets function effectively (Hall 1986). His diagnosis of Britain’s economic malaise in comparison to France centred around the unwillingness of the British state to promote policies to proactively upgrade the country’s economic system to cope with new market dynamics. The Polanyian view of the state as “market maker” was later adopted also to explain the counterintuitively important role of the state in managing countries’ transitions towards more free-market economies, such as the liberalisations of the eighties (Vogel 1996). Political economy’s later turn towards the VoC framework, however, significantly side-lined this role of the state (Bulfone 2023). Firms and micro-mechanisms became the unit of analysis, implicitly relegating the state to a residual actor and questioning the efficacy of industrial policy in the face of institutional complementarities that determined strong path dependencies (Hall and Soskice 2001, Amable 2003, Casper 2007). Thus, VoC authors tend to be sceptical about the potential for public policy to alter those institutional factors behind a certain country’s organisation of economy activity, including its propensity towards disruptive innovation (Casper 2007). The emergence of entrepreneurial ecosystems in close-to-archetypal CMEs such as Germany will inspire a new reflection on the degree to which institutions are amenable to public policy.

The theory proposed in this research resolves this puzzle by building on VoC and on the literature on policy learning and diffusion (Hall 1993, Dunlop and Radaelli 2018, Klingler-Vidra 2018), reclaiming a role for the state closer to that envisioned by earlier institutionalists (Katzenstein 1985, Hall 1986). Entrepreneurial ecosystems are a useful subject to test this view, because they are often described as a serendipitous outcome of free-market spirits, at the antipodes of government intervention. The theory

advanced here argues instead that, just like free-markets, innovation ecosystems do not simply occur “naturally.” Labour and financial markets institutions play an important role in directing incentives towards different types of economic activities and this results in different innovation outcomes. It is thus true, as VoC would predict, that the structural challenges present in European economies made success particularly unlikely and policymakers more prone to policy design mistakes. Over time, however, states learnt to structure programmes in a way that tackled those institutional challenges. Similarly, Saxenian’s considerations about the causal impact of culture ring true when looking at Europe historically, but have little predictive power: European countries seem to have been able to *change culture* through public policy. The implication is that culture as a variable has a different place in the causal chain. All in all, each country’s VoC and policy/business culture affected this learning process and the specific features of the programmes. It did not, however, prevent successful Market Creator States from ultimately emerging in several continental European countries. In these places, the political push for more interventionism on one side, and the European Union’s budgetary and legal constraints on “state aid” on the other, inspired common policy learning and reflections that yielded Europe’s “third model” of innovation funding, with important common principles across countries. In this sense, the explanation proposed differs also from that of the main existing work on VC policy diffusion, Klingler-Vidra’s *The Venture Capital State* (2018). This thesis shares with Klingler-Vidra a focus on the role of the state in creating VC markets. However, Klingler-Vidra argues that GVCs in East Asia fundamentally *adapted to* local institutions. The theory advanced here, to the opposite, argues that policies in Europe became successful when they *changed* local institutions. One important aspect, for instance, is that even in countries with a federal structure (Germany, Spain), a degree of centralisation of GVC policies improved effectiveness, as it indirectly supported the clustering dynamics of the innovation industry as opposed to contrasting them.

This research revisits also the literature on the (neo) developmental state and industrial policy. It fully engages with this tradition by using its concepts to analyse European policies and state-market relationships. However, it adapts them to extend their insight beyond their original geographical and development stage contexts. Introducing the concept of Partnership at Arm’s Length, it helps extend the spectrum of state-role typologies. At the same time, it expands its geographical reach and it challenges the path dependency implied in the institutionalist approach of this literature, by bringing evidence of significant within-country variation in policy approaches and outcomes. This literature tends to imply that certain countries are historically endowed with a level of state capacity and type of bureaucracies that allow them to implement industrial policies, while others are not. I instead explain how European countries have *evolved* their ability for GVC policies over time (France and Germany) and how even institutionally similar countries (Spain and Italy) experienced different outcomes.

This extension of (neo) developmental state concepts to Europe also speaks directly to the “competition state” theoretical school in political economy (Cerny 1990, 1995, 1997; Jessop 2002; Hay 2004). The Market Creator State concept resonates with some key tenets of this school of thought, while also providing an empirical use case as well as further depth and specificity. The “competition state” thesis argued that, as a reaction to the acceleration of globalisation and integration of global value chains since the 1980s, advanced economies’ “welfare states” gradually morphed into “competition states” (Cerny 1997, Jessop 2002). This did not necessarily mean a reduction in the state’s role. Instead, state actors

refocused their intervention from “protec[ting] national society from excessive competition” to “pursu[ing] ‘increased marketization’” (Genschel and Seelkopf 2015). In other words, in a global economy, states act to improve the global competitiveness of their national economic institutions. This literature is particularly relevant for Europe because some of its predictions are recognizable in the intensification of the European Monetary Union project as well as in the convergence pressure placed on European models of capitalism towards the Anglo-American liberal one (Schmidt 2002, Hancké, Rhodes, and Thatcher 2007). The Market Creator State indeed reflects some of the features identified by “competition state” authors. At the most basic level, GVCs such as those described in this thesis are an emblematic case of how creating domestic innovation markets that can be globally competitive required “actual expansion of *de facto* state intervention,” not a scaling back (Cerny 1997). More specifically, this school also highlighted that the competition state refocused state action “from macroeconomic to microeconomic interventionism ... promotion of enterprise, innovation and profitability in both private and public sectors ... New forms of industrial policy include encouraging private investment and venture capital ... often through joint public/private ventures” (Cerny 1997). The very idea of GVC as well as the concept of PAL introduced in this thesis fit well this narration. This tradition also foreshadowed some aspects of the “form” that GVC agencies in Europe would take: in this model, the state “must act more and more ... like a market actor itself” or a “quasi-enterprise association” (Cerny 1997). My work offers convincing empirical examples of how this has translated into practice. At the same time, the Market Creator State argument advanced here moves this tradition forward, picking up on some of the shortcomings highlighted by its critics in political economy, who argued that the “thesis should not be given up but developed” (Genschel and Seelkopf 2015). Most importantly, while being perhaps less holistic than the competition state, the Market Creator State offers more precise and observable implications that can be empirically tested (see criticism in Genschel and Seelkopf 2015). Moreover, the use cases shown in this research depart from some conceptualisations and expectations in these authors’ argument. At a macro level, the competition state’s relative emphasis on *regulation* (Jessop 2002) is augmented here with an empirical focus on proactive *investment policies*. In this sense, my thesis complements earlier empirical work focused on the role of the European competition state (and “regulatory state;” Majone 1998, Thatcher 2002) in promoting innovation-based growth in the telecom and ICT industries in the 1990s, for instance through the diffusion of “standards” (e.g., GSM) (Glimstedt 2001, Zysman et al. 2013, Cave, Genakos, and Valletti 2019). At the micro level, competition state authors tend to associate the emergence of the competition state with the rise of the “reinventing government” and “new public management” practices (Cerny 1997, Gruening 2001), which would be a misleading oversimplification of the phenomenon of European GVC. For instance, I find that discretion is a central feature of European GVCs, in contrast with the “rule bound” preference of competition states (Genschel and Seelkopf 2015). Most importantly, this thesis complements the competition state’s tradition with further empirical depth and a greater engagement with multiple traditions within the broader comparative political economy literature (Genschel and Seelkopf 2015).

Similarly, my work contributes to the emerging research on the resurgence of industrial policy in Europe and its political economy implications. It develops theoretical insights from a practical example of a very interventionist type of industrial policy that has already spread in Europe. On one level, this

complements the predominant narrative, consistent with the competition state concept, that describes twenty-first century European industrial policy as limited to regulation and market liberalisations aimed at deepening the Single Market (McNamara 2022, Iversen and Soskice 2019). It shows that, in the innovation field, countries and EU institutions have in fact been experimenting with much more interventionist policies. On a second level, the GVC experience brings to the surface the inevitable tensions and trade-offs that running industrial policies in the context of the EU's multi-level governance system entails. A key debate about future European industrial policy will be on whether it is implemented at the national or supranational level (Bianchi and Labory 2006, Di Carlo and Schmitz 2023). The most successful countries will likely be the ones who will manage a careful balance between the two, leveraging EU-institutions to complement national policies. GVC policies in Europe have been characterised, with differences across countries, by a dual level of activity: national GVCs intervening solely in the domestic economies and the European Investment Fund providing capital across Europe while also collaborating with national GVCs. But the theory advanced in this research suggests that there could be a tension between effective implementation models and their democratic legitimacy. The case of Germany offers an extreme example: to overcome the constraints of its domestic institutions, Germany decided to “outsource” the largest component of its GVC policies to the European Investment Fund. Whether this kind of separation between implementing bodies and national democratic institutions is feasible for wider and more politically salient industrial policies is a topical question for political scientists and policymakers.

This research also has important implications for the financial economics literature focused on GVC specifically. In a nutshell, it highlights that analysing *how* GVC intervenes in the market and *what* they invest in offers important insights on outcome variation. Lerner's seminal work on the subject (Lerner 2009) provided a very compelling case for why structuring effective GVCs is so difficult, offering ample evidence of the common pitfalls that derail government efforts. This thesis builds on Lerner's insights to highlight, instead, “what works.” Its focus on Europe, home to several of Lerner's past failure examples, opens a direct dialogue with this literature and contributes to the argument that innovation policy outcomes are not institutionally path dependent but rather determined by how policymakers approach the task. Compared to Lerner's work, the attention of my research to the political economic context within the case studies also advances the debate beyond Lerner's decontextualised “policy menu” approach. My theory about what type of GVC worked in Europe is instead grounded in the institutional gaps of these countries' economic models and in the policy processes that led to new forms of GVC. While its external validity might appear more limited, I would argue that my research' discussion of the underlying mechanisms between the state, existing institutions, and private actors provides less simplistic and more transferable lessons for policymakers worldwide. One aspect in which this is particularly true is the relationship between the state and the private sector. The proposed theory, by looking carefully at state capacity and competences, offers a more sophisticated account of what the state needs to do to collaborate with the private sector without falling prey to its interests. More broadly, the insights of this research are complementary to existing large-N economic studies, which typically aim at estimating the “average effect” of GVC, with little consideration for the vast policy variations within GVCs. The degrees of freedom required to generate statistically significant conclusions mean that often in these studies

observations that are substantially different are treated equivalently (Armour and Cumming 2006; Da Rin et al. 2006), which ultimately leads to conflicting conclusions (e.g., Da Rin 2006 vs. Cummings 2014). My work helps resolve this empirical puzzle by providing important insights on how differences in GVCs can be identified, helping those authors who more recently have started to explore how to code these variables in quantitative studies (Bai et al. 2021). Last but not least, the importance that my theory places on competence and capabilities building—both in the entrepreneurial and capital side—adds to the arguments of those who highlighted GVCs’ possible intergenerational effects and thus cautioned against evaluating the impact of these programmes in the short term (Hellmann and Thiele 2019). In this sense, my research may open pathways to quantitative longitudinal research that tracks key actors (e.g., entrepreneurs, investors) and observes their evolution and impact on the ecosystem over time.

Finally, my argument about how European countries managed the delicate balance between “picking the winners” and “laissez faire” connects to recent literature in economic sociology on the role of PDIs in Europe (Mertens and Thiemann 2018, Mertens et al. 2021). PDIs have been the main actors behind the latest GVC policies in Europe, thus my research expands this literature by providing a deep dive in this aspect of PDIs’ work. By keeping at arm’s length from both politics and the private sector, these rising actors in European political economy (Mertens et al. 2021) have enabled an interventionism based on a form of state-market relationship that transcends the “embedded autonomy” that Peter Evans described as the characterising feature of effective developmental states (Evans 1995). But PDIs alone cannot be *the* explanatory factor: they have been around for decades in continental Europe, and a constant cannot explain change over time. My research provides specific insight into how they were utilised by policymakers and what has made them successful or not.

In summary, this research develops a theory about GVC as a new model of European industrial policy. In so doing it builds upon various scholarly traditions from the fields of political economy, financial economics, and sociology. It utilises these insights to propose an explanation for the surprising evolution of European GVC policies and their outcomes, thus promoting an interdisciplinary dialogue that helps illuminate how European countries have found a new model of industrial policy for innovation.

### **2.4 Substantiation of the theory**

#### *2.4.1 State-market relationship: promoting private venture capital through a partnership at arm’s length*

The horizontal axis of the framework refers to the positioning of the GVC (the state) vis-à-vis private investors (the market). It considers the extent to which the state resembles a classic, rules-based Weberian bureaucracy, or is instead flexible and integrated with the private sector, in terms of its network and *modus operandi*. The axis builds on and extends Peter Evans’ “embedded autonomy” concept. Evans described how neo-developmental states benefited from continuous interaction with society and private industry, favouring better policy design and implementation (Evans 1995). The argument in my research is that for GVC policies “embedded autonomy” is not enough. Differently from Evans’ archetype, effective GVCs in Europe eschew entirely the Weberian model, are independent from both politics and the bureaucracy,

and have the competences to be highly integrated with the private sector without deferring to it. I describe this state-market model as a Partnership at Arm's Length (PAL). In the context of innovation policies, PAL meant that the state proactively supported the creation of private venture capital funds and built strong collaboration partnerships with them. Distant from politics, these GVC organisations prioritised long-term policy goals over short-term political objectives. At the same time, they were able to assert the public interest over private ones, not through top-down rule making but as influential peers in negotiations with private counterparts. This did not mean GVCs “picked the winners” autonomously from private investors: instead, contrary to the workings of a classic rules-based bureaucracy, PAL entailed that public capital was deployed only when private investors were involved too, in a symbiotic relationship. In practice, PAL was achieved by assigning the implementation of GVC policies mostly to PDIs, which could manage public capital while being very close to market actors and at arm's length from politics.

The theory asserts that the PAL approach worked in Europe for three reasons, which PAL summarizes into one concept. First, it enabled better decision making in public investment, with the necessary degree of independence both from political influence and from private vested interests. Successful GVC organisations were carved out from the public bureaucracy and this governance ensured that political considerations impacted only funds' high-level strategy, not the actual investment decisions. Moreover, being separate from the bureaucracy introduced the possibility for discretion-based decision-making, in contrast with the paradigm of the Weberian rules-based state. This *modus operandi*, analogous to that of private VCs, favoured the collaboration of these public funds with private counterparts as well as the recruitment of professionals from the private sector into the public side. In turn, such strengthening of state capacity with industry expertise ensured autonomous decision-making vis-à-vis the industry, reducing risks of state capture. GVCs were able to interact with private actors and negotiate with them on a level playing field, thus reducing the chances of succumbing to special interests. Importantly, these competences, combined with GVCs' sizeable financial resources, allowed them to impose “informed conditionality” on their private counterparts (see concept of “conditionality” in Mazzucato and Rodrik 2023 and Maggor 2021).<sup>16</sup> I use this term to indicate that GVCs promoted best practices and standards in the industry by providing capital with terms attached. However, these terms were not just reflections of various top-down political preferences; they were consistent with start-ups and VCs business models and aimed at maximising their positive externalities on the rest of the ecosystem. In practice, the theory claims that in Europe GVCs evolved towards a PAL model thanks mostly to the role of PDIs. These institutions gained prominence as operating arms of governments, managing public capital with private-sector trained professionals and deep networks in the countries' financial industries (Mertens and Thiemann 2018 and 2021). Their governance structure typically separates them from the public bureaucracy and allows them to operate without following the administration's practices and procedures. Running GVC programmes within these institutions allowed European governments to increase their effectiveness.

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<sup>16</sup> In their 2023 paper “Industrial Policy with Conditionality,” Mazzucato and Rodrik introduce the term “conditionality” and define it as “where the government provides a benefit to the firm (a grant, loans or equity investments, procurement contracts, tax incentives, training, infrastructure, technological support, regulatory forbearance, etc.) in return for the firm undertaking behavioral changes towards meeting certain public objectives. Conditionality refers to the framework specifying the responsibilities, commitments, or undertakings of the firm” (Mazzucato and Rodrik 2023).

Second, PAL meant proactively supporting the creation of an institution that was missing in Europe but that is fundamental for entrepreneurial ecosystems: private venture capital. European companies had historically relied much more on credit finance compared to their counterparts in liberal market economies like the UK and the United States. However, high-growth innovative entrepreneurship is financially incompatible with traditional banking instruments, due to information asymmetries and the long-tail shape of financial returns (Nicholas 2019; Lerner 2009). Financing disruptive entrepreneurship profitably requires financial tools that align the interests of investors and entrepreneurs. Moreover, instruments need to enable investors to more-than-offset the losses from the majority of the investments (which fail) with the returns from the few highly successful ones (Da Rin and Hellmann 2020, Nicholas 2019). In practice, this has meant that venture capital has emerged as the most effective and financially sustainable business model for channelling private capital into such companies (Gompers and Lerner 2001; Lerner 2009; Da Rin et al. 2013; Nicholas 2019). Europe, however, lacked the competences, legal frameworks, and capital pools for the VC industry to develop. From a competences point of view, Europe's reliance on credit finance implied a general lack of knowledge regarding the practices of private equity investment (of which VC can be considered a sub-category) (Casper 2007, Becker and Hellmann 2005). From a capital point of view, the relative dearth of large university endowments and private pension funds meant those capital pools that in the United States fuelled the growth of the VC industry (Gompers and Lerner 2001) were largely missing. Finally, the Limited Partnership (LP)—the legal structure typically used in VC funds, which ensures interest alignment between capital providers and money managers—was a “common law”-born institution that did not travel naturally across the Atlantic (Da Rin et al. 2013; Nicholas 2019).<sup>17</sup> PAL, thus, was key because it meant not only funding start-ups but also supporting the growth of new financial actors—venture capitalists—that channelled both public and private capital effectively to innovative companies.

Third, this integration with private VCs allowed European GVC policies to be more far-reaching than the public budget alone would have permitted. In other words: it expanded GVCs financial leverage (Griffith-Jones and Naqvi 2021). This is because European Union member states are constrained in their use of public resources for industrial policy by two important precepts of European integration. On the one hand, they have budget limitations, because they committed to rules of fiscal austerity that prioritise balancing the budget in the short term over investing to expand the economy's long-term growth potential (Streeck 2015). In this context, the combination of PDIs' and private funding effectively enabled an off-balance sheet industrial policy. On the other, the principles of the single market have led Europeans to agree to a strict set of state-aid rules that significantly bound a state's ability to intervene in the market (Buch-Hansen and Wigger 2010). In practice, these rules mean that governments are very limited in the ways they can fund start-ups—little money for each company and mostly for the very early stages of development. Larger public interventions are instead permitted only where independent private actors are

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<sup>17</sup> The LP structure is a legal/governance structure invented to resolve the VC's intrinsic principal-agent problem. VCs typically do not invest their own capital but rather that of third parties, who entrust them with picking the right companies. The LP structure presupposes the creation of a fund, in which capital holders (typically large financial institutions, pension funds, university endowments, etc.) allocate their capital, renouncing most decision power on it but also ensuring no legal responsibility on its use—this is why they are referred to as Limited Partners (LPs). The venture capitalists, also called general partners (GPs), manage the capital, choosing the investments. GPs' and LPs' financial interests are “artificially” aligned through a series of contractual clauses that ensure GPs are fully committed to the fund and do not have conflicts of interest and through a profit-sharing agreement where GPs typically receive a significant share of the fund's profits.

involved as co-investors (EU Regulation no. 651/2014). PAL, thus, was a solution for European countries to overcome one of the key pitfalls of GVC policies identified in earlier literature: programmes that were too small to have a systemic effect (Lerner 2009, Becker and Hellmann 2005).

In summary, therefore, the theory predicts that on the dimension of state-market relationship, successful GVCs were Partnerships at Arm's Length. PAL entailed a governance that allowed European GVCs to invest better, overcoming challenges of political influence, bureaucratic procedural complexity, and state-capture that had doomed similar policies before and elsewhere. At the same time, the PAL approach implied a deep cooperation with the private sector, supporting its growth and co-investing with it. This enabled countries to execute these ambitious interventionist industrial policies within the EU state-aid and fiscal constraints. Through PAL, thus, GVCs did not replace the market and did not “pick the winners,” but rather proactively created the new institutions that the market required to work.

### *2.4.2 Investment Focus: building entrepreneurial competences through talent recycling*

The second variable of the proposed theoretical framework captures “what” European GVCs invested in. The hypothesis is that successful programmes had a technology/sector agnostic approach, focusing instead on financing any type of high-growth company, without a precise industry target. This is because Europe was lacking not so much the technological inventions but rather the entrepreneurial talent and practices to commercialise them successfully. The goal of GVC programmes, therefore, was to kickstart or magnify a virtuous cycle of fast-growing companies that could attract and train talent and “recycle” it into the ecosystem, replicating the dynamics at the genesis of the Silicon Valley and of other successful innovation economies—but in a European way. This focus was also complementary to the involvement of private venture capitalists, whose business model relies on fast-growing, scalable companies more so than on technological discoveries.

The argument rests first on the idea that “innovation” does not coincide with technological “invention.” The concept is much broader and can be summarised, in Schumpeter's words, with “setting up a new production function” (Schumpeter 1934, 1939): finding new ways and combinations of doing things, which can span from identifying a new market, to designing a new production process, to inventing a new product with existing technologies, to indeed discovering a new technology. In fact, the history of the Silicon Valley is as much about the commercial exploitation of previously invented technologies as it is about new inventions (Janeway 2012, Mazzucato 2013).

Second, as countries approach the development frontier, the path of innovation becomes increasingly uncertain. During a catch-up phase, the government can relatively easily identify technological areas where a country is lagging and orchestrate an industrial policy to develop those specific technologies. Instead, for advanced economies—like the ones in this study—the pockets of opportunity are far less obvious and might encompass all types of innovations mentioned above. At least two types of problems follow. First, it is very hard to predict—for governments, just like for any other actor—which technologies will ultimately become of “strategic interest.” A most obvious and topical case is chipmaker Nvidia: how many governments would invest public resources in videogaming technology?

Yet, the companies' GPUs, originally developed for videogames, are now the engines behind most artificial intelligence models—a sector considered strategic by most governments. Second, the pace of political deliberation means that governments risk being consistently “behind the curve” in picking precise focus technologies. In these circumstances, instead, it becomes more important that the government invests to develop a general “capacity to innovate” (Breznitz 2007), leaving it to the market to identify where the best specific opportunities lie.<sup>18</sup> Historical evidence suggests building this general capacity to innovate requires igniting a dynamic of “talent recycling” from innovative companies. Indeed, one of the few common features in all successful entrepreneurial ecosystems worldwide has been that most start-up success stories were connected to each other. Successful companies grew and trained employees who eventually left to create new successful companies, spreading a certain technology, culture and management know-how in a self-reinforcing cycle (Saxenian 1996, Casper 2007, Bahrami and Evans 2005, Janeway 2012). However, this talent recycling dynamic has proven harder in Europe because of the relative rigidity of its labour markets. European economies, especially those more aligned with the CME model, have labour market laws, training practices and industrial relations that create complementary incentives for long-term employment and low labour mobility (Hall and Soskice 2001, Casper 2007). In Europe, therefore, it was particularly important to focus on those companies that had the highest potential to attract and train new entrepreneurial talent, rather than on the most technologically ambitious ones. Highly technological companies that do not grow do not hire and train employees, and thus cannot recycle them into the ecosystem either. The focus of GVC, therefore, shifted to the concept of High-Growth-Firms (HGFs): companies that grow at more than 20 percent per year and are typically responsible for the vast majority of new jobs creation in advanced economies (Brown et al. 2014). HGFs, however, can appear in all sectors and present very heterogeneous characteristics (Brown et al. 2014, Kolar 2014, Henrekson and Johansson 2010), thus requiring a technology and sector agnostic policy approach.

Finally, the focus on HGFs was also congenial to the collaboration of European GVCs with private investors. Venture capital is the most effective way to attract private money to funding innovation, but not to all types of innovation. The VC business model has specific constraints that render it more suitable to high-growth companies than to high-tech innovations that are not close to commercialisation yet. This is because VCs typically have a time constraint that derives from the fact that they do not invest their own money but rather operate as money managers. They raise funds from institutional investors with the promise of investing it in successful companies and return at least 3 times the capital invested within 10-12 years, after selling the companies. Given the very high incidence of failure in innovative companies, however, this return is achievable only if the surviving companies are so successful to more-than-offset the losses from the rest of the portfolio.<sup>19</sup> This “math of VC” has two relevant implications for the theory. The first is that VCs are generally only interested in high-growth-companies: a technology-based company

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<sup>18</sup> Breznitz' for instance argues that “The state should no longer methodically plan the development of strategic industries by choosing specific products and product niches, forcing private companies to enter them and supplying some of the necessary finance and technologies. Instead, the state should concentrate on creating more broadly defined technological capabilities, and should focus on motivating private agents to work in these areas and to collaborate with one another and with the state. The state's role is no longer to make the decisions and compel private companies to follow them, but rather to motivate private companies to make long-term commitments to operate in rapid innovation-based industries and activities.” (Breznitz 2007)

<sup>19</sup> This is why, for instance, identifying so-called “unicorns” is so important for the VC industry. “Unicorn” is a term used in the industry to refer to companies that reach valuations of at least one billion dollars.

that has achieved only moderate growth, or whose addressable market is small, is not enticing for them. The second is that VCs cannot invest in companies based on technologies that are too far from commercialisation, because the materialisation of their value would happen beyond the lifetime of the fund.<sup>20</sup> Thus, VCs prefer low capital intensity, highly scalable companies that can reach tens or hundreds of millions of euros in revenue within three-to-five years. Other types of innovations can of course still be very valuable—commercially and for society—but they are not “VC-backable.”<sup>21</sup> Given these characteristics and constraints of the VC model, it is logical that European GVC policies, which leveraged private VC, prioritised investments in any fast-growing company rather than channelling capital towards specific technologies.

In summary, the theory predicts that along the vertical dimension—investment focus—successful European GVCs implemented strategies that relaxed the definition of “innovation” and prioritised competence building via high-growth companies, rather than setting ambitious technology objectives or targeting specific industries. This approach was most appropriate for solving the institutional challenges that European countries faced: the absence of mobile labour markets and of a professional, financially attractive, risk-capital industry.

## 2.5 Testing the Market Creator State theory: observable implications of the independent variables, case selection, and data collection

In small-N case-study research, theories are tested by verifying whether clearly defined observable implications of the theory occur in the cases under scrutiny (King et al. 1994). In this thesis such observable implications take the form of clear expectations about the behaviour of public entities engaged in GVC, summarised in the seven elements of Table 2.2. In this section I explain these empirical elements that are consistent with the theory, for each of the two variables of the theoretical framework, as well as how the theory could fail. I later explain how the cases to test the theory were chosen and the process of data collection utilised.

**Table 2.2: Key elements of the Market Creator State along the two axes of the theoretical framework**

PAL	Focus on Horizontal Innovation Capabilities
Integration / co-investment with private VCs	Broad definition of innovation
Private-sector investment competences and practices	Tech-agnostic and focused on high-growth firms
Informed conditionality	Promotion/support of entrepreneurial skills development
Separation from politics / bureaucracy	

<sup>20</sup> For an earlier discussion of these dynamics and of how VCs affect the type of innovation in a country, see Breznitz (2007)’s chapter on the path of technological specialization of Israel.

<sup>21</sup> For a discussion of how other approaches—different from the VC-focused Silicon Valley model—can support other types of innovation, which are as or even more valuable for broader society, see Breznitz (2021), *Innovation in Real Places*.

### 2.5.1 *Observable implications of PAL GVCs*

On the type of state-market relationship dimension, the four elements reflect the Partnership at Arm's Length concept.

“Partnership” translates into a GVC that are clearly integrated with private investors active in the innovation ecosystem. In practice, this means GVCs that act in two main ways: co-investing “directly” in start-ups with private investors or investing “indirectly”—i.e., providing public capital to private VCs and letting them choose the specific companies to support. This “indirect investment” modality is expected to be predominant, given the theory's emphasis on the importance of developing private VC actors and capabilities. More broadly, the expectation is that, to nurture this collaboration with the private sector, successful GVCs utilise investment practices and instruments that are either the same as PVCs' or very complementary to them. This means investing in equity, using typical start-up investment contracting structures, and avoiding in particular credit-based instruments. It also means investing only in partnership with private investors, never alone. In other words, the theory implies that even direct investments tools are not so much means for the state to “pick winners” but a way to amplify, with public capital, investment choices made by private investors.

“Arm's Length” instead translates in elements that shield state agencies from the risks of “state capture” and political meddling, which the literature has shown often compromise GVC initiatives (Lerner 2009). In the context of GVC, state capture can take mainly two forms. First, GVCs could be set up with such strong negative biases that the public shoulders all the risks and the private sector merely reaps the rewards—Lerner calls this a “heads I win, tails you lose” model (Lerner 2009). Second, there could be outright collusion, where GVC management makes deals that favour private interests at the expense of the public. It should be noted that the use of equity co-investments, as outlined above, should already limit both of these risks—or at the very least expose them quickly.<sup>22</sup> However, a combination of investment competences and imposition of informed conditionality on privates are also important indicators. In practice, this means that, first, successful GVC attract, grow, and retain, professional talent with the competences to engage and negotiate with private VC investors without succumbing to their particular interests. A strong indication that the GVC has internalised these competences would be a high proportion of GVCs' team members with backgrounds in the private sector, in particular in equity investments, as opposed to in the state bureaucracy. Second, while collaborating with PVCs, GVCs need not just accommodate private investors' decisions and preferences but have the processes and means to ensure that risk-rewards are fairly allocated and impose terms and conditions that make the private activity contribute to the policy goals. This means direct investment teams structured similarly to those of private VCs (roles, mix of competences, seniority, but also clear incentive structures) and indirect GVCs that do not simply provide capital to private VCs but thoroughly negotiate the contractual agreements, following international best practices. In this sense, GVCs' performance incentive structures and returns expectations are particularly important to align the activities to policy goals. The theory's expectation is that GVCs have clear incentives to invest rigorously but return targets commensurate to a public policy

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<sup>22</sup> For one, a GVC fund that consistently co-invests at less advantageous terms than private investors would stand out and likely generate a loss.

intervention that aims to alter an existing suboptimal equilibrium (Becker and Hellmann 2005, Milgrom and Roberts 1994).<sup>23</sup> In other words, GVCs with no incentive structures and those that are expected to deliver top-of-the-industry returns are both likely to fail. The first because they have fewer checks on potential political interference and collusion with privates. The latter, because too high and unrealistic return targets may either undermine early days' relatively positive results or lead the investment teams to simply replicate the role of private investors, rather than act in line with the broader policy ambition.

On the flip side, Arm's Length should be reflected also in a governance structure that shields GVC operational decisions from political interference. As the literature has uncovered, this type of programmes can easily become prey to political meddling that can heavily distort the impact of the policy (Lerner 2009). The expectation, thus, is that well-functioning GVCs have governance structures with no political representation within committees that make the investment decisions. At most, they might allow political influence on the strategic direction of the organisation, via supervisory boards or similar high-level bodies. Top management with an industry background is also an expected predictor of good performance. Similarly, the expectation is that changes in political equilibria do not affect the GVC's top management and thus allow for managerial continuity.

All in all, this translates into a general prediction that GVC programmes are managed by PDI-type institutions. As the emerging literature on PDIs in Europe has highlighted, these organisations have three features that align with the characteristics outlined above. First, they are typically publicly funded but operationally independent. Second, their operational independence allows for recruiting and compensation practices more akin to those of the private sector. And third, they typically have well-developed relationships with private actors (Mertens et al. 2021). Thus, the implication is that, in Europe, PDIs are the best-placed public institutions to deliver GVC programmes with a PAL approach.

### 2.5.2 *Observable implications of Investment Focus*

If the observable implications of the horizontal dimension of the framework related to “how” GVC invest, those in the vertical dimension refer to “what” the GVC invest in. In short, the theory implies that there should be evidence that successful GVCs did not target specific industries but rather were open to all types of innovation.

Thus, the theory predicts a policy process where there was a conscious decision by policymakers to adopt a technology agnostic approach and prioritise instead the business prospects of companies, focussing on high-growth firms. It fits the theory particularly well if there is evidence of a discussion and learning process that led policymakers to “relax” the definition of innovation and include all forms, from high-tech to business model innovations.

The theory implies that GVCs would invest mostly via generalist funds—i.e., funds whose investment strategy is not limited to very specific industries. In the case when the GVC invests indirectly,

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<sup>23</sup> Becker and Hellmann (2005), with reference to Germany's first GVC attempt, use Milgrom and Roberts' theory of complementarities to explain that “*in an equilibrium with complementarities any single deviation is necessarily unprofitable: either some agent (possibly the government) has to be willing to incur losses for institutional change, or the initial change must be accompanied by further changes in the system so that the system can move toward a new equilibrium.*”

via PVCs, then it would be consistent with the theory if the GVC did not impose on private teams to focus their investment on certain industries but rather let the teams themselves choose their sectorial preferences. In this case, thus, the important factor is not whether or not the private funds are sector specific but rather who makes the decision about the sector preference—if it is the market, it would be consistent with the theory.

A related implication is that GVC programmes would be agnostic also about the source of innovation. A very high-tech focused approach would typically concentrate on commercial applications of research-based inventions. Successful GVCs, instead, are expected to invest in any type of company, independently of its genesis and background of the founders. In practice, this means GVC programmes that do not prioritise technology transfer from university research as an innovation route and thus devote relatively few resources to programmes such as university-based incubators or technology transfer offices.

As a consequence of the technology agnostic approach, another observable implication refers to the innovation intensity of companies funded by GVCs. The expectation is that patent-based companies are a minority in GVCs' portfolio—they are instead the majority for university spin-offs. To be sure, given the typically higher risk, it is possible that GVCs portfolios in aggregate might be relatively more exposed to technology transfer-based companies. However, the theory would be supported if both GVCs and PVCs portfolios contained a majority of non-patent based companies.

A final expectation is that GVC agencies, in their aim to build entrepreneurial competences, do not only limit their activity to investing but also offer entrepreneurial coaching to their investees. Such activities can take various forms, but examples include programmes to teach entrepreneurs horizontal business skills such as developing a business plan, setting up proper reporting, presenting to investors and so on. Similarly, efforts by GVCs to facilitate peer-to-peer learning between investees would also be consistent with the theory's emphasis on horizontal capabilities.

### *2.5.3 How can the theory fail: contradictory evidence*

Conversely, there are several characteristics of GVCs that cast doubt on the theory. In summary, if successful examples of European GVCs appear to fall in any other of the three quadrants, the theory would not stand the test.

Focusing on the horizontal dimension—state-market relationship—success cases of GVCs operated by government bureaucracies or with very tight links to political authorities would negate one of the theory's core hypotheses. For instance, successful GVCs run outside of PDIs or unsuccessful ones run within them deserve particular attention for testing the theory herein. The specific type of activities conducted could also provide contradictory evidence: if GVCs operate prevalently a direct model—investing directly in start-ups—this would undermine the assertion that European GVCs focused on developing the private VC industry, which would instead require a majority of the resources deployed “indirectly.”<sup>24</sup> Similarly, successful GVCs that utilised solely traditional, non-equity financial instruments and that did not co-invest with the private sector would also be problematic for the theory. Finally, certain

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<sup>24</sup> Indirect GVCs provide capital to PVCs and it is the latter who invest in start-ups

evidence would undermine the idea that GVCs operated autonomously from the private sector. For instance, it would be surprising if successful programmes were found to be simple “matching funds” that followed private investors without a dedicated and competent GVC team that performs its independent analyses and negotiates deal terms to balance private investors’ interests. More broadly, it would be theoretically inconsistent if GVC teams were primarily from a public service background, without relevant experience in equity investments.

With regards to the vertical dimension—investment focus—the theory would not stand if there were clear evidence that successful programmes developed very precise industry-targeting strategies or directed investment only towards very high-tech companies. This would emerge from process tracing of the decision making behind the launch of the funds but could also be observed *ex post*. For instance, if a majority of GVC capital is invested via sector-specific direct-GVC funds, this would hint that the agency strategy prioritised technology/sector targeting over horizontal capabilities building. Similarly, it would be surprising if the programme focus were mostly on technologies deriving from university research—for instance, if significant resources were devoted to technology transfer funds and accelerators for university spin-offs. Finally, if a majority of GVC-backed companies held patents, this would be an *ex-post* observation in contrast with the expectations of the theory.

### *2.5.4 Case selection and data sources*

This research is a structured, small-N comparative case study using a mix of qualitative and quantitative evidence.

The case selection involved choosing a set of countries that could help the research design control for other confounding variables. The research therefore analyses and compares several attempts at GVC policies in Europe, both within the same countries over time, and across countries. First, the scope was set to continental European countries, to limit the variation in the structural characteristics of the economy that are known to facilitate or deter high-growth entrepreneurship. For instance, while the emergence of a strong entrepreneurial ecosystem in the United Kingdom (a paradigmatic liberal market economy) is not theoretically surprising, it is much more puzzling in statist France and coordinated Germany (Casper 2007). These types of countries are therefore better suited to isolate the role of policy (see King et al. 1994 on choosing cases to control for variables out of the scope of the study). Second, cases were chosen to allow for a within-country and cross-country comparison to test the theory across European varieties of capitalism and policy outcomes. In practice, the thesis first analyses the starkest case of GVC intervention—France—comparing the latest GVC policies, which were successful, with prior disappointing attempts. It then conducts a similar over-time analysis in France’s most common paired case in political economy—Germany. Finally, it further tests the conclusions through a cross-country comparison among Southern European countries—Italy and Spain. This selection method allowed to observe how different European countries structured GVCs and how these choices were connected to different entrepreneurial ecosystem outcomes.

## Chapter 2: Theory

The measurement of the dependent and independent variables across these case studies took the form of both qualitative and quantitative analyses. Each case starts with an evaluation of the dependent variable: the growth of the entrepreneurial ecosystem over time. This is measured through five key indicators, which reflect both the “size” of the ecosystem and its “quality,” as well as control for some endogeneity risks. Table 2.3 below lists the indicators, why they were chosen, and why each alone would have limitations.

**Table 2.3: Indicators of ecosystem development (dependent variable)**

	What it captures		Limitations
Size	<b>No. of start-ups</b>	Reflects the entrepreneurial propensity in the country	Says little on quality of business models and innovations and may be endogenously affected by GVC
	<b>Amount of VC funding</b>	Reflects development of a fundamental institution for Silicon Valley-like ecosystems: VC	Can be endogenously affected by large GVC initiatives
Quality	<b>No. of unicorns<sup>25</sup></b>	Reflects companies with innovations / business models that yield global presence or ambition	May change over time with fluctuations of business cycle that impact valuations
	<b>€m of later stage VC</b>	Reflects presence of high-growth start-ups that do not remain small but become “scale-ups”	May be a lagging indicator
	<b>€m of foreign VC</b>	Reflects start-up quality as global investors are less directly influenced by local government policies and invests only if they see financially attractive prospects	Tends to be concentrated in later / growth stages

In each country, the research tracks the evolution of these metrics over the observation period. Growth rates are compared to those in a benchmark case, the United Kingdom, which is Europe’s largest start-up ecosystem and the economy structurally most similar to the United States (Hall and Soskice 2001, Casper 2007). All in all, this approach is consistent with previous political economy and entrepreneurial finance literature evaluating entrepreneurial ecosystems or looking at VC/GVC (e.g., Saxenian 1996, Bresnahan and Gambardella 2004, Breznitz 2007, Casper 2007, and Da Rin et al. 2013) and provides a multifaceted enough view that makes the overall evaluation not too reliant on a single metric. Importantly, it limits the endogeneity risk which is intrinsic in these types of studies.

I gathered the quantitative data outlined in the table mostly from Dealroom and Pitchbook, two commercial data providers to which I obtained access. Specific data points were then triangulated with additional sources. For instance, data on unicorns was completed using data produced by the VC firm Atomico, which kindly shared part of the analysis underpinning their yearly report *State of European Tech*.<sup>26</sup> In each chapter, this quantitative evaluation is complemented by qualitative commentary from key protagonists of the ecosystem who, during interviews, were able to provide informed nuanced views on the evolutions they witnessed in their local ecosystem. This type of commentary, although at times anecdotal, often stressed dynamics of maturation and professionalisation of the ecosystem that are hard to capture through purely statistical measures.

<sup>25</sup> Privately held companies valued at more than one billion dollars.

<sup>26</sup> See more on the State of European Tech here: <https://stateofeuropeantech.com/media>

## Chapter 2: Theory

Measuring the independent variables of this study meant instead verifying the observable implications of GVC models as described in the previous sections (4.1). In practice, this was achieved through a combination of in-depth elite interviews, archival research, and secondary research to understand the characteristics of each GVC policy and the policy process behind it. The information obtained was also used to build a proprietary dataset that estimated the size (in millions of euros invested) of investments by GVCs in each country, over time. All in all, the research involved 94 interviews, with 83 informants, across seven countries. Interviews lasted between 30 minutes and 2.5 hours (most were around one hour) and engaged interviewees representing most actors in the ecosystems: entrepreneurs and venture capitalists, but also key policymakers and GVC officials as well as informed observers. This approach allowed me to triangulate most information and obtain various points of view, limiting the risk of extreme biases in the recounts and other well-established reliability issues with interview data (Weiss 1995; Pekkanen and Bleich 2013). Informants were chosen with different techniques, depending on the objective, following the best practices of interview research. I used purposive sampling for speaking to those individuals that were particularly informed about certain events or had a particularly important role in the processes (e.g., policymakers and top management of GVCs). I instead pursued a mix of random sampling combined with a snowball technique to generalise the view of certain categories of actors (e.g., entrepreneurs or VCs) on ecosystem developments and on policy initiatives. On the quantitative front, I built the dataset of GVC investments by analysing agencies' annual reports and/or obtaining data from GVC officials I interviewed. Where not available, timeseries estimates were obtained by aggregating information from interviews and from secondary sources. All in all, the dataset obtained—although for some years and line items it includes only estimates—is in itself an important contribution to the literature, given the high fragmentation of the underlying data sources.

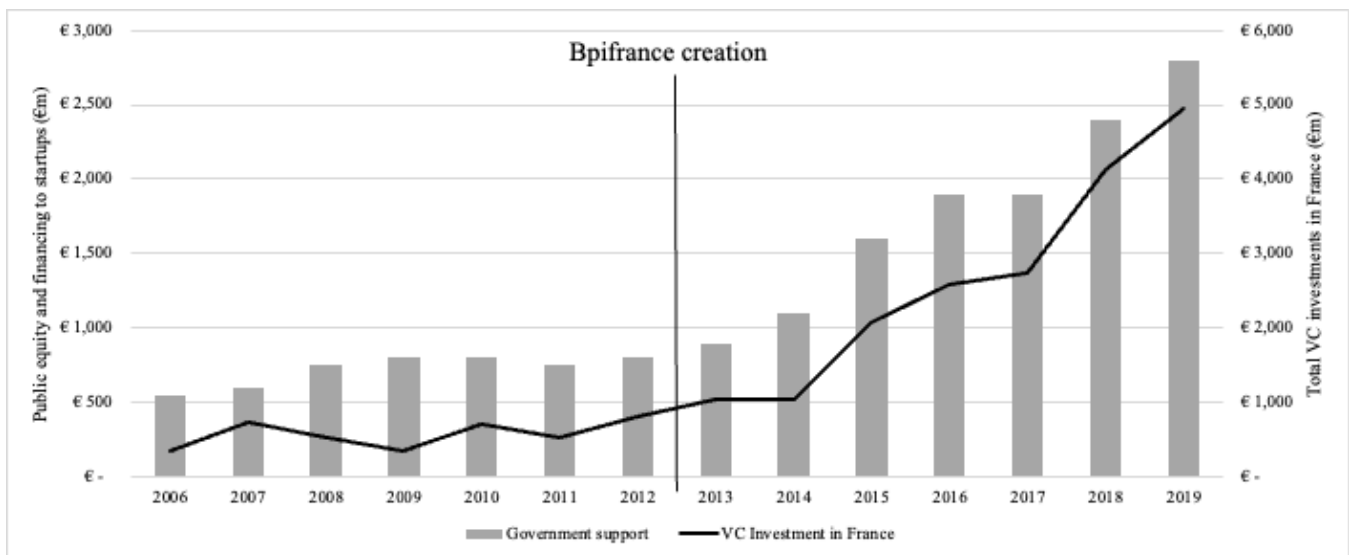
## Chapter 3 Can dirigisme innovate? Bpifrance and the state-coordinated ecosystem in France

“Our mission is to promote the economic development of France”  
Bpifrance Official

### 3.1 Introduction: a state-orchestrated start-up nation

This chapter analyses the impressive catch-up of France’s entrepreneurial ecosystem between 2010 and 2019 and the policies that supported it. In a country where the innovation landscape had traditionally been dominated by large and often state-owned corporates (Schmidt 2002), until the late two-thousands policy efforts to push France’s start-up scene had disappointed. Between 2010 and 2019, however, the country evolved to become the largest innovation ecosystem in continental Europe (head-to-head with Germany), amassing an aggregate of over 20 billion euros of venture capital funding and breeding some of Europe’s most valuable and successful innovative companies. This evolution was supported by a 360-degree innovation industrial policy in the form of government venture capital. Figure 3.1 below summarises this development, showing both the growth of the ecosystem (proxied by VC investment volumes) and the marked increased in GVC.

**Figure 3.1: Evolution of VC Investments in France and of Government support for start-ups**



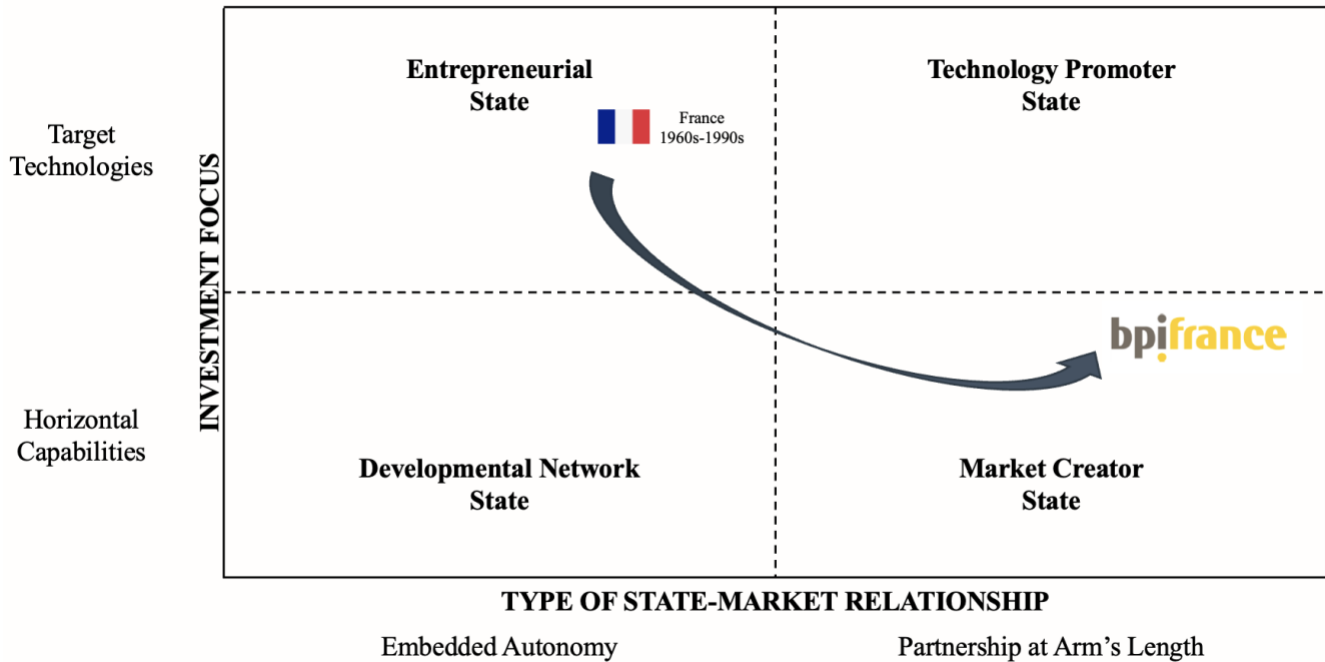
Source: Dealroom data and author’s analysis on data collected from Bpifrance internal documents and from Bpifrance 2023, 10 Ans d’Impact.

In this first case, I argue that France is the starkest European example of a state-orchestrated innovation ecosystem. Its specific characteristics that offer nuanced insights for both the literature and policymakers. In this story, the prominent role of France’s public development bank, Bpifrance, is clear. This centrality of the state is in perfect continuity with the French *statist* model of capitalism. However, interpreting Bpifrance’s role as just the latest instance of the country’s tradition of *dirigisme* would be

misleading. The in-depth analysis of the institution's GVC programmes shows that it introduced a modern form of industrial policy that departed from *dirigiste* practices. While some have been tempted to see in Bpifrance the materialisation of the *entrepreneurial state* (Mazzucato 2018, Sifted Report 2021), I show that its *modus operandi* is better defined as a Market Creator State. GVC in France became effective only when it strengthened state capacity to partner with the private venture capital industry and prioritised investing in general entrepreneurial capabilities, while scaling back the state's role in picking the winning companies and technologies.

By screening Bpifrance through the lenses of my proposed theoretical framework (Figure 3.2), I show this evolution of France's GVC activities from an Entrepreneurial State to a Market Creator State. Bpifrance's relationship with the market (X axis in the framework) is certainly a Partnership at Arm's Length (PAL). Bpifrance has clearly prioritised the growth and professionalisation of the private VC industry. Where it invests directly in start-ups, it does so by reproducing the practices of PVCs and always by co-investing with them. At the same time, it has ring-fenced its operations from the influence of the public bureaucracy and of politics. This private-sector integrated approach has triggered mechanisms that help PVCs attract private capital and facilitate their portfolio diversification, thus supporting the growth of this fundamental institution for the innovation ecosystem. On the Y axis—investment focus—Bpifrance has also made a marked move from the top half towards the bottom half of the framework. The chapter shows that the formation of Bpifrance coincided with a broadening of the definition of innovation to include “low-tech” companies rather than solely R&D and patent-based innovations. As a consequence, Bpifrance started to provide capital in a more technology-agnostic way to any innovative company with high-growth potential, beyond science-based technologies (e.g., technology transfer from universities). To be sure, Bpifrance was still more exposed than the private sector to particularly high-risk sectors, but this is within a carefully balanced strategy where public direct co-investments help private funds especially in those areas of the market perceived to have the highest risk. This new focus on commercialisation success rather than strategic technologies has allowed Bpifrance to promote the attraction and training of a critical mass of professional entrepreneurial and managerial talent for innovative start-ups—another key ingredient for the ecosystem.

Figure 3.2: Evolution of France GVC models based on proposed theoretical framework



Thus this chapter, through the story of Bpifrance, introduces the paradigm of the Market Creator State and offers a very clear model for how it was achieved in practice. Bpifrance's Market Creator State has four main characteristics. First, it is highly centralised and coordinated. In fact, Bpifrance is the outcome of the French government's decision to rationalise and merge into one institution the plethora of agencies and programmes that supported French companies until 2012. The second and third elements are the direct and indirect equity investment activities. Through these, Bpifrance has invested in close to two-thirds of French start-ups (see analyses later in this chapter). Most importantly, these two activities are highly coordinated—although there are clear Chinese walls, they work towards a common high-level strategy. Fourth, Bpifrance combines equity funding with non-equity tools, such as grants and—especially—subsidised loans. Importantly, these do not target a different segment of companies but often constitute complementary finance to Bpifrance's and private VCs' equity rounds. Finally, Bpifrance has a central role in the ecosystem beyond the provision of funding: it proactively coordinates the industry and promotes capacity building, both via networking and through in-kind support programmes for its investees and private partner investors. It is as clear, however, that these specific features of Bpifrance are largely enabled by France's historical model of capitalism, where the state has consistently played a central role. They are hard to replicate outside of France, as the next chapters will show. What is most important, therefore, are the key principles and mechanisms that support the Bpifrance model, which can—and will—be tested across cases.

The chapter also explains *why* France experienced this evolution in GVC policies—introducing the causal path to the emergence of the Market Creator State in Europe. By reconstructing the process of formation of Bpifrance and the decisions around its strategy, I show that the evolution towards a Market Creator State is the net result of internal forces pushing for more interventionism and external constraints

on the state's role on the economy. After the Global Financial Crisis (GFC), the French Government had a renewed drive to intervene in the economy by supporting struggling industries and investing in innovation. However, the European Union's limits on public debt levels (see the "consolidation state," Streeck 2015) and on "state aid" to companies led the government to operate "off the balance sheet," involving the country's public development institution (PDI)—the *Caisse des Dépôts et Consignations* (CDC)—to fund and manage a large part of the government's plans. CDC's involvement meant that GVC activities, which had historically been operated from within traditional public agencies, gradually became influenced by the practices and approach of the CDC. The institution has had a historical mandate of investing in profitable long-term projects, with independence from the French executive, as well as a network and expertise in private equity that it developed while supporting the growth of equity markets since the nineties. This led Bpifrance to operate at arm's length from the government as well as to deepen its ties with the private sector, recruiting staff from private VCs, embracing their investment practices, and systematically co-investing with them. France, therefore, exemplifies how Europe became the laboratory for a new form of innovation industrial policy, as a solution to squaring the circle between abiding to EU's budgetary and state-aid constraints and responding to politicians' ambitions to promote innovation.

The case offers important theoretical and policy implications. Bpifrance's story and France's state-orchestrated ecosystem add an important element to the decade-long debate over the evolving role of the state in France. The chapter explains that while dirigiste-era programmes were unsuccessful at fostering the ecosystem, the liberalisations policies that since the eighties moved France more towards an LME model were not sufficient either. Instead, the emergence of an innovation ecosystem in France is tied to a new intensification of state intervention, challenging the view that the ability of the French state to direct development of the economy has waned (Culpepper 2006). In so doing, the chapter contributes important findings to the literature on GVC as well: because state intervention in innovation in France has been a constant over the decades, the case highlights that *how* GVC is structured is an important determinant. For policymakers, the French experience introduces several mechanisms GVCs can trigger in the ecosystem. It shows that public agencies' investments in funds can provide a "certification mechanism," while direct investments in start-ups can be useful if the state is a knowledgeable and professional co-investor that helps start-up reach scale and PVCs diversify their portfolios. More broadly, a clear lesson from Bpifrance's success is that a good reputation and network of GVC's professionals within the ecosystem is a precondition for a positive policy impact.

The chapter is structured as follows. The next section summarises the findings of previous literature on the evolution and limits of the French model of state intervention, explaining its implications and limitations for innovation policies. Section three describes the rapid development of the French ecosystem after 2010. Against this backdrop, section four analyses the political process behind the formation of Bpifrance and section five the PDI's model of GVC and its role in the innovation ecosystem. Section six concludes by drawing the theoretical implications and insights for policymakers and how these can be tested across the next cases of this thesis.

### 3.2 French state intervention in innovation and its limits

France has a long history of state intervention in the economy and in support of innovation. This section builds on existing literature to identify two key periods and related approaches. For four decades since WWII, a *dirigiste* model meant that innovation policy in France was directed centrally by the state and implemented mostly through France's large corporates. Since the eighties, then, France passed reforms to move towards a more liberal market economy (LME) model. The focus of innovation policy turned to SMEs but the role of state bureaucracy in allocating capital remained central. Both these models proved ineffective at spurring a Silicon Valley-like entrepreneurial ecosystem as this French "entrepreneurial state" stepped into several of the pitfalls of entrepreneurship policies identified in the literature.

#### 3.2.1 *Dirigiste France and state-led innovation*

The origins of *dirigiste* France date back to the aftermath of World World II and they are historically rooted in the country's tradition of Republican *etatism* (Clift 2006; Hazareesingh 1994). A small elite within the French government engineered a rearrangement of public institutions that allowed the French state, particularly the Treasury, to direct and control the modernisation of the economy (Hall 1986, Zysman 1983). The state directly owned and managed a significant share of key firms and activities in the economy (13 of the largest 20 firms as late as 1981). Most importantly, as Zysman (1983) explained, the state was able to perform a "selective allocation of credit," both directly via public agencies but also through the state's control or network-based influence over the credit sector (Zysman 1983, Culpepper 2006, Hall 1986). The direct reach of the state also extended beyond finance and corporate governance, to other key areas of the political economy such as industrial relations and the education system (Culpepper 2006).<sup>27</sup> All in all, it was this heavily state reliant model that accompanied France through the *trente glorieuses*, until the pressure from globalization and European integration forced the country to rethink its institutional setup (Culpepper 2006).

During this time, innovation was largely a prerogative of the state, which centrally identified strategic technological priorities and directed economic actors to achieve them. In particular, through funding public laboratories and controlling large corporates, the state defined the agenda and provided the funding for R&D-heavy projects with strategic value for the country's development (Trumbull 2004). The state's control and influence on these large companies thus meant that they were the main vehicles for the implementation of the state's innovation industrial policies. One prominent example of this approach was the famous *Plan Calcul* in the 1970s. The plan mobilised around 16 billions of today's euros in trying to develop (or protect) the French semiconductor and computing industry, through a mix of government-led M&A and a profusion of subsidies to the national "champions" identified by the Government (Lerner 2009, Ziegler 1997). The Plan was built around two key public research centres (IRIA and LETI) and a core of industrial partners (CII, SPERAC, SESCOSEM) (Mounier-Kuhn 1994). The result was a "torrent

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<sup>27</sup> While the power of the French *dirigiste* state of those years is hard to overstate, some analysts caution against assuming a complete autonomy and unidirectional relationship between the French state and the other social actors, especially business, given the tight network between state and business elites at the time (Clift 2006, Schmidt 2003, Loriaux 2003).

of red ink” (Lerner 2009), used mostly to keep large corporates alive, while the state’s bureaucracy proved unwilling and unable to facilitate the integration of scientific advances and innovative SMEs/start-ups into the industrial system (Ziegler 1997). A couple of decades later, the French Government pursued another top-down effort to direct the development of a new industry. It attempted to create a telecom-focused technology cluster in Brittany, to replace the fading economic activity caused by the reduction in military spending affecting the companies of the area (De Penanros and Serfati 2000). Again, the result was the deployment of substantial resources to a mix of large companies (telecoms) and public universities with the expectation that they would provide the infrastructure and the innovations to generate high-tech entrepreneurship (OECD 2006). The sole focus on technology investment without consideration for the deficiencies of entrepreneurial tradition and skills of the area doomed the project from the start (Lerner 2009), although the end of the dot.com bubble certainly contributed to its failure. The National Agency for the Valorisation of Research (ANVAR) also funded innovative project since the sixties. Again, however, this funding was highly focused on supporting technology transfer from France’s public research labs and, until the eighties, mostly via large companies’ projects (75 percent of funding) (Trumbull 2004). It did little, instead, for the broader development of an ecosystem and to support start-ups in their commercial development. Similarly, in an effort to involve banks in funding innovation, a 1972 law created the *Sociétés Financières d’Innovation* (SFIs), providing the legal structure for vehicles dedicated to funding innovation (Granier and Badu 2019, Lachmann 1999, Dubocage and Rivaud-Danset 2002). Contrary to the American limited partnership model, however, these primordial French VCs were captive (i.e., funded and owned by a larger company) and often state-owned (Granier and Badu 2019), thus not mobilising significant third-party, private capital. Moreover, these companies were structured to invest only in the commercialisation of technological research and in the exploitation of patents,<sup>28</sup> again limiting their scope.

All in all, this innovation funding model was partially successful at generating some disruptive and R&D-intensive technologies (e.g., Concorde, Minitel, TGV; see Trumbull 2004, Schmidt 2002) but not at creating a sustainable innovation ecosystem akin to the Silicon Valley (Lerner 2009).

### 3.2.2 France’s move towards a liberal market economy model

Starting in the mid-eighties, France underwent a significant evolution of its political economy, which also affected its approach to innovation industrial policy (Culpepper 2006, Clift 2006, Levy 2016). During this time, it passed reforms to reduce the role of the state and tweak its model of capitalism towards a liberal market economy (LME), theoretically more conducive to disruptive innovation (Levy 2016, Culpepper et al. 2006, Loriaux 1991; Gordon and Meunier, 2001; Hall and Soskice 2001). Innovation policy also evolved to favour entrepreneurship, but with limited results.

Scholars disagree on the degree of change that the French economy underwent during this period (Culpepper 2006; Clift 2006 and 2013) but, overall, the outcome is a more idiosyncratic economic model: the state is less directly in control but still interferes significantly in markets. On the one hand, the

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<sup>28</sup> See definition at: <https://vitrinelinguistique.oqlf.gouv.qc.ca/fiche-gdt/fiche/8365980/societe-financiere-dinnovation>

liberalisations and privatisations loosened the grip of the state on the economy (Culpepper 2006). In particular, the credit and financial sector, which the literature considers instrumental for innovation markets, were liberalised (Jabko and Massok 2012, Morin 2000, Hancké 2002, Goyer 2005, O’Sullivan 2007). The banking law of 1984, together with the central bank independence in 1993 and the privatization of the largest public banks in 1999 were all important steps in this process (Jabko and Massok 2012). The governance of French industry and finance was also gradually diversified, favouring the increase in ownership by foreign investors, which possessed 40 percent of the CAC-40 by the mid-two-thousands (Culpepper 2006). Other developments at the time pointed to a more entrepreneurship-friendly France: the relative weight of equity funding for French companies grew significantly (Culpepper 2006), stock-based compensation became widespread (Trumbull 2004), and wage flexibility increased as industrial relations negotiations moved from the sector level to the firm level (Lallement 2008, Yakubovich 2002). On the other hand, however, the prominence of the state in France far from disappeared (Smith 2004, Pedder 2012, Levy 2016, Beffa 2005, Clift 2013). Vivien Schmidt, for instance, has argued that the “state-led” model instead evolved into a “state-enhanced” one (Schmidt 2003). Industrial policy and market interference were still very present but took the form of supply side laws and incentives, as well state orchestration via the deep elite networks that embed the French bureaucracy with the top management of corporate France (Schmidt 2003, Clift 2006). The role of capital markets in this new French model, although more prominent, also still differed from the Anglo-Saxon case, with much less impact on driving innovation, new ventures, and investment (Clift 2006, O’Sullivan 2001).

In this period, innovation industrial policy also evolved, reflecting the contradictions of France’s emerging, hybrid economic model, with only some elements of discontinuity with the dirigiste past. On one side, the focus moved towards SMEs. Especially during the dot.com frenzy of the nineties, the French state “turned French innovation policy on its head,” putting in place a plethora of new policies and funding programmes to move the *locus* of technology commercialisation from large corporates and laboratories to more nimble start-ups (Trumbull 2004). On the other side, however, even in these new policies the state remained the guiding actor. The public innovation agencies ANVAR and later OSEO became increasingly important. They started to provide seed funding specifically for start-ups, through grants, loans and by organising national competitions for the selection of the most innovative projects (e.g., National Funding Competition for the Creation of Technically Innovative Companies). Public funding became close to ubiquitous in start-ups (84 percent of them had received ANVAR support in those decades) (Trumbull 2004). Similarly, the Ministry of Research, through the *Fonds de la Recherche Technologique* (FRT), provided resources to fund technology-transfer projects, originally to large companies (in the eighties) and later to incubators (in the nineties). In practice, most funding to French start-ups at the time was allocated by state agencies and public bureaucracies. Even the policies that aimed to leverage private finance retained clear dirigiste traits, in the form of the state using banks to channel credit towards its preferred sectors and technologies. Since the eighties, OSEO offered guarantees on loans for start-ups: the actual capital was provided by private banks but most of the risk was assumed by the State. Even when France tried to catalyse private retail investment towards innovation, the state retained the ultimate word on the innovations to be funded: when in 1997 a law introduced tax-exempt mutual funds for innovation (*fonds commun de placement dans l’innovation*, FCPIs, see 4.1), these funds were allowed to invest only

in companies that had been certified by state agency ANVAR (Trumbull 2004).<sup>29</sup> Similarly, the late-nineties programme *fonds d'amorçage* was supposed to support the proliferation of seed (i.e. early stage) venture funds but retained many of the same problematic characteristics of the other initiatives. Most funds were in practice set up by CDC in collaboration with academic and industrial partners and they focused on pre-determined sectors and technologies. A senior executive at Bpifrance, closely involved with this initiative at the time, recalls that this reliance on one or two industrial partners for each fund was problematic because the corporates were more interested in integrating the technology in their core business than in the growth of the start-ups themselves. In addition, because the programmes provided solely seed capital, but there was no money for later-stage investments, the funding proved completely insufficient to support companies' growth (author's interview with Informant-FR-GVC-7-ZDL, Senior Executive at Bpifrance, 16/02/2021). In short, since the eighties, on the one hand liberal reforms were passed that should have made France more hospitable for Silicon Valley-style innovation; on the other, the French state continued to intervene in innovation very proactively—albeit with a different approach. As of 2000, French start-ups could benefit from over 1,200 different kinds of aid and programmes (European, national, regional) (Trumbull 2004).

All in all, the results fell short of expectations. In the late nineties a report commissioned by the Economics Minister Strauss-Kahn concluded that finding start-up capital was still a critical bottleneck for the commercialization of innovation in France. Instead, external observers noted that France's comparative advantage in innovation continued to lie in those sectors and technologies that were “still heavily state-dominated” (Schmidt 2002). In particular, French policies had not been able to develop a private finance industry that could support a start-up ecosystem. For instance, the FRT programme initially saw a quick update of incubators but by 2002 most of the private incubators had already closed (Trumbull 2004), signalling the unsustainability of the model without a broader funding ecosystem around it. Even CDC's *fonds d'amorçage* had mixed results at best: according to the senior executive, they were successful at finding very interesting technological companies but less so at transforming them into commercial successes and generating good financial returns (Informant-FR-GVC-7-ZDL, 16/02/2021). In summary, it turned out that liberal market reforms were not enough for an ecosystem to bloom. At the same time, the state also seemed unable to kickstart it proactively through its initiatives.

The situation was certainly worsened by the ensuing of the dot.com bubble. This “flirt” with the tech economy during the bubble had resulted in a scarring “breakup” for France, adding to the structural obstacles already present also widespread scepticism towards the “start-up economy.” Frédéric Mazzella, founder of one of France's most well-known start-up—BlaBlaCar—recalls that a general sentiment of scepticism towards the internet and technology companies pervaded the finance community post bubble. Banks would not even allow him to open a bank account for his company, due to the fear of reputational risk from internet-based businesses (author's interview with Frédéric Mazzella, founder and CEO of BlaBlaCar, 02/11/2021).<sup>30</sup> Similarly, the founding partner of Serena—today one of France's most

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<sup>29</sup> In theory FCPIs could invest either in companies that could prove to have spent 30 percent of their revenue on R&D or to companies certified by ANVAR. However, given that few start-ups had a three-year track record, in practice almost all start-ups funded by FCPIs were ANVAR-certified.

<sup>30</sup> 10 years later BlaBlaCar went on to be the first French start-up to raise a 100 million euro VC round but this anecdote about the difficulty of even opening a bank account at the time is a telling testament of the atmosphere surrounding tech entrepreneurs in the mid-2000s in France.

successful VCs, with over 600 million euros in asset under management (Pitchbook data)—recalls that “from 2001 to 2008 it was impossible to pronounce the name VC in France. If you said that, you would not raise any money. I was in the market at the time, so we would call it ‘growth’ or *anything but VC*; we would do VC but we would call it something else” (author’s interview with Marc Fournier, founder and partner at Serena VC, 25/12/2020). In summary, despite all the policies attempted, by the late 2000s, with only a few hundred million euros VC financing in 2009 (Dealroom data), France still seemed destined to watch from afar the opportunities that were being created by innovation ecosystems in competing countries such as the United States and the UK.

### 3.2.3 *The limits of the French model of public investment in innovation*

In hindsight, one could argue that these French policies were bound to fail: for the most part, they are a bookcase of poor practices for innovation and entrepreneurship policy. Through the lenses of this thesis’ theory, the *dirigiste* legacy led French innovation programmes until the 2000 to reflect an Entrepreneurial State approach, which proved ineffective. More specifically, French policymakers ran into at least three classic pitfalls identified in the GVC literature and implied by my theoretical framework.

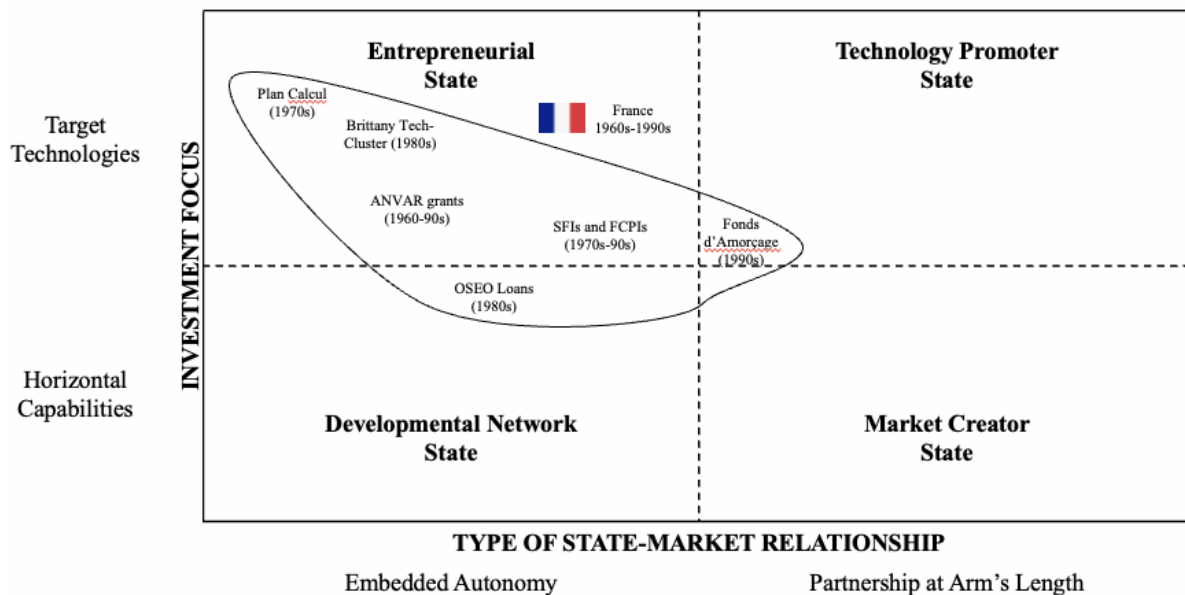
First, the state often “picked the winners.” A common feature of most of these policies was a prominent role of state agencies in defining strategic sector on which to focus resources and even selecting specific companies. In Lerner’s words, these French policies were not “listening to market” but very much trying to direct it (Lerner 2009). The Plan Calcul and the Britany Tech Cluster initiative tried very explicitly to engineer new technological industries based on a top-down decision from Paris. They also allocated substantial resources to specific companies chosen by the state to implement the plan. ANVAR and OSEO also became “public venture capitalists,” selecting start-ups and providing capital from within state bureaucracies.

Second, the state pursued this venture-capital-like activity with modalities that did not reflect the business model of disruptive innovation or of venture capital, another notorious risk of GVCs (Lerner 2009). Classic state agencies such as ANVAR were in charge of selecting companies, without having the competences, processes or incentives to replicate the venture capital model. These organisations were highly bureaucratic, historically focussed solely on research-based innovation, and operating with completely different practices from those of the venture capital industry. Even a government official at the time described ANVAR as “very dynamic, *from a Soviet perspective*” (Trumbull 2004; this author’s italics). In other words, these GVCs were not at arm’s length from government, nor did they have a close partnership with the private sector. Most were operated fully from within government bureaucracies and used classic public funding mechanisms, unable to do equity investments. As such, they encountered the typical financial sustainability problems of these schemes. For instance, an analysis found that the default rate for the OSEO-guaranteed loans was 21 percent, versus 9 percent for equivalent loans with no guarantees (Lelarge et al. 2011; Lerner 2009). While this programme mobilised private capital, its reliance on banks as funding vehicles meant that start-ups were still funded by institutions with business models incompatible with disruptive innovation.

Third, a “technology-centric” view of innovation led to programmes that were very focused on research-based inventions, rather than on supporting the general development of innovation capabilities in labour and financial markets. Most programmes centred around technology transfer from universities and limited funding to the very early stages of start-ups, discounting the importance of support for commercialisation and growth. One of the main organisations in charge of funding, ANVAR, was indeed founded as an *agency for the valorisation of research*.<sup>31</sup> When FCPIs were introduced, they could only invest in companies that ANVAR certified as “intensively innovative” (Trumbull 2004). The *fonds d'amorçage* also provided only seed capital. As an influential government report later diagnosed “In France, public discourse evoking innovation is often focused on *research and technological innovation* ... France has traditionally been more interested in *invention* than innovation” (Morand and Manceau 2009; this author’s italics). Early days GVC policies clearly reflected this limited view.

In conclusion, therefore, French innovation policies from the sixties to the late nineties still reflected the *dirigiste* legacy. The state was directing innovation funding from above, not only providing resources but also directing them towards the technologies it deemed most strategic. GVCs were integral to the state bureaucracy and followed its practices rather those of the VC industry. Overall, these programmes were also very focussed on investing in specific, typically very high-tech, innovations and sectors. This long-dated presence of state intervention in France, however, also offers a perfect opportunity for within-case comparison to show that *how* GVC is structured matters for outcomes. In short, the French GVC approach until the nineties is clearly located in the top left corner of the theoretical framework proposed in this thesis (Figure 3.3 below). The rest of this chapter will explain how France moved to the bottom right corner, evolving towards a Market Creator State.

Figure 3.3: France innovation policies categorised by the theoretical framework



<sup>31</sup> ANVAR stands for *Agence Nationale de Valorisation de la Recherche*

### 3.3 France's transformation: the rapid growth of the entrepreneurial ecosystem 2010-2019

The growth and evolution of the French innovation ecosystem in the decade since 2010 is impressive under most relevant metrics. Table 3.1 below summarises these figures, for the earliest and latest years for which the full data is available pre-pandemic. The country's metrics are compared with those of the UK, the main liberal market economy and largest ecosystem in Europe, for reference.

**Table 3.1: Evolution of key metrics of French innovation ecosystem 2013-2019**

	UK		France		CAGR 2013-19	
	2013	2019	2013	2019	UK	France
No. of startups	25,200	39,000	10,300	19,800	8%	12%
No. of unicorns (Private companies worth >\$1bn)	1	30	1	11	76%	49%
€m of VC funding	2,001	14,807	1,039	4,957	40%	30%
€m of later stage PVC funding	405	2,615	206	1,473	36%	39%
€m of foreign PVC funding	1,542	7,015	346	2,739	29%	41%

Source: author's analysis on Dealroom and Pitchbook

As explained in the theory chapter, these metrics reflect both the overall growth of the ecosystem (the *quantity* component) but also try to control for the endogeneity of government investment in the ecosystem and thus reflect also the *quality* of the ecosystem. The growth in number of companies that reach a one-billion-dollar valuation, later-stage private funding, and foreign funding are all indicators that should be considered much more independent of government intervention, since they typically follow successful commercial development by companies, which the government cannot control.

The table clearly shows that France's ecosystem has developed very rapidly, at pace and in some regards even faster than the UK—Europe's frontrunner for innovation funding. On average, for most of the KPI considered, the growth rates imply that France doubled its metric every two years or faster. It is important to notice that foreign investment and later stage private investment grew particularly quickly, signalling that the overall quality of France companies has also been good enough to grow well into the more mature phases (thus attracting later stage VC), and be noticed by foreign investors. For instance, it is notable that over this time period the participation of American investors in French start-up deals doubled, from just above 10 percent in 2013 to close to 20 percent (of a much higher total) in 2019 (Dealroom data, Bpifrance 2023).<sup>32</sup> Similarly, Mr. Mazzella points to the frequency of large, later-stage rounds as the best indicator of the evolution that the French ecosystem has underwent. In 2020 alone the amounts invested in rounds larger than 100 million euros was higher than the cumulative of all the five years before (Mazzella, BlaBlaCar, 02/11/2021; Dealroom data). What was exceptional news only five years before quickly became the norm:

<sup>32</sup> Note that in 2012 and 2011 the proportion was slightly higher, yielding a lower change. However, it should also be noted that the number of rounds has also grown significantly over the time period. Thus, even if the proportion had remained the same, it would have implied a general growth in American interest in French companies.

## Chapter 3: France

“In 2014 we [BlaBlaCar] raised 100 million dollars and I got a *phone call* from François Hollande, the French President at the time, to congratulate me ... I'm not sure Emmanuel Macron, our current President, makes a phone call each time there is a 100 million fundraising now. Not because he is not interested in this topic, in fact he is very interested in it, but he just would not have time because now there are too many rounds like that—last year there were nine such rounds, while in 2014 we were the only ones.”

Author's interview with Frédéric Mazzella,  
founder and CEO of BlaBlaCar,  
02/11/2021; author's italics

This growth in investment figures has gone hand in hand with a general professionalisation of the industry. Based on his experience in both ecosystems, Mr. Fournier notes that in the early two-thousands the Silicon Valley “was twenty years ahead in any terms compared to France,” not only with regard to VC investments but also in relation to the “vocabulary used, the maturity of the entrepreneurs, and the ecosystem at large.” Today, instead “everybody speaks fluently ‘entrepreneur’—whatever that means. That level of sophistication is now common practice. It is the same feeling I got in the Silicon Valley twenty years ago” (Fournier, Serena VC, 25/12/2021). Very similar commentary came from other pioneering VCs and entrepreneurs during fieldwork. Bertrand Diard, an experienced entrepreneur and investor on both sides of the Atlantic, explained how one of the biggest challenges during the early days of his start-up (later listed on the Nasdaq) was to find investors that would truly understand the technology and business model. “I relocated to the USA, where I found an ecosystem that was 10-15 years ahead; today, however, that gap is only 3-5 years” (author's interview with Bertrand Diard, founder of Talend, 05/02/2021).

The general cultural attitude towards start-ups also seems to have drastically changed. With reference to the earlier anecdote about the struggles at the founding of BlaBlaCar, Mr. Mazzella highlights how today this dynamic has completely changed in France:

“When I started the company ... it was considered as a kind of a weird path ... I remember reading *compassion* in the eyes of my friends. It was not considered as cool. They looked at me as if they were thinking ‘Oh, my God, he had a good start and now he decided to create a website for beatniks. What happened?’ And it's funny because now if you say ‘I'm creating a start-up’ people react ‘Wow, how cool.’ So it has changed from being something weird to being something totally hyped.”

Author's interview with Frédéric Mazzella,  
founder and CEO of BlaBlaCar,  
02/11/2021; author's italics

Even younger entrepreneurs agree. Mr. Chatelain contrasted his experience building his first start-up in the late 2000s with his most recent one.

“10 years ago there was not even French content about how to grow a start-up: we had to use American books and examples to learn what to do. We had no role model and no guide about how to build a start-up in Paris ... When I went to pitch my first start-up to VCs I felt ‘very young,’ while now there are 10 times the number of VCs in France and they are all happy to see young people or students pitching to them! ... I used to feel lonely being a tech entrepreneur—for real—and I definitely don't anymore”

Author's interview with Antoine Chatelain,  
founder and CEO of WeCasa, 22/01/2021

Analogous remarks about the change in cultural attitude towards start-ups and high-tech entrepreneurs in France were made by the almost totality of interviewees in this study, independently of their role in the ecosystem. The trend is confirmed also by data on the career choices of students at the famous French *grandes écoles*. By the mid 2010s, around one in four *grandes écoles* students was interested in starting her own venture, while this figure was no more than 10 percent a decade before, according to the *Conférence des grandes écoles* (Authemayou, 2016). Mines Paris Tech-PSL has seen the percentage of graduating students preferring to work for a large company (over a start-up) drop from 85 percent in 2007 to 35 percent in 2019 (Richard, 2019). Another engineering *grande école*, Insa Toulouse, noted a 67 percent growth in the founding of companies by its graduates (Richard, 2019). Entrepreneur interviewed confirmed that it is much easier today to find university graduates more interested in joining or launching start-ups (Chatelain, WeCasa, 22/01/2021)

The general attention towards start-ups and entrepreneurship has also grown in French institutions. Interviewees have reported a growing coverage by the media and it is telling that France's most important business newspaper, *Les Echos*, by 2020 had three full-time journalists dedicated to covering the French innovation ecosystem compared to none up until the late 2000s (author's interview with Hugo Weber, Direct of Communications and Public Affairs at Mirakl, 10/09/2021).

The French ecosystem has therefore come a long way in the 10 years from 2010. Volume and quality of investment in start-ups have rapidly improved, while the general perception has also turned in favour of high-tech entrepreneurship, in a country traditionally dominated by large companies and their clout over the careers of the French elite. The next sections will introduce how these changes have been accompanied by an important evolution of the French innovation policy landscape.

### **3.4 The emergence of Bpifrance: France evolves towards the Market Creator State**

This section recounts the evolution of the French state's approach to innovation policy in the two-thousands, which seeded the ecosystem development described above. It argues that this was a gradual process that culminated with the creation in 2013 of Bpifrance. It was during this period that French agencies evolved their approach to innovation support, creating the premises for the focus on capabilities building and proactive market promotion that will become the defining features of Bpifrance. I show, therefore, that Bpifrance should not be interpreted as an isolated initiative but rather as the arrival point of a longer policy learning process. Its creation and characteristics are explained by the institutions and competences that the French state developed over the 10 years before its founding.

#### *3.4.1 Fiscal policies for the support of innovation in the two-thousands*

In the two-thousands France expanded some of the supply side policies to favour high-tech entrepreneurship. Fieldwork and secondary research identified three worth noting.

First, investors active in the VC industry from the early days explained that the introduction of a wealth tax together with tax deductions for innovation increased the importance of the FCPIs. These funds were available to retail clients and had to invest at least 70 percent of the capital in private (not listed) innovative SMEs and start-ups.<sup>33</sup> They existed from the late nineties but when in the late two-thousands the TEPA law introduced a wealth tax, the benefit of the tax deductions also increased, drawing more capital to these instruments (author's interview with Matthieu Baret, partner at VC fund Eurazeo, 12/01/2021; Moulin and Schmidt 2014; Trumbull 2004).<sup>34</sup>

A second important fiscal instrument for innovation that was expanded in the two-thousands is the *Crédit d'Impôt Recherche* (CIR). Introduced in the eighties, the CIR is a tax credit for R&D activities that since the early two-thousands became particularly favourable to start-ups (Direction générale des impôts, 2000, 2005, 2008, 2009).<sup>35</sup> It became possible for young innovative companies to obtain the benefit not just as a tax deduction on future income but as an automatic and immediate “cash refund,” addressing a core criticism of the academic literature on this type of schemes, which typically favour larger companies (OECD 2015). By 2013, CIR amounted to almost 6 billion euros of credits and transfers to companies for innovation and R&D activities and made France by far the European country with the most generous R&D credit scheme (Figure 3.4; Ministère de l'Éducation nationale, de l'Enseignement supérieur et de la Recherche, 2016; OECD 2016b). The majority of interviewees in my fieldwork noted the importance of the CIR (see interview material). In particular, the founders of several scale-ups highlighted how the CIR allows to reduce the costs of developers' teams drastically. This contributes significantly to the fact that by 2020 a development team is “three-to-four times cheaper in France than in the United States” (Diard, Talend scale-up, 05/02/2021). As another founder put it “now, thanks to the CIR, I basically hire a PhD engineer for free” (Chatelain, WeCasa scale-up, 22/01/2021). Over time, this can cumulate to significant indirect funding: both BlaBlaCar and Talend benefited of €2-5 millions each between 2005 and 2010—at a time when early-stage VC rounds in Europe averaged €4 million (author's interviews with BlaBlaCar and Talend's founders).<sup>36</sup>

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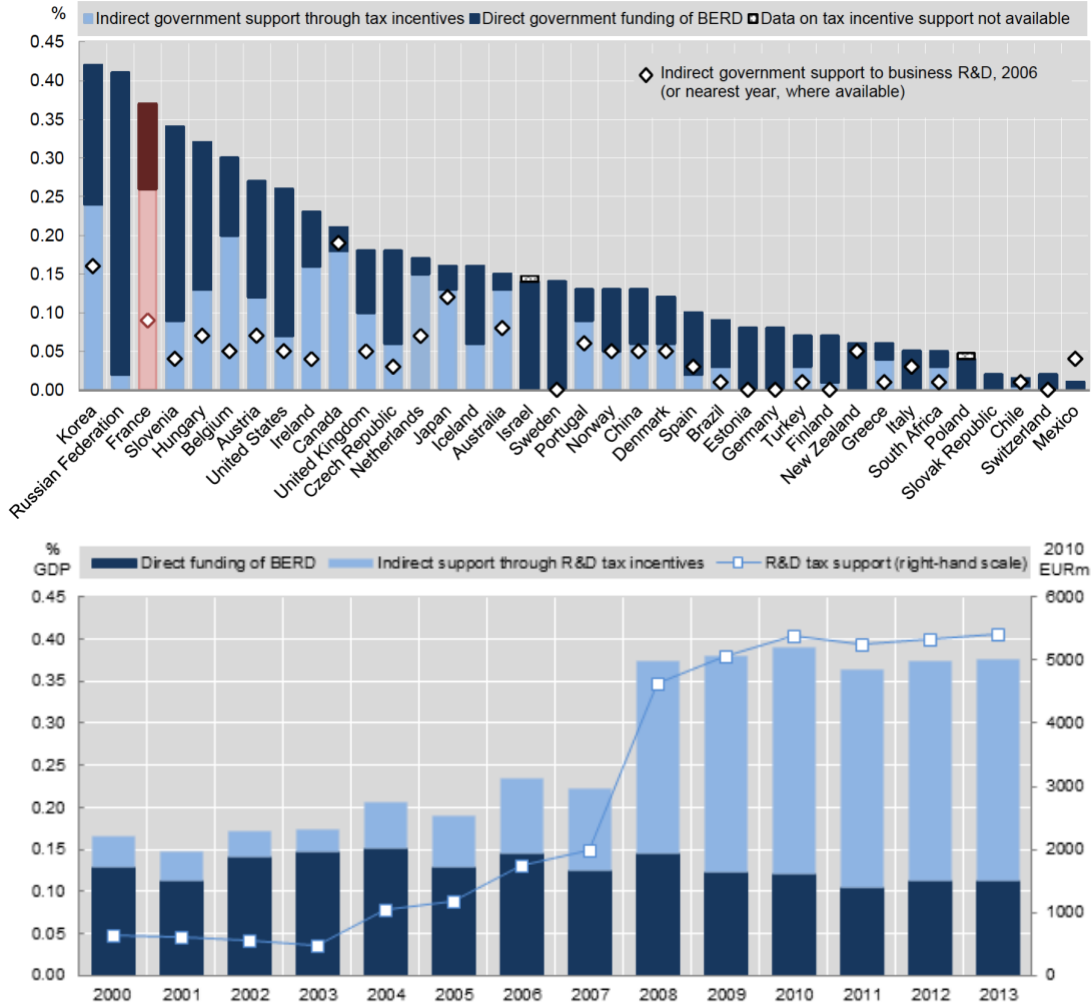
<sup>33</sup> The remaining 30 percent is allocated to a management company that invests it in traditional mutual funds (*sociétés d'investissement à capital variable*, SICAV), which compensate the risk profile.

<sup>34</sup> In 1999 tax incentives were introduced that allowed individuals to deduct (with certain ceilings) 25 percent of the value invested in these funds, as well as in other forms of innovation, from their income tax liability and pay no capital gains tax on those investments. The deduction had caps (€2,160 for a single person and €4,320 for a couple). The tax incentives expanded when in the late two-thousands the TEPA law (*loi pour le travail, l'emploi et le pouvoir d'achat*) introduced the possibility to deduct up to 45 thousand euros from the wealth tax liability (*impôt de solidarité sur la fortune*, ISF) per fiscal year, in particular for those investments made in start-ups. For FCPIs, the deduction was equivalent to 50 percent of the attributable value of the assets in the FCPI with a cap at 45 thousand euros per household. Any extra amount could be deducted from the income tax liability at a 18% rate. Eligible funds had to be invested in companies no older than 5 years old.

<sup>35</sup> Details available in the following OECD report: OECD, 2013. “R&D Tax Incentive support: France.” OECD Publishing, Paris.

<sup>36</sup> For figures on average size of A rounds, see: <https://techcrunch.com/2019/04/25/a-quick-look-at-how-fast-series-a-and-seed-rounds-have-ballooned-in-recent-years-fueled-by-top-investors/>

Figure 3.4: Government funding and tax incentives for business R&D as % of GDP



Source: OECD, 2013. "R&D Tax Incentive support: France." OECD Publishing, Paris.

Finally, changes to the French welfare system also favoured entrepreneurship. As one VC interviewee put it "In France we say that the first funder of any start-up is the *pole employ* [unemployment office]" (author's interview with Marie Fauré, French VC, 29/01/2021). Although this is an exaggeration, France offers a noteworthy cushion for professionals who want to start a business: the unemployment system guarantees 18 months at 75 percent of the lost income. In general, research has shown that such "social insurance" benefits correlate with a higher incidence of high-tech entrepreneurship (Bozkaya and Kerr 2014) as they reduce the opportunity cost for skilled professional to forego employed work. In addition, the ARCE scheme (*Aide à la reprise ou à la création d'entreprise*) allows to cash-in upfront nine-months' worth of unemployment benefits if the recipient is to start her own company. This provides

both a minimum level of capital to invest and ongoing compensation for the entrepreneur in the early days of the venture (Fauré, French VC, 29/01/2021).<sup>37</sup>

Overall, therefore, the French State has introduced significant fiscal policies for the general support of entrepreneurship, some of which particularly targeted to high-tech. Although these do not count as GVC programmes, they are an important part of the policy context within which Bpifrance was created and the French ecosystem developed. Although other evidence in this study cautions against how such fiscal and tax incentives can go (see Italy case), they are a good indicator of the changing policy environment towards entrepreneurship in France.

### 3.4.2 State direct intervention in the two-thousands: the predecessors of Bpifrance

Over this period, the state also expanded its direct support for start-ups and VC. Four initiatives and organisations deserve special attention, because they embody the state's various roles that in 2013 will merge into the Bpifrance project. These are: OSEO (from the French “oser”, “to risk”), *CDC Entreprises*, the *Fonds Stratégique d'Investissement* (FSI), and the general initiative of the *Programmes d'investissements d'avenir* (PIA). In this period these programmes expanded the resources available to start-ups and introduced some of the practices that later characterised France's Market Creator State approach. OSEO guaranteed the capillary presence of Bpifrance throughout the country, while CDC Entreprises and FSI provided the blueprint for Bpifrance's governance and for its relationship with politics and the market. The PIA was the overarching state initiative that allocated significant public resources to these organisations.

#### 3.4.2.1 Financing SMEs and innovation: OSEO

Because of its long history of state intervention, France in the past century saw a proliferation of institutions dedicated to these goals. After various restructurings, mergers, and renamings, by the mid two-thousands one main products was OSEO (see image in the appendix and Thiemann and Volberding 2021).<sup>38</sup> This agency became the main provider of subsidised finance to those areas of the economy underserved by private credit markets: innovation and SMEs. OSEO operated through a network of regional offices inherited from its predecessors. It provided mostly guarantees, credit, and grants for innovation and R&D directly to SMEs. By the time it was merged in Bpifrance, OSEO had 37 regional offices, employed over 1,600 people and had financed approximately 84,000 companies (Thiemann and Volberding 2021). It provided over four billion euros of loans per year and guarantees for almost seven billion euros (Thiemann and Volberding 2021, OSEO 2012). Most importantly, the organisational structure and activities of OSEO in the mid two-thousands provided the backbone for Bpifrance's

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<sup>37</sup> See: <https://www.pole-emploi.fr/candidat/je-creereprends-une-entreprise/les-aides-financieres-creation-d.html>

<sup>38</sup> OSEO resulted from the merger of the previous BDPME (*Banque de développement pour les petites et moyennes entreprises*), ANPME (*Agence Nationale pour la Promotion des Petites et Moyennes Entreprises*) and ANVAR (*Agence nationale de valorisation de la recherche*)

operations. In particular, the regional presence and the direct relationship with the companies funded will remain key attributes for Bpifrance and enable its unique *modus operandi* (Gaston-Breton 2015).

### 3.4.2.2 Supporting the private equity industry: CDC Entreprises

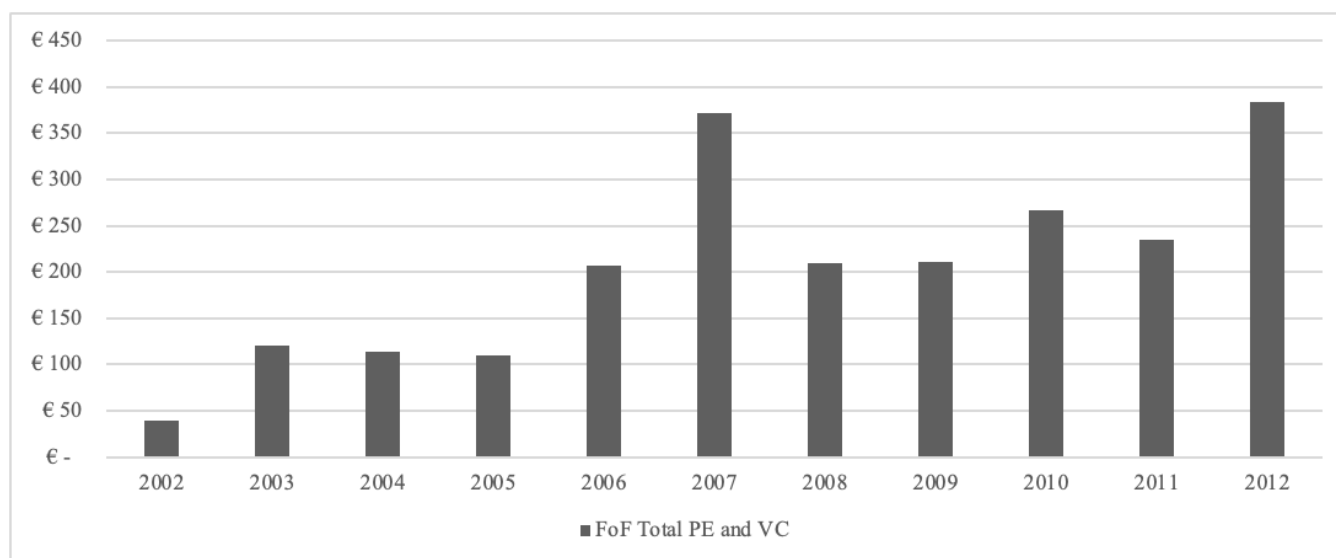
While OSEO—like ANVAR—always had a clear remit of innovation support, I argue that a fundamental change in the two-thousands was the gradual involvement of CDC in this area of the economy. Its focus on attracting private players to invest in innovation and its own development of private market-like practices were instrumental to enable Bpifrance’s Market Creator role and for the development of the French ecosystem.

CDC was founded in 1816, with the objective of collecting public savings and invest them in long-term strategic projects for the country. Importantly, it was designed to avoid direct control by the executive, in light of the disastrous Napoleonic defeats that had brought the country on the brink of bankruptcy. Instead, it was placed under the indirect control of the French parliament (Thiemann and Volberding 2021). Over time this has contributed to a culture of independence from the various passing governments and a focus on long-term financial sustainability.

CDC started intervening in innovation markets in the late nineties/early-two-thousands through *CDC Entreprises*, its wholly-owned investment arm. The organisation was later absorbed by Bpifrance, with an important impact on its strategy and operations. CDC Entreprises became a key player in the country’s strategy to support the development of private equity markets during the policy push for financial markets liberalisations and diversification away from traditional bank credit (Culpepper 2006, Thiemann and Volberding 2021, Granier and Badu 2019). With the growing interest in technology surrounding the dot.com bubble, CDC Entreprises pioneered a funds of funds (FoF) approach to support the creation and better capitalisation of venture capital funds in France, often acting as the “anchor investor” (i.e., the largest initial capital contributor; see Bouchara 2003, Grandguillaume, 2015). In the mid two-thousands CDC used the proceeds from its sale of the *Caisse d’Epagne* to double down on its involvement in supporting VC and PE funds. As a result, in the decade from 2002 to 2012, CDC Entreprises invested close to €2.3 billion in such funds, of which €971 million was allocated to early-stage VC funds (Figure 3.5).<sup>39</sup>

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<sup>39</sup> Programmes included the *Fonds Public pour le Capital-Risque* (FPCR, 1998, 91 million francs plus 45 million francs from the EIB), the *fonds d’amorçage* (1999, 15 million euros from French Government, matched by 122 millions from private acotrs), the *Fonds de Fonds Technologie Numéro 3* (FFT3, 2002) (Gaston-Breton 2015, Trumbull 2004).

**Figure 3.5: CDC Entreprises Fund of Funds (FoF) investments in PE and VC (€ Mln, 2002 - 2012)**

Source: author's analysis on Bpifrance data; historical data on the PE vs VC split by year was not available but, in total, VC accounted for 43 percent (see Bpifrance 2018)

In parallel, CDC Entreprises developed also the capabilities to conduct direct equity investments. First with CDC Innovation and the fund *Valeurs de Croissance* (in 1996) and later with the *Fonds de Co-investissement pour les Jeunes Entreprises* (FCJE) in 2002, CDC Entreprises provided a total of 173 million euros in the ten years between 1996 and 2006. This was important to provide extra capital to the start-ups and the private investors at a moment when PVCs were still few in the market—note that the market share of CDC Innovation quickly reached 10 percent in the early two-thousands (Gaston-Breton 2015).

The importance of these early days' activities via CDC Entreprises, however, goes beyond its financial impact. To deliver on this new focus on equity investments in innovation, the institution insourced financial and private market investing expertise, which until then were scarce on the public side. It also developed a network of several hundreds of funds and management teams in the private sector, which were CDC Entreprises' co-investor and/or investee funds (around 400 by 2013; data from author's interviews). CDC Entreprises, therefore, developed a new approach to intervening in innovation markets, quickly became the most prominent public actor with professional expertise for investing in innovation, and nurtured tight relationships with the local private venture capitalists. When in 2013 Bpifrance was created, the 147 professionals working at CDC Entreprises brought this approach to the new organisation, influencing its formation and the definition of its strategy (Thiemann and Volberding 2021; Gaston-Breton 2015; Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021).<sup>40</sup>

<sup>40</sup> 147 is the number of professionals as of 2012, according to Gaston-Breton 2015 p. 223

### 3.4.2.3 Industrial policy meets the “consolidation state:” the Fonds Stratégique d’Investissement (FSI)

After the financial crisis, a third institution entered the scene of state investment in innovation: the *Fonds Stratégique d’Investissement* (FSI). FSI started as a clear political project: €20 billions to invest in companies deemed strategic and preserve their “frenchness” (Thiemann and Volberding 2021, Levy 2016). In practice, however, setting up the initiative required negotiations between the government and CDC. The compromise created the precedent for a new governance framework for GVC, which limited political influence on the investments and later became the model for the set-up of Bpifrance.

FSI’s mission was much broader than start-up investing.<sup>41</sup> The fund was created to secure the capital base of strategic companies (including listed ones), fund high-potential businesses and projects with a medium-to-long-term investment horizon, and support innovative SMEs with difficulties in accessing finance (Levy, 2016; author’s interview with Maïlys Ferrere, former member of FSI and currently Managing Director of Bpifrance Large Ventures, 10/03/2021). Nevertheless, its genesis and activity show that the development and retention of French technological capabilities was at the centre of the strategy, making the fund a prominent example of GVC, which had two fundamental institutional impacts.<sup>42</sup>

First, it set the framework for how the French state would pursue direct equity investments in companies within the budgetary and regulatory constraints of the EU single market rules (Trumbull 2004). In particular, FSI encountered two problems: there was limited fiscal space to fund the programme entirely from the state budget (Levy 2016; see the “consolidation state” concept in Streeck 2015) and EU State Aid Law impeded unconstrained state investment in companies. As a solution, the government created FSI by sharing its capitalisation and governance with CDC and accepting that investments would be solely minority positions in co-investment with private sector actors (Ferrere, FSI and Bpifrance Large Ventures, 10/03/2021). This investment approach was demanded by CDC and remains still today a core characteristic of Bpifrance direct investment activities (Levy 2016, Dumout 2004; Fournier, Serena VC, 25/12/2021). Strong of its negotiating power, CDC demanded also that part of the FSI capital was invested through vehicles managed by CDC Entreprises, 100 percent controlled by CDC and thus even further removed from political influence (Gaston-Breton 2015). The consequence of this governance and investment strategy were that the political ambitions of the FSI project were diluted. The fund’s strategy was determined more by CDC’s management and its investment committee filled with “an A-list of French business figures,” who saw the attempts of the Government to direct the investment strategy of FSI for industrial policy as political interference (Levy 2016). At the same time, FSI was a crucial step in

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<sup>41</sup> Most of its capital was originally invested in later stage private equity or in any case in tickets greater than 10 million euros. According to Pitchbook data, only 10 out of 230 deals (including add-ons) were venture deals, and all of these were later-stage venture deals

<sup>42</sup> Several elements indicate the central importance of technology for FSI. First, in one of the first public mentions of the need to create FSI, Alain Juillet—in charge of “economic intelligence” within the Prime Minister’s Cabinet in the mid two-thousands—talked explicitly of creating an “In-Q-Tel à la française,” citing the renowned American VC fund that invests in the strategic technologies for the key security agencies of the country (Dumout 2004). Second, this idea was originally inspired by a 2003 parliamentary report that identified a worrying gap of technological competitiveness for French firms (Carayon 2004, Dumout 2004). Third, the controversy around the French smartcards company Gemplus was the *casus belli* that shaped the future efforts to create FSI (Dumout 2004), since the French state at the time did not have a tool to impede that the American Fund TPG invested in the company and transferred its cryptologic technology to the USA. Finally, the fund invested in some of France’s most important large tech companies at the time (Valneva, Innate Pharma, Cellectis, NantHealth, Qosmos, Ercom).

## Chapter 3: France

rehabilitating the idea of an interventionist state and of new governance models that would allow to introduce “discretion” in public investment:

“In the past, we would create a bureaucracy, establish some rules, and say that any company that meets the criteria can receive government aid. The creation of a sovereign fund reflects a *more strategic approach*. Here the state *makes choices*. It is a *discretionary intervention*. Companies are not automatically eligible just because they meet the criteria. Rather, the state makes hard choices.”

Henri Guaino, Special Adviser to the President,  
13/04/2011

Cited in Levy 2016  
(This author’s italics)

Second, as a direct consequence of this governance at arm’s length from politics and non-bureaucratic approach, FSI was able to recruit for its management and investment team a group of professionals with long-standing careers in the private sector. This staff brought in-house the expertise to execute equity investments the way private investment firms do. As Ms. Ferrere explained, for professionals like her “it made sense to join this type of public-private structure ... with political purpose but private modalities and practices” (Ferrere, FSI and Bpifrance Large Ventures, 10/03/2021). She also confirms that while this approach was not entirely new to French industrial policy—which is used to revolving doors between development institutions and the private sector—with FSI the alignment with market practices was strengthened, in large part because of the EU rules that require state direct funding of companies to follow a very competitive process (Ferrere, FSI and Bpifrance Large Ventures, 10/03/2021). The result was that the FSI created a team of 63 professionals coming almost entirely from banking, private equity, and capital markets backgrounds. This team would later transfer to Bpifrance (Ferrere, FSI and Bpifrance Large Ventures, 10/03/2021; Gaston-Breton 2015).

All in all, therefore, FSI signalled the newfound determination of French politics to proactively pursue innovation industrial policy via direct investment but also the constraints it would face in doing it. FSI foreshadowed the practices these policies would have to follow to simultaneously address budgetary concerns, leverage private actors’ involvement, and abide by EU State Aid law. It thus became the first clear materialisation of a Partnership at Arm’s Length approach to GVC in France—together with CDC Entreprises. The state provided capital, decisions were fully discretionary, but they were removed from politics and from the public bureaucracy—all elements that Bpifrance would inherit in 2013.

### 3.4.2.4 Investing in the future: the Programme d’Investissements d’Avenir (PIA)

Several of the initiatives described above were funded through an overarching public investment plan: the *Programme d’Investissements d’Avenir* (PIA). The 35-billion-euro, debt-funded plan was a combination of public funding for research, innovation, and for the general modernisation of the country (Thiemann and Volberding 2021). Resources were entrusted to a variety of agencies and institutions and utilised for five broad goals: higher education, research, support to industry and SMEs, sustainable development, digitisation (Juppé-Rocard commission report 2009). The original plan was later extended by each

successive government, with additional 12 billion euros from PIA 2 (2013) and 10 billion euros from PIA 3 (2015). Overall, it represented the “fuel in the engine” for several of the flagship initiatives for the support of start-ups that OSEO, CDC Entreprises, and FSI launched in the late two-thousands. The later versions of the plan also funded Bpifrance’s activities.

Overall, the institutions that would later form Bpifrance were entrusted with over 15 billion euros over the three PIAs (Cour des Comptes 2015, and 2021). Key programmes in the innovation strategy of Bpifrance were launched at this time. CDC received 600 million to launch the *Fonds national d'amorçage* (FNA, see later for details) and several direct investment funds were also launched by the FSI and CDC in the focus areas of PIA (300 million euros for digital start-ups and 150 millions for energy ones). In addition, OSEO was recapitalized and it expanded its loan guarantees and innovation-support activities originally via 1.5 billion euros from the state (Gaston-Breton 2015).

The PIA, hence, despite some limitations (Levy 2016), gave the financial impulse to the three main organisations that by 2013 would form Bpifrance. It was primarily born as an initiative to respond to the 2008 Global Financial Crisis, but it had an important role in the evolution of the country’s innovation policies and funded many flagship programmes of Bpifrance’s during the next decade.

### *3.4.3 Preparing the ground: long-term effects of a new policy approach*

The initiatives described above (4.1 and 4.2) were the first to evolve France’s policies towards a Market Creator State. Gradually, France moved from purely funding technological inventions to building the key institutions needed for a private and self-sustaining innovation market: a professional VC industry and entrepreneurial talent competences. Bpifrance would later explicitly institutionalise this approach, but it was already in the making in the second part of the two-thousands. Although during this time policies had mixed or limited effects, they facilitated some long-term mechanisms that underpinned the growth of the ecosystem a decade later.

FCPIs and tax deductions, for instance, contributed substantially to generating capital flows into the VC asset class. Official statistics report that between 1997 and 2007 these instruments collected a total of €4.4 billions and invested in over 800 French start-up and SMEs (OSEO 2009). These flows seeded a first generation of VCs in France as large financial institutions that collected retail investors’ money for FCPIs had to create management teams with the competences to invest in innovation (Trumbull 2004). 216 FCPIs were created by 35 management companies (OSEO 2009). Now-established VCs such as Eurazeo VC, Omnes Capital, and Odyssee were all created first as managers of FCPIs, often within insurances or banks (Allianz for Eurazeo VC, Credit Agricole for Omnes, for instance). In addition, this channel for retail money into innovation provided a cushion that ensured that “money kept flowing” to start-ups even during the crisis years after 2008, avoiding a complete collapse of the nascent ecosystem (Baret, Eurazeo VC, 12/01/2021). For example, Baret, long-time partner at Eurazeo VC, recalls that in 2011 Idinvest (later Eurazeo VC) experienced over €200 millions of inflow into its FCPI in that year

alone—the equivalent of an €800 million traditional VC fund (Baret, Eurazeo VC, 12/01/2021).<sup>43</sup> Finally, the tax deduction incentivised the recycling of capital within the ecosystem: successful entrepreneurs that made large exits received a tax benefit if they became “business angels,” i.e. using part of their proceeds to fund the new generation of entrepreneurs (author’s interview with Jean-David Chamboredon, founding Partner ISAI VC, 12/01/2021). On the flip side, it must be noted that such front-ended tax incentives might have also distorted the market, facilitating the proliferation also of some management teams with poor track records from a VC point of view but that still generated positive returns for retail investors (Trumbull 2004).<sup>44</sup> An index of French VC funds including FCPIs shows returns that are 50% lower than those of the same sample but excluding FCPIs (comparison of data in AFIC and EY reports 2020 and 2021). This might go to some length in explaining the historically lower aggregate performance of French VC funds compared to international benchmarks (AFIC and EY 2013 data p. 17; author’s interview with another Eurazeo VC investor, 30/07/2021).<sup>45</sup> Overall, the story of FCPIs in France might therefore resemble the Small Business Investment Companies (SBICs) in the early days of VC in the United States (Lerner 2009, Nicholas 2019). Studies have concluded that, while the performance of SBIC-backed VCs was typically lower than VCs without any public funding, the SBIC-induced proliferation of VC funds contributed to the training of individuals in this profession as well as to the creation of a market for other important actors for the innovation ecosystem, such as lawyers, consultants etc. (Suchman 2000; Josh Lerner’s Testimony to Congress 27/07/2005; Nicholas 2019). The analysis in Figure 3.6, for instance, shows that more than half of the most active French funds (based on 2015-2019 investment data) were founded between the end of the nineties and mid two-thousands. Figure 3.7, instead, shows the significant growth of professions related to VC and start-ups in France over the 2001 – 2010 period.

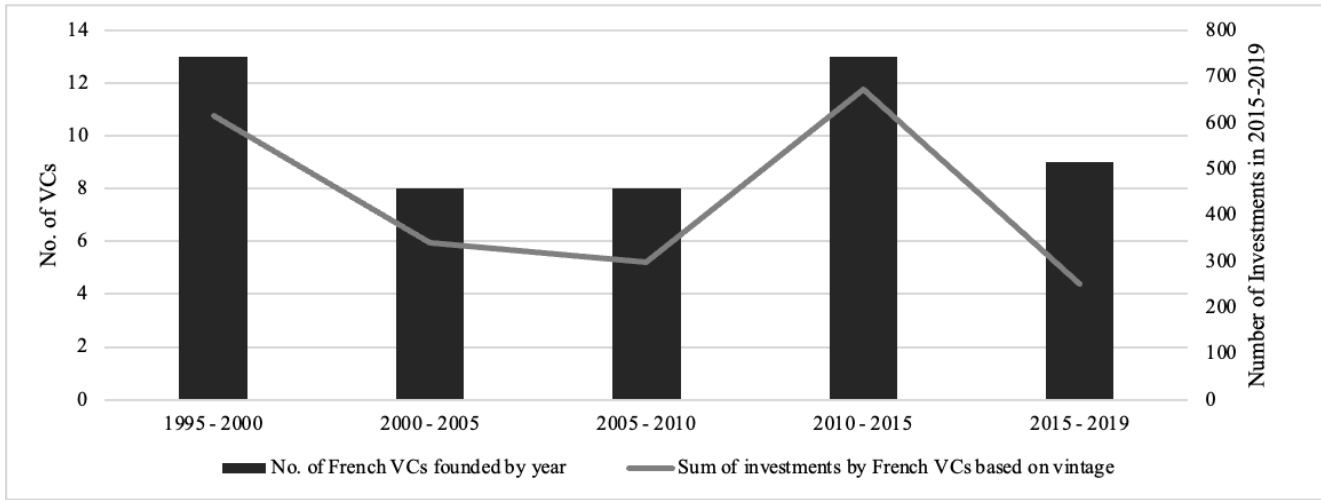
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<sup>43</sup> The equivalence of €200 millions to an €800 million fund is based on the fact that a VC fund usually first raises capital and then invests it all over a 4-5-year period. From a capital deployment point of view, therefore, having an inflow of capital of €200 million every year over four years is the equivalent of having raised a fund of size €200 x 4 = €800 millions.

<sup>44</sup> The tax deduction implies that even a fund that returned to its retail clients just the capital they invested, would generate a positive return for those clients, since the total return would amount to 1x + “savings from tax deduction”. Notice that this is 1/3 of the general return that a competitive VC fund must generate (3x on capital)

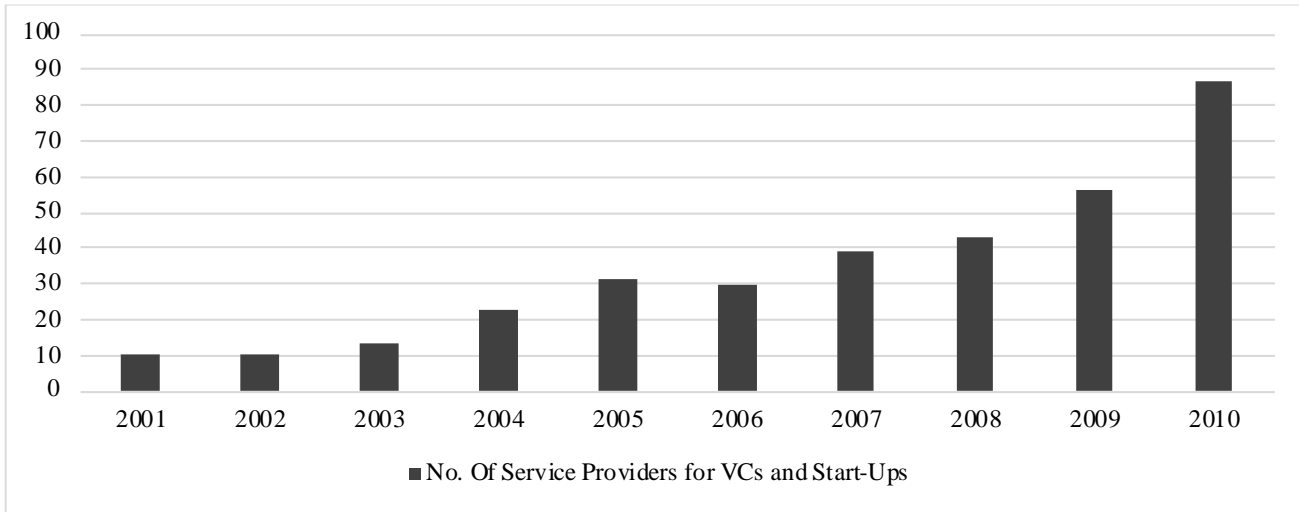
<sup>45</sup> Informant-FR-VC-4-KVS

**Figure 3.6: French VCs still active between 2015 and 2019 by year founded**



Source: author’s analysis based on Pitchbook data; to control for sporadic investors, it only considers funds with at least one investment per quarter in France during the observation period

**Figure 3.7: Number of service provider firms for VCs and start-ups in France**



Source: author’s analysis on Pitchbook data

It must also be noted that several of the famous start-up success stories that interviewees mentioned as the catalysers of the ecosystem development after 2010 were in fact founded and supported during the two-thousands (see e.g., with Chatelain, WeCasa, 22/01/2021). The three most frequently mentioned inspirational “successes cases” are shown in the table below, together with the type of public support they received in those early years. Table 3.2 also shows the total number of employees as well as those who later founded companies themselves, as a proxy for these companies’ intergenerational impact on the French ecosystem.

**Table 3.2: Example French success cases from the early 2000s**

Company	Founded	CIR	Invested by CDC-Supported VC	Invested by VC started as FCPI	Employees by Dec 2019	Former Employees who Became Founders / CEOs
<b>BlaBlaCar</b>	2006	>€2m	ISAI		629	54
<b>Talend<sup>46</sup></b>	2005	>€2m	Eurazeo VC	Eurazeo VC	1,248	20
<b>Criteo</b>	2005	n.a.	Eurazeo VC	Eurazeo VC	3,024	166

*Source: author's interviews data and analysis on Dealroom and LinkedIn data*

Finally, as state initiatives contributed to the gradual build-up of equity investing expertise in the private sector, the public agencies themselves also increasingly internalised similar competences. While originally more focused on general SME investing, not necessarily on start-ups, the direct investing activities of CDC Entreprises and later FSI recruited into these public institutions professionals with private sector backgrounds, who “imported” investment best practices into these organisations as well retained their network of private sector colleagues (Ferrere, FSI and Bpifrance Large Ventures, 10/03/2021; Gaston-Breton 2015 Chapter 5). In the decade from 2002 to 2012, between CDC Entreprises and FSI, over 200 professionals with this background were recruited into what will later become Bpifrance, strongly impacting the perception that the market initially had of the organisation (Chamboredon, ISAI VC, 12/01/2021).

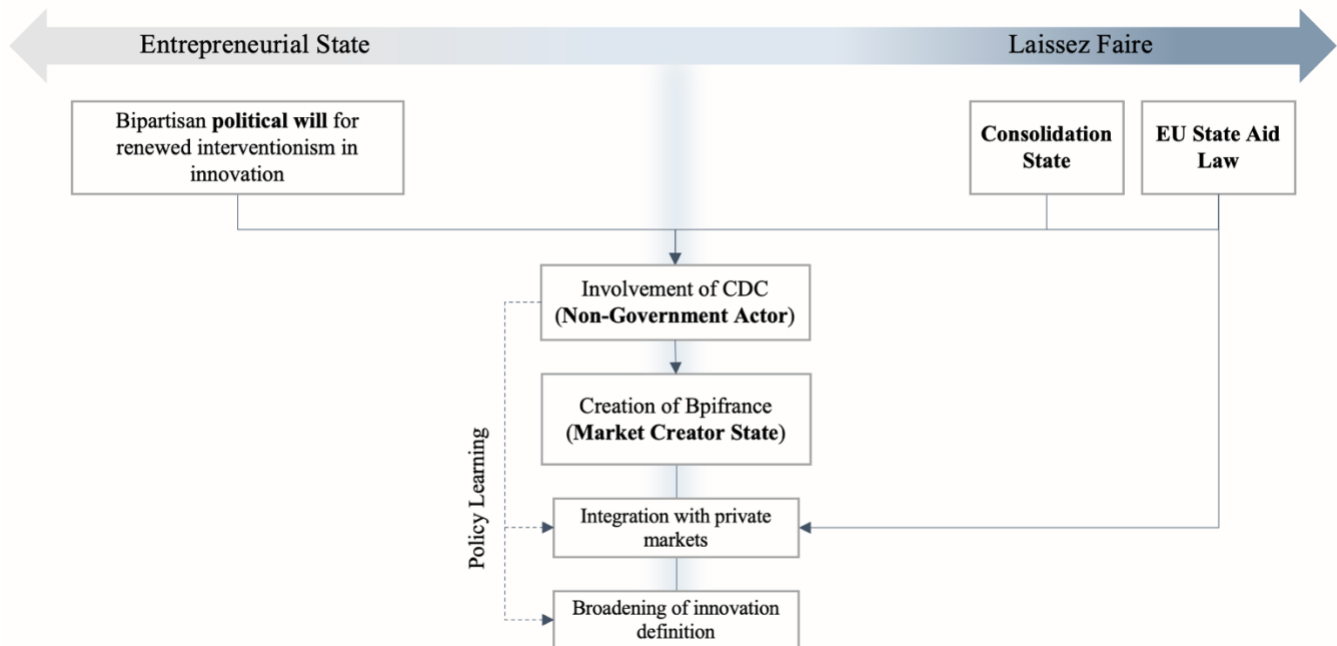
In conclusion, in the two-thousands some key elements that later will characterise Bpifrance started to emerge in French GVC policy. OSEO, CDC Entreprises, and FSI became increasingly proactive in targeting support to start-ups. CDC Entreprises began its role of facilitator of the private equity industry by functioning as an anchor investor for private funds or by supporting investments directly through its own resources. FSI introduced the governance compromise that allowed the state to pursue strategic investments without taking on the full financial burden and abide to EU State Aid Law. Both CDC Entreprises and FSI also built up state capacity, in the form of a competent and well-regarded workforce to perform equity investments (Thiemann and Volberding 2021, Gaston Breton 2015). At the same time, however, this legion of institutions lacked at least three key features that later made Bpifrance effective: 1) it did not have the unified governance necessary to represent the point of reference for the innovation ecosystem and to maximise the synergies between programmes (credit and equity, direct and indirect); 2) it could not coordinate the VC industry the same way Bpifrance started to do since 2013; and 3) it retained a selective definition of innovation, which prevented it from fully supporting the ecosystem at large. As a consequence, the policies of these years had mixed effects: they did not generate an immediate growth in the ecosystem but introduced key elements that underpinned its future development.

<sup>46</sup> Note that Talend also received a direct investment from Bpifrance, before they IPOed in 2016

3.4.4 The process of creation of Bpifrance

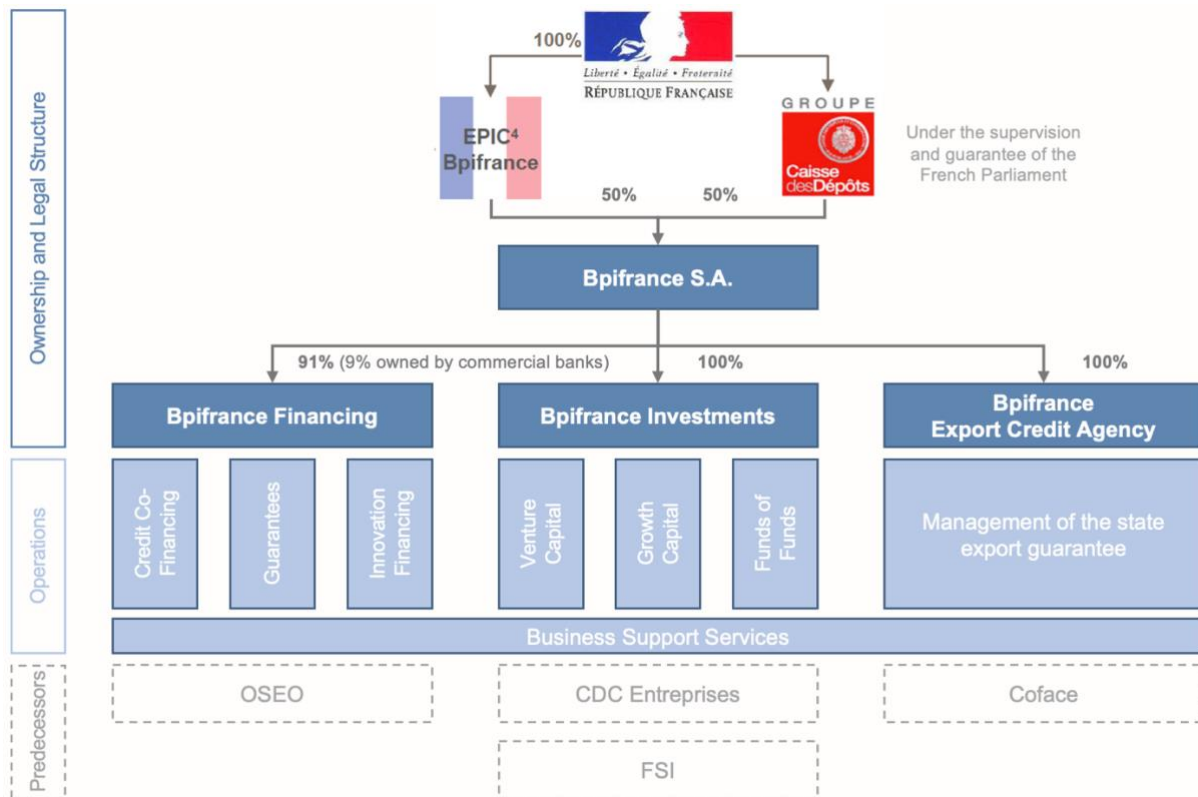
The political process that led to the creation of Bpifrance is fundamental to understand the mission and *modus operandi* of the institution. In this section I argue that the positioning of Bpifrance as a Market Creator State emerged as the net result of two opposing forces: the political will to intervene in innovation on the one hand, and the constraint of European state-aid laws and “consolidation state” on the other (Streeck 2015). These competing priorities yielded the two key elements that characterise Bpifrance. First, the French government was driven to share the governance of the new PDI with CDC. The Caisse, in turn, pushed for independence from politics and for a deep alignment with private VCs, making Bpifrance a clear case of Partnership at Arm’s Length with the market. Second, a renewed focus on innovation led to an open debate on its definition and on the type of companies that should be supported. The outcome was that Bpifrance expanded the definition of innovation to broaden its support schemes to all type of innovative companies with high-growth potential, rather than focussing merely on high-tech projects in strategic industries. In France, therefore, the opposite forces of EU orthodox economic principles and strong political will created a window of opportunity for policy learning based on the bargaining between all the actors and organisations engaged in the creation of the new institution. This led to an acceleration of the policy trends that had already emerged in the decade before, with the involvement of CDC in innovation funding and the creation of FSI. In Germany, as we will see, similar forces led to more drastic change, with a reflexive policy learning process that yielded the creation of entirely new intervention models (Radaelli and Dunlop 2018). Figure 3.8 below maps the forces and causal process that led Bpifrance to take the form of a Market Creator State.

Figure 3.8: Causal process leading to Bpifrance’s Market Creator State characteristics



The flow diagram shows how there were three critical scope conditions that led to this outcome. On the left side, a strong, bipartisan political will was pushing for renewed interventionism of the state in innovation. On their own, and if it relied on the traditional state apparatus, it would have led to a model closer to the Entrepreneurial State, similar to past innovation policies, and down a path resembling Lerner’s “boulevard of broken dreams” (Lerner 2009). On the opposite side, however, the growing European economic elite’s consensus around the “consolidation state” and EU’s state aid laws pulled in the other direction: low-touch government intervention and budget-neutral reforms. The result is Bpifrance: a political project but one that hides the compromises between these forces at play. Figure 3.9 below shows the resulting structure. In short, it is a PDI owned 50 percent by the state (through EPIC Bpifrance) and 50 percent by the Caisse des Depots. Operationally, it merges three development functions previously managed separately by OSEO (non-equity financing, now *Bpifrance Financement*), CDC Entreprises and FSI (equity investments, now *Bpifrance Investissement*), and Coface (export insurance, now *Assurance Export*). Sub-sections 4.4.1 and 4.4.2 explain the political process outlined in Figure 3.8’s diagram and the negotiations that led to this model. In other words, the next sections explain the political reasons why France did not go down the GVC’s boulevard of broken dreams (Lerner 2009).

**Figure 3.9: Bpifrance ownership, legal, and operating structure after the merger of its predecessors**



Source: Author’s elaboration based on Bpifrance debt investor presentation document 2020 and fieldwork interviews

3.4.4.1 Bpifrance, a political project with constraints: Partnership at Arm's Length

In this section I explain why Bpifrance embraced a PAL approach to GVC—independent from the rest of the state apparatus and highly integrated with the private sector.

In the wake of the financial crisis and of the experience with FSI, the idea of a public bank for a revamped intervention of the state in industrial policy became very popular across the French political spectrum—both presidential candidates in 2012 included it in their manifestos (Michel 2012, Thiemann and Volberding 2021). After Mr. Hollande's victory, the newly elected President and its cabinet pursued an ambitious plan that aimed to merge into one all the key institutions for the support of SMEs and innovation (OSEO, CDC Entreprises, and FSI), *as well as* to exercise more direct influence over their operations (Thiemann and Volberding 2021). The political process that followed, however, delivered only the first of these two objectives, with the creation of Bpifrance. Instead, it significantly limited the political clout of government over this new-born industrial policy institution: direct government control at the Board level was prevented and so were other attempts to create influence channels into the governance; more generally, management held its grounds to ensure full operational autonomy so that the activities of the bank could follow business standards. The key determinant of this outcome was the role of CDC, whose mission and management background counterbalanced politics' aspirations and imposed a private-company mindset on the new entity. More broadly, the tight links between the French political and business elites (Clift 2006, Levy 2016) meant that the creation of Bpifrance was not a top-down insulated process but one open to the influence of France's corporate community.

First, the negotiations over the governance of Bpifrance highlighted the tension, already evident with the FSI experiment, between the executive's intention to direct industrial policy and its need to leverage off-the-budget capital in order not to contravene EU fiscal rules (Griffith-Jones and Naqvi 2021, Streeck 2015). Creating Bpifrance was in a way a move by the government to access CDC resources, following the blueprint of FSI, and thus increase its spending capacity while remaining within EU parameters (Fournier, Serena VC, 25/12/2021). However, this access to capital came with constraints. Officials involved in the implementation of the merger between OSEO, CDC Entreprises, and FSI recall that, while there was little debate on the general idea (the merger of the three entities), tough negotiations began on the governance implications. This was a critical inflection point in the process. It was at this stage that the Caisse vehemently opposed a scheme where the state would own 51 percent (thus, control) of the new entity (Gaston-Breton 2015). The result of this *tête-à-tête* was a 50-50 split ownership of Bpifrance between the state and CDC.

Other key governance decisions in the early days of Bpifrance determined the private-sector minded nature of the organisation and the limited power of government. This dynamic reflected the change in the balance of power that had taken place in the French political economy since the eighties: from a strong state with an elite bureaucracy that directed the private sector, to a powerful *public-private* elite that alternates top management roles in state institutions and in business (Clift 2006, Levy 2016). Nowhere was this clearer than in the choice for the CEO of Bpifrance, another fundamental inflection point with important implications for the approach of the organisation. For the role, Emmanuel Macron—who led the merger implementation and negotiations—recruited Nicolas Dufourcq. Just like Macron, Dufourcq was an *Ecole Nationale d'Administration* (ENA) alumnus and a manager with a mix of public and private

sector experience (source: LinkedIn).<sup>47</sup> With this professional baggage, as some observers noted in interviews, the manager immediately worked to set up Bpifrance as a “good commercial entity that is attentive to its customers’ experience, ... even better than usual banks” (Chamboredon, ISAI VC, 12/01/2021). Reconstructing Dufourcq’s first moves indeed shows that he clearly prioritised ensuring as low political interference and as high professional competences as possible in the operations of the new institution. First, as conditions for accepting the appointment, he demanded to be the sole General Director and that the Investment unit retain all the professionals of CDC Entreprises. This reverted the original agreement between CDC and the state, where the former would not cede its teams and the latter would nominate a separate director for the Financing unit (interview with Nicolas Dufourcq, cited in Gaston-Breton 2015). Given the importance this thesis theory assigns to GVC competences, this was a pivotal decision. Second, Mr. Dufourcq ensured that the unavoidable political representation in the Board of Directors would not translate into operational interference by politics (Chamboredon, ISAI VC, 12/01/2021). While President Hollande insisted for Ségolène Royal to become the vice-chairman of Bpifrance<sup>48</sup>—a sign of the political exposure the Bpifrance project would get—the Caisse and Mr. Dufourcq obtained that the Board of Directors be chaired by CDC’s CEO and have a majority of CDC and independent directors.<sup>49</sup> Most importantly, Mr. Dufourcq circumscribed the decision power of the Board to broad strategic stewardship. Almost all decisions on capital allocations and single investments, instead, rested with internal Bpifrance management.<sup>50</sup> This decision also further shielded the organisation from politics, as the theory asserts.

Mr. Dufourcq negotiated further emancipation of Bpifrance from political pressures also in two other areas. First, he limited the role of regional governments. These had gained significant power in allocating public funding since the devolution of the nineties and saw Bpifrance as the opportunity to create a “bank of the regional councils” (in agreement with Hollande). Mr. Dufourcq instead feared that a regionally-based governance would have subjected the investment strategy of the institution to very local development needs, diluting the bank’s ability to follow business-like investment practices (Gaston-Breton 2015, Chamboredon, ISAI VC, 12/01/2021). The result was that regions were given almost no representation on investment boards—only some formal channels to direct their point of view to the decision making bodies within Bpifrance.<sup>51</sup> Similarly, Mr. Dufourcq objected to the original plan that the state would directly own a 20 percent stake in the financing arm and appoint a separate Managing Director for it—a clear risk for political interference in credit allocation. He ultimately obtained that he be the General Director of the whole Bpifrance and, most impressively, that the state’s stake in the financing arm

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<sup>47</sup> Four years in the ministry of Finance and Economics, then two years in the Ministry of Health and Social Affairs, later nine years at French Telecom and 10 at Capgemini.

<sup>48</sup> Ségolène Royal was former presidential candidate for the Socialist Party and mother of Hollande’s four children

<sup>49</sup> The Board of Directors of Bpifrance is composed by 14 members. Five from the Government, 3 from CDC, 2 representatives of the employees, and three qualified experts from the industry (Thiemann and Volberding 2021)

<sup>50</sup> For the role of Mr. Dufourcq and the decision to limit the power of the Board, see author’s interviews with Chamboredon, ISAI VC, 12/01/2021, and Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021; for the investment decision process in general, see author’s interviews with various Bpifrance’s managers, all confirming the same “internal-only” process.

<sup>51</sup> In contrast with the regions’ demands of having representation on the regional investment funds managed by the bank, the regions were given representation only on those funds that they directly financed and formal channels were instituted to direct the regions’ point of view and concerns to the key decision making bodies within Bpifrance’s governance.

be replaced with a 9 percent ownership by *private* commercial banks. In short, through a series of pivotal decisions, the fight to keep Bpifrance at arm's length from politics was won almost across the board.

This approach—which clearly prioritised a business mindset and circumscribed the political direction of the public bank—caused tensions early on and set the course for how Bpifrance would operate and be perceived. As a senior executive familiar with the early-days negotiations put it “at the beginning, there were several discussions [meaning: arguments] between Ministers and Nicolas Dufourcq and the board members about possible operations and investments; these discussions were tough, but they created ‘references’, and these references are applied still today” (Informant-FR-GVC-7-ZDL, Bpifrance, 25/02/2021). Notably, when already in 2013 Bpifrance refused to intervene to rescue the French oil refinery Petroplus, the two contrasting views over the role of the bank became evident: Mr. Dufourcq explained that the deal represented “*bad business* for Bpifrance,” while Ms. Royal condemned the decision as a “grave mistake [because] Bpifrance's purpose is *not to do business nor to make profits*” (author's own italics).<sup>52</sup> Thus, the involvement of the CDC and Mr. Dufourcq's negotiating power with the French state officials were crucial to align Bpifrance to a market-based approach that would also be reflected in its innovation investments and avoid it going down Lerner's “boulevard of broken dreams.”

All in all, therefore, the political process and negotiations behind the formation of Bpifrance yielded an institution almost entirely in control of the public (via CDC and the direct ownership of the state) but where the role of the executive and politics is structurally limited and where funding decisions follow private-market practices. This reflects both the role of CDC and the modern French state's revolving doors with corporate France, which brought to Bpifrance Mr. Dufourcq and more broadly the views and approach of the country's management elite. As one interviewee summarised it “Now Bpifrance has a life of its own. It is political, but it lives parallel to the political scene” (Fournier, Serena VC, 25/12/2021).

### 3.4.4.2 The Doctrine of Bpifrance: the definition of innovation is expanded

Bpifrance's creation led to a fundamental evolution in the way the state funded innovation. Resources were greatly expanded but so was the definition of the *type* of innovation the state should promote. Bpifrance's management did not just execute the government agenda but promoted a dialogue between public authorities and the private ecosystem, supporting the view that all types of innovative companies should be funded, not solely R&D-heavy and patent-based companies. The new approach was embodied by Bpifrance's Innovation unit and explicitly reflected in the Bpifrance Doctrine—an official document explaining the organisation's remit and approach.<sup>53</sup> The characteristics of this Unit and the document foreshadow how Bpifrance embodies the key characteristics of the Market Creator State's focus on

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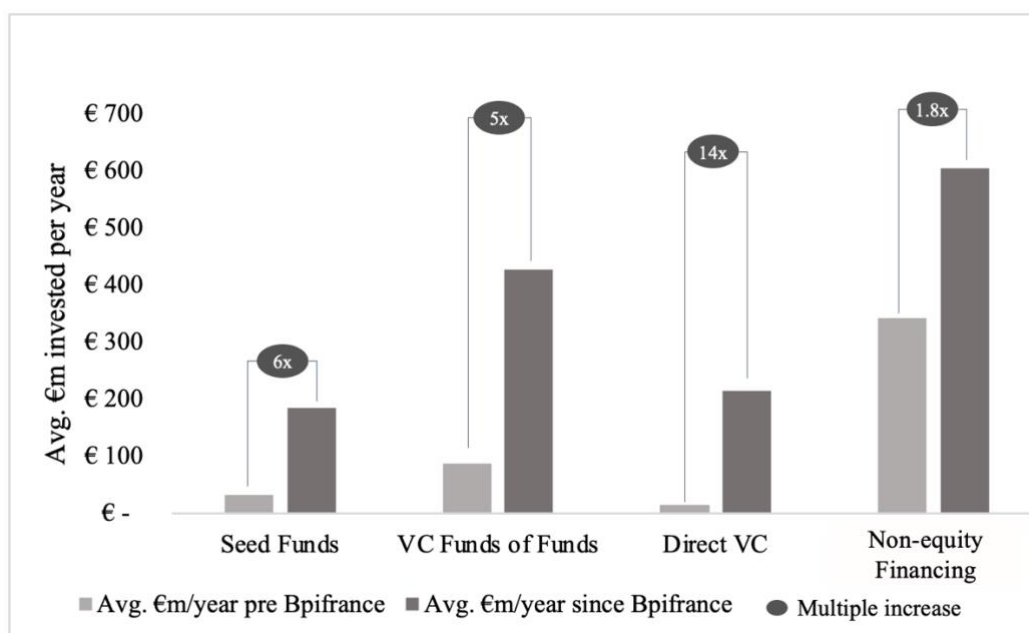
<sup>52</sup> See quotes, for instance, at: <https://www.latribune.fr/actualites/economie/france/20130423trib000761131/bpi-segolene-royal-vole-la-vedette-au-directeur-general.html>

<sup>53</sup> The Bpifrance Doctrine was the subject of a presentation to the Assemblée nationale and the Senate on may 15<sup>th</sup> 2013; it can be found at [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjBgbVt7iAAxXv0AIHHdJ\\_CxYQFnoECB0QAQ&url=https%3A%2F%2Fwww.bpifrance.fr%2Fcontent%2Fdownload%2F3499%2F46658%2Fversion%2F%2Ffile%2FDoctrineBpifranceavril2014.pdf&usg=AOvVaw3HY4poanlY9D-rYkJzEsih&opi=89978449](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjBgbVt7iAAxXv0AIHHdJ_CxYQFnoECB0QAQ&url=https%3A%2F%2Fwww.bpifrance.fr%2Fcontent%2Fdownload%2F3499%2F46658%2Fversion%2F%2Ffile%2FDoctrineBpifranceavril2014.pdf&usg=AOvVaw3HY4poanlY9D-rYkJzEsih&opi=89978449)

horizontal innovation capabilities: a broad definition of innovation and prioritising high-growth firms and entrepreneurial skills development.

With the deployment of PIA, innovation became a core focus of state industrial policy. In the period 2012-2019, Bpifrance funding to start-ups and R&D projects quickly rose to a multiple of that of its predecessor organisations (Figure 3.10 below).

**Figure 3.10: Bpifrance’s increase in innovation commitments**



Source: Bpifrance 2013: Premier bilan d’activité; Bpifrance 2017: Fonds national d’amorçage résultats de l’étude Capintech / Bpifrance le lab 29/03/2017; Bpifrance 2023; Bpifrance Investissement annual reports; author’s analysis and calculations; Gaston-Breton 2015;

Note: Seed Funds data is average for years 2008-2012 vs 2013-2019; FoF, Direct, and Financing is 2002-12 vs 2013-19;

This stark increase in funding was enabled by a dual expansion in the definition of innovation. First, there was a departure from the simplistic view that innovative start-ups needed support solely at the very early stage. Instead, in light of the difficulties encountered with previous initiatives, Bpifrance’s management structured tools to support companies from inception to consolidation and internationalisation. As the senior executive interviewed, who was involved in drafting the Doctrine, explained, one of the main differences between Bpifrance and its predecessors was that Bpifrance broadened innovation support both in terms of the financing tools it could use and in terms of the type of companies it supported (Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021). In other words, Bpifrance moved to an “ecosystem view,” realising the importance of supporting any technological high-growth company that could expand the general innovation capabilities of France. One of the key examples of this new, whole-encompassing approach was the launch of the Large Venture fund in 2013. This was a later-stage VC fund investing not in start-ups but in “scale-ups”—technological companies already structured and often with tens of millions of euros in revenues but still with potential for high growth. “This type of fund is not really for start-ups, but we understood at the time that one of the difficulties was to invest large

sum of money on the other side [i.e., after the start-up stage]. This [later stage investments] ‘pulls’ start-ups and the ecosystem to grow; so it is technically not for start-ups, but it is very important for start-ups to have it” (Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021). This type of comments by Bpifrance leadership reflect their realisation that “start-up” is only one phase of an innovative company’s life, and start-ups that grow into “scale-ups” are most valuable for the ecosystem.

Second, the focus of innovation policy shifted from investing solely in very high-tech and R&D-heavy innovation to supporting any company that would favour the formation and diffusion of general innovation capabilities. In its Doctrine, Bpifrance officially changed its definition of innovation so that it included not only high-tech start-ups coming out of the scientific laboratories but any company that was innovating a market in any sense. This included also companies simply “enabled” by technology—where the value of the business does not reside in the technology per se. The rationale behind this evolution can be traced through three connected policy documents. First, a very influential report (*Pour une nouvelle vision de l’innovation*, Morand and Manceau 2009), written for the government right before Bpifrance’s creation started, articulated very explicitly the need for a broader approach to innovation that prioritised commercialisation potential over technological disruption:

“In France, public discourse evoking innovation is often focused on research and technological innovation. Besides the fact that these two subjects are distinct, they are now out of step with business practices and the reality of the processes of emergence and realization of innovation ... Innovation takes many forms. It covers *supply, process* and *business models*. *User-experience innovation*<sup>54</sup> plays an essential role, the economic impact of which should not be underestimated. Even for technological innovations [i.e., deep tech], an analysis of uses is an essential factor in stimulating their *adoption and use, which are the only sources of income* ... Innovation is the result of a global process in which *R&D is just one ingredient among many*, to be integrated into a complex organizational process” (Morand and Manceau 2009, this author’s italics)

The report proceeded to highlight the importance of prioritising and promoting the general capabilities to commercialise innovation (competences and general mindset) over the top-down planning of disruptive innovation in strategic sectors:

“If innovation is an essential factor in economic competitiveness, it cannot be reduced to research and patents. *France has traditionally been more interested in invention than innovation*, while *other countries have developed real skills to develop and commercialize innovations* ... Innovation is a source of value and income for businesses and for the economy if it translates into the commercial and operational activity of firms ... *Innovation cannot be considered the sole prerogative of certain sectors*, certain sizes of companies, or even certain functions, since by definition it is nourished by the complementarity of sectors, companies and functions. The subject requires a *transversal, broad and proactive vision*, the only one capable of changing mentality, which plays an essential role in this subject and today [in France] is not very conducive [to innovation] ... The point is ... *emphasizing the need, for companies and public authorities, not to focus on disruptive innovation*, which is difficult to achieve, even more to plan. *Too much will to plan and sort out a priori can dry up everything.*” (Morand and Manceau 2009, this author’s italics)

Next, in 2014 Bpifrance wrote its own report (*Innovation Nouvelle Génération*, Bpifrance 2014a) outlining its new expanded vision of innovation support. It built on Morand and Manceau’s work and included insights from a consultation the bank promoted with representatives of the ecosystem:

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<sup>54</sup> *Innovation d’usage* in French version

“We must mobilize so that French and European public innovation support systems are *open to all forms of innovation*, so as not to miss out on a large number of potentially transformative projects. Starting with the financing tools: this is the commitment that Bpifrance is making today ... Our challenge: to *recognize and support innovation in all its forms*.” (Bpifrance 2014a, this author’s italics)

The broad spectrum of innovation that Bpifrance aimed to support can be summarised in a matrix like that in Table 3.3 below, based on the above-mentioned report. Each company can be innovative in a different way, along two axes. It can offer one (or more) of six *types* of innovation (Y axis) and each can be characterised by different *intensities* (incremental or disruptive; X axis).

**Table 3.3: Matrix of “innovations” supported by Bpifrance**

<b>INNOVATION TYPES</b>	Commercial and marketing innovation		
	Innovation of product, services, and user experience		
	Technological innovation		
	Innovation of processes and organisations		
	Business model innovation		
	Social innovation		
		Incremental Innovation	Disruptive Innovation
		<b>INNOVATION INTENSITY</b>	

Source: author’s elaboration based on Bpifrance 2014a. *Innovation Nouvelle Génération*. Paris

In interviews, Bpifrance management confirmed the evolution in this institutional point of view:

“When Bpifrance began, we did some new stuff quite innovatively. For example, we integrated non-technology / non IP-based innovation in our Doctrine ... At the beginning, when Bpifrance was just created, a lot of the instruments, especially on the financing side, were only for tech [meaning R&D- and patent-based technology]. We then discussed internally and did a study to check that it was possible from a legal—and European law—point of view, but also consistent with our Doctrine, to include and support also everything that is ‘tech-enabled.’ We discussed it with the government, and we argued that tech-enabled innovation had been very important in the past years and that we should and could support it.”

Author’s interview with Senior Executive at Bpifrance,  
16/02/2021<sup>55</sup>

<sup>55</sup> Informant-FR-GVC-7-ZDL

Similarly, Paul-François Fournier, Executive Direct of Bpifrance Innovation, explained at the time that “Until now [2014], we had too technological a vision of innovation, which forced us to twist our funding criteria to support certain promising projects” (interview with Paul-François Fournier, Executive Direct of Bpifrance Innovation, cited in Houzelle 2015). BlaBlaCar, for instance, was only supported through indirect means because, at the time, the innovation that the company was bringing to the market did not reflect the criteria of “technological innovation” (Houzelle 2015).

This evolution was ultimately reflected in Bpifrance’s Doctrine, which explicitly includes references to both “disruptive” and “incremental innovation,” allowing for a 360-degree approach to innovation support (Bpifrance Doctrine, 2014).<sup>56</sup> This change of mindset led to changes to other important innovation funding schemes: with the 2013 Finance Law, the government extended the eligibility criteria of the innovation tax credit. As Mr. Mazzella explains:

“The government has evolved its tax credit schemes to include a broader definition of innovation. In addition to the *Crédit d’Impôt Recherche*, which was originally structured to support fundamental research, it introduced the *Crédit d’Impôt Innovation*, which instead explicitly aims to fund a broader set of innovation activities. This is because we in the ecosystem made the government realize that fundamental research and innovation are two different things but that all innovative companies can create social and economic value, even those that are working on some business model innovation rather than a revolutionary technology per se.”

Author’s interview with Frédéric Mazzella,  
founder and CEO of BlaBlaCar,  
02/11/2021

It is very clear, therefore, that the creation of Bpifrance opened the floor to a cross-institutional debate on the role and nature of innovation. Bpifrance’s management, together with the actors involved in the ecosystem, pushed for an evolution of innovation policies away from supporting solely disruptive and R&D-based innovation and towards focusing on the broader development of innovation capabilities in France. This translated into a relaxation of the definition of innovation and in policy tools to support the commercialisation of any technology and the growth of any type of innovative company.

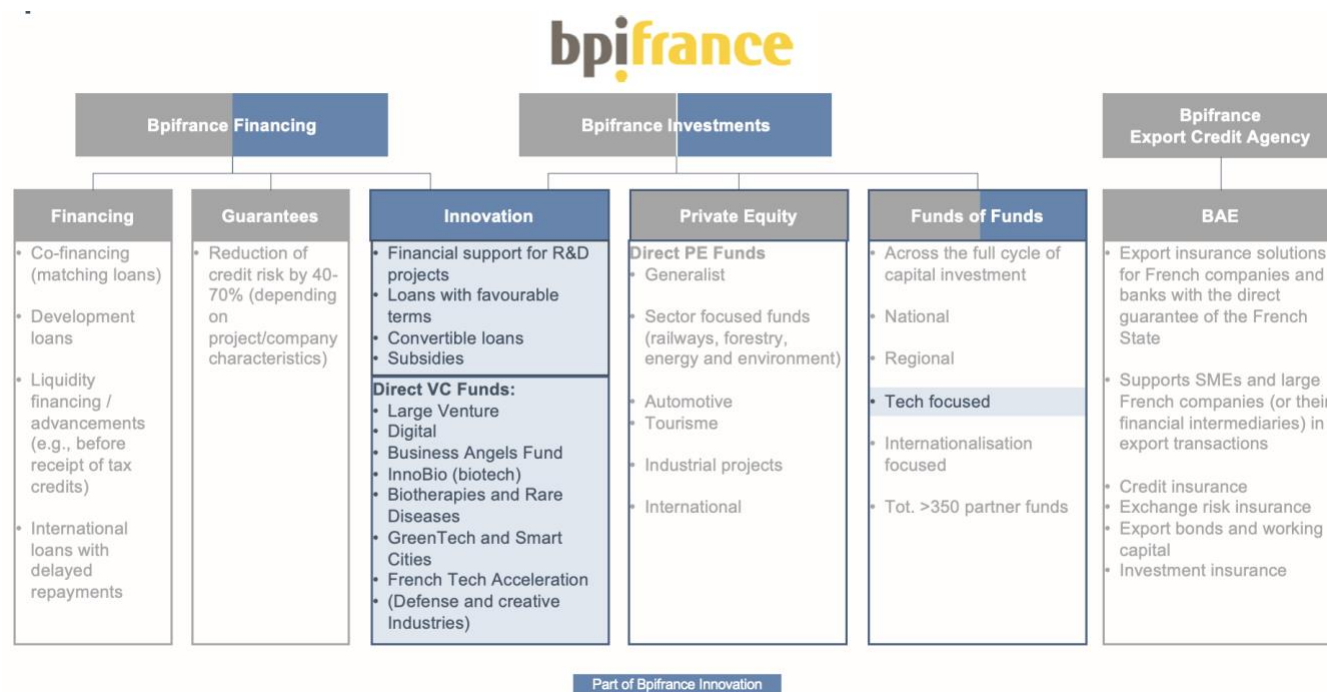
### 3.4.4.3 Bpifrance Innovation: an industry-focused approach

This new view of innovation materialised in Bpifrance Innovation. This is a cross-unit group of professionals and programmes, with a 360-degree approach to resolving the market failures in innovation markets. It includes funding and in-kind support from the earliest stages (companies founding and product prototyping) to the later stages (expansion and even internationalisation). The tools utilised range from grants and subsidised loans to equity investments. Figure 3.11 represents Bpifrance Innovation and its relationship with the three key operating units of Bpifrance.

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<sup>56</sup> “*Bpifrance soutient et accompagne jusqu’à l’industrialisation l’innovation de rupture, notamment pour faire émerger de nouveaux acteurs de référence et répondre aux nouveaux besoins sociaux. L’innovation incrémentale, porteuse de compétitivité accrue, est également soutenue.*”

Figure 3.11: Bpifrance Innovation (blue shading indicates Innovation functions)

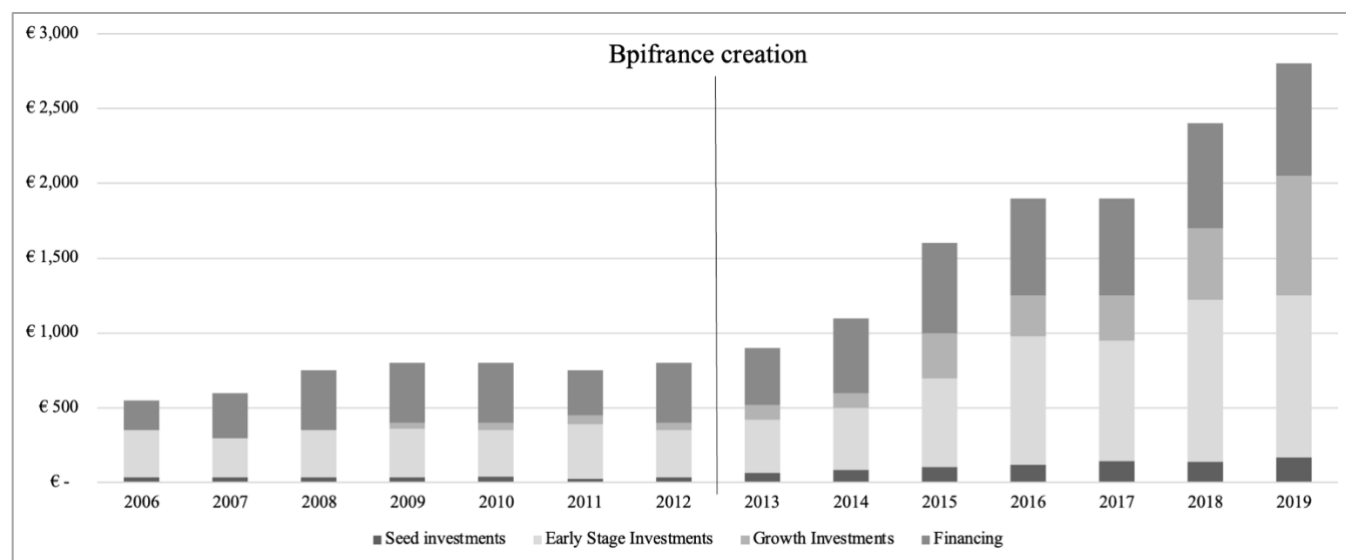


Source: author's own representation based on Bpifrance internal documents

In summary, the activities of Bpifrance Innovation are performed by three teams within Bpifrance. First, the Financing Unit provides a series of non-dilutive funding to start-ups, in particular low-interest loans, totalling on average about 600 million euros per year.<sup>57</sup> Second, the Direct Investments unit has five main teams that perform equity investments directly in start-ups to the tune of 2-300 million euros per year.<sup>58</sup> Finally, the Indirect Investment (or Funds of Funds, FoF) team supports innovation by providing capital to private venture capital funds, in order to facilitate their fundraising with private institutional investors. These resources, around 500 million per year, therefore reach start-ups when the PVCs make their investments. Figure 3.12 below summarises the evolution of Bpifrance Innovation funding since the creation of Bpifrance and in comparison with the previous decade.

<sup>57</sup> This refers to only the amounts going to start-ups, based on Bpifrance 2023.

<sup>58</sup> These figures refer to 2016-2019; investments were lower in the earlier years

**Figure 3.12: Bpifrance Innovation funding over time (€m)**

Source: author's analysis on Bpifrance annual reports and Bpifrance (2023)

Although this structure is partially based on some programmes that predated the formation of Bpifrance (see Figure 3.9), the creation of the new public bank has concentrated and integrated the competences and thus allowed for a holistic approach to supporting innovation markets. The testimony of Informant-FR-GVC-7-ZDL is again helpful to understand this evolution:

“When I joined CDC in the nineties... we decided to launch a funds of funds programme helping young companies coming from research to develop ... It was a very hands-on programme: we created new teams with academic and industry partners ... and they were very ‘sectoral’ funds—one focused on IT, one on biotech, one on semiconductors. And we decided to do seed *and only seed*. And that was a big mistake, because you can't really do the first round, if you're not able to put money later on—but nobody knew that at the time, it was the nineties! So the result was that these funds were very successful at finding very nice companies but financially not very successful. That was one of those kind of failures from which you take some experience [i.e., learning].”

Author's interview with Senior Executive at Bpifrance,  
16/02/2021

Through these experiences the future management of Bpifrance learnt that funding “nice” companies by itself is not the right approach. If the key institutions for the industry are not present, such interventions risk being just a drop in the ocean. With the creation of Bpifrance, instead, the focus moved exactly to coordinating the overall development of the industry. VCs highlighted this clear perception:

“There is an event that is super important [for the ecosystem] in France, which is the set-up of Bpifrance ... Bpifrance made sure that every element of the ecosystem was there, from the entrepreneurs, to the business angels, to VC, to PE firms, to the lawyers, consultants and everything ... They identified all the pieces needed for an ecosystem.”

Author's interview with Marc Fournier,  
Founder and partner at Serena VC,  
25/12/2021

Very similar comments were made by most private actors interviewed. They all stressed the launch of Bpifrance as a turning point for the ecosystem in France, in particular because of the whole-encompassing approach which contrasted with piecemeal programmes offered by the previous organisations (CDC, OSEO, FSI).

In conclusion, therefore, the creation of Bpifrance Innovation brought an important new focus and increased resources to innovation support in France. Most importantly it introduced a new approach to state intervention in innovation: it evolved from financing strategic technologies to methodically developing the key components necessary to create a self-sustaining innovation market—one that the state might help create and direct, but that must be sustainable and attractive for private investors and entrepreneurs. In so doing, Bpifrance has perfectly embodied the concept of a Market Creator State. The next section will show how this approach is reflected in the operations of the organisation. It delves into the details of Bpifrance’s innovation activities and the mechanisms through which these programmes have helped develop the necessary institutions for the ecosystem.

### **3.5 Bpifrance under scrutiny: evaluating Bpifrance’s GVC operations**

This section analyses Bpifrance’s activities through the lenses of the proposed theoretical framework. It finds that Bpifrance embodies the quintessential Market Creator State, an approach that distinguishes it visibly from past GVC policies in France. Bpifrance retains the dirigiste ambition to promote innovation through state intervention, but it has deeply changed *how* the state invests and *what* it invests in.

On the one hand, Bpifrance has built on previous institutions to embrace fully a PAL relationship with the private sector. Promoting the private venture capital industry is an evident priority in the mission of the organisation. Bpifrance achieves this through a very large and proactive indirect investment (funds of funds) programme as well as through direct investments that are always in collaboration with the private sector. Moreover, the governance and competences it has acquired ensure the organisation is highly independent from political pressures and that it limits the risks of being “captured” by the interests of its private counterparts. On the other hand, Bpifrance’s investment focus reflects the evolution in the conception of innovation described in the previous section: it prioritises the development of broad innovation capabilities in the ecosystem and only a minority of its investments are targeted to specific, pre-determined sectors. Its investment record shows that the organisation’s funding instead clearly targets any type of high-growth company and support it across all growth stages, although the direct investment portfolio remains more exposed to particularly risky and high-tech companies as these are the segment of the market where public co-investments are most useful to private VCs. Overall, this approach has contributed to creating that critical mass of capital and entrepreneurial competences that the French ecosystem was historically missing.

The following two sub-sections lay out the evidence with regards to Bpifrance Innovation’s approach along the “State-Market Relationship” (5.1) and “Investment Focus” (5.2) axes. The section

finds that Bpifrance’s activities reflect all the key sub-elements of the Market Creator State model introduced in the Theory chapter and reported in Table 3.4 below.

**Table 3.4: Key elements of the Market Creator State along the two axes of the theoretical framework**

PAL	Focus on Horizontal Innovation Capabilities
Integration / co-investment with private VCs	Broad definition of innovation
Private-sector investment competences and practices	Tech-agnostic and focused on high-growth firms
Informed conditionality	Promotion/support of entrepreneurial skills development
Separation from politics / bureaucracy	

### 3.5.1 State-Market Relationship: the arm’s length partner of the French risk-capital industry

Looking at the “X axis” of the theoretical framework shows how Bpifrance departs from a mere resurgence of *dirigisme*. The state is a key actor but there is no top-down and unidirectional political management of the innovation industry: rather, Bpifrance coordinates the industry by being the main partner of private actors, while remaining at arm’s length from both them and politics. In practice, all equity capital allocations to start-ups are made either through private VC funds or in co-investment with them. Bpifrance’s resources and initiatives are predominantly focused on developing France’s private VC industry and making VC an attractive asset class for institutional investors. This was done mostly through indirect investments, which has provided a critical mass of capital and enforced standards on VC teams, but also through direct co-investments. The latter appear as more of a tool to provide financial leverage to the ecosystem, especially in the most challenging areas of the market, rather than a way for the state to “pick the winner companies.” Compared to other countries in this study, Bpifrance represents the most proactive and structured version of PAL: true to its interventionist tradition, modern French GVC is centralised, with a full integration of all innovation funding activities (indirect and direct equity, but also non-equity financing), and a very visible role in orchestrating the development of the ecosystem.

#### 3.5.1.1 Promoting the private VC industry: Bpifrance Funds of Funds

The first main way in which Bpifrance’s GVC acts as a partner for the private industry is through the PDI’s funds of funds (FoF) team. This team selects private VCs and helps them raise funds by providing a substantial part of the capital they will manage. The team’s relationship with private VCs perfectly embodies the concept of PAL: on the one hand Bpifrance FoF is an important partner in the fundraising process (“critical mass” effect); on the other, it has enough professional competences and independence from these private actors to impose informed conditionality on them. In this way, it triggers a “certification effect” on these funds. Bpifrance FoF’s GVC therefore significantly reduces the uncertainty intrinsic in the VC market and thus helps attract private capital into this asset class.

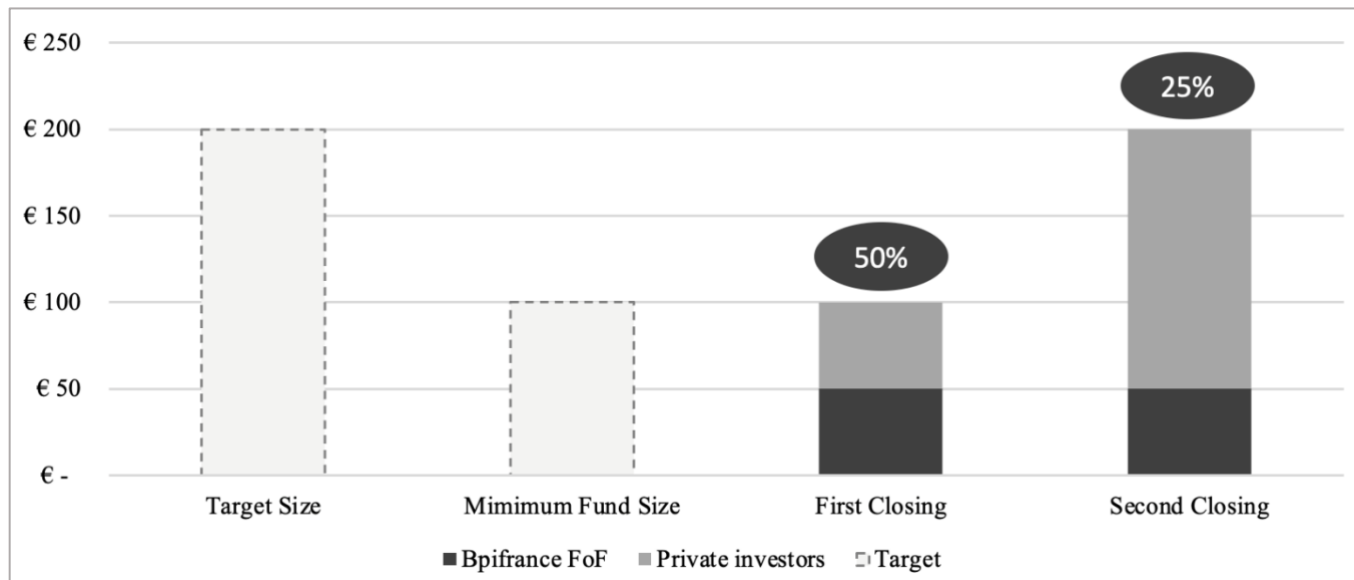
First, Bpifrance FoF represents the go-to partner for French VC teams looking to raise a new fund. Bpifrance invests public money by underwriting shares of private VC funds, typically committing this

capital in the early phases of their fundraising process. This has important implications for the private funds, because it helps reduce the uncertainty around whether the fund will reach the minimum viable size to deploy its investment strategy. This is due to the “staged” dynamic of VC fundraising, illustrated in Figure 3.13. The process is typically organised in multiple “closings”—moments when the LP and capital base is defined and the fund can start operating. The “first closing” is typically set at the minimum size the fund needs to implement the target investment strategy. Second/third/fourth closings expand the fund until it reaches its ideal target size. In this process, the most critical stage is the first closing, and it is here that the Bpifrance operates (author’s interview with Informant-FR-GVC-1-KYL, Senior Official at Bpifrance FoF, 26/11/2020). In other words, Bpifrance provides the “critical mass” of capital during a private fund’s fundraising process. Although quantitative data on Bpifrance’s contribution throughout the multi-stage fundraising process is not available, interviews with the FoF’s team and private investors confirmed that Bpifrance typically represents a “significant first-closing investor” (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020) and thus that it has a more-than-proportionate impact on fundraising prospects, as one French VC investor explained:

“Every fund has the same problem: how do you start [the fundraising]? ... Bpifrance is there from day one ... So, when you see a fund that has a 25 percent stake by Bpifrance at final closing, it means they [Bpifrance] were a much larger percentage at the first closing. The fact that they contribute 50 million of the first 80 is very different from putting 50 million of the last 200 million. Because it means that other investors know that they don’t risk locking in money into a fund that is not actually going to close [i.e. to launch operations]: it means that even if an asteroid hits earth, the fund can still happen and operate”

Author’s interview with Xavier Lazarus,  
founding Partner of Elaia Partners VC,  
26/01/2021

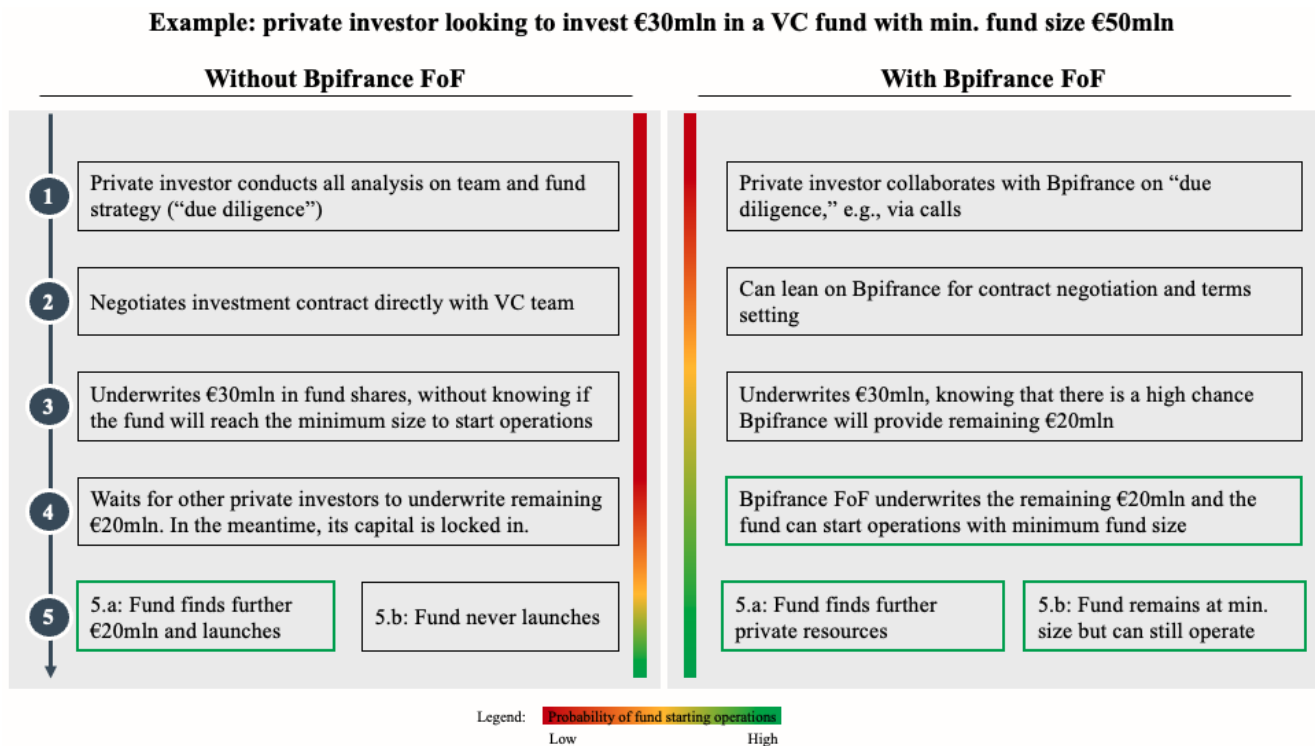
**Figure 3.13: Example of contribution of Bpifrance to a fundraising process**



Source: example from author’s interview with Xavier Lazarus, founding Partner of Elaia Partners VC, 26/01/2021 and comments from Informant-GE-VC-1-WOR, 05/08/2021. Example is consistent with the multiple between public and private capital reported by Bpifrance for its FoF’s activities (5x) (Bpifrance 2023).

It should be noted that this operating model of Bpifrance FoF’s is not unique: it is very similar to the activities of another fundamental institution in Europe’s GVC landscape, the European Investment Fund (EIF; see next chapter). The two PDIs simultaneously developed this model of intervention over the course of the nineties and two-thousands and are today the two most active European institutional investors in private funds. The EIF, however, invests across Europe, while Bpifrance focuses on France. The history and modus operandi of the EIF will be detailed in the next chapter but, for now, suffice it to say that a main difference between the two is that Bpifrance only commits capital in concomitance with private investors, never *before*. This is because “the idea is to provide leverage for the private sector” (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020). Interviews with both management and PVCs have highlighted that even the simple engagement of Bpifrance with funds provides important signals to the market (Chamboredon, ISAI VC, 12/01/2021; Lazarus, Elaia Partners VC, 26/01/2021): “the market knows that if we are doing formal due diligence on a fund, the probability that the fund will close is very high ... we are also happy to do calls with private LPs who are considering to invest in the fund” (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020). Figure 3.14 below exemplifies the fundraising process and how it is affected by Bpifrance’s intervention through a “critical mass” dynamic. It illustrates how the participation of Bpifrance increases from the start the probability that the fund will launch, lowering the private investors’ risk of locking in capital as well as their burden during the due diligence and contract negotiation process. Further explanations of these dynamics are available in the next chapter’s section on the EIF (4.5.3.1).

**Figure 3.14: Difference in fundraising process with and without Bpifrance FoF’s participation**



Source: author’s elaboration based on fieldwork interviews

Bpifrance, however, is not just a neutral provider of capital to private funds but instead imposes strict conditionality on them. This is because the FoF team has had the mission of building and professionalising the venture capital industry in France. First, when it partners with PVCs, it requires that at least as much capital as what it commits to their fund is invested in French start-ups. Second, it scrutinises their investment strategy and negotiates investment contracts to ensure they follow international best practices. This is a crucial step because it is the moment when Bpifrance can use its knowledge of the industry and bargaining power to impose best practices on the fund, in particular the adoption of the *limited partnership* model—see EIF section in next chapter for further detail. As Tom Nicholas has recounted in his *VC: An American History* (2019), the limited partnership emerged as the most effective legal set-up to avoid the principal-agent problem in the context of innovation investments, because it aligns the incentives of LPs and GPs. However, being a US-born institution, the limited partnership was never a natural set-up for any investment company in Europe. The role of Bpifrance, therefore, has been also to spread the limited partnership as the main legal structure for VCs, replacing alternative French-born models (such as FCPIs and SFI). Interviewees have explicitly explained that, in so doing, Bpifrance has a “certification effect” on the funds: other private institutional investors become more likely to commit capital to the fund, *because* they trust Bpifrance FoF’s due diligence and negotiation process.

Admittedly, this argument that private investors would trust and follow a public agency seems improbable—historically, governments had been particularly bad at negotiating terms with private funds (Lerner 2009). However, fieldwork interviews indicated that, in Europe, PDIs such as Bpifrance FoF or the EIF have been dedicated to this activity for so long that they have cumulated the competences, resources, and experience to be among the very top experts in this specific activity (e.g., see author’s interview with Chris Wade, founding partner of Isomer Capital VC and former high-tech entrepreneur, 04/03/2021). Most importantly, investment in VC funds has become a core part of their business. This instead is often not the case for many private institutional investors (e.g., pension funds, family offices), which often have experience, and teams, for investing in other asset classes but not in VC funds specifically.<sup>59</sup> As a Senior Official at Bpifrance FoF explained:

“We spend a lot of time on LPAs, Side Letters and the likes, making sure everything is clean and investors friendly. A lot of French institutions simply do not have the resources for this particular activity. A lot of these LPs may have large stakes in large PE funds etc. but not specifically in the strategies that we [at Bpifrance innovation FoF] invest in (early stage and technology). So even those [experienced] LPs, when they decide to invest a little bit in a 200 million VC fund [which for them is a very minor investment], they do not want to spend a lot of time on it, so they basically delegate to Bpifrance, although of course they would never say it”

Informant-FR-GVC-1-KYL,  
Senior Official at Bpifrance FoF,  
26/11/2020

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<sup>59</sup> Fieldwork with industry experts confirmed the issue that, for example, pension funds in Europe are often not structured to invest in VC funds because the capital commitments required are too small (tens of millions instead of hundreds of millions) and thus their investment teams have not developed the competences to invest in this asset class.

Actors from the private sector have largely confirmed this recount. They have repeatedly mentioned that Bpifrance FoF conducts a particularly “tough” due diligence and negotiations but also that the conditions they impose are informed by a deep understanding of the industry and by a long experience in the business—the definition of “informed conditionality.” This renders them effectively a “*market maker* in this field ... [and] makes [other LPs] more comfortable to invest without having to spend too much time themselves entering into the legal documentation—it is like a delegation” (author’s interview with Guillaume Aubin, founder and partner at Alven VC, 22/12/2020).<sup>60</sup> Importantly, this ability of Bpifrance to influence the market for VC fundraising derives from its institutional history and the competences it inherited from CDC Entreprises. The team transferred the skills originally developed for supporting PE markets in the nineties to investing in VC funds. As another pioneer French VC put it: “This fact that it was not a new entity, that the people were not new, was probably one of the reasons also for success—the people were not ‘newbies.’ The team in charge of FoF has been doing that for 25 years” (Chamboredon, ISAI VC, 12/01/2021).

### 3.5.1.1.1 The role of Bpifrance’s Funds of Funds in the ecosystem

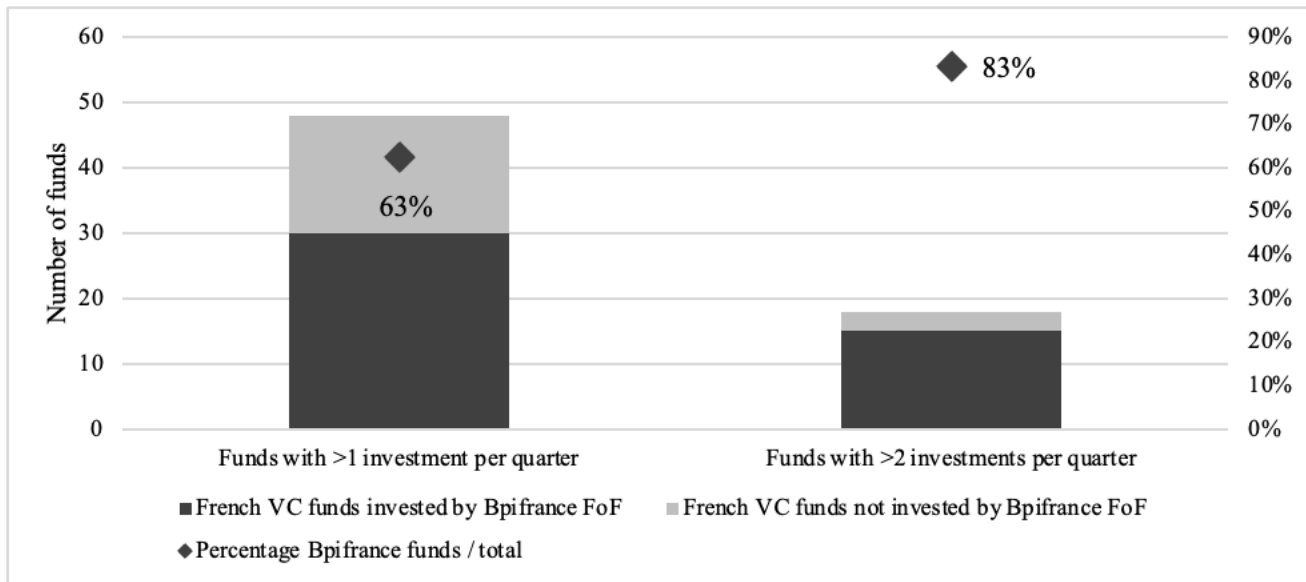
The combination of these certification and critical mass effects has meant that Bpifrance has contributed to the expansion of the VC industry, without compromising its financial performance.

Bpifrance has been a very significant funder of French VCs: as Figure 3.15 below shows, 63-83% of active French VC funds have received Bpifrance funding—estimates varying depending on the definition of the reference funds population. In other words: the vast majority of French private VC funds have Bpifrance as an LP. The analysis in Figure 3.15 is consistent with interview statements by management of the FoF team, who summarised it as: “Anyone who is trying to raise a fund in France knocks at our door first, no doubts” (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020).

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<sup>60</sup> See also fieldwork interviews with author’s interview with Chamboredon, ISAI VC, 12/01/2021; Chris Wade, founding partner of Isomer Capital VC and former high-tech entrepreneur, 06/12/2020; Carles Ferrer, partner of Nauta Capital VC, 04/03/2021

**Figure 3.15: Proportion of French PVC funds (active between 2015-19 VC) invested by Bpifrance FoF**

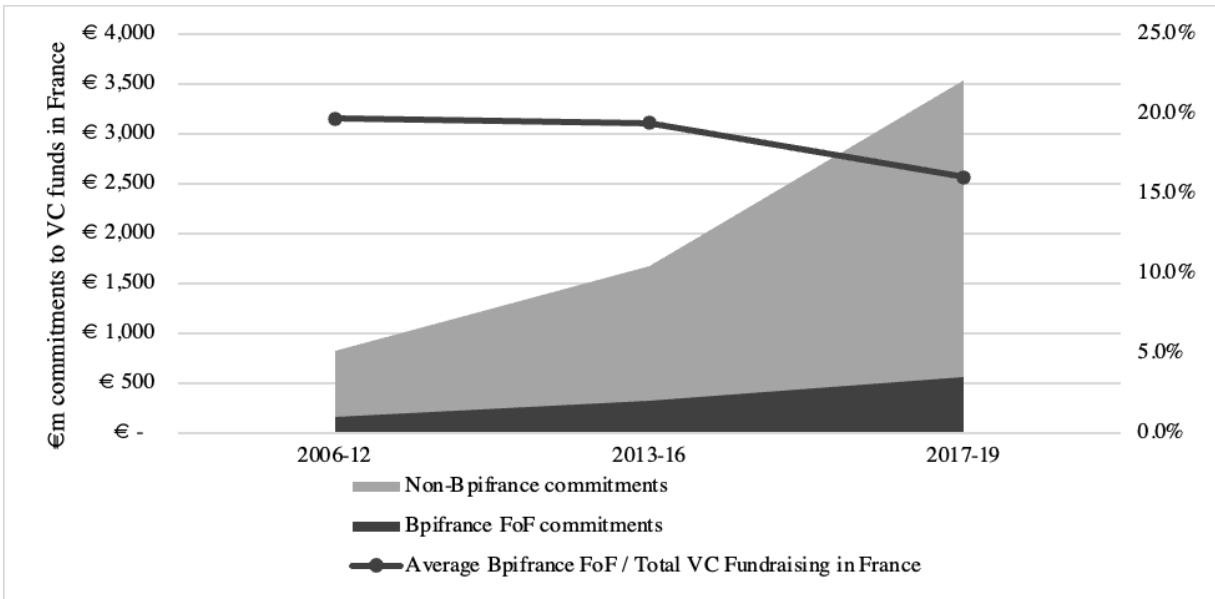


Source: author’s analysis based on fund data from Pitchbook; search included all VC funds active in France, excluding public funds and corporate venture capital funds (since neither would typically look for external private LPs so it would not be correct to include in the reference population to see the weight of Bpifrance on the private funds industry).<sup>61</sup>

This heavy state intervention, however, appears to have been complementary to the private sector, rather than cause for crowding out. While Bpifrance FoF’s yearly commitments to VC funds have grown by 250 percent over the decade, private commitments have grown even faster, at 350 percent (Figure 3.16). In other words, private investors have become increasingly interested in the VC asset class, causing Bpifrance’s share in it to gradually decrease over time—a healthy sign that the industry is becoming less reliant on the state. At the same time, the French median VC fund has almost sextupled in size (Figure 3.17). This evidence is consistent with the argument that indirect GVC can favour the development of private VC by reducing the uncertainty in the early days of an ecosystem.

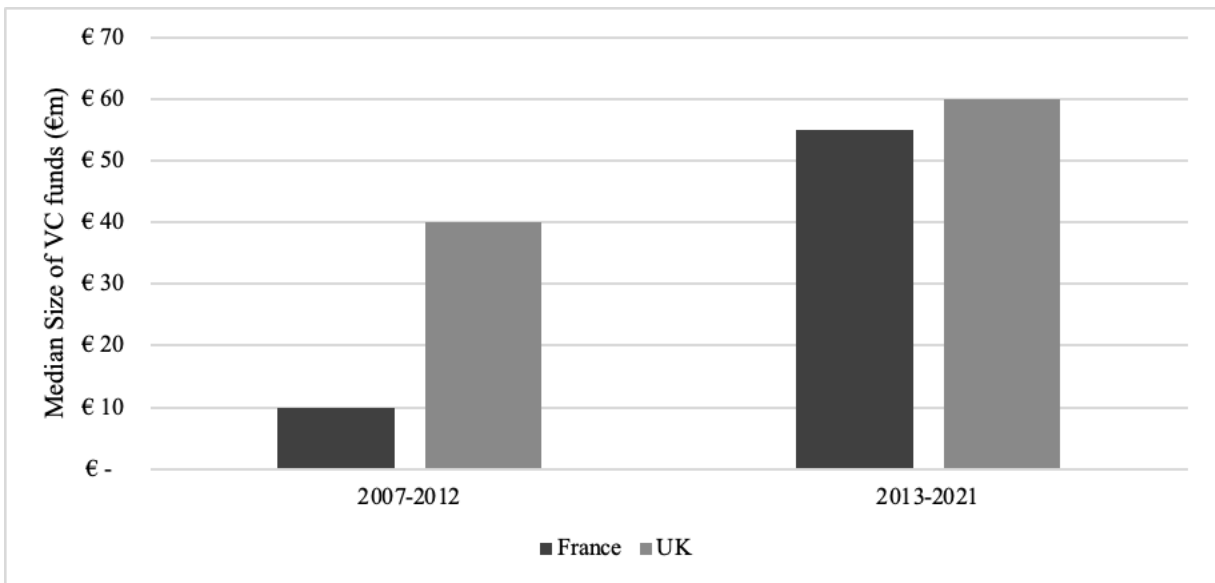
<sup>61</sup> To exclude non-institutional investors from the reference population, the latter was restricted to those who invested consistently (on average). This is a high-level filter and it is therefore still possible that the reference population still includes sporadic investors, BAs and other types, in which case the results are a slight underestimate

**Figure 3.16: Expansion of VC market in parallel with Bpifrance FoF activity<sup>62</sup>**



Sources: author's analysis based on Bpifrance data

**Figure 3.17: French VC funds median size development versus British VCs, by vintage years**



Sources: Pitchbook and Bpifrance 2023

These figures are matched by the commentary of the top VCs that I have interviewed in France. They all highlighted, often unsolicited, the instrumental role that Bpifrance FoF has had both in their fundraising and in the growth of the VC industry in France overall. The frequency of these comments was

<sup>62</sup> Note that, as of now, these figures do not separate out EIF investments, which are part of the non-Bpifrance category in the chart but should still be considered public FoF capital.

particularly surprising: I expected VCs to downplay the role of public institutions and instead emphasise their own merits in raising funds, since it is a key sign of their reputation in the market.

Importantly, my research found no evidence that such indirect GVC intervention lowers the quality of the industry by supporting “second tier” investors.<sup>63</sup> First, the pioneering French VCs I interviewed reported *both* competitive returns and high proportions of Bpifrance (and/or EIF) funding (Table 3.5). Private LPs investing in VCs corroborated this view: “Every single VC in Europe has had government money. This is not for the pathetic and weak. Atomico, Index, etc. [the most famous European funds] all had it” (Wade, Isomer Capital, 04/03/2021). Rather, the importance of GVC changes over the lifetime of a PVC: an investment by Bpifrance is particularly important for the first fund, when the new team does not have a track record yet. This is why both Bpifrance and the EIF have in their mandate to support these so-called “first-time funds.” Second, Bpifrance FoF unit reports to generate a profit from its funds investments (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020). Indeed, evidence is emerging that even first-time-funds perform at least as well as the rest of the portfolio (Bpifrance 2020d).<sup>64</sup> Finally, it should be noted that during this publicly-induced expansion of the French VC market there has been no clear sign of deterioration in the asset class performance. For instance, as Figure 3.18 shows, the average exit multiple (proceeds from divestments divided by capital invested) was 0.7x in the last year before the foundation of Bpifrance and 1.9x in 2019. All in all, the data lends credibility to the argument that indirect GVCs can decrease uncertainty in VC markets and thus help attract private capital to it.

**Table 3.5: Performance of VCs interviewed who received Bpifrance FoF investment**

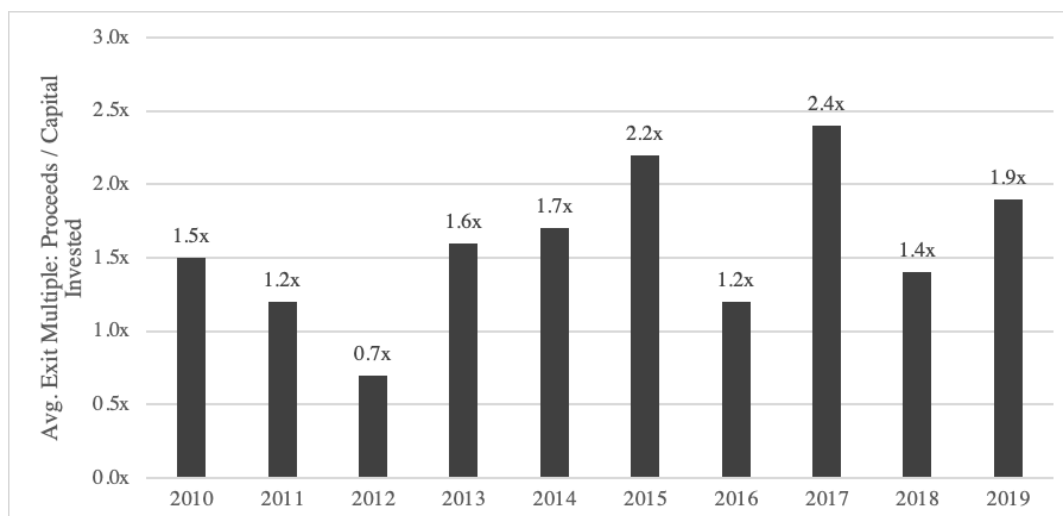
VC	Founding Year of VC	No. of Investments (2015-2019)	Reported Bpifrance + EIF % of AUM	Average Reported Return <sup>65</sup>
<b>Eurazeo VC</b>	1997	128	20-25%	25% gross IRR
<b>Serena Capital</b>	2008	48	40%	20% gross IRR
<b>ISAI</b>	2010	52	15-20%	2x DPI on 2010 fund
<b>Elaia Partners</b>	2002	68	30-40%	10-15% net IRR

Sources: author’s interviews with each VC; for Elaia Partners, see also: <https://medium.com/elaia/yes-you-can-earn-big-money-with-venture-capital-even-when-going-through-a-couple-of-economical-780525827bee>; fund investment numbers from Pitchbook.

<sup>63</sup> The sceptics would argue that public LPs such as Bpifrance would end up supporting mostly those funds that “do not have the track record to fundraise from private investors,” thus lowering the overall quality of VCs in the market.

<sup>64</sup> At the event dedicated to its PVC partners, Bpifrance’s management unveiled some results of their internal analysis on historical portfolios and found that first-time funds on average outperform the others. See [video](#) of presentation, minute 6:45

<sup>65</sup> Different interviewees reported returns differently. Gross IRRs are typically 2-3 percentage points higher than net IRR. TVPI: is the total value of the capital already returned to investors (“realised returns”) plus the estimated value of the companies still in the portfolio (“unrealised returns”) over the total committed by the LPs. DPI refers solely to the capital already returned to the LPs over the capital committed.

**Figure 3.18: Average exit multiples in innovation investments in France, over time<sup>66</sup>**

Source: Bpifrance research team data, from document *Les Fonds Partenaires et Bpifrance, Billan 2017-2019* (Bpifrance, 2020b).

In conclusion, therefore, this research finds that Bpifrance has been an important catalyser for the private VC industry in France. Bpifrance FoF has been both a partner and an independent evaluator for private VCs. On the one hand, it has provided funds with the critical mass of capital they need at the start of the fundraising process. On the other, its selection and contract negotiations impose informed conditionality and have provided a minimum-quality stamp of approval that reassures other potential LPs and draws additional resources to the industry.

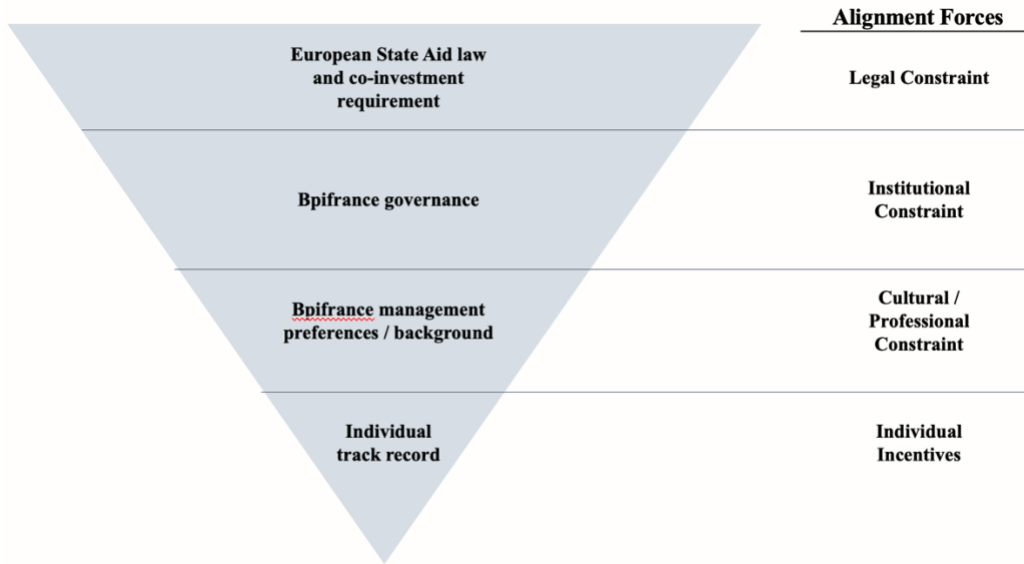
### 3.5.1.2 At arm's length from both politics and the market: direct investments at Bpifrance

The PAL characteristics of Bpifrance's approach also transpire from the institution's autonomy from the rest of the state apparatus and from its private-sector counterparts. This is particularly evident in the way Bpifrance invests directly into start-ups. Through my fieldwork, I investigated in depth the day-to-day *modus operandi* of Bpifrance's teams involved in these activities. It emerged that a set of legal and institutional constraints as well as individual incentives ensure that the PDI acts largely as "another private investor" in the market.<sup>67</sup> This approach distinguishes it neatly from traditional state bureaucracies but also limits the chances of state capture. Figure 3.19 below represents this set of forces, going from European rules to individual incentives.

<sup>66</sup> Investment proceeds divided by capital invested

<sup>67</sup> Both Bpifrance officials and PVCs have used this expression during the interviews (e.g., author's interview with Jacq, Digital Venture Fund, 12/02/2021)

**Figure 3.19: Forces aligning Bpifrance’s operations to private-sector practices**



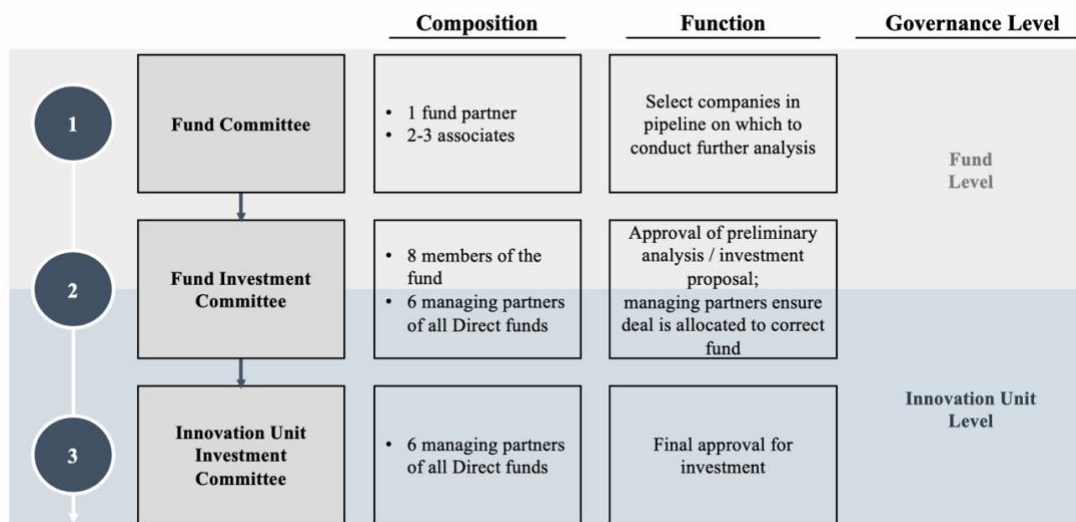
Source: author’s elaboration based on insights from interviews

First of all, Bpifrance direct investment unit has a strict private co-investment requirement. In practice, this means that when a Bpifrance fund invests in a start-up it must ensure that another investor, typically a private VC, is also investing at exactly the same terms as Bpifrance (i.e., *pari passu*). This implies that, first, Bpifrance cannot just select the companies it likes, and, second, it cannot attribute to the company a value that is not “confirmed” by the private market. This requirement is largely due to the constraints imposed by European State Aid Law but is reinforced by Bpifrance management’s own views. Although European regulations grant some flexibility, Informant-FR-GVC-7-ZDL explained that, in practice, Bpifrance never does solo investments in innovation. This is firstly because it does not want to take on the full risk and, secondly, because if it invested alone it would need to prove that such investments were done “at market conditions,” which is particularly difficult with tech investing (Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021).<sup>68</sup> The result is that Bpifrance’s investment teams need to collaborate constantly with PVCs to perform investments. Such “syndicated” investments are common in the VC industry, even among private VCs, but to be part of these syndicates Bpifrance’s direct investments team needs to be perceived as “one of them” by the rest of the investors. This leads the teams to adopt practices and processes akin to those of its private co-investors (author’s interview with Veronique Jacq, Head of the Digital Venture Fund at Bpifrance Direct Investments, 12/02/2021). On the flipside, this practice is evidence of Bpifrance’s conditionality power and helps avoid state capture risk: by requiring that its private co-investors grant Bpifrance the same rights and pro-rata share of the company, Bpifrance avoids getting the “short-end of the stick” in private deals where, theoretically, entrepreneurs and private investors could collude to benefit at the expense of the state.

<sup>68</sup> The difficulty lies in the fact that, differently from traditional PE, in early stage tech investments there is ample variance in the metrics that can be used to assess a company’s value (insight from same interview cited in main text).

The market-aligned approach is also visible in the governance structure around the investment decisions. This is distinct from typical state bureaucracy in that it is fully insulated from political interference but also allows for a highly discretionary process (not based on predefined rules, see earlier quote by Guaino in Levy 2016). In short: all start-up investments are approved solely by internal management of Bpifrance, with no involvement of the Board (which is the only body with government representation). Figure 3.20 below exemplifies the process and committees involved.

**Figure 3.20: Bpifrance direct investments in innovation, approval process**



Source: author’s elaboration based on insights from interviews

Each direct investment fund has a three-step approval process for the investments. The deals are first analysed and approved within the fund’s team and later receive a check and approval from an investment committee comprised of the top operational management of the Investment Unit (Ferrere, senior official at Bpifrance Large Venture, 10/03/2021; Informant-FR-GVC-5-CXL, official from Bpifrance Ecotech fund). From scouting to approval, therefore, the investment process is fully managed by Bpifrance’s investment professionals and the go/no-go on an investment is determined not by *a priori* rules but by agreement within the management team based on the ad-hoc analyses on the specific opportunity.<sup>69</sup> Interviews with Bpifrance funds’ management reflected that they consider this operational independence vital to the role Bpifrance aims to play in the market. As the senior executive interviewed explained: “Having leverage in the market ... means also being able to say a lot of ‘Nos.’ This means having a lot of independence and no pressure from the political side ... There might be a strategy, e.g., a national idea to do more biotech, and ok you will try, but not by going under a certain level of quality—because it is useless, it doesn’t work. And I have to say, in the direct investment side of Bpifrance it is close to that, because you need to have a certain credential in the market—people need to believe in you” (Informant-

<sup>69</sup> As an exception, for the Ecotechnology and Smart City funds, where the government agency ADEME is a direct LP, representatives of the agency participate to a final company presentation and contribute to the go/no go decision, mostly with technical feedback on the technology, since that is the agency’s area of expertise (author’s interview with Informant- GVC-5-CXL, Bpifrance Ecotech 10/12/2020). Even in this case, however, they are not integral part of the investment committees.

FR-GVC-7-ZDL, Bpifrance, 25/02/2021). In other words, the result of the governance negotiations described earlier in this chapter is that the government might be able to decide on the broad strategic focus of the investment activity but the implementation of the strategy (i.e. the decisions over single investments and fund management) is very insulated from political influence, as CDC had intended.

Finally, there are individual-level incentives that lead Bpifrance investment professionals to behave similarly to private investors. This further differentiates them from regular state bureaucrats but also strengthens the institution's stance vis-à-vis its private co-investors. In contrast with the expectations going into fieldwork, however, it emerged that these incentives are not formalised in performance-based compensation (for an example of more formal incentives, see the German GVC *HTGF* in next chapter). Interviews with management of Bpifrance funds surfaced that investors' compensation is not directly linked with the fund performance. However, Bpifrance staff background and professional ambitions help maintain a certain rigour in the investment choices, which limits both politically motivated investments as well as "favours" to private actors. Most of the top managers were recruited from private VC funds and thus retain those practices. As one interviewee who has worked in both private and public European VCs put it, "if you were a private VC before, some practices, terms, and conditions become almost an 'ideology,' and you will follow them anywhere you work" (author's interview with *Ciro Spedaliere*, *Claris Ventures*, 12/12/2023). Secondly, since many of the more junior professionals aspire to a future career in the private sector, where remuneration prospects are higher, they are very focused on developing a track record and reputation that will facilitate their transition to private funds: "An important fact to understand is that people in my team are very focused on their reputation as professionals in the market; when they invest as part of my team, they are also building their track record, and they know how important it is to have a good track record if they want to go elsewhere later" (quote from *Jacq*, *Digital Venture Fund*, 12/02/2021; similar commentary from *Ferrere*, *Bpifrance Large Ventures*, 10/03/2021; Informant-FR-GVC-7-ZDL, Bpifrance, 25/02/2021; and Informant-FR-GVC-5-CXL, Bpifrance Ecotech 10/12/2020). In short, thus, Bpifrance does not replicate a carried interest bonus structure but its revolving doors with private funds motivate its investment professionals to have a strong investment track record.

Statements from staff could obviously be biased but this point of view was confirmed by French PVCs as well as by this author's own high-level data analysis. All investors interviewed referred to Bpifrance as some variation of "a school of venture capital," which trains young professionals to then "release" them into the ecosystem. Mr. *Chamboredon* of *ISAI*, for instance, stated "These Bpifrance people find jobs in the private sector, so they clearly have the skills to be investment directors and partners in a VC fund" (*Chamboredon*, 12/01/2021). The founder of another VC confirmed that "we recruited several team members from them" (*Aubin*, *Alven VC*, 22/12/2020). Figures collected during my fieldwork seem to confirm that Bpifrance trains professionals with the skills and reputation to join the private sector. Table 3.6 below shows the career path of professionals leaving two of Bpifrance direct investment funds. More broadly, author's LinkedIn-based analysis surfaced that 13 former Bpifrance employees became partners in VC (and PE) funds in France, a comparable number to those coming from private companies such as *Mckinsey* (8) and *Goldman Sachs* (13).

**Table 3.6: Career destinations of professionals leaving Bpifrance direct investments funds**

Bpifrance fund	Total Professionals Who Left	PVC	CVC	Startups	Other	Retired
Digital Venture Fund	6	3	1	(1) <sup>70</sup>	1	1
Large Venture	6	5 <sup>71</sup>	0	0	1	0

Source: author's interviews with Jacq, Digital Venture Fund, 12/02/2021; and with Ferrere, Bpifrance Large Venture, 10/03/2021

These figures, therefore, illustrates the very integrated relationship between French public institutions and their private counterparts, where the crosspollination of talent is more the norm than the exception. As Jacq noted “The adverse effect of the quality experience people get at Bpifrance is that they are well trained and so they eventually leave. But it is ok, because they are ambassadors. We are a co-investment fund, so this helps build our network of co-investors” (Jacq, Digital Venture Fund, 12/02/2021). This soft-incentives model and the role of Bpifrance as a “school of VC” is thus insightful not only for the GVC literature but also because it provides a very concrete example of the public-private elite networks that dominate the French political economy and industrial policy (Schmidt 2003, Clift 2006, Levy 2016).

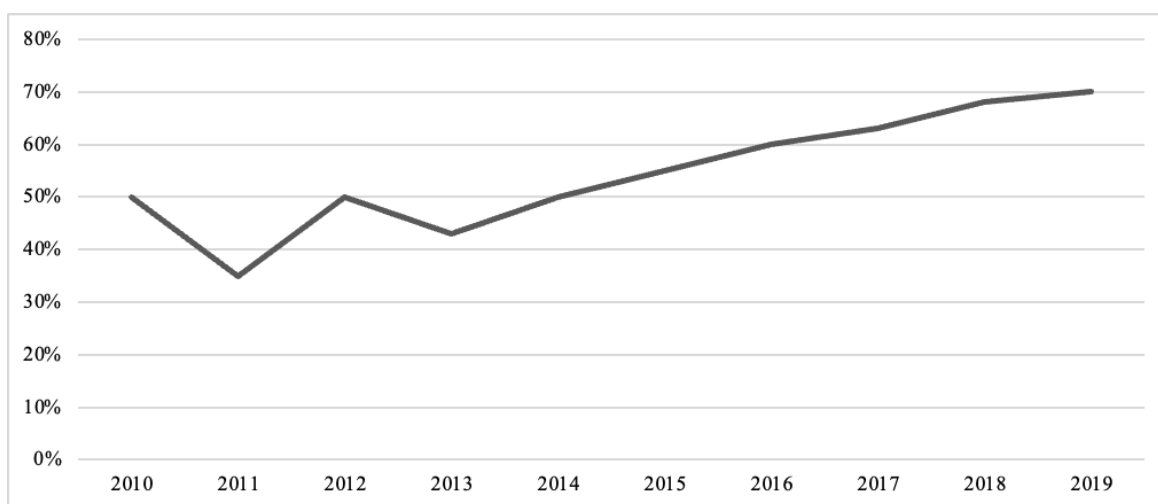
As a concluding note on the relationship between GVC at Bifrance and the private market, a surprising finding from the fieldwork was that even Bpifrance Financing division—offering more traditional tools such as grants and low-interest loans—operates in symbiosis with private VCs. The *Prêt Innovation FEI*, which is the largest (by volume) of the three key Bpifrance non-equity financing tools utilised by start-ups (*Bourse French Tech*, *Prêt Innovation FEI*, Innovation Aids), is in practice almost a capital matching tool for private investors. Private investment is not a stated requirement but interviewees explained that in practice this tends to be the case: the size of the loan Bpifrance offers is a function of the equity of the start-up and thus companies typically obtain loans simultaneously to an equity round. More recent instruments, such as the French Tech Seed (launched in 2019), have introduced a more formal link with private actors: while the capital is disbursed by Bpifrance, the start-ups are selected and proposed to Bpifrance by a pre-approved list of private partners across the country (investors, accelerators, etc.) (Bpifrance 2021; interviews with Philippe Tandeau de Marsac, Director at Grandenov Accelerator, 29/04/2021; Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021; and Chamboredon, ISAI VC, 12/01/2021). The result is evident from Figure 3.21: the large majority of start-ups that raise venture capital in France also have received some form of non-equity financing from Bpifrance.

All in all, thus, despite being part of a very “political project,” Bpifrance direct investments into start-ups reflect the PAL characteristics. A combination of legal/institutional constraints as well as individual incentives and professional background lead to systematic co-investment with PVCs as well as a high degree of independence both from politics and from Bpifrance’s private counterparts (Figure 3.19). Bpifrance teams’ competences also help the organisation obtain investment conditions that avoid state capture and instead influence the development of the industry. This approach has important implications for the role Bpifrance direct investments have in the ecosystem.

<sup>70</sup> Same person first left to found a start-up, then joined a private VC.

<sup>71</sup> Two of these actually founded their own new VC funds.

**Figure 3.21: Proportion of start-ups raising capital who have benefited from Bpifrance non-equity financing instruments**



Source: Bpifrance 2023

#### 3.5.1.2.1 The role of Bpifrance's direct investments in the ecosystem

As a result, Bpifrance direct investments is a very prominent investor in the French ecosystem—in fact, in 2020 it was the most active VC in Europe (Thiemann and Volberding 2021). The way it operates, however, means its role is not to act as the state's hand that “picks the winners” but rather to provide leverage to its private co-investors, in particular in the most challenging areas of the market. Its policy mechanism is therefore quite different from Bpifrance FoF's “certification” and “critical mass.”

Most importantly, unlike the FoF's team, this direct activity cannot have a “certification role,” for two reasons. First, the co-investment requirement means Bpifrance can never invest in a company *before* private investors. Second, even according to Bpifrance's management, it is improbable that, despite the institution's good reputation in the industry, private VCs would simply “follow” Bpifrance in a start-up investment (Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021; and with Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020). Why would the private market “trust” Bpifrance's investments in funds but not its investments directly in start-ups? The answer that has emerged from interviews with professionals on both sides of the business is that, while start-up investments are the core business of PVC investors, for many private LPs investing in VC funds is not at all their core business. In other words, Bpifrance FoF is often more competent than its private sector's partners in investing in funds but Bpifrance direct investments is simply as competent as a PVC. As an important consequence, Bpifrance is constraint in its ability to venture into new investment fields where private venture capital is not active and take on the initial risk to catalyse private investments—this is an interesting difference from the German HTGF GVC, discussed in the next chapter.

Interviewees have instead explained that the main role of Bpifrance direct activity is to provide “additional capital” to start-ups in which private investors are already interested in investing. Doing so is useful for the ecosystem because of a key aspect of how venture capital works: portfolio diversification.

As Figure 3.22 and Figure 3.23 show, the “long-tail” distribution of VC returns (Nicholas 2019) means that a VC must maximise its chances of investing in those outlier companies that generate most of the profitability of the fund—otherwise it will be unprofitable (less than 3x return). But funds have limited resources and so Bpifrance’s co-investment helps them achieve portfolio diversification by reducing the amount PVCs need to invest upfront in each company. An extreme example of this is shown in Figure 3.23 where the PVC’s larger portfolio includes one large success case that drives fund returns above 3x. In practice, given the staged dynamic of VC investments, this also allows PVCs to reserve fund resources to double down on those companies that are performing best, which is another way to improve fund performance. Thus, given that, *a priori*, the PVC does not know which start-ups will succeed, Bpifrance co-investment allows PVCs to avoid the trade-off between giving each start-up enough capital to succeed and diversifying risk across more investments. Ultimately, this is the same reason why even PVCs often co-invest with each other. But in an emerging ecosystem or particularly challenging sectors there might simply not be enough private investors to partner with in each investment—Bpifrance steps in as that partner.

**Figure 3.22: Effect of diversification and large successes on a VC fund financial return**

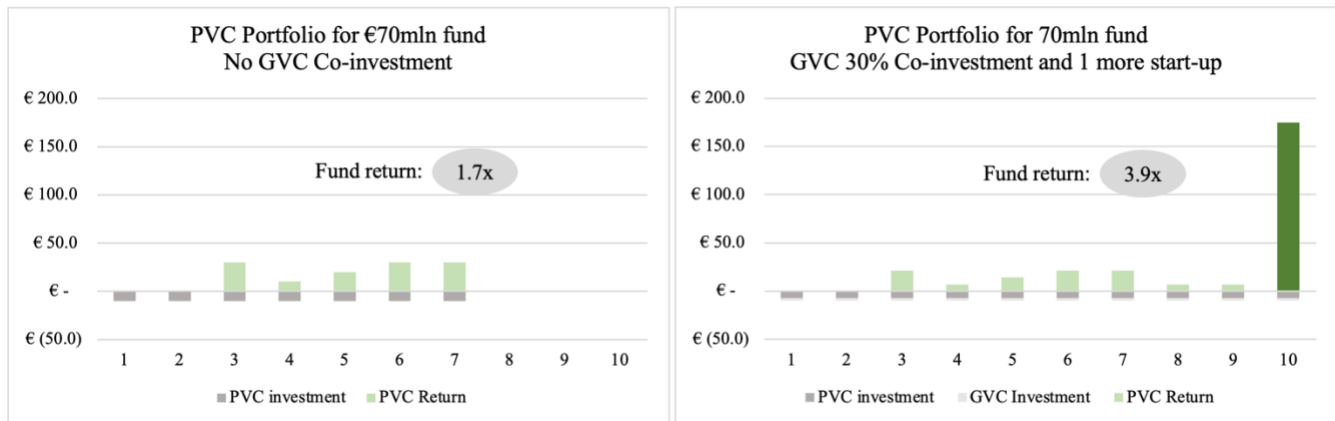
**PORTFOLIO SIZE (A): 30**

Start-up Outcome Types	Frequency Distribution	Multiple Return	Theoretical Return	# of Real Start-ups	Real Fund Return
	B	C	D = BxC	E = round. AxB	CxE/A
Failed company	50%	0.0x	0	15	0.00x
Mediocre performance	25%	0.5x	0.13	7	0.12x
Small success	18%	3.0x	0.54	5	0.50x
Large success	5%	15.0x	0.75	1	0.50x
Unicorn	2%	100.0x	2.00	0	0.00x
					<b>1.12x</b>

**PORTFOLIO SIZE (A): 60**

Start-up Outcome Types	Frequency Distribution	Multiple Return	Theoretical Return	# of Real Start-ups	Real Fund Return
	B	C	D = BxC	E = round. AxB	CxE/A
Failed company	50%	0.0x	0	30	0.00x
Mediocre performance	25%	0.5x	0.13	15	0.13x
Small success	18%	3.0x	0.54	10	0.50x
Large success	5%	15.0x	0.75	3	0.75x
Unicorn	2%	100.0x	2.00	1	1.67x
					<b>3.04x</b>

Source: based on McClure 2015, with some modifications by the author.

**Figure 3.23: Example of how Bpifrance co-investment can improve a fund's performance**

Source: author's elaboration based on insights from interviews with PVCs. Models behind graphs assume 70mln euro funds investing in 7-10 start-ups, with a realistic distribution of successes vs. failures. Each start-up needs a 10 million investment, which can be provided either by the PVC alone (graph on the left) or by a mix of PVC (70%) and GVC (30%). On the right, the PVC trades off 30 percent of its returns on all mediocre companies (numbered 1-7) to have the opportunity to invest in more companies and obtain 70 percent of the return on the outlier company (no. 10). Model simplifies the dynamics of start-ups investments. In particular, follow-on investments are not shown but they would amplify the result

The logic of Bpifrance non-equity financing is largely aligned to the above. The added advantage of these financing schemes, compared to Bpifrance direct equity investments, is that they are entirely non-dilutive. This makes them particularly helpful in the early stages of start-ups where greater equity funding would imply substantial management dilution too early in the life of the company. Low-interest loans allow start-ups to be properly capitalised while limiting the exposure for PVCs. As Mr. Chamboredon explained:

“The majority of Bpifrance money that gets to the ecosystem is actually from the Financing side ... Most of it is flexible loans to fund R&D, opening an office abroad, etc. They look at your equity and if you have enough equity, you can borrow from them. So when you see an announcement of a company that raises 5 million euros [in France], in reality they have raised 3.5 in equity, say, and 1.5 from Bpifrance Financing—because the financing typically is provided right after the equity fundraise. Most of the time, however, you don't even read anything about Bpifrance in the announcement—but this is the ‘model’ behind.”

Author's interview with Jean-David Chamboredon,  
founding Partner ISAI VC,  
12/01/2021

It would certainly be wrong, however, to view Bpifrance direct investments as purely reactive. Interviews with management and PVCs provided clear evidence that these direct GVCs are very proactive at sourcing and analysing investment opportunities. They can even play the role of the so-called “lead investor” on deals—taking the leadership in conducting due diligence and finding private co-investors. In other words, Bpifrance direct investments does not act like an automated dispenser of public resources at PVCs' demand but rather as any other VC in the market, which looks for deals and for co-investors. This is because the investment teams are structured to perform all functions of a VC fund and, over time, they have consolidated these competences and institutional knowledge. Both Bpifrance management and private sector interviewees reported that, as the investment teams have gained experience and competence,

they have also increased their proactiveness in the market (see e.g., author’s interview with Alessio Beverina, founder and partner at Panakes VC, 02/11/2020). It could be argued that a simpler, passive “matching fund” approach, relying entirely on PVC’s decisions, would be a more operationally lean way to allocate public resources. However, the experience of Bpifrance suggests that this approach might be short-sighted. A pure matching fund will almost inevitably incur in a negative bias problem—one the most likely forms of state capture in the GVC context. In other words, the GVC would risk being involved only in the worst or riskiest deals, where a start-up cannot find enough private resources in the market. Bpifrance’s set up, with in-house expertise to analyse each deal, helps at least avoid the most obvious cases. As Ms. Ferrere of Large Venture put it: “We are just classical normal investors; it is fundamental that we are ‘normal’ investors, otherwise we would receive only the less attractive subjects that nobody wants” (Ferrere, Bpifrance Large Ventures, 10/03/2021). While the negative financial implications of this bias might not be considered a public policy problem (the positive externalities might offset it), the medium-term risk is that this bias will be altogether counterproductive to the policy goals, through a “negative stamp” dynamic on the start-ups funded. Such a stigma would undermine all Bpifrance’s activities, especially in those areas where it tries to play a more proactive role (see next sections). As several interviewees have expressed, instead, Bpifrance direct investments’ approach has allowed it to develop enough of a reputation that its investment in a company is considered “neutral” or even positive (Beverina, Panakes VC, 02/11/2020; Baret, Eurazeo VC, 12/01/2021; and Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021). This allows the institution to play a careful balance, providing extra capital in rounds that need it, but in a way that is selective and maintains a good fund performance that avoids stigma.

Indeed, it should be noted that this *modus operandi* of Bpifrance direct investments has so far delivered satisfactory financial returns. Contrary to this researcher’s original expectations, Bpifrance’s funds do not have precise and formalised return targets as it is usually the case at private funds. Funds’ management however mentioned that, while the very minimum expectation of the public shareholders was to return the capital invested, the investing teams are very focussed on generating returns that are equal or higher than the average private fund. They also explained that this ambition is balanced with the other policy goals of the funds. For instance, some interviewees mentioned that their funds have been more exposed to riskier sectors and business models. Others highlighted that each investment is approached with the same rigor and target as private funds but that, where needed, the fund is more flexible on the time horizon for exiting their investment (Jacq, Digital Venture Fund, 12/02/2021; Informant-FR-GVC-5-CXL, 10/12/2020, Ferrere, Large Ventures, 10/03/2021). In any case, direct funds’ performance has reportedly exceeded expectations, with investments in seed, early stage, and late stage VC delivering returns in line with the industry average (around 1.3x, 5 percent IRR) or above it (Jacq, Digital Venture Fund, 12/02/2021; Ferrere, Bpifrance Large Ventures, 10/03/2021).<sup>72</sup> It must be noted that these returns are lower to those a private fund would theoretically needs to be competitive (3x or 15 percent IRR). However, they reflect the hybrid nature of Bpifrance’s direct investments, which tries to balance an ecosystem role with a professional approach to each single investment. As Jacq explained, “the key is having a good portfolio strategy that mixes companies with different levels of risks, while always aiming for quality investments.”

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<sup>72</sup> For industry-wide data see, for instance, VC portfolio data in Marion 2012.

Thus, Bpifrance direct GVC's relatively positive performance is due to the professional capacity this public institution has been able to build over time and its tight integration with the private market. It also exemplifies one of the expectations of the theory: GVCs that have in place processes and incentives (albeit not formalised) to perform rigorous investments but that do not fall into the trap of promising top-of-industry returns. Bpifrance returns arguably *should* be lower than PVCs if Bpifrance funds are, in aggregate, more exposed to risky sectors or accept longer time horizon for divestments. This is why policymakers should be very clear about their expectations from GVC and understand that imposing very high return targets can be as detrimental as having none.

In conclusion, Bpifrance direct investments best exemplifies the importance of the arm's length relationship that this modern French GVC has with politics and with markets. On the one hand, the governance structure secures full independence of the investment teams. They are completely separate from the public bureaucracy and operate just like any other private VC fund, with full discretion on the investment decisions. On the other, the strict co-investment policy and Bpifrance internalised capacity help it avoid state capture and the negative biases that would arise from a complete deference to its private sector partners. This approach has allowed the GVC to help the ecosystem by providing extra capital and risk diversification to private investors where it is most needed. It is thus clear that even in the case of Bpifrance's direct investment the state does not autonomously "pick the winners" but rather invests in symbiosis with private sector partners. In turn, this model has delivered financial returns that, while not stellar, have exceeded policymakers' expectations. This earned the institution a respectable reputation in the market and ensured the sustainability and continuity of the policy.

### 3.5.1.3 Coordinating the private VC industry: Bpifrance as an industry leader

Finally, Bpifrance's relationship with the market is also characterised by its very proactive coordination role in the ecosystem. In comparative perspective, Bpifrance is exceptionally active in shaping the development of the French VC industry. This was enabled by the merger of the previous organisations into one PDI, which allows Bpifrance to synergically use its indirect and direct GVC tools to nudge the VC industry towards the state vision. Such proactive coordination is unique to Bpifrance among European GVCs and reflects the country's dirigiste tradition—but in a modern declination.

First, since its early days Bpifrance has taken almost a "hand-holding" approach to the VC industry. As one private VC pointed out, "it is important that Bpifrance didn't just give out money to VCs but also transferred knowledge. It took people [i.e., professionals from the industry] around worldwide, taking firms with them (e.g., I went to Singapore with them), to show what other ecosystems were like out there. They took the best from them [i.e., those ecosystems] and implemented that in France" (Fournier, Serena VC, 25/12/2021). As another example, Bpifrance FoF also organises events and workshops to support and "upskill" the GPs in its network. In 2020, for instance, it held seven workshops on themes such as branding, digitalisation, diversity, cybersecurity, etc. (Bpifrance 2020c). Moreover, every year, the FoF team organises an industry-wide event to bring together all the VC (and PE) funds. All partner funds are invited and Bpifrance presents its analysis of the "state of the industry" as well as its

visions and plans for how it should evolve (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020; author's attendance of Capital Invest 2020 event on December 8<sup>th</sup> 2020).

More specifically, Bpifrance has developed a view that the competitiveness of the French VC industry requires a consolidation of VCs in fewer, high-performing “platform” firms—management companies with several funds that span the various funding stages, thus maximising competence synergies and economies of scale. This view is very evident from internal Bpifrance documents, which track and anticipate the consolidation of the industry (Bpifrance 2020b) as well as from the comments of Bpifrance officials in the FoF team (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020). External observers, unsolicited, also emphasised this orchestrating role of Bpifrance: a senior official at the EIF explained that Bpifrance differs from the EIF because “[it] is a particular operator in the European landscape; it really has a central role and defines the strategy for the VC industry, pushing for its consolidation” (author's interview Informant-EU-GVC-1-ZYO, Senior Official at the EIF, 20/01/2021). Pioneering French VC Marc Fournier went further, stating that “Nicolas Dufourcq had a great vision and he is the one that almost single-handedly, although he had a great team around him, reshaped the entire private equity ecosystem from A to Z” (Fournier, Serena VC, 25/12/2021). While this statement might be a hyperbole, other observers from within the industry stressed that one of the key changes Bpifrance introduced was greater coordination: “Bpifrance accelerated and, especially, provided structure to the innovation support initiatives that were already there before. [Before Bpifrance] these were not coordinated and there was no clear vision of a path that came from above ... France, with its cultural of Jacobinism, needs to receive very clear ‘directions.’” (Tandeu de Marsac, Grandenov Accelerator, 29/04/2021; translation by the author). Such statements were particularly noteworthy, given the general tendency of private actors, and especially VCs, to underplay the role of state intervention in innovation markets (Mazzucato 2013, Nicholas 2019).

A second way in which Bpifrance's proactively coordinates the industry is its integrated use of direct and indirect investments. The two must be seen as two hands working towards the same artifact. Bpifrance has used them to support the development of the private VC supply in particular for specific stages of company development. A first example of this integrated approach is seed investments. In 2011 CDC Entreprises (and later Bpifrance) launched the *Fonds National d'Amorçage* (FNA), a FoF initiative to create private French VC funds investing in start-ups at a pre-revenue stage. Between 2011 and 2017 FNA contributed to creating 22 such funds. In parallel, starting in 2015, Bpifrance also launched French Tech Acceleration, a programme for the creation of start-up accelerators that is also funded both by the FoF and the direct investment teams. More broadly, it supported regional initiatives to launch local incubators and accelerators in partnership with private investors and local authorities (author's interview with Massimo Magnifico, COO at EuraTechnologies, 21/12/2020)..<sup>73</sup> Thus Bpifrance/CDC Entreprises had a clear diagnosis of the state of the industry (“France needs more seed funding”) and addressed it with both the direct and indirect investment teams. A second example of Bpifrance's integrated intervention was in the “growth” segment of the industry.<sup>74</sup> Bpifrance's view was that at in the early 2010s there were

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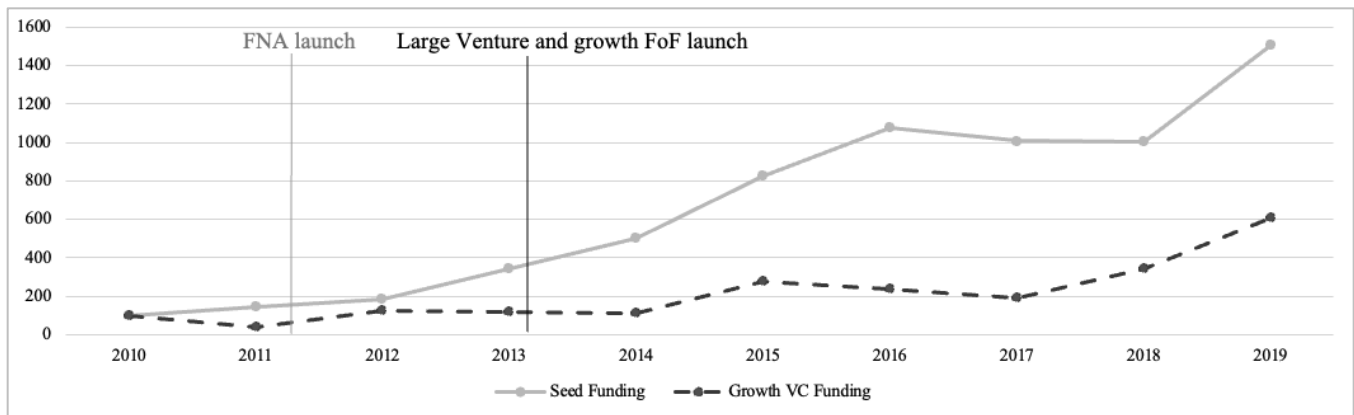
<sup>73</sup> The direct investment team invests in the companies running the accelerators, while the FoF team invests in the partner funds of the accelerators (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020).

<sup>74</sup> Growth (or scale-up) VC funds invest in 20-50 million euro rounds in scale-up companies to support their international expansion or other growth objectives.

no French funds large enough to support French scale-ups in their growth and international expansion ambitions, causing these companies to seek foreign investors. One of the first initiatives of the newly created PDI, therefore, was the launch of a direct growth GVC fund (Large Ventures). At the same time, the FoF team proactively started to encourage private GPs to set up larger funds that could pursue growth investments. “At the beginning of Bpifrance we developed the first scale-up fund in France—Large Ventures. But then with the FoF team we also had a very strong activity in the market, the team went to all the big VC firms and told them ‘if you’re ready to do a scale-up fund, we will invest ... because now it’s the time, based on the calculations we made on the maturity of start-ups in France.’ So we pushed a lot of people to develop scale-up funds. Now the market has evolved and we have several scale-up funds and even pre-IPO funds ... but the first one was Large Venture. So, we demonstrated to the market that we would do it but we said ‘ok we will do it but we do not want to be the only ones’” (Informant-FR-GVC-7-ZDL, Senior Executive at Bpifrance, 16/02/2021). Ferrere, Managing Director at Large Venture, provided a very similar recount that highlights this idea of Bpifrance as example setter: “The idea behind Large Venture was to launch a direct initiative in the late stage financing, at the end of 2013, and push the VC landscape to do likewise, supported by the Fund of Fund activity of Bpifrance, in order to help the ecosystem” (Ferrere, Bpifrance Large Ventures, 10/03/2021).

Partially as a consequence of these coordinated initiatives, seed and growth VC investments in France have increased particularly rapidly since 2011, growing at a 28 and 31 percent CAGR respectively (graph in Figure 3.24).

**Figure 3.24: Growth in seed and growth VC funding in France 2010 – 2019 (private only, 2010 = 100)**



Source: author’s analysis based on Dealroom data and Bpifrance annual reports; funding data reported is net of Bpifrance direct investments, thus showing investments from private funds only

All in all, thus, Bpifrance has not simply funnelled public resources into start-ups and VCs but has instead proactively intervened to shape the private capital industry. Bpifrance is a partner for the market but also a market leader. This contrasts starkly with other countries’ GVCs (e.g., Irish GVC policies in the 1990s, see Breznitz 2007) but also with previous French policy for supporting the private VC industry. While policies such as vehicles to channel bank and retail capital via tax deductions (e.g., FCPIs and SFIs) drew resources to innovation investing, they did not have a mechanism to determine the development and professionalisation of the local VC industry. With Bpifrance, instead, FoF and direct investment both aim

to strengthen the VC industry. FoF provides capital conditional on PVCs following certain practices. Direct investments are not merely a tool for the state to pick strategic companies but rather are utilised as an “example setter” to nudge PVCs towards certain investment areas.

The analysis of Bpifrance’s along the horizontal dimension of the theoretical framework thus showed that its GVC activities accurately align with a PAL approach. Bpifrance has been a partner of the VC industry because, above all, it has been the “go-to” institutional investor in France’s PVCs. In addition, Bpifrance direct investments systematically co-invests with PVCs, helping private investors diversify their risk exposure but also building a wide network of relationships across France’s VC industry. At the same time, Bpifrance acts at arm’s length from these private actors as well as from the rest of the state apparatus, which has been instrumental for its success so far.

### *3.5.2 Investment focus: prioritising horizontal capabilities and high-growth companies*

The vertical axis of the theoretical framework refers to whether the GVC prioritises specific technologies or broader horizontal capabilities. The evidence from Bpifrance’s operations is consistent with the findings of section 4.4: the broadening of the concept of innovation advocated by Bpifrance’s management during the creation of the PDI translates into an investment activity more focused on supporting any type of high-growth company rather than on investing in specific target technologies. To be sure, Bpifrance appears more exposed to particularly risky sectors, where its direct funds take more leadership compared to PVCs. Overall, however, the balance clearly leans towards investing to grow the horizontal innovation capabilities of the economy. This has been the result of Bpifrance’s connection and integration with the emerging ecosystem of start-ups and PVCs, as well as of the lessons learnt through the previous policy experiences. The attention shifted to prioritising the creation of success cases that could contribute to the overall growth of the ecosystem, rather than merely finding disruptive and “strategic” technologies. As a consequence, Bpifrance’s role in the ecosystem has been mostly to facilitate the build-up of a critical mass of entrepreneurial talent by supporting commercially successful companies, rather than pushing new technological paradigms as the Entrepreneurial State concept would imply.

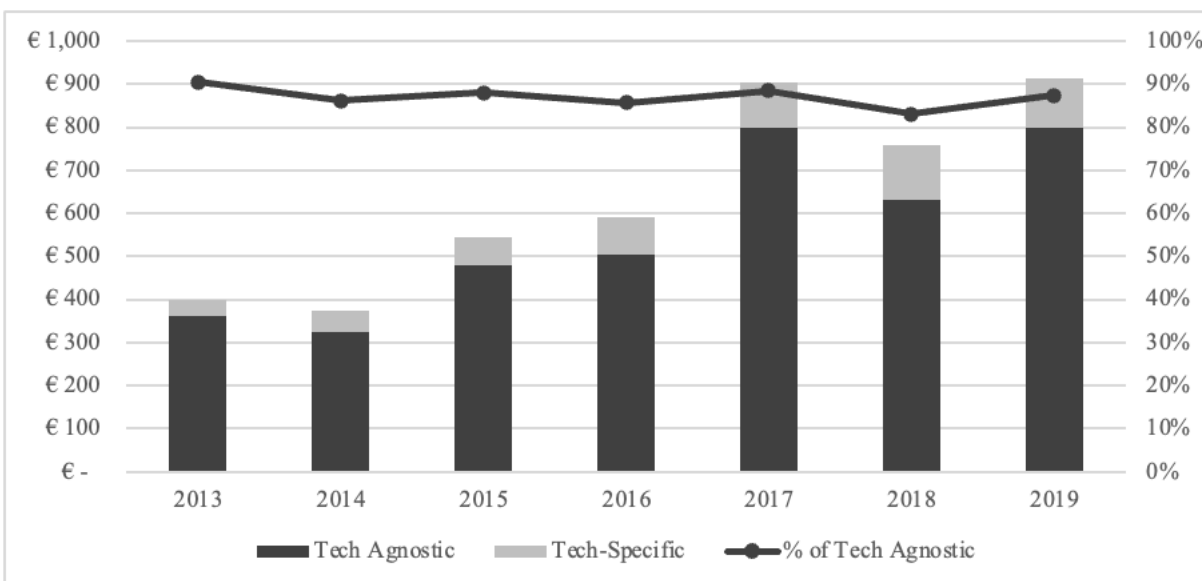
#### 3.5.2.1 Investing in innovation, not necessarily in specific technologies

Data analysis of Bpifrance’s investment activity across the indirect and direct investments units paints a clear picture: on average, most Bpifrance’s investments are broadly “tech agnostic” and focused on high-growth companies (Figure 3.25).

This author collected yearly data on all investments by the PDI and categorised them as “tech agnostic” or “tech-specific,” based on insights from fieldwork interviews. Within direct investments, the Large Ventures and Tech Acceleration funds fall within the first category as they invest across technologies, Digital Venture funds are considered hybrid because they have partially paid particular attention to specific sectors, while the rest of the direct funds are categorised as tech-specific. Indirect

investments are all categorised as tech-agnostic, since interviews have clarified that historically there were no clear mandates of pushing specific technologies (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020).

**Figure 3.25: Tech-agnostic vs. tech-specific investments (direct and indirect funds)**



Source: author's original dataset and analysis based on data from Bpifrance Investissement annual reports and fieldwork interviews; Tech Agnostic includes Large Venture, Tech Acceleration, the majority of the Digital Venture Fund, and all FoF commitments; the rest is categorised as Tech-Specific. For the Digital Venture Funds, the split is based on the portion of the portfolio (36 percent) that management reported was exposed to deep tech over the observation period, and on which the fund has had a particular focus.

More specifically, the in-depth, process tracing analysis conducted for this research suggests that Bpifrance investment focus strategy is more nuanced. Bpifrance indirect investments (the majority of capital deployed) have almost entirely focused on building out the VC industry, “following the market” in its technology focus. Direct investments have been more hybrid. Although most resources are still invested via generalist funds, through these instruments the organisation tries to intervene especially in those areas of the market where complementary public capital is most needed.<sup>75</sup> This is far, however, from the dirigiste, top-down sectoral strategies of the past or from the idea of an entrepreneurial state unilaterally pushing technological paradigms through investments that private actors could not sustain.

On the FoF side, which expanded significantly since Bpifrance's launch, interviews surfaced that operations are not organised by technology or sector and, although the team has many “mandates,” the approach is mostly “tech agnostic” without specific ratios to allocate to certain areas of the market (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020). To be sure, many PVCs supported by Bpifrance FoF are focused (and increasingly so) on specific sectors. However, this results from the decisions of GP teams, not from an a priori allocation by Bpifrance. In other words, historically, Bpifrance

<sup>75</sup> It is important to note that Bpifrance's strategy since 2019 has become increasingly focused on promoting in particular “deep tech” (see interview comments by Informant-FR-GVC-7-ZDL, later in this chapter). Thus, reading the organisation's statements and positioning since after the pandemic, therefore, would provide a slightly different interpretation from the one that emerged from this fieldwork, which has focused on Bpifrance's activities until 2020.

supported the sector specialisation of PVCs, but it largely left the decision about priority sectors to the market itself. A renewed interest in deeper tech companies is only a recent trend and indeed highlights the contrast with the past approach: “In the past couple of years we are receiving more nudge on deep tech and now also for clean energy. We have now have the Deep Tech Initiative: so really trying to focus on real deep innovation, rather than things such as the next online retailer” (Informant-FR-GVC-1-KYL, Bpifrance FoF, 26/11/2020; author’s italics).

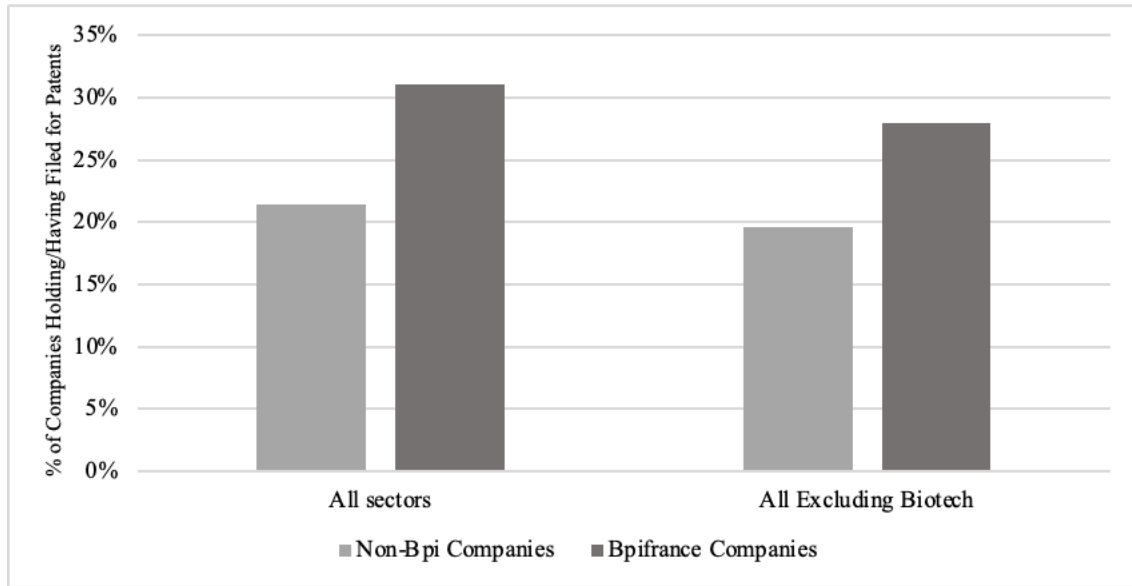
Bpifrance direct investment funds are also focused on high-growth companies but, at least some of them, seem to be particularly active in areas of the market that are more challenging for PVCs, such as deeper technologies. Micro-data obtained by this author on Bpifrance’s direct investment portfolio and patent filings of French companies show that Bpifrance-backed companies are on average significantly more likely to hold patents. This remains true even when the sample is modified to exclude all biotech companies, which Bpifrance is particularly exposed to and are known to be almost all based on patented technologies (Figure 3.26). As Figure 3.27 suggests, this is largely a sector effect: Bpifrance is more exposed to sectors with higher technological content, compared to PVCs. Interviews provided complementary evidence: Jacq explained that an internal analysis of the first generation of the Digital Venture Fund<sup>76</sup> found that it was different from the profile of the average portfolio of private sector funds. “Deep tech” sectors (hardware, telecom, etc.) accounted for over a third of the invested amounts (36 percent) compared to 13 percent for the average portfolio of private funds.<sup>77</sup> Jacq also explained why this is the case: “we have developed more expertise in electronics, robotics, Internet of Things, AI ... and some of these are areas in which historically it has not been easy to find co-investors ... Because usually you have to invest more money and more time as the technology first needs to be proven and then be commercialised, often through very complex value chains” (Jacq, Digital Venture Fund, 12/02/2021).

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<sup>76</sup> Fonds Ambition Numérique, which invested between 2011 and 2018. Since in 2019 Bpifrance launched the Plan Deep Tech, this exposure has been even higher.

<sup>77</sup> Data obtained by author over email on 10/01/2024.

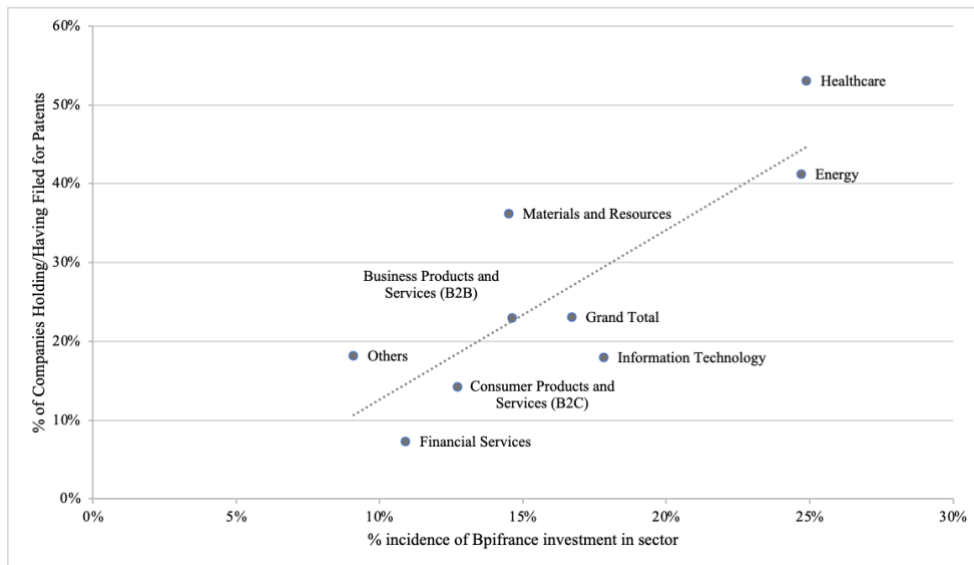
**Figure 3.26: Percentage of companies with patents (Bpifrance start-ups vs all others)**



Source: author’s analysis based on Pitchbook data.

Note: difference is statistically significant at the 1% level, calculated through Chi-Square Test.

**Figure 3.27: Correlation between Bpifrance investment incidence and patents, by sector**



Source: author’s analysis based on Pitchbook data.

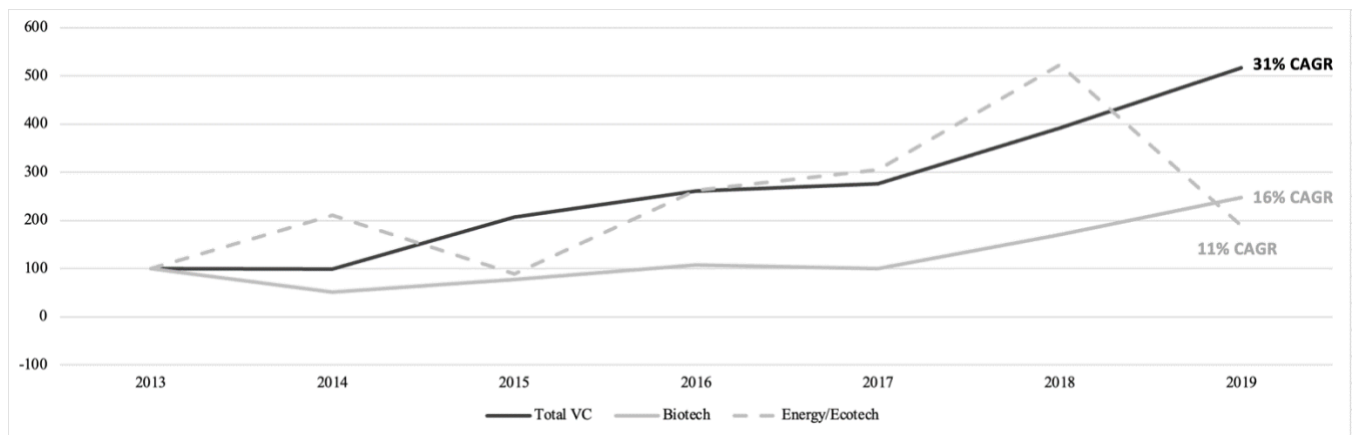
This does not mean, however, that Bpifrance changes its practices for investing in these sectors. These funds do not pick companies independently and co-investment with PVCs remains a requirement. Indeed, in other words it could be said that Bpifrance is more exposed to such “deep-tech” companies because its co-investment is most needed in sectors and start-ups that are R&D-heavy and thus require more capital. The high-growth potential of companies also remains the priority. Ferrere explained that Large Venture

(which contributes around 50 percent of yearly Bpifrance direct investments in innovation) is “focused on very high-growth companies, leaders or potential leaders with minimum growth of 60-100 percent per year, therefore very scalable” (Ferrere, Bpifrance Large Ventures, 10/03/2021). Informant-EU-GVC-4-TVO explained that the mandate of the Digital Venture Fund is “to detect start-ups with high growth potential, with capacity to become market leaders, ... only those with the potential and ambitions to become champions in their market, at the very least at the European level, more ideally at the global level ... At the same time, our portfolio has been more exposed than the average private portfolio also to deep tech companies” (Jacq, Digital Venture Fund, 12/02/2021). In other words, while the Digital Venture Fund is meant to also invest in the more high-tech areas that PVCs historically found less attractive, even these more “deep tech” investments are subject to the requirement that the companies need to have high-growth ambition and potential.

It should also be noted that the launch of Bpifrance coincided with the creation of funds that were focused on less high-tech sectors and on scaling commercially successful companies, rather than promoting technology transfer from scientific research. Large Venture was launched in 2013 with a view that the French ecosystem needed a mechanism to support large scale-up success cases, independently of the specific technology behind them (Ferrere, Bpifrance Large Ventures, 10/03/2021). Another example is the Fonds Patient Autonome (2018), which expanded French GVC’s health-related activities (historically very exposed to biotech and medtech) into the lower-tech field of digital health, with a general aim of funding technologies that help “connecting the patient” (Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021). The net result is that only a minority of Bpifrance-backed companies comes from academic research and/or holds patents (31 percent), suggesting that most Bpifrance direct equity has been invested in high-growth digital or tech-enabled start-ups, in line with the typical preferences of private VCs.

The evidence is also mixed on whether Bpifrance sector-focused funds are able to catalyse more PVC investment in those areas. This view would align with the Technology Promoter State of my framework. However, Figure 3.28 offers mixed evidence.

**Figure 3.28: Growth in PVC investments for Bpifrance focus sectors vs the rest (100 = year 2013)**



Source: author’s analysis based on original dataset of Bpifrance investments and Dealroom data; VC investment data is net of Bpifrance direct investments

On the one hand, the data shows a clear growth trend in the sectors targeted by specific Bpifrance funds (Biotech and Energy/Ecotech). On the other, however, VC investments for those specific sectors have not grown at a faster rate than the rest of the VC market, as would be expected if the sector-based intervention of Bpifrance had an effective catalysing impact. Although it is of course hard to estimate the counterfactual (how much “would have been invested in these sectors, had Bpifrance not launched a dedicated fund”), the overall trend for the VC market is a reasonable comparison, which casts doubts on the ability of Bpifrance direct investments to “drag” investors into specific sectors. This is consistent with the insights from interviews about the limited leadership Bpifrance can take in new sectors, due to the co-investment requirement, and about the difficulty for direct GVC to provide a “certification effect” on start-ups.

In conclusions, while from Bpifrance’s communication it might appear that a core role of the institution’s innovation strategy is to be a strategic investor in the most high-tech sectors, the reality is more nuanced. The organisation balanced a strategy of sector-agnostic VC industry development (via FoF), with more targeted interventions via direct investments. Generally, however, the first years of Bpifrance were rather characterised by a broadening of its investments to all areas of innovation and by funds focused on high-growth, often tech-enabled firms. In practice, most capital (direct and indirect) was not invested in target sectors nor in deep tech. Direct funds intervened relatively more in riskier areas of the market but still within the constraints of private co-investment and subject to the high-growth potential of the companies. If Entrepreneurial States are meant to “push the technological paradigm” (Dosi 1982, Janeway 2012, Mazzucato 2013), the evidence is scarce to argue that this was Bpifrance’s core role. Instead, the organisation’s activities in the years analysed place it in the lower part of the theoretical framework, away from the Entrepreneurial and Technology Promoter States, focused on expanding the general innovation capabilities of France’s ecosystem.

### 3.5.2.2 Promoting entrepreneurial talent development

Bpifrance’s focus on horizontal entrepreneurial and innovation capabilities is also evident from a series of other, non-investment activities. Similarly to its coordinating role in the risk capital industry, Bpifrance also proactively tried to attract entrepreneurial talent to the ecosystem, spread start-up management best practices, and facilitate start-up-to-start-up and start-up-to-investor networking.

First of all, a recurrent theme in my interviews were Bpifrance’s efforts to change the cultural attitude towards entrepreneurship in France. As one top manager at a French scale-up put it, “it is striking the efforts that Bpifrance has put in democratizing entrepreneurship in France” (Weber, Mirakl scale-up, 10/09/2021). A telling example are Bpifrance’s recurring advertisement campaigns to promote the entrepreneurial career and establish Bpifrance’s own place as the “one-stop-shop for entrepreneurs in France” (Informant-FR-GVC-2-WTL, 27/01/2021; e.g., see Figure 3.29). Although it is of course very hard to isolate the impact of these initiatives, interest for entrepreneurship has indeed grown over the period (see section 3 and Figure 3.30). Most importantly, these campaigns clearly indicate Bpifrance’s focus on talent development and its ambition to make entrepreneurs feel the “presence of the State in their

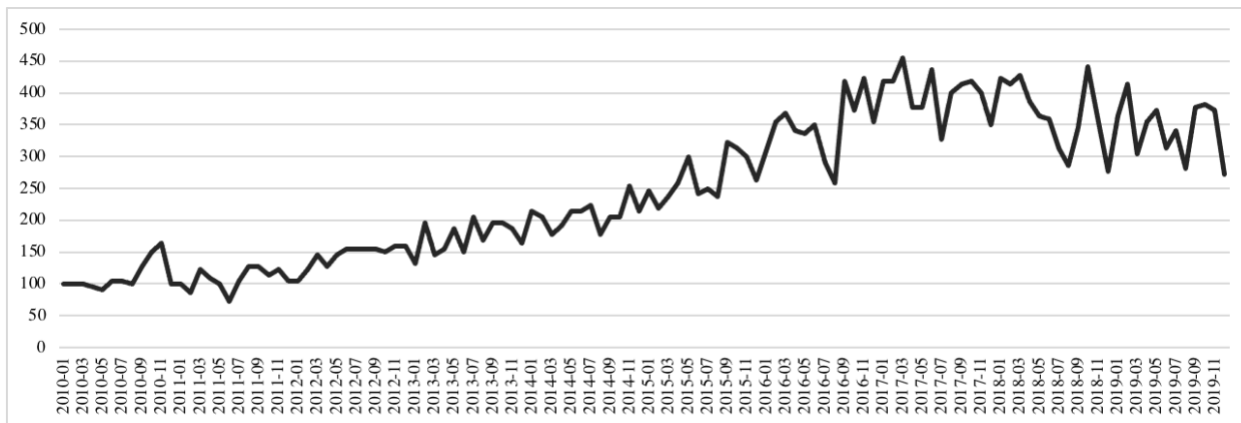
support” (Tandeu de Marsac, Grandenov Accelerator, 29/04/2021; translation author; Weber, Mirakl scale-up, 10/09/2021).

Figure 3.29: Examples of Bpifrance communication campaigns to inspire entrepreneurs



Source: Google image search for “Bpifrance campagnes”

Figure 3.30: Frequency of online searches of the word “startup” in France



Source: author’s analysis on Google analytics data

More practically, Bpifrance also has dedicated teams and programmes to offer in-kind support for professional and business development. The Dealflow Team has the responsibility to help any start-up that received Bifrance investment or financing to find new investors (author’s interview with Bpifrance official Informant-FR-GVC-3-WUL, 12/02/2021). This six-person team sitting across the Innovation Unit maintains a database of French and international investors, with their characteristics and investment

preferences. The team connects Bpifrance start-ups with these investors and supports them in developing a business plan and present it (Informant-FR-GVC-3-WUL, 12/02/2021). The team is also one of the main channels throughout which Bpifrance recruits university graduates and train them before they join the investment teams of Bpifrance or of PVCs. Similarly, Bpifrance *Le Hub* is publicised as “the operational partner for the growth of start-ups” (see [website](#) 2020; author’s translation). It offers dedicated operational assistance from a Bpifrance team, but also access to a peer-to-peer support network with other Bpifrance-backed start-ups, and access to relationships with large French corporates. Beyond the Dealflow Team and *Le Hub*, Bpifrance also offers other support services through its 47 local offices where professionals from the financing team are the go-to people for any company who is looking to benefit from any state support programme for SMEs. This advisory, brokerage, and even talent building role is both very telling of Bpifrance’s own conception of its role in the ecosystem and unique among the GVC agencies analysed in this research.

All in all, these programmes and campaigns further highlight the emphasis that Bpifrance has put on developing horizontal innovation capabilities in the French ecosystem. Not only does the PDI invest in any type of entrepreneurship, but it also provides in-kind support to increase human capital. In a comparative perspective, it is interesting to note that no other country analysed offers this type of 360-degree support to the ecosystem. In this sense, Bpifrance proves that the French state has not disappeared at all from the economy. Instead, it has evolved its modalities of intervention. If historically it outright controlled the allocation of capital and the education/training system (Culpepper 2006), today with Bpifrance it “orchestrates” the creation of the pools of financial and human capital necessary for innovation ecosystems.

### 3.5.2.3 Investing in horizontal capabilities: the importance of supporting scale-ups

A possible criticism of Bpifrance’s market aligned and technologically agnostic approach is that it is not focusing public resources on the companies and technologies that have the greatest positive externalities for the public. This point has been raised by some interviewees and has been a matter of public debate (author’s interview with Informant-FR-VC-1-VRS, Partner at Impact VC, 23/11/2021).<sup>78</sup> Although it has merits, this view overlooks the importance of the intergenerational effects of Bpifrance’s model. By investing in any high-growth company, Bpifrance maximises the chances of “success cases,” which are key to create and spread innovation competences as well as draw private capital to the ecosystem—a dynamic seen in other successful historical examples.

First, Bpifrance capabilities-focused investment approach is instrumental in supporting the development of the private risk capital industry. Bpifrance can co-invest with PVCs across the spectrum of start-ups, without many selection constraints. This overcomes one of the typical GVC pitfalls identified by Lerner (2009)—the tendency to self-impose too strict requirements on the “type” of companies that can be funded as well as spreading the capital too thin across many start-ups instead of focussing on the

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<sup>78</sup> In January 2022, for instance, Bpifrance was mocked by political economist Clément Fontan on Twitter for investing in such “strategic technologies” as a non-fungible-token-based digital dog company (<https://twitter.com/clemfon/status/1610615067938111489>).

ones with high potential. Such an approach risks creating a parallel market for public funding, reliant on criteria and dynamics different from private ones. Bpifrance instead, on the one hand largely delegates to the private sector the identification of the most promising sectors and companies. On the other, through the risk-diversification mechanism described in section 5.1.2, its capital helps PVCs deliver a better performance to their investors, thus increasing PVC's chances of attracting further private capital in their future funds.

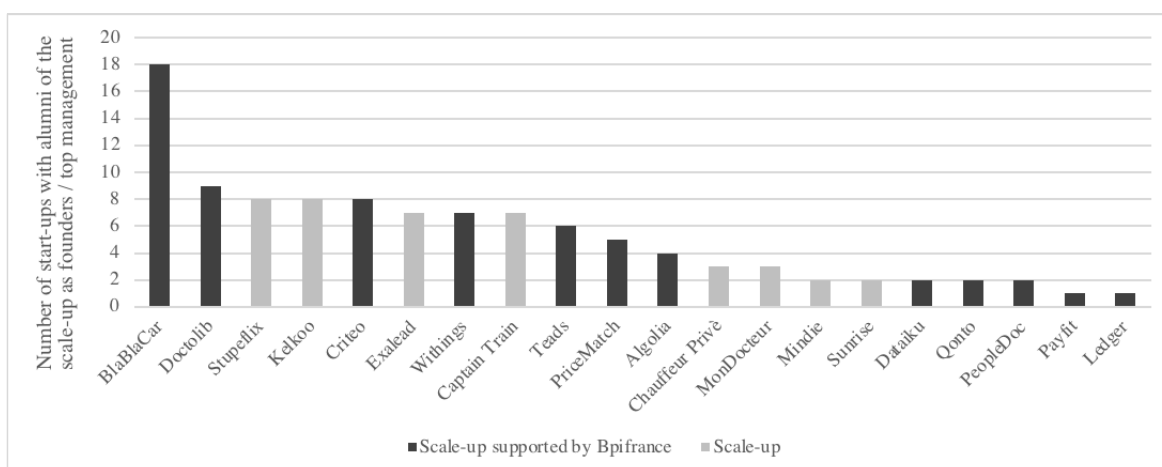
Second, focussing on high-growth start-ups is justified by the intergenerational effect of scale-ups on an ecosystem's human capital stock. By recruiting and training hundreds of engineers and developers, but also product and operations professionals, scale-ups become key institutions for human-capital formation (Casper 2007). As entrepreneurs and start-up professionals across ecosystems have explained during the interviews, working for a scale-up allows professionals to learn the standard solutions to the most common mistakes and challenges entrepreneurs face. As these employees move to new companies, their acquired knowledge increases the chances of survival of new start-ups and their own ability to scale quickly. As one expert observer put it "if I had to give one piece of advice to any government for how to develop an entrepreneurial ecosystem, I would tell them: 'get a scale-up to grow in your country.'" (Wade, Isomer Capital VC, 04/03/2021). In other words, scale-ups are fundamental to create a critical mass of entrepreneurial talent and this is what Bpifrance largely tries to favour.

This intergenerational contribution of successful technology companies is well documented in the academic literature. The early history of the Silicon Valley was shaped by at least two nuclei of high-impact entrepreneurs related to the same one company: the so-called Fairchild and PayPal "mafias."<sup>79</sup> This critical role that a couple of successful companies and a few experienced entrepreneurs can have in accelerating an ecosystem explains Bpifrance's focus on start-ups' commercial potential and on scale-ups. As Informant-EU-GVC-4-TVO explicitly put it: "the idea is to support the next European tech champion, like the ones that we have seen in the USA" (Jacq, Digital Venture Fund, 12/02/2021). It also explains why one of the first moves of Bpifrance was to launch the scale-up fund Large Venture.

French scale-ups are indeed emerging, often supported by Bpifrance, and they are starting to have positive spill overs onto the ecosystem. Figure 3.31 below shows the French scale-ups with the largest "mafias" and the proportion of them that was supported by Bpifrance.

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<sup>79</sup> Employees of Fairchild went on to creating dozens of start-ups, among which Intel and AMD, among the biggest early success stories of American tech. PayPal's management and employees include Elon Musk but also Reid Hoffman, the founder of LinkedIn and currently a VC.

**Figure 3.31: Number of companies founded or managed by former employees of French scale-ups**

Source: author's elaboration on original analysis in Dewez 2020; data as of 31/12/2020

Figure 3.31 therefore highlights the positive externality for a GVC actor like Bpifrance in prioritising high-growth start-ups. While a private investor only benefits from the financial success of the one scale-up they back, the state benefits also from the ripple effects that the scale-up has by forming managerial talent who eventually leaves and forms new start-ups. As one manager of a French accelerator put it “ten years ago the state funded a lot of start-ups; many of them failed but it was the price to pay to train people” (Magnifico, EuraTechnologies, 21/12/2020). Table 3.7 provides a further level of detail to estimate the “value” of such externalities, on the basis of employment figures.

**Table 3.7: Sizing scale-ups’ “mafias” – selected cases**

Scaleup	Descendant Start-ups	Supported by Bpifrance?	Support Type	Details on Bpifrance Support	Original Scale-up Employees	Sum of Total Employees of All Descendant Start-ups	Employee Multiple
<b>BlaBlaCar</b>	18	Yes	Indirect	Via ISAI (Pre-Bpifrance)	683	382	0.6x
<b>Doctolib</b>	9	Yes	Direct Indirect	Direct and via Idinvest	1125	586	0.5x
<b>Criteo</b>	7	Yes	Indirect	Via Elaia (Pre-Bpifrance)	3165	309	0.1x
<b>Exalead</b>	7	No	n.a.	n.a.	150	539	3.6x
<b>Withings</b>	7	Yes	Direct Indirect	Direct; via Idinvest and 360 Capital	269	507	1.9x
<b>PriceMatch</b>	5	Yes	Indirect	Via Partech	15	522	34.8x

Source: author's analysis based on original data in Dewez 2020 and own Dealroom- and LinkedIn-based analysis; data as of 31/12/2020

Overall, as recounted in section 3, the result has been an ecosystem that has grown rapidly and produced an impressive number of commercially very successful ventures, increasingly appreciated by foreign investors as well. It should be noted, however, that this entrepreneurial success has so far been slow to translate into the exploitation of France's most advanced technological inventions. As Figure 3.26 showed, barely one in five French start-ups seems to be "science" based. Informant-FR-GVC-7-ZDL's reflections are telling:

"We integrated non-technology innovation inside our Doctrine ... and we had some very good successes with these kind of ideas [meaning, at supporting this tech-enabled innovation] ... Then 2-3 years ago [i.e. in 2018-19] we said: ok we have done that, now let's go back to *tech*: ... because we have a problem that the French academic system does not produce enough innovation that is embedded in new companies ... because it prefers to sell the IP. So we created the Plan Deep Tech, which is like 'back to basics' to push this innovation out of labs by working a lot with universities and research labs ... We have a good pipeline in tech-enabled projects but we need to put more project on the pipeline for 'deep tech'—things like hydrogen, biotech, greentech—where you need a lot of science to have disruptive technology "

Author's interview with Senior Executive at Bpifrance,  
16/02/2021

It is clear, thus, that Bpifrance's relaxation of the definition of innovation has been instrumental in allowing it to support the expansion of the ecosystem. The new definition allowed the PDI to focus resources on those investments that have the highest chance of increasing horizontal innovation capabilities in the ecosystem. The analysis in this section thus has found that this modern French GVC falls in the bottom half of the framework. The process tracing approach analysed the timing of policies and programmes and showed that, while by 2020 Bpifrance's own focus and presentation had shifted towards emphasizing "deep tech," this is only a recent reaction to the realisation that the ecosystem was lagging in terms of funding technology-transfer from scientific research. As calls for "strategic autonomy" in key technological areas increase, so does the pressure to retune the GVC approach. This, however, was not the focus for the first decade of Bpifrance's activity. Instead, Bpifrance's predominant feature since its foundation was that it relaxed the definition of "innovation" and shaped its programmes accordingly. Whether the approach will need to change to match France's new deep-tech ambitions and strategic challenges is yet to be seen. Arguably, this process has already started.

### 3.6 Conclusion

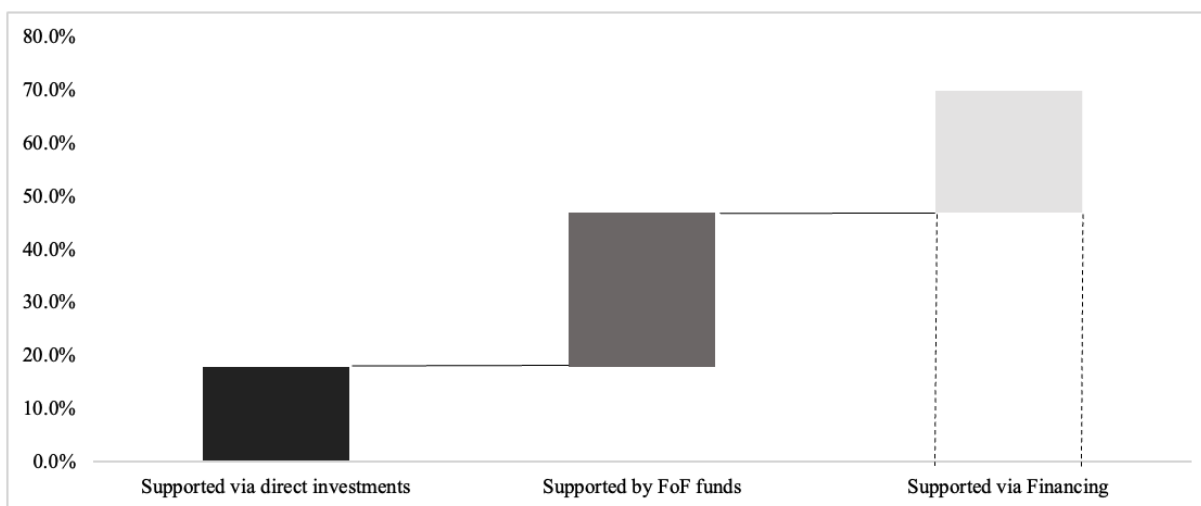
In this chapter I argued that Bpifrance, the latest iteration of French GVC, had a pivotal role in the development of the innovation ecosystem in France and that it did so by embracing a Market Creator State model. The evolution towards this model was the result of political struggles and policy learning. However, France's institutional legacy of dirigisme and the country's overall political comfort with state intervention in the economy meant that public institutions already had the capacity to implement a modern form of GVC. Almost from its founding, Bpifrance was ready to play a central and orchestrating role for the French innovation ecosystem.

The chapter therefore has provided the first practical example of a 360-degree Market Creator State. Table 3.8 summarises the main policy tools that comprise this paradigm and that will be compared to the other countries’ policies in the following chapters. Thanks to a combination of these tools, the result is that the majority of French start-ups that received VC funding between 2010 and 2019 were at some point supported directly or indirectly by Bpifrance (Figure 3.32)—a striking aspect for an external observer used to associating start-ups with American capitalism and Silicon Valley-style libertarianism. At the same time, indicative figures suggest this state investment in innovation is also generating a positive financial performance.

**Table 3.8: Summary of the Bpifrance policy tools “menu” for start-ups**

Bpifrance	Description	Policy Mechanism
<b>Indirect Investments (1)</b>	Underwriting minority shares in PVC funds	Critical Mass & Certification
<b>Direct Investments (2)</b>	Taking equity directly into start-ups	Leverage and portfolio diversification for PVC
<b>Financing (3) (grants and loans)</b>	Providing grants or low-interest loans to companies	Leverage and portfolio diversification for PVC and non-dilutive funding for entrepreneurs
<b>Integration between 1, 2, 3</b>	Tools developed to be complementary to each other	Reciprocal leverage between public tools and appropriate tools for each stage of financing
<b>Coordination and support (4)</b>	Promoting networking and best-practice sharing via dedicated support teams	Capabilities building

**Figure 3.32: Overall proportion of French start-ups supported by Bpifrance**



Source: author’s analysis based on Pitchbook data (2010-2019). Last column based on Bpifrance (2023) data, which probably renders overall picture an underestimate because it assumes complete overlap between start-ups that received financing and those that received direct or indirect equity investments from Bpifrance, while it could be that some companies have received only equity.

The key insight for this thesis is that these outcomes are the consequence of a significant evolution in French innovation industrial policy. Bpifrance, contrary to what could appear on the surface, is not a revival of French dirigisme. In contrast with past experiences of French innovation policies, Bpifrance's intervention has had a greater focus on developing the general capabilities of the industry, shunning the top-down promotion of specific technologies and sectors that characterised the French traditional approach. Bpifrance also represents a clear case of PAL: the state is not anymore a central planner that imposes its will on the industry but rather an important partner that promotes and orchestrates private markets. This approach has been key to develop the critical mass of capital necessary for the French VC industry to take off. Moreover, Bpifrance clearly shifted the public investment focus from funding only strategic technologies to investing in horizontal innovation capabilities. This emerges from the in-depth analysis of the investment instruments, from the process tracing of Bpifrance's Doctrine's genesis, and from the existence of explicit capability building, non-investment programmes the PDI runs to support the ecosystem "in kind." The next chapters will show that other successful GVC cases followed similar principles and triggered the same mechanisms, even though no other country replicated Bpifrance's specific model.

The chapter also sheds light on the drivers of this evolution. Bpifrance is the outcome of two opposite forces. On one side, in France since the mid-2000 there was a growing and bipartisan political will to increase government investment in innovation. On the other, the general trend towards a "consolidation state" in Europe (Streeck 2015) and the evolving landscape of EU state aid rules made a traditional government intervention less feasible. Involving the *Caisse des Depots* emerged as the solution. But with CDC's capital also came the views of its management and investment professionals. They pushed for a highly independent governance for Bpifrance, introduced private sector-like operational practices, and favoured the revolving doors between the PDI and the private market. In turn this contributed to making Bpifrance highly integrated with the ecosystem as well as receptive to a view of innovation more akin to private VCs'. In the next chapters we will see that where/when comparable forces were present, the Market Creator State also emerged, even if the specific actors and processes were different.

The findings from this chapter provide important contributions to the literature on the relationship between the state and innovation. First, the emergence of a successful innovation ecosystem in France has been the result of a forceful government intervention. Those who argue that France has been moving more towards an LME model (e.g., Culpepper 2006) would interpret this growth in high-tech entrepreneurship as further evidence of such liberalisation efforts. My work, however, shows that the liberal reforms of the nineties were not sufficient conditions to trigger an innovation ecosystem. The state had to "come back in" in order to help both the demand and supply side of the innovation market to reach self-sustainable levels. In this sense, Bpifrance represents a crucial case in the history of European industrial policy, offering modern evidence that states can "govern" and "create" markets (Polanyi 2001, Hall 1986).

Second, it shows that the specific way in which countries set up GVC policies, even within Europe, is heavily influenced by their model of capitalism. The story, actors, and policy process in France are unique to the country and cannot be expected to find a close equivalent elsewhere. These findings are consistent with VoC's arguments that emphasize institutional path dependency. Yet, in its core principles, France's GVC model is similar to those that will be described in other European countries. Even in France,

state interventionism has not truly translated into an Entrepreneurial State (Mazzucato 2013) but rather into a Market Creator State. These findings seem more consistent with state roles described in earlier theories about the developmental network state and the “competition state” (Breznitz 2007, O’Riain 2000 and 2004, Cerny 1997). They also add evidence to the decade-long debate about the new role of the state in France (Culpepper 2006, Clift 2006, Levy 2016): if past innovation policies retained a distinctively *dirigiste* flavour, Bpifrance today reflects the hybrid and idiosyncratic nature of France’s model of capitalism, which has departed from a state-led model but does not fully align with a CME or an LME. Bpifrance is more powerful and has a stronger coordinating role than its predecessors. However, it does not act as a top-down “director” of the innovation industry but more like an orchestrating partner, which derives its influence and credibility from its strong network with private investors and its staff’s competences. These characteristics support the view that the new political economy of France is significantly dominated by networks of elites that typically share an academic background in the *grandes écoles* and a professional path that alternates private and public sector management roles (Clift 2006, Schmidt 2003, Loriaux 2003).

Finally, the French GVC model described can be insightful for the entrepreneurial finance literature. For one, the highly integrated nature of Bpifrance’s various start-up investment and support tools means that researchers should be careful about analysing the impact of one of these policies in isolation. Such an approach would ignore the high complementarities between different instruments (e.g., between direct and indirect GVC; between equity and non-equity funding). In addition, the strict co-investment policy means that attempts to estimate the “certification effect” (e.g., Guerini and Quas 2016; Bertoni et al. 2019) of Bpifrance’s direct investments or the differentials between the PDI’s portfolio outcomes and PVCs require very careful interpretation. More broadly, the case has shown the importance of maintaining a long view in GVC policies and that research should always pay attention to their intergenerational effects.

From a practical point of view, the chapter shows that policymakers should look at Bpifrance carefully. By 2020 France offers several useful examples of how to structure GVC effectively. However, any policy entrepreneur outside France should be mindful of the French context and of the very specific role that the state has historically played in France. Nevertheless, the Bpifrance case suggests the importance of the combination and complementarity of indirect and direct GVC tools. At the same time, the analysis has pointed to the substantial difference in the mechanisms behind these policies: while indirect investments can trigger a certification and critical mass mechanism, direct GVCs are unlikely to have similar effects and should instead be structured to help PVCs diversify their portfolio, rather than crowding them out. Bpifrance also exemplifies how a nascent ecosystem can benefit from proactive, centralised coordination. However, Bpifrance’s effectiveness rests on its perceived legitimacy: such an approach risks being counterproductive in less centralised political economies less used to the leadership of state agencies. More broadly, instead, the French case shows that there might be value also in “soft” activities and in “in-kind” support. The analysis explained the FoF team’s promotion of the professional development of the PVC industry, Bpifrance’s role as a “school of VC,” and its programmes for entrepreneurial competence building. All these show that GVCs can be more than just “VCs with public money” and instead offer those public goods that the private industry would chronically underprovide.

Finally, the case of Bpifrance has highlighted the intergenerational effects of innovation policies. It shows that, although Bpifrance's mode of intervention has been particularly effective since 2013, the French ecosystem had a long gestation period of over 20 years—where various policies had gradually supported the proliferation of first generations of start-ups and VCs. Policymakers, therefore, need to be patient and cautious to draw immediate conclusions on the impact of GVC programmes. Instead, they should identify upfront the interim metrics that reflect the development of the ecosystem, to understand if they are moving in the right direction. In turn, this medium-term perspective stresses the need for GVC programmes that are reasonably insulated from the political cycle, since their effects require decades, not years, to become apparent and be fully evaluated.

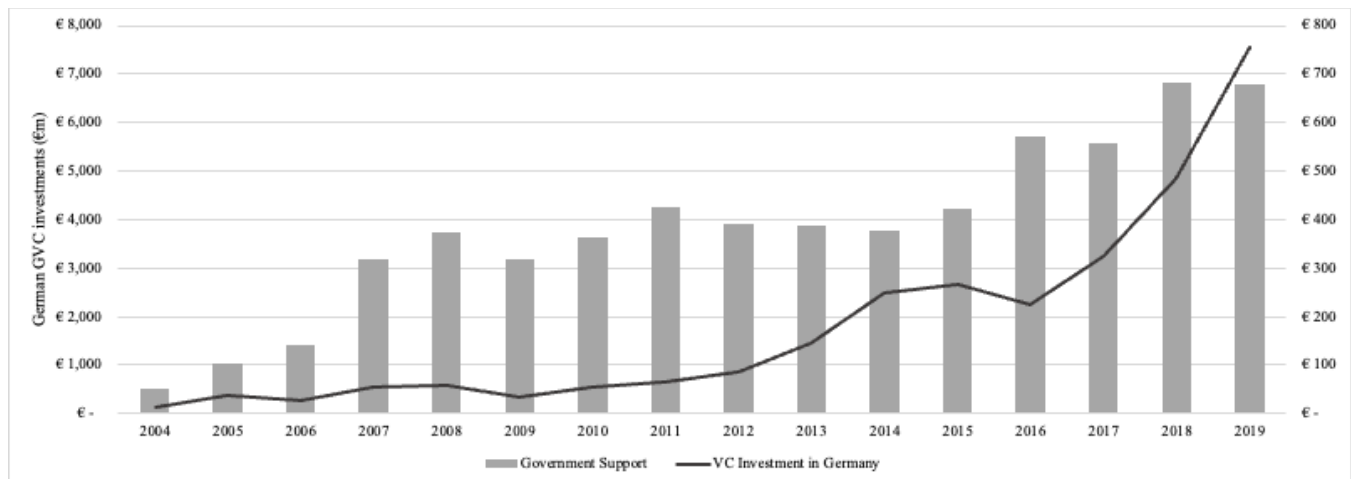
## Chapter 4 Public funding without the state: modern GVC in Germany

*“I do not do economic development ...  
The intention here is to fund successful start-ups”  
High-Tech Gründerfonds Official*

### 4.1 Introduction: a coordinated market economy rises to largest innovation ecosystem in Europe

This chapter traces the development of Germany’s government venture capital (GVC) policies and the simultaneous rapid evolution of the innovation ecosystem in the country. The case is particularly insightful as Germany was conventionally considered by the literature an inhospitable place for disruptive innovation, due to the structure of its political economy. Instead, starting in the mid-2000s, the country experienced rapid growth in VC funding and the emergence of start-ups that became global businesses, making the country the first real innovation ecosystem in Europe. Fifteen years later, the ecosystem maintains its primacy in continental Europe, head-on-head with France (see previous chapter), although it lost ground to the UK. The journey was a difficult one and this chapter shows that the evolution of government policy was an important driver of a very uncertain *a priori* outcome. Figure 4.1 below summarises this story, showing both the growth of the ecosystem and the evolution of public VC.

**Figure 4.1: Evolution of VC investments and government VC investments in Germany**

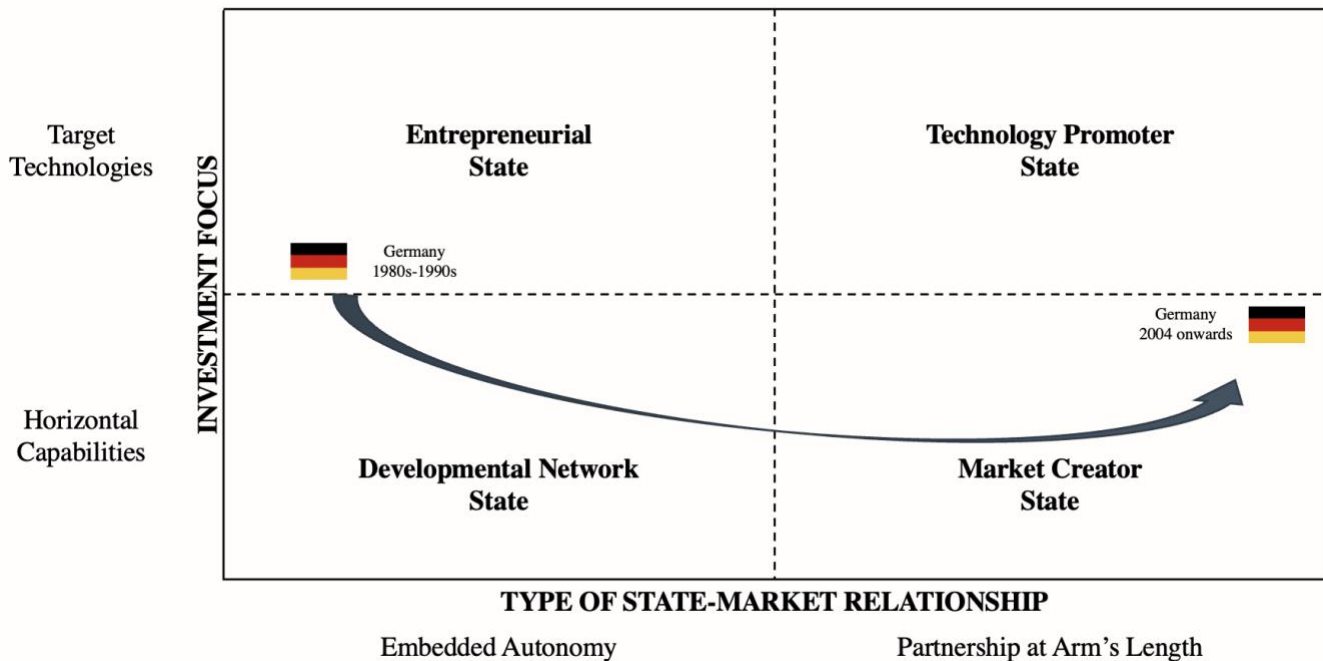


Source: total VC investments based on Dealroom data. GVC based on author’s estimates from bottom-up data collected from KfW, EIF-ERP and BMWK internal documents, field interviews with officials at all organisations, and Invest Europe; note that figures may underestimate early-2000s indirect programmes by KfW, for which the institution retained only partial data

This rise of Germany as the first innovation hub in Europe presents a clear theoretical puzzle for political economists: the country’s coordinated market economy (CME) had long been considered not conducive to disruptive innovation, especially within the *varieties of capitalism* tradition (VoC). Indeed, several attempts at public venture capital in Germany had previously proven unsuccessful. What changed? I argue that Germany experienced a substantial institutional transformation, sparked by the private sector,

but proactively complemented by a new set of effective government interventions. On the labour market side, private initiatives—notably the Rocket Internet accelerator—provided the initial critical mass of talent and success stories that for the first time made “being a tech entrepreneur” an attractive option in Germany. On the capital side, the state structured programmes that drew private investors to German innovation and de-risked their investments, but also imposed conditions and practices to professionalise the VC industry in a country with little equity investment tradition. With reference to the theoretical framework advanced in this thesis, I find that German GVC policies in the two-thousands made a clear movement to the right. The more successful GVCs embraced a Partnership at Arm’s Length approach, becoming examples of the Market Creator State (Figure 4.2), albeit in a less obvious case than France. Before the country embraced this model, its GVC efforts yielded disappointing results.

**Figure 4.2: Germany GVC models categorised by the theoretical framework**



To be sure, Germany’s resulting GVC policy do not fit squarely in the paradigm exemplified by France. First, in Germany there is no single GVC agency like Bpifrance, but rather a variety of actors and models, and this has several implications. In Germany, the various instruments (indirect GVC, direct GVC, and credit tools) are less coordinated and thus have less of a comprehensive coverage of the ecosystem. The federal nature of Germany, versus centralist France, has thus partially limited the ambitions of national-level German initiatives. Above all, none of the German GVC actors have the remit of coordinating the whole ecosystem. Instead, German GVCs have acted in a more “surgical”—albeit not less effective—way, addressing specific institutional gaps in the market. Second, in Germany the political push for public intervention in innovation was not as strong as in France, and it quickly took more of a technocratic nature. Partially as a consequence, German GVCs have been far less central to the economic development strategy of the country. In fact, they have been even farther removed from politics and from

the traditional bureaucracy than in France. Finally, GVC programme design was not informed as much as in France by an explicit and proactive rethinking of the types of innovation that the country should pursue; instead, decisions about investment focus resulted from the involvement of non-government actors in GVC programmes.

Overall, however, Germany's model, after years of changes and fine tuning, came to reflect the core principles of the Market Creator State. With regard to the X axis (state-market relationship), Germany created new institutions independent of the existing public bureaucracy, it internalised private venture capital practices, and proactively supported the development of the private VC industry, with strict informed conditionality. Importantly, no GVC investments were made without the involvement of private investors. Along the Y axis (investment focus) the movement was less stark, as mentioned above, but fell nevertheless clearly in the bottom part of the framework. The new policies left mostly to the private sector the decision on the most promising technologies, while in the 1980s and 1990s Germany had also invested significant resources in trying to promote high-tech districts in specific government-chosen technologies (in particular biotech). In practice, since 2004 Germany has run: a) a direct investment programme that was designed together with Germany's largest private companies and has been managed in partnership with them; and b) an indirect GVC, the management of which was outsourced to the European Investment Fund (EIF). These were disruptive policy innovations compared to Germany's traditional approach of using its development bank *Kreditanstalt für Wiederaufbau* (KfW) to try to catalyse innovation mainly through credit tools and via the banking industry. All in all, thus, modern German GVCs offer a noteworthy example of how, to achieve its innovation policy objectives, Germany separated "state funding" from "state picking the winners."

The chapter also explains how Germany arrived at the Market Creator State through a different path from France. This path reflected the same underlying forces and scope conditions, but also the country's very specific model of capitalism and policymaking. A moment of policy reckoning after the dot.com bubble created the conditions for rehauling innovation policy and overcoming the traditional constraints of Germany's traditional development model by assigning GVC implementation to new actors. The story is different from France's, where *Bpifrance* did not represent a discontinuity with the past but rather the culmination point of a coherent state-led push for the broader development of private equity financing.

This story complements France's with additional theoretical and policy insights. From a theoretical point of view, the findings create a bridge between literatures on VoC (Hall and Soskice 2001, Casper 2007), on policy learning and diffusion (Hall 1993, Dunlop and Radaelli 2018, Klingler Vidra 2018) and on GVC specifically (Lerner 2009; for a review, see Da Rin et al. 2013). The case provides surprising evidence that Germany—the archetypal CME—was able to support via public policy the development of an innovation ecosystem, by learning from its past policy mistakes and by designing an innovative model compatible with its institutions. The findings are consistent with analyses of successful diffusion and adaptation of GVC policies in non-liberal-market contexts, such as in the Asian political economies (Klingler-Vidra 2018), as well as with stories of policy learning that lead to paradigmatic changes in policy approach (Hall 1993, Dunlop and Radaelli 2018). The in-depth account of the within-case variation in German policies also shows that, even within the same country, not all GVC programmes are born alike

and that their effectiveness depends on the specific ways in which they are implemented. While previous literature had extensively explained “what can go wrong” with GVCs (Lerner 2009), this German story juxtaposes cases of failure and success to highlight their key determinants. It shows that *how* the state invests and *what* it invests in matter. This insight is particularly important as Europe is revamping its ambitions to pursue interventionist industrial policies. The German case shows how even a country without a tradition of centralised industrial policy can implement an ambitious interventionist strategy, but it must do so by creating institutions fit for purpose. Coordinated market economies like Germany need to take special note of the likely need for an overhaul of their implementation agencies before attempting GVC programmes. But all countries can learn from Germany how to design policies that effectively complement and leverage the private sector to achieve industrial policy objectives.

The chapter is structured as follows: in the next section I summarise the expectations of the literature regarding innovation in Germany and the poor track record of previous German GVC policies. I then provide an overview of the traditional actors involved in innovation policy in Germany and of the limitations of this model (section three). Section four recounts the surprising growth of the ecosystem in the 20 years since the dot.com bubble. Section five then looks in detail at Germany’s two modern GVC programmes, their policy process, and their role in the ecosystem. Section six concludes, expanding on what this case means for theory and what policymakers can learn from it.

### **4.2 Germany and innovation in the literature: a coordinated market economy with low chances and a poor track record at developing innovation ecosystems**

The academic literature on the German political economy and innovation has theorized and found evidence that the German model of capitalism historically did not have the right institutions to breed the type of disruptive innovation typically associated with Silicon-Valley style start-ups and innovation ecosystems.

The political economy literature has analysed in depth Germany’s economic model. Authors from the *varieties of capitalism* (VoC) tradition, in particular, categorise Germany as one of the archetypal coordinated market economies (CME) (Hall and Soskice 2001, Schmidt 2003). In these economies, they argue, the combination of long-term stable employment practices, large companies’ investment in employees’ training, consultative patterns of company organisation (e.g., union representation on company boards) and, importantly, bank financing (i.e., credit) has facilitated long-term incremental innovation but created constraints for more disruptive or radical innovation. In short, this archetypal economic model provides a more stable market environment: change takes place when the network of stakeholders (companies’ management, employees, funding banks) agree on its direction. In addition, an education and training system where companies invest heavily in their employees’ skills to increase productivity leads to employee-sourced innovation remaining within existing companies (Streeck 1984, Schmidt 2003), as opposed to spinning off into new businesses. Overall, this dynamic slows the innovation process and favours insider-led innovation versus innovations introduced by outsiders, such as new start-up companies that are not yet part of the stakeholder network. Over time, this post-war structure of the German political economy has evolved (Schmidt 2003) but recent work has argued that the result has not

been an overhaul of its institutions. If anything, a dual system has emerged: only new industries and related workers are affected by more flexible labour laws, industrial relations, and welfare institutions, while the traditional stakeholders of Germany's core industries remain largely shielded (Palier and Thelen 2010, Thelen 2019). Even the response to the digital revolution, authors argue, has been shaped by the traditional institutions in a way that has led to "doubling down" on the country's manufacturing primacy, rather than investing in ICT industry as it was the case in Sweden (Thelen 2019). The literature, therefore, predicts that Germany would be able to produce incremental innovation that maintains competitive its core industries but would not develop innovation ecosystems of start-ups in new sectors of the economy.

The country's record at promoting innovation ecosystems seemed to confirm this scepticism. The country's large "promotional bank" KfW has been recognised as a powerful engine behind Germany's vital SMEs: in 2017 alone, the bank provided over 22 billion euros in financing for SMEs (Mertens 2021, KfW, 2018). However, the institution's financing instruments have historically proven ineffective for start-ups (Adelberger 2000). Germany, therefore, tried over time to develop alternative policy tools targeting innovative companies specifically, with scarce results. Becker and Hellmann (2005), for instance, reviewed one of the first attempts at GVC in Germany, the WFG programme.<sup>80</sup> The fund was active between 1975 and 1984 and invested 50 million D-marks in innovative companies. The result however was "complete failure," according to the authors: the fund generated negative financial returns (-25%) and was ineffective at triggering the development of a larger innovation market that could offset such negative financial performance (Becker and Hellmann 2005). Most interestingly, the authors highlight structural reasons for this failure. German venture capital investment tools were ineffective, due to the absence of the necessary contracting and governance practices found in the American context. Capital providers were too risk averse, since the involvement of banks was necessary, but their practices were incompatible with the high-risk/high-reward innovations that underpin innovation ecosystems. Finally, high-quality entrepreneurs were lacking, due to the significant disincentives for entrepreneurship that classic Germany employment contracts posed to highly-skilled employees of large companies. The authors concluded that "the mere creation of the WFG was not sufficient for an institutional change" (Becker and Hellmann 2005).

Similarly, Steven Casper analysed Germany's next wave of German public policies to support start-ups, especially in the biotech sector, in the 1990s (Casper 2007). Despite the over 3 billion dollars invested by the federal government, Casper claims that "it is hard to avoid the conclusion that government policy towards biotechnology has failed" (Casper 2007). The government funded a network of regional biotechnology promotion offices to facilitate technology transfer from university labs into start-ups, created a new stock market for tech companies (*Neuer Markt*), and provided over 1 billion dollars through a public fund (*Technologie Beteiligungsgesellschaft*, TBG), largely to biotechnology companies (Adelberger 2000; Casper 2007). However, by early 2000, very few firms had withstood the bursting of the dot.com bubble, revealing the underlying fragility of the businesses and of the ecosystem. The GVC initiative TBG was closed due to heavy losses and replaced with a traditional government grants programmes (BioFuture and BioChancePlus) (Casper 2007). As a 2004 OECD report clearly stated, "Germany has benefited less than other high-performing countries from the surge in new technologies,

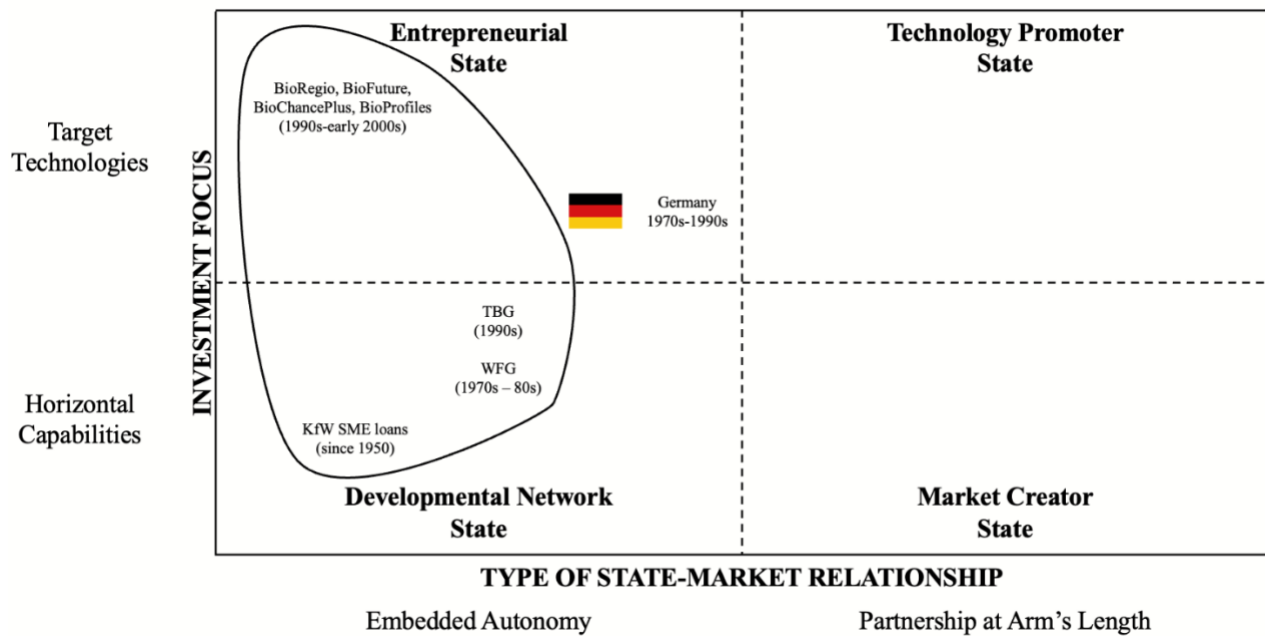
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<sup>80</sup> *Deutsche Wagnisfinanzierungsgesellschaft*

such as ICT and biotechnology... The size of the VC market is also smaller than in many European countries, notwithstanding generous public sector support, relative to the size of the market” (OECD 2004a). Once again, it seemed that Germany could not develop the right institutions to house disruptive innovation in a sustainable way. The only timid exceptions, Casper found, were those sub-sectors (platform biotechnology and middle-layer software) where innovation patterns were more incremental and where Germany’s traditional institutions continued to provide a comparative advantage (Casper 2007).

The literature therefore offers two insights. First, political economy and economics literature predicted and found evidence that Germany could not stimulate the growth of an entrepreneurial ecosystem, because it lacked the complementary institutions to support it. Second, it provides evidence consistent with the theory advanced in this research (Figure 4.3): Germany’s early-days innovation policy tried to promote innovation mostly through classic developmental- and entrepreneurial-state type tools and institutions, which did not resemble private venture capital. In the 90s, it also focused extensively on specific high-tech industries (in particular biotechnology). In doing so, it failed. The next section explores the intrinsic limitations of this traditional German model of GVC intervention.

Figure 4.3: Germany historical innovation policies categorised by the theoretical framework



Source: author’s elaboration based on literature review and fieldwork interviews

### 4.3 Germany’s historical institutions for innovation support and their limits

This section illustrates the key institutions that were historically involved in innovation and SME support in Germany. It highlights how the features of these institutions made them prone to several common design and implementation pitfalls that the literature on GVC has long identified (Lerner 2009). These included,

above all, Germany's reliance on credit financing (rather than equity) and a federal structure that yields programme fragmentation, biases towards traditional companies, and slows policy learning and best-practice diffusion. I first summarise the role of each key organisation and later explain the challenges this institutional architecture has faced.

#### *4.3.1 Bundesministerium für Wirtschaft und Klimaschutz (BMWK)—the Federal Ministry of the Economy and Climate Action*

This Ministry (previously Federal Ministry of the Economy and Energy, BMWi) has changed several names over time but remains broadly in charge of directing industrial policies, including innovation initiatives. It is involved in innovation funding in two main ways.

First, it manages directly two programmes—one for start-ups and one for investors. On the start-ups side, the programme EXIST provides very small grants to university students, graduates, and researchers to facilitate the launch and very early-stage funding of start-ups within universities. The funding covers the stipend for the entrepreneur (one to three thousand euros a month) and research costs up to thirty thousand euros.<sup>81</sup> Given its nature, it is relatively small, with total funding available amounting to around forty million euros a year until 2019.<sup>82</sup> On the investors' side, the programme INVEST has a similar budget and provides investment subsidies to business angels (BAs). In short, the scheme reduces risks for BAs, by providing a 20% tax-free rebate on their investment and a tax deduction on future capital gains.<sup>83</sup>

Second, BMWK oversees the European Recovery Program Special Fund (ERP Special Fund), which is the most important source of funding for SME and innovation programmes. These resources are the capital accumulation resulting from Germany's investment of the post-war Marshall Plan's resources, net of repayments to the United States.<sup>84</sup> Since the end of reconstruction, Germany has been using this revolving fund, which works like an endowment, to provide credit financing to SMEs, the backbone of the German economy.<sup>85</sup> The ERP is thus important for two reasons. First, it constitutes a substantial pool of resources that has been historically channelled to SMEs, including start-ups. Second, it has always been treated as a separate fund, excluded from the Federal annual budget. This means that it is partially shielded from political appropriation but also that it needs to continue generating a financial return on its activities

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<sup>81</sup> [https://www.exist.de/EXIST/Navigation/EN/About\\_EXIST/about\\_exist.html](https://www.exist.de/EXIST/Navigation/EN/About_EXIST/about_exist.html)

<sup>82</sup> <https://www.bmwk.de/Redaktion/EN/Artikel/Ministry/budget-2019.html#:~:text=Amongst%20other%20things%2C%20the%20EXIST,doubled%20to%20%E2%82%AC78%20million.>

<sup>83</sup> Specifically, the initial investment rebate amounts to 20% of the equity investment made. The investment must amount to at least €10,000. Investments of up to €500,000 annually per investor are eligible for an acquisition grant. At exit, lump-sum refund of capital gains tax on the sale of shares purchased (only applies to natural persons) Amount: 25% of the profit earned from disposal of shares acquired under the INVEST programme. The capital gain must amount to at least €2,000. The exit grant is capped at a maximum of 80% of the investment in shares under the INVEST programme. The combined total of the investment and exit grants must not exceed the original amount invested. For details: [https://www.existenzgruender.de/SharedDocs/Downloads/EN/Broschueren/Flyer-INVEST-Venture-capital-grant.pdf?\\_\\_blob=publicationFile](https://www.existenzgruender.de/SharedDocs/Downloads/EN/Broschueren/Flyer-INVEST-Venture-capital-grant.pdf?__blob=publicationFile)

<sup>84</sup> <https://www.kfw.de/About-KfW/F%C3%B6rderung-und-Geschichte/Geschichte-der-KfW/KfW-Themen/Marshallplan-und-ERP/>

<sup>85</sup> When Germany received in-kind aid from the United States, it sold it to consumers and firms in the German economy and utilised the proceeds to create a fund for productive investments to rebuild the economy. In practice, these resources were lent out to German businesses for development projects and paid back with an interest, eventually making the ERP a revolving fund with an expanding capital base. By the mid-nineties, resources, net of repayments to the United States, amounted to 27 billion DM (ca. 15 million euros) (Biesinger 2006).

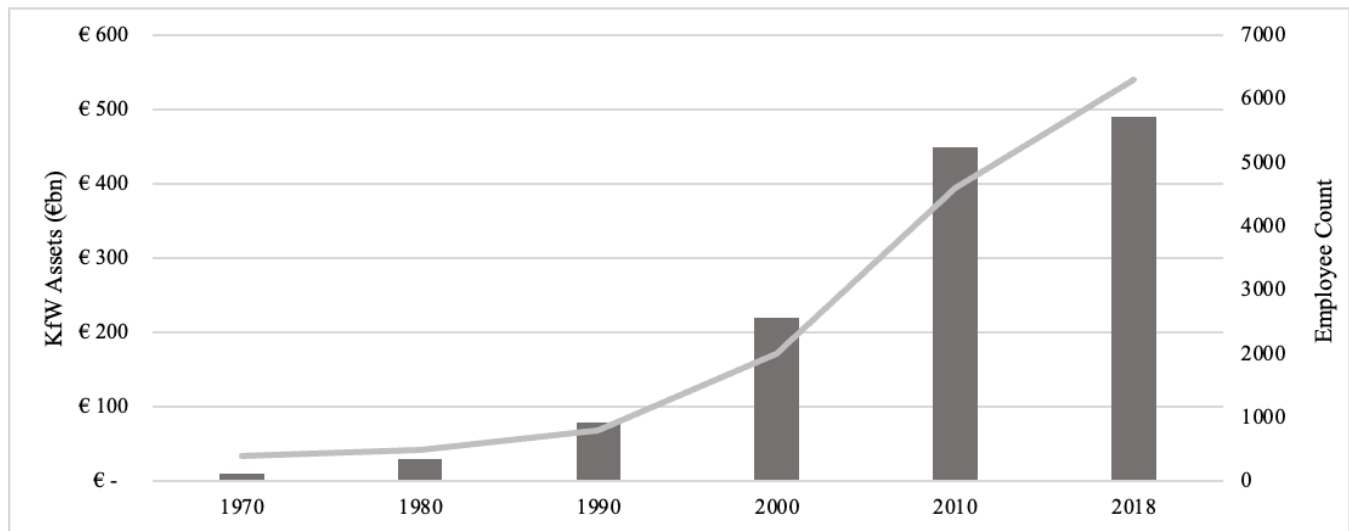
to remain in existence. BMWK has overseen the fund since 1961, and thus it makes the strategic decisions over its use. Operationally, however, the resources have been managed mostly by the German development bank, KfW, to which we turn next.<sup>86</sup>

4.3.2 *Kreditanstalt für Wiederaufbau (KfW), Germany’s national development bank*

KfW has been the central institution in German economic development since post-WWII reconstruction. Its structure and operations both reflect and have contributed to forming the German model of capitalism.

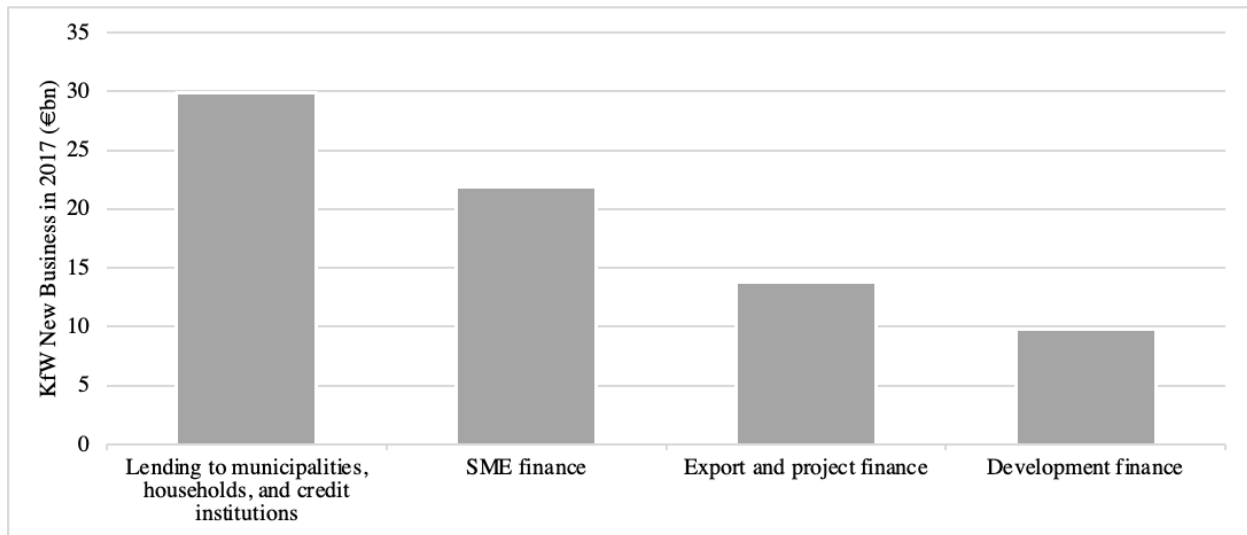
Founded in 1948 to manage the Marshall Plan’s resources, after reconstruction its focus shifted to providing financing to the German *mittelstand*, the vibrant ecosystem of SMEs that underpins Germany’s manufacturing sector. It is hard to overstate KfW’s role and size: with 6,300 employees (two times the European Investment Bank) and almost 490 billion euros in assets, it is Europe’s largest development bank and Germany’s third largest bank (Mertens 2021). Its operations expand from domestic lending (to SMEs, municipalities, households, and credit institutions) to export, project, and development finance. Figure 4.4 and Figure 4.5 below show how KfW has grown over time and the relative size of its various operations.

**Figure 4.4: KfW assets and employee growth over time: the third largest German bank**



Sources: original chart in Mertens 2021

<sup>86</sup> In addition to KfW, during the reconstruction period and until the late 1990s, there was also another development bank, Deutsche Ausgleichsbank (DtA), which was later merged with KfW in 2003.

**Figure 4.5: KfW operations by new business volumes (2017): €22 billions to SMEs**

Sources: author's elaboration on data from KfW and Mertens 2021

The most relevant aspect for this research, however, is that KfW's governance and business model are quintessential of Germany's coordinated market economy (Shonfield 1965, Grünbacher 2004). First, its governance reflects the tenets of stakeholder capitalism. The federal government owns 80 percent of the bank; 20 percent is owned by the *Länder*. In addition, all major economic actors are represented: ministers of both federal and state governments, parliamentarians, bureaucrats, but also trade unionists, banking, and industry leaders. Decisions are a compromise between all these interests. Second, the business model of the institution is reflective of Germany's credit-based system of financing economic activity. KfW acts primarily as a bank and it has therefore developed the competences and structure to manage credit instruments. In addition, KfW does not typically lend directly to businesses. Instead, it relies on an "intermediated" (or "on-lending") model: it channels its capital through a network of private commercial banks distributed all over Germany, which on their part are well-integrated in the local network of firms in their region. These banks make the specific lending and capital allocation decisions and are compensated with a profit margin by KfW. Their deep integration with the local economic system reduces knowledge asymmetries, facilitating the provision of "patient capital" to existing firms (Bathlet and Gertler 2005). The systemic role of KfW, in other words, is to raise cheap capital using the German state triple-A credit rating and then pass it through to companies and SMEs, via the commercial banks (Mertens 2021).

Some of the programmes organised around this model, and mostly financed by the ERP Special Fund, can theoretically be used by start-ups as well. The main ones are summarised in Table 4.1 below:

**Table 4.1: KfW loan programmes also applicable to start-ups**

Programme	Maximum Capital Provided	Credit Risk Assumed by KfW	Other Requirements
<b>ERP Start-up loan: start-up money</b>	€125k	80%	No equity required
<b>ERP capital for start-up</b>	€500k	100%	Finances max 40% of investment
<b>ERP promotional loan for SMEs</b>	€25m	50%	-

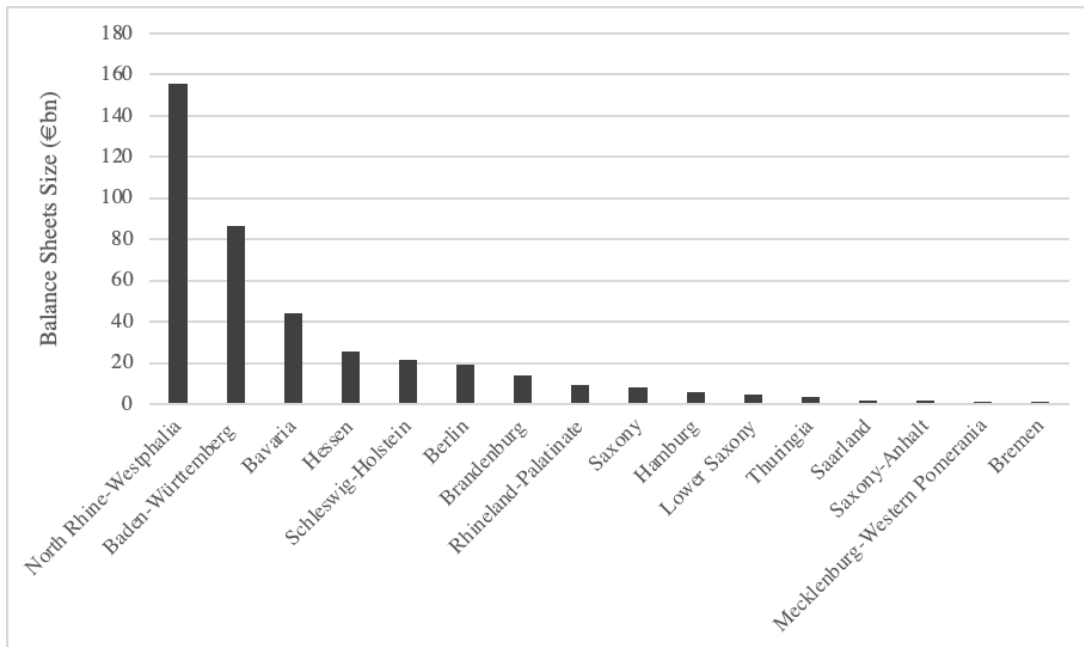
Source: data from author’s interviews, BMWK and KfW materials

In short, KfW is the most influential developmental institution in Germany and, historically, it has also been the natural place where to develop start-up support programmes. However, its nature as a bank has meant that even the programmes directed to start-ups were typically structured around its credit-based, intermediated lending model.

### 4.3.3 Regional development banks

True to its federal structure, Germany also has several regional development banks, one for each *Land*. They operate similarly to KfW but, being closer to the local companies and investors, they provide additional support to entrepreneurs. Figure 4.6 below provides an overview of the size of each Land’s banks.

**Figure 4.6: German Länder by size of their development banks balance sheet**



Source: data from VOEB.de

### 4.3.4 Research and technology transfer institutes

A final set of institutions responsible for innovation in Germany are the country's renowned non-university research institutes. There are four such institutes, covering the full spectrum of research, from most fundamental to very applied. Within these, the *Helmholtz Gesellschaft Deutscher Forschungszentren* and, especially, of the *Fraunhofer Gesellschaft*, have historically been in charge of facilitating the transfer of research to industry. They provide in-kind support to innovation, by funding research activities directly relevant to German industry. In that, they represent a clear feature of Germany's coordinated market economy, where networks of firms are incentivised to collaborate on pre-commercial R&D from which the whole industry can benefit (Rothgang 2011).

*Fraunhofer Gesellschaft* is the most renowned for its ties with industry. It was founded in 1949 and has since grown to be a network of 75 research institutes across Germany, employing 29 thousand people.<sup>87</sup> Its activity is integrated with the private sector in two ways. First, its budget (around 2.8 billion euros in 2020) is for one third funded by private companies. Second, the research focus is continuously informed by the needs of private industry. As the Head of International Relations and the institute put it in an interview "We work on real projects with companies. We only open a new applied research institute where and if we feel there is a real need for it. The question we ask ourselves is: how can we help this or that company?"<sup>88</sup> *Helmholtz Gesellschaft Deutscher Forschungszentren* is instead the largest non-university institute and its focus is in between pure and applied research. The institution, established in 1995, is comprised of 18 scientific research centres and around 43 thousand employees tasked with "solving the grand challenges of society, science and industry." Its budget is higher than Fraunhofer's (around 5 billion euros annually) but is entirely publicly funded (Informant-GE-GOV-4-LVC, former Helmholtz, 15/12/2022).<sup>89</sup>

The model of these institutes has historically been very effective at producing research that benefitted private companies (OECD 2004a). The same, however, cannot be said for their record at turning research inventions into start-ups (see next section).

### 4.3.5 The limits of the German model

This model of state support has been one of the engines of the German economy and especially of its *mittelstand*. However, several features were instead problematic for executing GVC policies. In his seminal work on GVC, Lerner (2009) identified two broad types of policy mistakes common in GVCs. *Design* mistakes occur where programmes do not reflect how entrepreneurship and venture markets work or force the private sector to invest in too-narrowly-defined regions or sectors. *Implementation* mistakes typically derive from failing to set up the correct incentive structures. In this section I show how the

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<sup>87</sup> Figures from: <https://www.morningfuture.com/en/2021/05/17/fraunhofer-germany-model-research-company/>

<sup>88</sup> Interview cited in (<https://24plus.ilsole24ore.com/art/come-funziona-modello-ricerca-applicata-che-alimenta-l-economia-tedesca-ADyPpJLB>); translation from Italian by this author.

<sup>89</sup> For facts and figures on Helmholtz, see: <https://www.helmholtz.de/en/about-us/structure-and-governance/>

traditional German model had intrinsic biases towards some of these key pitfalls and therefore explain why so many German attempts were unsuccessful.

First, the German institutional set up for economic development support reflected the CME model of the economy. In such a system capital typically comes from banks' credit and is used for incremental R&D. High-risk R&D would not be undertaken by SMEs through this type of financing and thus is left either to large companies (which can fund it with internal resources) or to the institutes described above. KfW's operating model is at the centre of this system and of its limitations. The institution acts primarily as a bank and it therefore historically developed the competences, mindset, and structure to make loans, not equity investments. Such instruments are generally unfit for start-ups: in Lerner's terms, they don't reflect how entrepreneurship and venture markets work. Indeed, interviews with government officials, VCs, and entrepreneurs, have highlighted that even KfW's programmes theoretically targeted to start-ups are used more by traditional SMEs in their start-up phase, rather than by true innovative start-ups (Informant-GE-VC-1-WOR, German VC, 05/08/2021; Informant-GE-GVC-5-SUD, TBG, 22/12/2022; Ott, DTC Ventures, 25/03/2021; Senior government official, 20/01/2021).<sup>90</sup> This is consistent with the findings of the literature on the difficulty for start-ups to access KfW traditional instruments (Adelberger 2000) and on the general "disastrous history" of loan-based programmes to support start-ups (Lerner 2009). Authors have shown that such policies are intrinsically flawed, because they "do not share potential upside returns, but assume a significant portion of downside risks," thus creating large losses that make them hard to sustain (Lerner 2009, OECD 1997a, OECD 2004a). In the case of KfW, this is magnified by the institution's intermediated model of lending. The network of private local banks that KfW relies on to allocate funding is averse to the risk posed by true disruptive innovative companies at the early stages (Adelberger 2000, Bathlet and Gertler 2005): these banks' business model is not aligned with the risk-reward profile of start-ups, where bankruptcies are the norm, not the exception (Lerner 2009). The consequence is that in Germany the large capital pool available to SMEs via on-lending was not in practice accessible to innovative start-ups (Adelberger 2000). This is consistent with the findings from the literature, which found that these types of intermediated, bank-based programmes for start-ups either do not reach them or necessitate of substantial state-subsidies to incentivise banks to lend to these businesses, with the common result of incurring into principal-agent issues of moral hazard (Lelarge et al. 2011; De Angelis 2018).

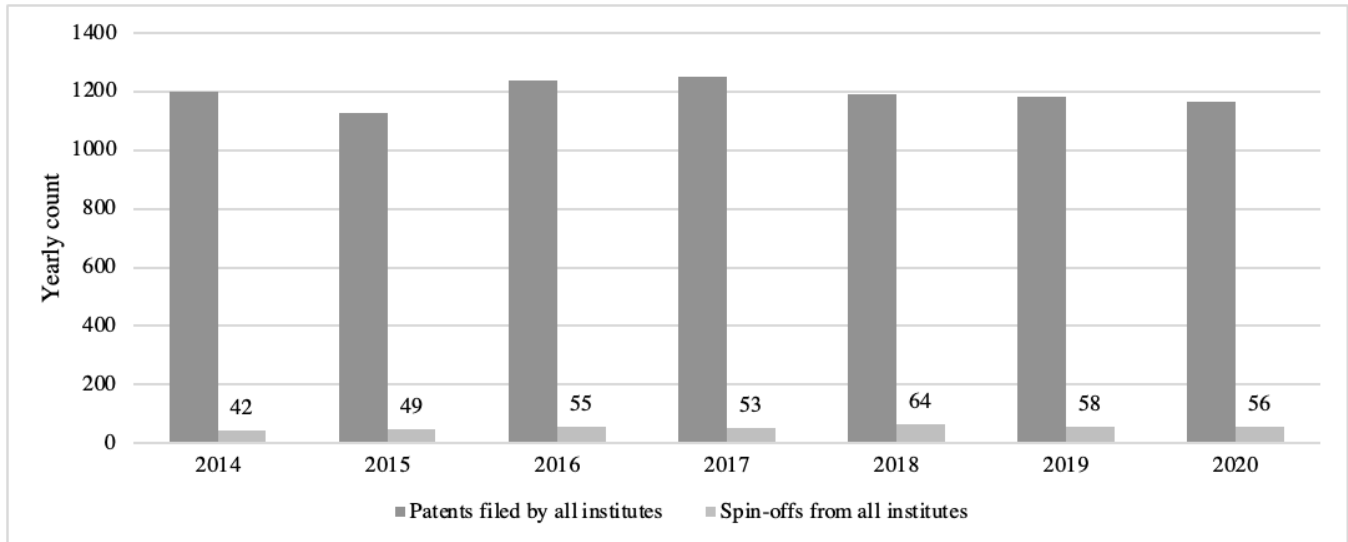
Similarly, the country's research institutes, which have been a comparative advantage to support incremental innovation for networks of existing firms, have not been as effective in terms of start-ups and spin-offs creation. Despite mounting political pressure to focus on it, data shows that there has been relatively little technology transfer activity compared to the close to 1200 patents filed (Figure 4.7). This is largely because the institutes historically monetised inventions by licensing technology to existing industry. Licensing is appealing for the institutes because it brings in immediate revenue, differently from using discoveries to start new ventures, which is risky and expensive in the short term (author's interview with a German policy official formerly at Helmholtz, Informant-GE-GOV-4-LVC, 15/12/2022). "Start-ups are the Achille's heel of all these institutes. In the end they consider themselves 'knowledge creators.'

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<sup>90</sup> Author's interviews with author's interview with Informant-GE-VC-1-WOR, pioneer German VC, 05/08/2021; with Informant-GE-GVC-5-SUD, former investor at German GVC TBG, 22/12/2022; author's interview with Niklas Ott, co-founder of German VC DTC Ventures, 25/03/2021; and Informant-GE-GOV-5-EFO, Senior government official, 20/01/2021)

Even for Fraunhofer, their research commercialisation route was licensing to industry... Start-ups are only ‘a thing’ of the past seven years or so, and numbers are still very low... so it cannot be said that they have been among the main contributors to the growth of the start-up ecosystem in Germany so far” (Informant-GE-GOV-4-LVC, former Helmholtz, 15/12/2022).

**Figure 4.7: Patents and start-ups emerging from Germany’s non-university research institutes**



Source: data from GWK 2021

A second institutional characteristic that rendered GVC policies difficult to implement is the federal, and therefore fragmented, nature of the German state. Regional public banks represent over 40 percent of German development funding.<sup>91</sup> However, insights from interviews suggest that most of their programmes reflect the structure of the more traditional credit instruments offered by KfW, focusing more on traditional SMEs rather than on high-tech entrepreneurship (author’s interview with Informant-GE-GVC-9-PJU, 20/11/2023). To be sure, some of these regional banks have locally focused GVC funds (Informant-GE-GOV-4-LVC, Helmholtz, 15/12/2022). However, field interviews and previous literature have surfaced that too small local funds can be a particularly challenging form of GVC. First of all, the very idea of regionalising and “spreading” innovation runs against “the powerful forces that lead firms to cluster in particular places” (Lerner 2009). In other words, for a network-based industry like innovation and VC, investing X million euros in just one place is typically more effective than spreading the same amount over 10 different locations. In addition, fragmenting resources raises significant operational challenges as small local funds have budget constraints that prevent them from creating a diversified portfolio of companies and from attracting the investment talent required (interview with Michael Brandkamp, HTGF, 02/12/2020;<sup>92</sup> Lerner 2009; Murray 1994). More broadly, the literature on place-based development also shows that local management of innovation funding may lead to less ambitious innovation. Regional authorities are more responsive to *existing* local needs and thus prefer directing

<sup>91</sup> Estimate based the size of KfW’s balance sheet and those of all Länder development banks.

<sup>92</sup> Michael Brandkamp was Managing Director of HTGF for 15 years and before then held positions within Germany’s previous GVC, TBG.

resources towards established companies, even if less innovative, rather than funding highly innovative but risky new businesses (D'Amico 2021). Finally, the federal structure of Germany is likely to have also prevented a more linear policy learning process. As the literature on policy learning and federalism suggests, in policy areas where solutions are unclear, local experimentation is useful. However, once best-practices are discovered, a level of central coordination is often necessary for their diffusion (Dente 1997, Keating and Cairney 2012). This local-vs-central aspect is insightful also in comparative perspective. The German framework contrasts significantly with the French approach, where Bpifrance maintained a very centralised governance, typical of French industrial policy. In France, all equity investments are made centrally; only non-equity financing has a regional component but, even in this case, it is through Bpifrance's local branches, not independent regional banks like in the German Länder. This has allowed Bpifrance to use non-credit financing in a coordinated way with equity investments, within a coherent innovation strategy. In Spain, similarly, a plethora of GVC initiatives had emerged at the *comunidad autonoma* level but—with perhaps the exception of Catalonia—the country did not experience a significant ecosystem growth until the 2013 launch of the first national-level GVC programme (see chapter 5).

All in all, therefore, the institutional architecture of Germany's innovation support reflected the country's CME and federal model, relying on credit instruments and a distributed network of development banks, research institutes, and private banks. While historically very effective at supporting broader economic and regional development, this architecture proved challenging for disruptive innovation support and vulnerable to many pitfalls identified in the literature on GVC and entrepreneurship policy. The rest of the chapter recounts how Germany eventually overcame these obstacles and leapfrogged to new and innovative GVC policies by departing from its traditional approach and institutions.

### **4.4 The German surprise: a digital innovation ecosystem starts to develop in the mid-2000s**

Against this backdrop, Germany surprisingly experienced a rapid growth in its innovation ecosystem starting in the mid-2000s. The trend is notable for two reasons: first, the country's ecosystem grew as quickly as the UK. Second, the companies that emerged were operating neither in those sectors where Germany had a historical comparative advantage nor in those that public policy had tried to foster in the late nineties, such as biotechnology (Casper 2007). Instead, the growth was predominately driven by low-tech, business model innovation in the digital economy.

Overall figures tell a clear story of rapid growth. For the 15 years since 2005, the country experienced a trajectory similar to that of the UK (the largest and most advanced ecosystem in Europe), despite lagging behind in size, as Table 4.2 below shows. Importantly, the country kept pace with the UK not only in early stage and domestic investments, which can typically reflect public policies more endogenously, but also in later stage and foreign investments. In other words: Germany not only started creating more start-ups; these start-ups also grew quickly enough to become successful businesses and attract foreign investors, who would have no reason to invest in German businesses other than for their financial attractiveness. By 2013, Germany became the first continental European country to experience

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over 1 billion euro in VC investments and has since continued to remain the largest continental ecosystem in terms of capital invested each year. By 2019, 24 companies had become “unicorns”—businesses with a valuation greater than 1 billion dollars.

**Table 4.2: Evolution of key metrics of the German innovation ecosystem (2005-2019)**

	UK		Germany		CAGR 2005-19	
	2005	2019	2005	2019	UK	Germany
No. of startups	11,800	39,000	5,600	18,100	9%	9%
No. of unicorns (Private companies worth >\$1bn)	0	30	0	24	<i>n.a.</i>	<i>n.a.</i>
€m of VC funding	616	14,807	362	7,560	25%	24%
€m of later stage PVC funding	177	2,615	191	1,923	21%	18%
€m of foreign PVC funding	572	7,015	323	4,989	20%	22%

Source: author’s analysis on Dealroom and Pitchbook data.

The growth of the ecosystem (a “quantity” indicator) went hand in hand also with its professionalisation (“quality” indicator). The vast majority of interviewees who were active entrepreneurs or VCs across this time highlighted this evolution:

“The ecosystem has changed really dramatically. When I started 25 years ago there was nothing—literally no VC player around. Just a few corporate venture capital funds that had been set up for some reason—mostly some banks that were doing mid-market venture capital. They didn’t know how the industry works... they had very amatorial investment practices... then after 2005, new entrepreneurs and real financial investors with better understanding of VC came into the system.”

Author’s Interview with Informant-GE-VC-1-WOR  
German VC, 05/08/2021

This development is also reflected in the gradual attraction of American investors, whose contribution to VC investment increased from just over 10 percent in 2010 to around 30 percent in 2020 (Dealroom data).<sup>93</sup> In parallel, entrepreneurs changed too, triggering a virtuous cycle:

“Around that time a big change was the emergence of successful start-up examples, like Zalando. This is when founders started to change their attitude: from aiming for a 50 million euro exit [i.e., company sale or listing] to wanting to build a unicorn company. Zalando was the first but then we had HelloFresh, SumUp, etc. And VC needs big exits like this, otherwise the business model doesn’t work. Historically the challenge in Germany was that there were no big exits but now there are, and the whole industry is delivering great returns”

Author’s Interview with Informant-GE-VC-1-WOR  
German VC, 05/08/2021

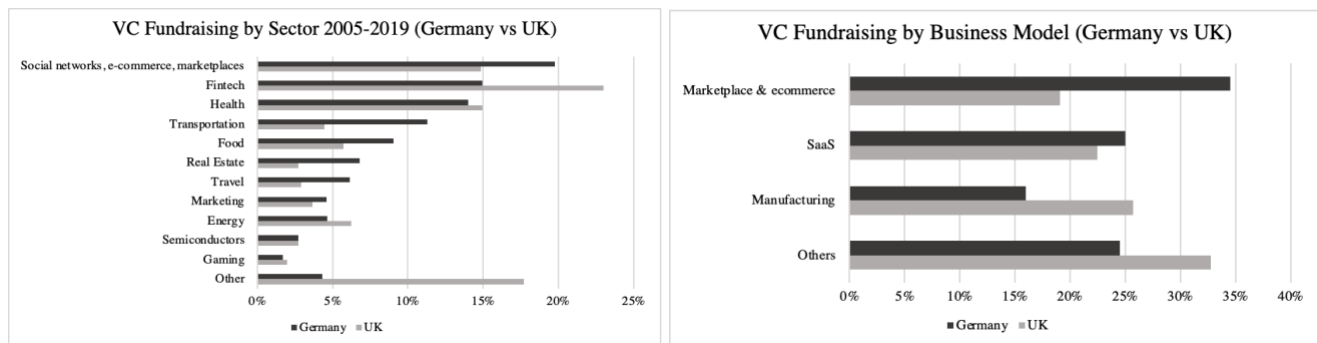
A perhaps even more surprising finding on the German ecosystem development is that it did not reflect the literature’s predictions on the country’s fields of comparative advantage in innovation, nor the

<sup>93</sup> Data also reported in Bpifrance 2023.

areas where previous government programmes had focused their resources. German start-ups were not overrepresented in German traditional industries (advanced manufacturing, in particular automotive), nor in biotechnology, nor in the business-to-business software that Casper (2007) had identified as an emerging comparative advantage niche. Instead, the ecosystem bred companies mostly similar to those of the ecosystems in liberal market economies—such as the UK and the United States—during the 2000-10s innovation wave: low-tech, digital businesses focused on disrupting business-to-customer (B2C) products, rather than inventing new technologies (author’s interview with Alberto Cresto, VC partner at German deeptech VC Lunar Ventures, 06/04/2021).

As Figure 4.8 below shows, most VC funding to German start-ups went to new, internet-based sectors and business models such as social networks, e-commerce, marketplaces, and fintech. Even within the Health category, a significant proportion was represented by digital access to healthcare products. These figures are similar to those for the UK: 70% of the top-10 funded sectors in Germany are also in the top-10 for the UK; business model-wise, Germany surprisingly had significantly less funding going to manufacturing (-50%) and more going to marketplaces (+80%) compared to the UK (author’s analysis on Dealroom data).

**Figure 4.8: VC fundraising by start-ups’ sector and business model (2005-2019)**



Source: author’s analysis on Dealroom data

A similar picture emerges when looking at the most valuable German companies. Figure 4.9 below shows the distribution of German unicorns by sector and business model. The data further confirms that the ecosystem developed around new sectors and low-tech business models, mostly focused on providing products to consumers via digital channels. Over 60% of these companies had a business-to-consumer (B2C) model, while only one in five is in the enterprise software industry. In addition, only four hold patented technologies, and none appears to be a true spin-off from scientific research, suggesting that their value rested in business model innovation, or digitally enabled operational improvements, rather than pure inventions. It is also noticeable that none of these companies is connected to the automotive manufacturing sector, which is certainly a sector where Germany has a comparative advantage.<sup>94</sup> Most strikingly, for

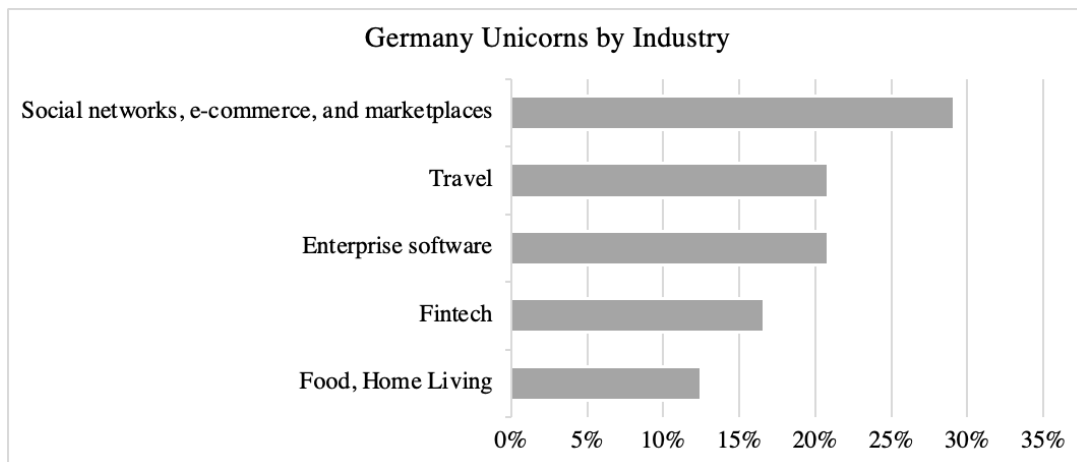
<sup>94</sup> Automotive manufacturing represents around 7-8% of German gross added value, 7.2 percent of employment, and almost 50 percent of all patents applications in Germany (see industry report at: <https://www.iwkoeln.de/en/studies/thomas-puls-manuel-fritsch-the-importance-of-the-automotive-industry-for-germany.html>); see also: [https://www.economist.com/business/2023/07/31/what-if-germany-stopped-making-cars?utm\\_medium=social-media.content&utm\\_source=linkedin&utm\\_campaign=editorial-social&utm\\_content=discovery.content](https://www.economist.com/business/2023/07/31/what-if-germany-stopped-making-cars?utm_medium=social-media.content&utm_source=linkedin&utm_campaign=editorial-social&utm_content=discovery.content)

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instance, no significant electronic vehicle player has emerged in Germany. Biotechnology is also not represented, despite the country's targeted policy efforts in bolstering that specific industry (Casper 2007).

**Figure 4.9: Business model and sector characteristics of German companies that reached unicorn status by December 2019<sup>95</sup>**

List of Unicorns:	Business Model	Holding Patents	Year Founded
CTS EVENTIM	B2C	NO	1999
Teamviewer	B2B	YES	2005
Delivery Hero	B2C	NO	2010
CityDeal	B2B	NO	2009
Hybris	B2B	NO	1997
Zalando	B2C	NO	2009
Scout24 Holding	B2C	NO	1999
Auto1 Group	B2C	YES	2012
Celonis	B2B	YES	2011
SumUp	B2B	NO	2011
N26	B2C	NO	2013
Zooplus	B2C	NO	1999
HelloFresh	B2C	NO	2011
Deposit Solutions	B2B	NO	2011
Check24	B2C	NO	1999
XING	B2C	NO	2003
Trivago	B2C	NO	2005
Hypoport Group	B2B	NO	1999
Flixbus	B2C	NO	2011
GetYourGuide	B2C	NO	2009
SUSE	B2B	NO	1992
1&1 Internet	B2B	NO	1990
Omio	B2C	YES	2012
About You	B2C	NO	2014
<b>Total % of B2B</b>	<b>37.5%</b>		
<b>Total % of B2C</b>	<b>62.5%</b>		

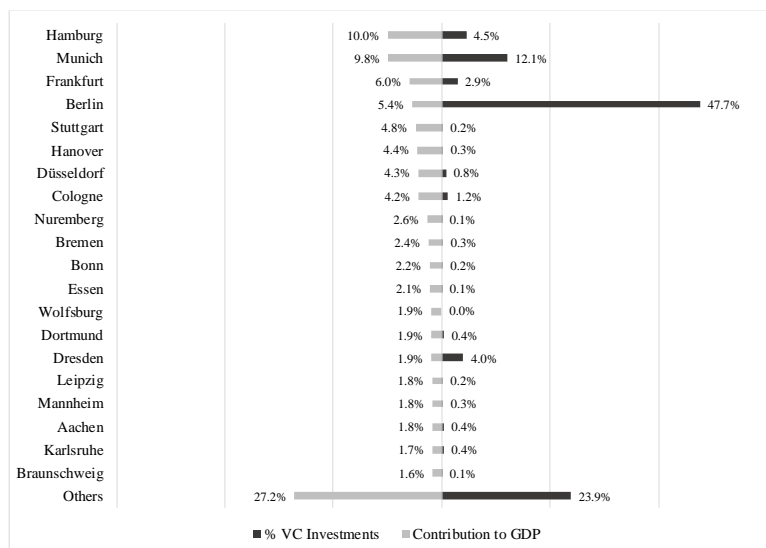


Source: author's analysis on Pitchbook, Dealroom and Atomico data

<sup>95</sup> The unicorn list excludes Wirecard, due to the scandals that emerged in 2019 and led to file for insolvency in 2020.

Geography is another lens to understand the nature of the German ecosystem development. The ecosystem grew with a different geographical distribution from the rest of the German economy. In particular, in the first 10 years start-up funding concentrated disproportionately in the city of Berlin, rather than more evenly in the main German cities that contribute the largest share of national GDP (see Figure 4.10). As of 2019, Berlin still hosts twice as many start-ups as Germany’s second city by start-up numbers (Hamburg).<sup>96</sup> Determining exactly what rendered Berlin such a fertile ground is beyond the scope of this study. However, its prominence in the ecosystem further shows that the innovation economy in Germany developed rather separately from its traditional industries.

**Figure 4.10: German cities, contribution to GDP vs. share of VC investment volume received**



Source: author’s analysis on Pitchbook data and German cities’ (2018) GDP statistics from [www.statistik-bw.de](http://www.statistik-bw.de)

Insight from interviews partly explain these statistics. Entrepreneurs and VC alike highlighted that the German start-ups in the 2000s focused mostly on creating European versions of highly efficient business models that had emerged abroad. As an investor at one of Germany’s oldest VC funds put it, “in the early days of the German ecosystem, the ecosystem was dominated by the ‘copy-cat’ start-up model... execution-based businesses that were very successful from a monetary point of view but not so focused on genuine innovation like deep tech” (Ruessmann, EarlyBird VC, 18/05/2021). “In the early days”—another pioneering German investor explains—“it was about testing a hypothesis – for example, ‘let’s try to sell pizza online;’ then have a minimum viable product and deploying online marketing at its best to scale it. This is ‘low tech’: technology is just an accelerator for scaling the business” (Informant-GE-VC-1-WOR, German VC 05/08/2021). The iconic and most influential business behind this approach was Rocket Internet, a “start-up factory” company founded in 2007 in Berlin. Almost all interviewees cited the company as the cornerstone of Germany’s innovation ecosystem, which goes some way also to explaining the disproportionate role of the country’s capital. Its model arguably turned on its head the

<sup>96</sup> Data from <https://www.deutschland.de/en/germany-year-usa-20182019-startup-capital-berlin>

common conception of innovation: Rocket Internet's companies rarely *invented* anything. Rather, Rocket Internet selected a high-calibre team, offered it the necessary funding, and guided it in replicating a business idea that had already proven successful elsewhere in the world, often in the United States. As a result, by 2019 this "factory" had created and launched over 100 start-ups employing over 25 thousand employees all over the world (Dealroom data; The Economist 2014). Out of the 14 German unicorns "born" between 2007 and 2019, five were Rocket Internet's investments (author's analysis on Dealroom data). Even more importantly, Rocket Internet became a start-up school: as one interviewer put it, "almost every start-up in Germany is connected somewhat to Rocket" (author's interview with Chris Gamon, co-founder of Razor Group, 10/03/2021). Indeed, over 400 current German start-up founders and CEOs are former Rocket Internet employees (author's analysis on LinkedIn data). As several interviewees explained, Rocket Internet developed a top-down, analytical model for structuring a start-up, an approach that some have defined as "very Germanic," because of its focus on precise execution (Gamon, Razor start-up, 10/03/2021). The model was deployed over and over, mostly in the digital, e-commerce and marketplace sub-sectors. This method "taught" managerial and commercial best practices to all the teams that were supported by the company. Arguably, the model was also particularly fit to break some intrinsic barriers of the German economy, in particular in the labour market. As one interviewee explained, Rocket Internet's approach significantly reduced the risk-reward trade-off for high-quality talent with entrepreneurial aspirations: "it has provided an interesting bridge [for potential entrepreneurs], with a lower downside, because they provided a good salary, and the infrastructure to support you" (Gamon, Razor start-up, 10/03/2021). The model had its limits but, as interviewees put it, "it had an extremely important role: it started the ecosystem when Berlin was nothing" and it fundamentally contributed to the "professionalisation" of the start-up industry (Gamon, Razor start-up, 10/03/2021; Informant-GE-VC-1-WOR, German VC, 05/08/2021; Ruessmann, EarlyBird VC, 18/05/2021).

In summary, thus, Germany in the late 2000s and 2010s experienced the surprising growth of an innovation ecosystem largely based on digital companies. The phenomenon in some way defied the predictions of the VoC literature, which was sceptical about the chances that start-ups and venture capital could proliferate in a CME. It is thus more consistent with the literature that argues that the German economy developed dualistically in the twenty years since the nineties (Palier and Thelen 2010, Thelen 2019). The liberalisations created pockets of the German economy (sectors and labour market segments) where the coordination mechanisms and rigidities typical of Germany's economy do not apply. In these new sectors, a German model of disruptive innovation emerged, with characteristics more similar to those of liberal market economies. At the same time, the generally low-tech characteristics of the companies confirmed that the ecosystem was built more on German ability at efficient execution than on radical technological innovation per se.

But what was the role of government in all of this? The comparison with neighbouring France, where state intervention has been highly visible, has made observers think of the German story as much more private-sector led (Informant-EU-GVC-1-ZYO, EIF, 25/11/2020; Ruessmann, EarlyBird VC,

18/05/2021).<sup>97</sup> While there is truth to this, the next section will show that German policymakers were able to design new GVC policies that provided a crucial complement to the emerging private sector activity.

#### **4.5 The evolution of German innovation policies: innovative institutions for funding innovation**

This section analyses how German government venture capital policies evolved in the 2000s and it provides three important insights. First, it finds that public policies were more central to the ecosystem growth than implied in common storytelling by the industry. Second, it shows that programmes were successful when they veered towards a Partnership at Arm's Length (PAL) approach, embracing governance and practices more akin to those of private VCs than to those of the German bureaucracy and traditional public financing institutions. Such highly market-oriented approach enabled the state to support the private-led development of the German ecosystem. It provided critical capital that complemented private initiatives such as Rocket Internet, while renouncing to the ambition of shaping the innovation direction of the ecosystem, which remained mostly low-tech focused. Finally, it explains that the emergence of this policy approach was not a simple and linear process: the fragmented nature of Germany's policy landscape meant that while some new models were tried and proved successful, it took time for the main traditional institution, KfW, to adopt the new best practice and change its model of innovation intervention. This non-linear development contrasts particularly with the case of France, where the creation of Bpifrance was a significant event but within a consistent, gradual, and centrally-drive evolution of innovation policy. This section first provides a general introduction on the situation in Germany after the bursting of the dot.com bubble (5.1). It then considers the main policies of direct investment (section 5.2) and indirect investment (5.3): it explains why they were structured in a certain way, how their model supported the ecosystem, and how policymakers evolved these policies by learning from the mistakes of previous less successful German GVC initiatives.

##### *4.5.1 Policy reckoning in Germany after the dot.com bubble*

The bursting of the dot.com bubble in the early two-thousands dealt a significant blow to the nascent German ecosystem and forced policymakers to reconsider their policy approach.

After 2001, the emerging technology industry, which had been propelled by government policies and by the growing bubble, collapsed. As Casper documented, the new technology stock exchange Neuer Markt lost 96 percent of its value, leading to most firms delisting. Venture capital investments in biotechnology, for instance, which had reached over half a billion dollars in 2000 and 2001, plummeted to less than 200 million dollars in 2002 (Casper 2007). As Dr. Johannes Velling, one of the key innovation policymakers within BMWK at the time, recalls “after the acceleration of the dot.com, there was a plunge in venture capital: all the VCs and institutional investors who invested in those lost almost all of their

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<sup>97</sup> Author's interview with Informant-EU-GVC-1-ZYO, Senior Official at the EIF, 25/11/2020 and 20/01/2021; and with Julius Ruessmann, Principal at German VC Early Bird, 18/05/2021.

capital” (interview with Dr. Johannes Velling, former senior official at BMWK, 07/01/2021<sup>98</sup>). The events confirmed many expectations of the VoC and GVC literature about the institutional obstacles and policy mistakes that doom such innovation policies. First, the labour market had not adjusted to the high-turnover/high-recycling dynamics typical of entrepreneurial ecosystems in liberal market economies. Many start-ups, especially in biotech, remained “tiny enterprises housed within incubators and technology parks,” more akin to academic projects and unable to attract the technical and commercial talent needed to productise inventions and turn them into successful businesses (Casper 2007). Capital markets and private equity markets for technology companies demonstrated to be “thin,” opportunistic, and largely not professionalised. With reference to the two common types of policy mistakes identified by Lerner (2009)—“bad design” and “bad implementation”—government policies had failed mostly because of design issues: force-feeding a specific new high-tech industry (biotechnology) from scratch was probably overly-ambitious and the GVC scheme offered incentives that promoted poor private investment practices (see details in section 5.2.6).

As a response to the situation, in 2004 the Schröder Government launched the Partnership for Innovation, a consultation process with experts from different fields to “examine ways to help boost economic growth and create more jobs... aim at improving the quality of science education and increase funding for research programs... to make sure that Germany’s economic prosperity will continue well into the future.”<sup>99</sup> In a typically German, coordinated manner, the process involved all main stakeholders of the German economy, who were divided in 15 working groups to design proposals on different policy areas related to innovation. One of these working groups was tasked with the issue of risk capital and how to revive the venture industry, recalls Dr. Velling, who chaired this group (Velling, BMWK, 07/01/2021). This was a paradigmatic example of what Dunlop and Radaelli call a “reflexive policy learning” process (Dunlop and Radaelli 2018). The crisis had undermined many of the norms, assumptions, and actors’ authority, opening the way for a redefinition of approach and proposals for innovative policies. It was during this time that the most important GVC programmes Germany put in place in the following years were designed. As the next sections will show, a group of policy entrepreneurs took the opportunity to mark a discontinuity with past policies, in a clear example of what Hall identified as a third order policy paradigm shift (Hall 1993). Until then, as explained in the previous sections, Germany had focused on promoting specific industries (in particular biotechnology) through financing tools managed by the traditional developmental institutions of the country. Learning from those mistakes, these policymakers collaborated with non-state actors to design new programmes, with a common feature: an arm’s length separation from the state apparatus and CME institutions, to strengthen state capacity by embracing VC-like practices and support the development of the private VC industry. The next sections analyse in detail these policies, dividing them between direct and indirect investments.

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<sup>98</sup> Dr. Velling was Head of Section within BMWK at the time HTGF was created and was the person who led the design and launch of HTGF.

<sup>99</sup> See announcement at: <https://www.dw.com/en/germany-focuses-on-innovation/a-1091097>

### 4.5.2 Germany's direct GVC: the High-Tech Gründerfonds, a GVC with little government

Coming out of the dot.com crisis, Germany launched a very innovative and successful direct government fund, the *High-Tech Gründerfonds* (HTGF), which the government co-designed with the private sector. The HTGF was the main result of the Partnership for Innovation's working group on risk capital. It is a seed-stage fund with an unconventional and innovative structure: the capital is primarily public (from the ERP Special Fund) but the fund is structured as a corporate venture capital fund, with the governance including several German private companies, which oversee the investment decisions. The state puts the bulk of the money, but it has almost no say in the investments. This outcome is a good example of the compromise between the forces of political will to intervene in innovation on one side, and the restraints provided by non-state actors, on the other.

This section explains the policy process behind HTGF, how the fund has worked and, importantly, how it has differed from three other German direct GVCs tried over time—the WFG, TBG and Startfonds. HTGF succeeded where other programmes failed because, although it retains some peculiarly German institutional features, it shunned those elements of the traditional German model that constituted obstacles to effective GVC. In summary, it moved towards the right side of the framework, towards the PAL approach: it was an autonomous organisation, completely separate from government, and that internalised the necessary investment competences, processes, and governance to replicate a private VC. The other programmes, in contrast, were hindered by KfW's banking-focused governance and processes or tried to do plain co-investments with private investors at a time when the private VC industry did not truly exist yet. Because of Germany's fragmented policy landscape, however, HTGF operated alongside some of these other less effective programmes for several years, as it took time for the policy learning to spread across all institutions involved in innovation support, in particular KfW.

#### 4.5.2.1 The genesis of HTGF: the state relies on private corporates to constrain itself

HTGF's founding was a quintessentially CME policymaking process—involving multiple stakeholders of the German economy—but was also a true moment of “policy reflection,” where actors were clear about the failure of past policies but very unsure on how to proceed (Dunlop and Radaelli 2018). Policymakers involved the large private corporates with experience in VC in the policy design and, through this process, the German state was able to leap forward. In particular, the corporates involved pushed to ensure that the new organisation, separate from KfW, embraced those fundamental practices of private VCs that it had been all but impossible to assimilate within the public bank.

In a very German fashion, the political mandate to resolve the risk capital problem was executed by convening into the working group the three main stakeholders of the innovation ecosystem: 1) the state, represented by one official from the BMWK and one from the Ministry of Education and Research; 2) innovation investors, represented by the corporate venture capital experts from German industry giants BASF, Deutsche Telecom, and Siemens; 3) R&D institutions, in the person of a Fraunhofer Institute representative. It is noteworthy that no representative of KfW was originally involved as the institution had just had a negative experience with venture investments and it was thought that its involvement might

prevent a full re-thinking of the policy approach (Velling, BMWK, 07/01/2021). The moment, thus, exhibited the three key features of a reflexive policy learning process (Dunlop and Radaelli 2018): no actor really knew what to do about the issue, all were interested to engage in a dialogue about it, and none had a greater authority than the others on the subject matter. These six people met around 10 times during 2004 and eventually developed a very precise proposal for a new government fund (Velling, BMWK, 07/01/2021; Brandkamp, HTGF, 02/12/2020; Informant-GE-GVC-7-NBR, German corporate, 13/01/2021<sup>100</sup>). The process, however, was not easy and the outcome very uncertain. All key people who were involved in the process highlighted during interviews that the result was largely due to the involvement of the private companies (interviews with Velling, BMWK, 07/01/2021; Brandkamp, HTGF, 02/12/2020; Informant-GE-GVC-7-NBR, German corporate, 13/01/2021). Their contribution redefined priorities and introduced a new policy design approach, in at least three ways.

First, Dr. Velling, who led the process, recalls that the very idea of a new fund with state money was initially out of the question: “when at the second meeting the industry representatives proposed a privately coined structure of a new fund with public money, I said ‘forget it, we will never be able to bring public money into that construct’” (Velling, BMWK, 07/01/2021). The losses of the previous years and the costs of creating and running a new entity made its creation very unlikely. As the first Managing Director of HTGF explained, to argue for a new and separate organisation was particularly hard because “you always need to justify why to spend public money to create a *new* organisation” (Informant-GE-GVC-2-WTR 02/12/2020). However, the presence and conviction of German corporates provided momentum to the initiative and, Dr. Velling argues, lent credibility to it in the Government’s eyes. “Key was the participation of the industry; and by this I mean ‘large industry,’ corporates that are taken seriously by the Government” (Velling, BMWK, 07/01/2021). The combination of this industry support and Dr. Velling’s expertise in German law and EU regulation made it possible to come up with a proposal that was legally feasible and palatable for the government.

Second, BMWK policymakers and the private sector representatives formed a coalition with alignment of views on the structure and governance of the new fund (interviews with Velling, BMWK, 07/01/2021; Brandkamp, HTGF, 02/12/2020; Informant-GE-GVC-7-NBR, German corporate, 13/01/2021). In particular, both groups considered fundamental that there should be no channels for politics or the bureaucracy to interfere with investment decisions: as Velling put it “for these things to work there must be no room for the public side to decide on investment decisions—it all must be decided by the experts and partners in the investment fund, not by government or civil servants” (Velling, BMWK, 07/01/2021). Corporates agreed and explicitly requested that HTGF be “a separate organisation from KfW, fast-moving, able to talk to start-ups and act in a more entrepreneurial way” (Informant-GE-GVC-2-WTR 02/12/2020). Informant-GE-GVC-7-NBR, who represented one of the main corporates at the table, explained that “we corporates were keen that HTGF should not be a traditional public vehicle but rather be like a private venture capital fund and act like one. And this was a shared opinion with the representatives of BMWK. The problem was how to do this within the public constraints and EU state aid laws” (Informant-GE-GVC-7-NBR, German corporate, 13/01/2021).

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<sup>100</sup> Informant-GE-GVC-7-NBR is a long-term executive at one of the corporates involved in HTGF.

Finally, the private companies turned out to be crucial because their capital commitments ensured the launch of the fund. The corporates had pledged to contribute to the fund's capital, if the government gave it the green light. This commitment was ultimately decisive. When a year later most of the funding originally planned for the Partnership for Innovation initiatives was cancelled, the momentum provided by the corporates' pledge meant HTGF was one of the very few proposals emerging from the consultation process that actually launched. As Velling recalls, corporates at the time turned to the government and said, "we stick to it, so you government now need to stick to it too" (Velling, BMWK, 07/01/2021).

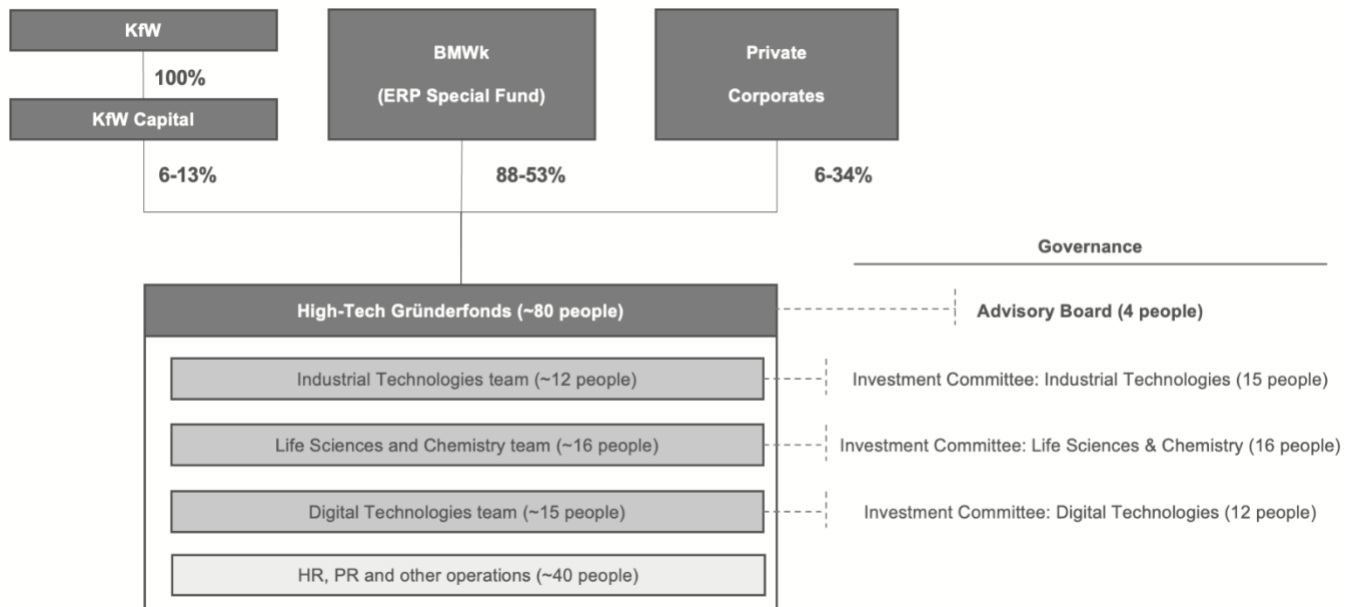
In summary, after the dot.com bubble, the German government had decided it needed to do something to revitalise the innovation ecosystem; but it did not know what. The main institution that had been involved in similar policies, KfW, had lost credibility due to recent failures. The government thus initiated a moment of open confrontation and thinking. In this reflexive policy learning context, a very small coalition of creative bureaucrats and private companies redefined the approach and proposed an innovative policy design, with one priority: that the new organisation would act as much as possible like a private venture capital fund. In other words: they ensured a PAL type of relationship with the market. The result is a fund with a governance that still reflects the German CME approach but at the same time embraces VC practices. The influence and monetary contribution of the corporates was essential to "pull" the design away from a traditional government intervention and make it more aligned with a Market Creator State model.

### 4.5.2.2 How HTGF works

The result of the negotiations is a government venture capital fund with four core characteristics: 1) it is separate from KfW, 2) it has a governance that includes all key German innovation stakeholders—the government, KfW, private corporates, and research institutes, 3) it acts with the operating freedom of a private fund, with almost no influence from the public side, 4) it focuses on very early-stage investments in most sectors. In summary, HTGF was constructed as a seed-stage, corporate venture capital fund where the government is only one of the shareholders—the one that has the most financial exposure but, oddly, the least say in the decisions. Because of its structure, it has been able to play what I define as an "incubator role" in the German ecosystem: it invests in very high-risk companies at the stages where private VCs do not want to invest yet, thus de-risking later-stage investments for them. Its role is thus comparable to Bpifrance's direct investments in the riskiest sectors, but with the important difference that it does not need co-investors and thus can intervene *before* PVCs.

As Figure 4.11 shows, HTGF exists as a separate entity from KfW, which is involved solely as a minority shareholder. In practice, this means that HTGF does not abide by the rules and practices of the public bank. Similarly, its employees are not KfW employees and are hired through a different and separate process.

**Figure 4.11: HTGF, capital and organisational structure**



Source: representation by author, based on data collected during interviews with HTGF staff and policymakers and HTGF internal materials; shareholding ranges reflect over time evolution, because HTGF was recapitalised several times and private corporates have gradually increased their share

From a capital point of view, most of the resources are public: the ERP Special Fund contributes the majority, with a smaller component coming from KfW, through KfW Capital.<sup>101</sup> Corporates’ contribution was originally around 15 million euros: it has always been a minority but has been growing over time. There have been three iterations of HTGF; a fourth fund started fundraising in 2022. Table 4.3 below shows the progression of the size of the HTGF funds.

**Table 4.3: Launch date and size of HTGF funds**

Programme	Fund Size	Year Launched
<b>Fund I</b>	€272m	2004-5
<b>Fund II</b>	€304m	2011
<b>Fund III</b>	€320m	2017
<b>Fund IV</b>	>€400m	fundraising in 2022-23

Source: data collected by author during interviews with HTGF staff and policymakers

Operationally, the fund focusses entirely on very early stage (also known as “seed”) start-ups and aims to be a “de-riskier” for the ecosystem: it intervenes at those stages where private investors are particularly reluctant to invest, since the failure risk is still very high (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020; Brandkamp, HTGF, 02/12/2020; Informant-GE-VC-3-TZC, 10/05/2021). This strategy reflects a precise diagnosis by the working group. First, that after the bubble burst the seed market needed the most support. Indeed, data analysis shows that there were no more than 20 seed deals per year between

<sup>101</sup> KfW Capital is the equity investment arm of KfW, set up in 2015 to manage all equity investments. Originally, KfW had a direct stake into HTGF.

2002 and 2005 (Dealroom data). Second, that there were no private investors in Germany at the time willing to take that level of risk and therefore that the fund needed to be able to operate independently, without requirements for private co-investor (Velling, BMWK, 07/01/2021; Brandkamp, HTGF, 02/12/2020; Dr. Von Frankenberg, HTGF, 25/05/2021<sup>102</sup>). Dr. Velling, thus, was able to identify an exception to European State-Aid regulation that allowed member states to invest directly in start-ups without private co-investor, via convertible loans with a size limit (Informant-GE-GVC-7-NBR, German corporate, 13/01/2021; Dr. Von Frankenberg, HTGF, 25/05/2021).<sup>103</sup> Historically, HTGF invested a maximum of 600 thousand euros in its first investment in a start-up and could do further follow-on investments (with co-investors) for up to a cumulative total of three million euros per company. This strategy and *modus operandi* make HTGF a very exceptional direct GVC in Europe: most GVCs act solely as co-investors, thus providing extra capital to those companies that have already attracted private funds but where further resources are needed to meet the start-ups' capital needs. HTGF, instead, has taken on the role of being the first institutional investor in companies, providing the first sizable round and helping them prepare to raise further resources from private investors. The strategy was extremely ambitious: most public ventures of this type, where the state invests independently, have proven disastrous (Lerner 2009).

To be sure, the presence of mostly public capital is not the only difference between HTGF and a regular private VC. HTGF's governance reflects very clearly both the policymaking process behind the fund and the coordinated approach typical of the German CME model. Its committees and board are comprised of representatives of all the stakeholders of the innovation ecosystem who were involved in the design of the policy: the government, corporates, the research institutes, and KfW. The fund has three Investment Committees and an Investor Advisory Board. The Investment Committees, divided by domain of expertise, are comprised entirely of technical experts, indicated by each stakeholder. They evaluate and approve/reject each investment that is proposed by the investment teams. The Advisory Board, instead, has two government representatives, one from KfW Capital, and one from the industry. However, it has solely a high-level supervisory role—it oversees the HTGF's management activity and provides strategic advice (interviews with Velling, BMWK, 07/01/2021; Informant-GE-GVC-7-NBR, German corporate, 13/01/2021; Informant-GE-GVC-1-UTR, HTGF, 24/11/2020; and info on the HTGF website).

In short, with HTGF the German government created an innovative instrument as far removed as possible from the traditional institution of German development but that retained those German characteristics that policymakers considered compatible with the VC model. It is a perfect and original example of the hybrid compromises that European policymakers have found, by engaging non-state actors, between a traditional interventionist model and a hands-off approach. The next sections apply the theoretical framework proposed in this research to understand why this approach proved successful and why it was different from comparable GVC initiatives.

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<sup>102</sup> Author's interview with Dr. Alex v. Frankenberg, a long-time manager at HTGF and Managing Director at the time of the interview

<sup>103</sup> The exception was based on the fact that convertible loans, by being semi-equity instruments, do not set a valuation for the company.

4.5.2.3 HTGF's relationship with the market

The X axis of my theoretical framework is about how a GVC relates to its private counterparts. From the evidence, it emerges clearly that for HTGF this relationship took the form of a Partnership at Arm's Length: the state did not act in isolation from the market but rather partnered with private firms to create an organisation that replicated as much as possible a private fund. The governance of this new GVC allowed it both to be highly integrated with the rest of the VC industry and to retain independence, thus avoiding state-capture risks.

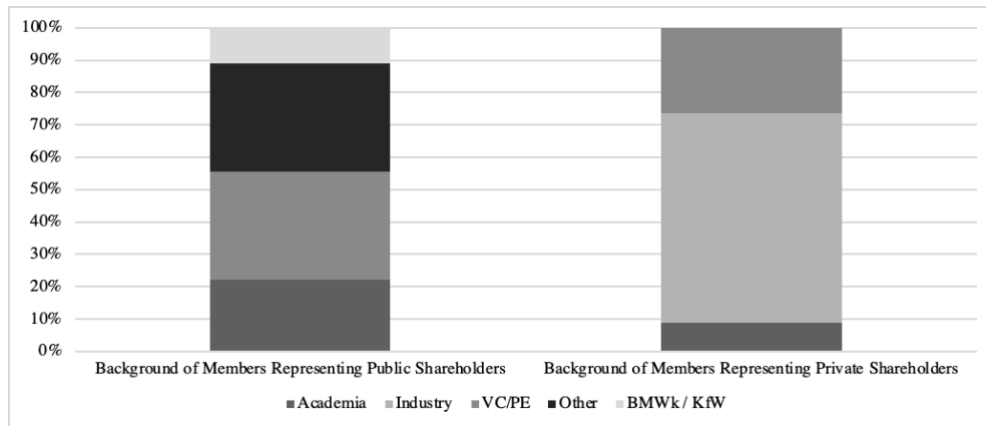
While the governance of HTGF exhibits peculiarities that distinguish it from a regular PVC, three elements rendered it similar. First, the involvement of corporates in the governance and capital structure of the fund was a driving force to ensure it would operate following a private-sector mindset rather than a state bureaucracy one. Separating it from KfW was the first critical step, to avoid that the new institution would have to follow the processes of the state development bank, which would have hindered its responsiveness and flexibility of operations (Velling, BMWK, 07/01/2021; Informant-GE-GVC-7-NBR, German corporate, 13/01/2021; Brandkamp, HTGF, 02/12/2020). In addition, the corporates requested that all investment decisions be made without any government officials' interference. This was reflected in the composition of the investment committees, which are filled with corporate managers and industry experts (author's analysis in Figure 4.12). The fund has three investment committees, one for each main investment area: Industrial Technology, Life Science and Chemistry, and Digital Tech. They are in charge of evaluating the deals that the investment teams propose and approving the investments. Each committee has around 15 members, comprised of corporates' and government (BMWK and KfW) representatives. Importantly, however, the latter are not bureaucrats or KfW staff but also external industry experts (typically entrepreneurs, VCs, or professors, see Figure 4.12). As one seasoned investor at HTGF explained: "fortunately the Ministry does not send its own bureaucrats to the committees; they choose people who have the experience to understand the nature of start-ups; they are completely independent, with no influence from the Ministry. In fact, it is usually HTGF management that proposes the experts to the Ministry and the Ministry approves them" (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020). This approach reflects the views of BMWK officials, who also strived to avoid political interference in the investment decisions "because we do not want to take the decisions; we just want them to be taken in a good way, *in a market way*" (interview with BMWK representatives, Informant-GE-GOV-1-UOL and Informant-GE-GOV-2-WHL 23/07/2021; italics by the author). Each corporate Limited Partner can participate to maximum two investment committees and has voting power only in one.<sup>104</sup> The governance, thus, although it is representative of all stakeholders, is highly insulated from political interference and relies on private sector expertise for its investment decisions. This was largely due to the corporates' involvement in the design of the policy. As two key people involved in the process explained: "we gave the fund a lot of freedom and that's because the industry was behind the scenes. They guaranteed, in a way, that nobody from the Government or the KfW, which later became an LP, would intervene in certain ways that might not be helpful. So, the fund was really free to act as they [the corporates, and management]

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<sup>104</sup> No veto powers are granted although, with the growing number of corporates becoming involved in HTGF over time, the overall corporates' voting power was capped at 50 percent (which is still higher than their capital contribution) (Dr. Von Frankenberg, HTGF, 25/05/2021).

thought it was necessary” (Velling, BMWK, 07/01/2021). Instead “politicians viewed it differently” but the presence of the corporates helped strengthen the argument that HTGF should be out of the control of public organisations (Brandkamp, HTGF, 02/12/2020). In short, the BMWK officials involved in the process were able to utilise corporates as allies in the policy design process to insulate HTGF from the potential public interference.

**Figure 4.12: HTGF investment committees’ composition by members’ background**



Investment Committee	Total members	Members representing public shareholders					Members representing private shareholders			
		Academia	Industry	VC/PE	Other	BMWk / KfW	Academia	Industry	VC/PE	Other
Industrial Technology	15	1	0	1	0	0	1	8	4	0
Life Sciences and Chemistry	16	1	0	1	1	1	2	8	2	0
Digital Technologies	12	0	0	1	2	0	0	6	3	0
<b>Total</b>	<b>43</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>22</b>	<b>9</b>	<b>0</b>

Source: author’s analysis based on HTGF publicly available information

A second indicator of HTGF’s PAL approach was its effort to internalise competences. It recruited an investment team with profiles and backgrounds typical of private sector investors and as different as possible from the bureaucracy or KfW’s staff. “The team was built very carefully, with almost nobody from KfW or the Ministry” explains a current investment manager at the fund, “we have always been trying to recruit only entrepreneurs and investors from the private sector. When we hire, the most important question we ask is whether a candidate has entrepreneurial spirit” (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020). In practice, at the beginning the core team had to rely on some resources from KfW: the top position, Managing Director, went to an investment manager of the late public fund TBG. He recalls originally recruiting a couple of people very selectively from KfW and one from Siemens’ corporate venture capital arm. Then they started recruiting in the private market, which at the time was full of former investors that were out of a job after the dot.com bubble. HTGF’s independence from public institutions allowed for a recruitment process very different from that of the civil service: “We looked for three pillars in the people we hired”—recalls Brandkamp—“understanding of technology (scientists, physicists, etc.), transactional experience, and—most important—entrepreneurial experience (best if they worked for or founded a start-up before) ... We were very selective: we hired 2 out of 100 people that we evaluated and at the beginning we staid without the additional team members we needed because we were rejecting so many” (Brandkamp, HTGF, 02/12/2020). By 2020, however, the team had reached around 80

professionals and this author’s analysis on existing staff’s profiles confirms that around 90% of current professionals come from non-government background—mostly private investment companies, consulting, or industry.<sup>105</sup> The team has also been recruited to reflect the specific role that HTGF aims to play in the ecosystem: to fund high-tech companies at the very early stage—where technological content matters the most—it needs a technically very competent team of investors. Indeed, data obtained by the author from HTGF shows that the fund has a very high proportion of professionals with doctoral degrees (Table 4.4), significantly higher than a traditional venture capital fund (Cresto, Lunar VC, 06/04/2021).<sup>106</sup>

**Table 4.4: Level of education of HTGF investment professionals**

Investment Team	Total members	Members with PhDs	% with PhDs
Industrial Technology	12	5	42%
Life Sciences and Chemistry	16	11	69%
Digital Technologies	15	3	20%
<b>Total</b>	<b>43</b>	<b>19</b>	<b>44%</b>

*Source: data collected by author from HTGF management; HTGF internal documentation; note: the difference between the 80 professionals mentioned above and the 43 listed here are HTGF employees not working in investment functions (e.g., controlling, HR, marketing)*

This is fundamental because HTGF’s model, differently from other GVCs, does not rely on private co-investor to co-conduct the analysis and due diligence on companies. Instead, it needs to house all the expertise necessary for making the investment decision: not only business knowledge and experience drafting investment contracts, but also scientific expertise to understand technological innovations thoroughly. This investment team expertise is also complemented by the composition of the committees described above: a high proportion of industry experts in the committees means that investment teams can rely also on their comments and opinions to evaluate the opportunities that arise (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020). As a consequence, HTGF has the competences to conduct very in-depth independent analyses on each investment opportunity. As an investee reported, “they do more technical due diligence than some other VCs would do for this type of early-stage investing... So they would just go in more depth than other investors, just very thorough” (author’s interview with Max Laarman, founder of German start-up Emma, 17/03/2021). In short, HTGF, by being entirely independent of the public apparatus, was able to build a more entrepreneurial and highly technical team, attracting profiles that it would have struggled to hire within a ministry or at a traditional public institution like KfW.

Finally, HTGF has also created a system of performance incentives very similar to that of private funds, making investment managers accountable for their portfolio of companies and rewarding them financially if the portfolio does well. Private VC funds typically have the so-called “carried interest”—at the end of the fund’s life, the investment team receives 15-30 percent of the profits that it generates for the limited partners, beyond a pre-agreed return threshold (hurdle rate). While HTGF did not adopt exactly the private practice, it found a way to replicate its principles within a semi-public institution. The scheme has evolved over time to adapt to the maturing of the industry, but it has been broadly comprised of two

<sup>105</sup> Analysis conducted by the author, using LinkedIn. 50 out of 80 current staff were identified (62.5% sample). Of these, 46 had a private sector background (92%).

<sup>106</sup> For instance, Bengtsson and Hsu 2010 found that 13 percent of VC partners hold PhDs

profit sharing components, one at the fund level, and one at the individual portfolio manager level. In both cases, the yearly bonuses are paid only if the fund generates extra profit beyond the minimum return agreed with investors (Table 4.5 shows the scheme’s evolution over time). This has translated into substantial disbursements in bonuses over the years: until 2020 HTGF had paid out 20 million euros to its investment teams across the first two funds (Dr. Von Frankenberg, HTGF, 25/05/2021). HTGF management believes this aspect has been fundamental to strengthen HTGF over time, retaining and selecting the best performing managers: “we have clear goals ... if people meet their goals, they are rewarded, if they miss their goals, they are not rewarded; and if they miss them by a lot, they are asked to leave ... This really improves performance” (Dr. Von Frankenberg, HTGF, 25/05/2021). It has also ensured that HTGF could maintain some top talent even when a growing private VC industry started to compete for it (Dr. Von Frankenberg, HTGF, 25/05/2021). Note that such structured performance incentives are highly unconventional for GVC funds: interviews with GVC officials in other countries have stressed that it is generally very difficult to convince public authorities to provide performance bonuses from pools of public resources. Indeed, a recent survey found that only 12 percent of GVCs in Europe uses carried interest schemes (Le Pedeven et al. 2023; note that the statistics likely includes HTGF). At the same time, it is critical to note the nature of these incentives: both schemes were anchored on very realistic return targets for the funds. Policymakers, recognising the innovative ambition of HTGF and the structural challenges of Germany’s VC market, did not expect HTGF to deliver top-of-the-industry returns. Instead, they calibrated the targets as the ecosystem developed. This allowed for this incentive scheme to be “truly incentivising” but also not to lose track of the public policy role of HTGF. Vice versa, too high return targets for HTGF would have likely both prevented its role as a public actor (de-risking investments for the privates) and not incentivised its staff, who would have perceived the performance bonuses as unattainable.

**Table 4.5: HTGF performance incentive scheme**

Parameters of performance bonus	2005-2016	After 2016
Minimum payback (proportion of capital invested after which profit share is applied)	0.5x	1.0x
Fund-level profit share % distributed to all HTGF team	1.7%	10.0%
Profit-share % to managers if their sub-portfolio performs above minimum payback	0%	7%
<b>Total performance bonus %</b>	<b>1.7%</b>	<b>17%</b>

Source: created by author based on interviews with HTGF management

All in all, therefore, the combination of these three features (closer to corporates than to government; team composition; and performance incentives) has meant that HTGF employees feel and behave as if they were in a fully private fund rather than in the public bureaucracy. The comment of a long-time investment manager at the fund perhaps summarises it best: “I do *not do economic development*. The intention here is to fund successful start-up companies and provide *economically beneficial investments to our LPs*” (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020; emphasis by the author). High-level statistics on the fund’s activity confirm that it operates with the selectivity of a private firm: in 2020, for instance, the team invested in only 3% of the over 2000 companies it reviewed (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020; HTGF internal documentation). HTGF, therefore, is a very peculiar GVC. It is

public, because it is predominantly publicly owned and funded. However, it has been carefully designed not to look like one and instead to replicate a private fund. This positions it squarely in the PAL side of the framework.

PAL also means a state-market relationship where the state is an equal partner and avoids being “captured” by private interests. Indeed, HTGF’s “commercial” approach is not free of potential downsides. The literature warns that the risk of state capture is high when the state is so embedded with the private sector (Hellman et al. 2000; Evans 1995): an effective state needs to collaborate with the private sector but also retain its policy objectives without succumbing to the interests of private companies. The history of industrial policy is indeed full of examples state-market relationships degenerating into state capture (e.g., see the cautionary tale of the Asian developmental state and financial crisis of the late nineties). In the HTGF case it must be pondered whether BMWK is delivering “a bad deal” to the German taxpayer and, if not, what allowed for it. Apart from the fund’s performance, which is discussed later, the key aspects to investigate is whether the state is paying the right amount to HTGF’s management team and whether the corporate partners are not freeriding on the state money, since they heavily influence the governance even with small financial contributions.

Although salary figures are not available, the details on the performance mechanism explained above suggest that management is rewarded in line with market standards. Typical “carried interests” for a private VC fund are 15-20% above the hurdle rate, compared to the 17% shown above. More broadly, it is fundamental to note that the mechanism of the carried interest means that employees are rewarded only in case of *excess profit*, beyond what the state has considered a reasonable baseline return. There are two reasons that emerged from fieldwork and that explain why the state might have had enough bargaining power to obtain a reasonable agreement. First, private corporates that participate to the fund as investors have similar interests to those of the state: they are putting money into the fund, so they want it to be utilised for investments, not to overpay management. Second, the timing of HTGF’s launch gave an upper hand to the government and its corporate co-investors: after the dot.com bubble burst many of the few existing VC professionals found themselves out of a job, with funds closing down, capital dissipated, and very few institutional investors willing to provide capital to private VCs. In this context, the opportunity to work in a very large fund, albeit publicly owned, was an appealing alternative. In other words, HTGF was in a position to attract private sector talent without compromising on the engagement terms. This storyline resonates with the case of France, where Bpifrance’s management has pointed to the importance of having hired investment talent during downmarket moments, when fewer employment alternatives were available to these professionals. Vice-versa, this fact poses a general cautionary insight for policymakers: creating similar programmes during more bullish markets might be a much dearer endeavour.

Finally, there could also be a risk that the private corporates freeride on public resources to advance their own strategic priorities. The distributed governance of the fund, however, limits this risk. Since all corporates invest in the same fund, no single one has a dominating share. Each corporate’s veto power also means that potential “pet projects” of one corporate can be vetoed by the others. In other words, through HTGF each corporate can benefit from exposure to technologies that might have strategic relevance to it, but none has enough power to dictate the investment strategy of the fund. This is an important feature that differentiates HTGF from other corporate venture capital funds, which the literature

has shown can be plagued by a lack of investment rigour and focus, due to the influence of the corporate investor (Gompers and Lerner 2000, Teppo and Wustenhagen 2009).

### 4.5.2.4 HTGF's investment focus: incubating the most high-risk companies

Looking at the other dimension of the theoretical framework—investment focus—helps to obtain a complete picture of HTGF's role. From a sector point of view, the fund has a very wide-ranging investment mandate. However, its structure and risk appetite have allowed it to conduct particularly high-tech investments.

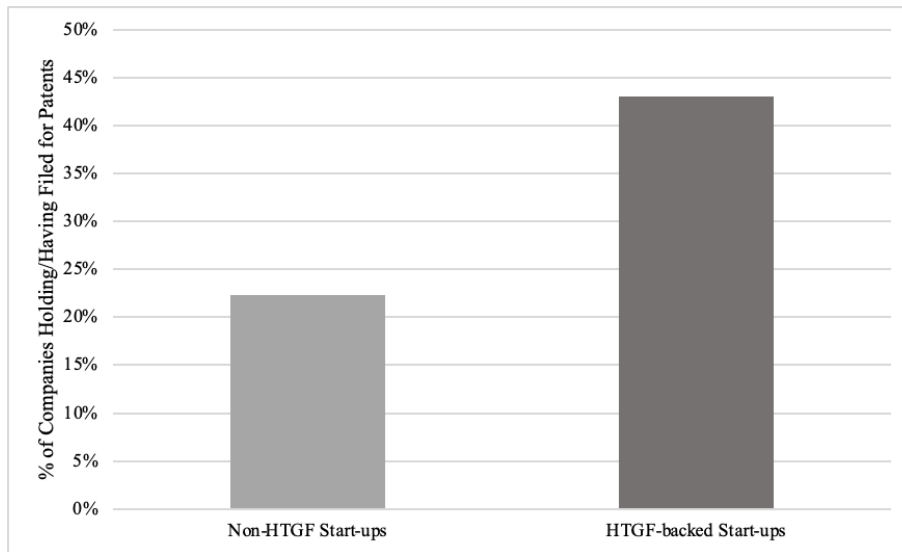
HTGF's investment strategy is, in practice, very broad. The fund has three teams focusing on different sectors. However, these sectors definitions mean that there is very little technology that is left out. Internal HTGF documentation shows that the Industrial Technologies includes hardware, automation, optical technologies, energy, and industrial software. Life Sciences and Chemistry comprises life sciences, material science, healthcare and chemical. Digital Tech spans from telecommunications to software, media, internet, and e-commerce.<sup>107</sup> In short: HTGF invests in everything. This broad strategy stems from HTGF's genesis: the original idea was for the fund to invest in those technologies that could be strategically most interesting for German corporates that participated to the fund (Informant-GE-GVC-7-NBR, German corporate, 13/01/2021 13/01/2021). However, from the start the corporates represented such different sectors that, to meet the goal, "the decision was to invest in all technologies, with no specialisation" (Velling, BMWK, 07/01/2021). This has become increasingly true as HTGF has attracted more and more corporates and SMEs to its shareholder basis.

At the same time, however, the composition of HTGF's investment teams and structure of the fund makes it particularly inclined to invest in so-called "deep-tech," compared to the average European VC fund. Team members' highly technical background allows them to understand new technological inventions, not only analyse business plans. In addition, the possibility to engage constantly with technical experts from the network of corporates allows for very in-depth technical due diligence as well as an understanding of where new technologies could find market applications and clients (Dr. Von Frankenberg, HTGF, 25/05/2021). The result is that HTGF has invested disproportionately in start-ups spinning out of university research or, more generally, holding patents. Figure 4.13 and Figure 4.14 below shows the statistics of the HTGF portfolio compared to the rest of Germany's VC-funded start-ups.

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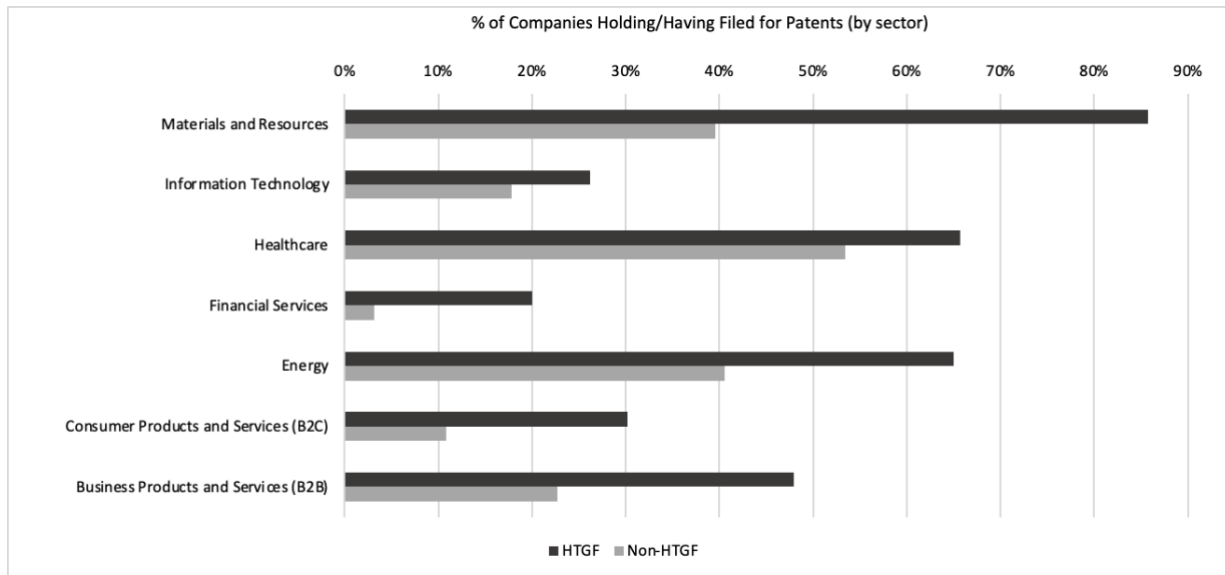
<sup>107</sup> Data from HTGF management presentation 2020

**Figure 4.13: German start-ups with patents (HTGF vs. rest of VC industry)**



Source: author’s analysis on Pitchbook and HTGF data; statistical significance is clear but also confirmed via Chi-Square test, with p-value significantly lower than 1%

**Figure 4.14: Start-ups with and without patents by sector (HTGF vs non-HTGF)**



Source: author’s analysis on Pitchbook and HTGF data

HTGF’s portfolio has over 70% more start-ups with patents compared to the rest of the German ecosystem. To be clear, this should not be interpreted causally—HTGF does not necessarily favour the granting of patents to its start-ups. Instead, it is more likely to reflect the type of companies HTGF is targeting, which tend to be higher in technological content than the average German start-up. As Figure 4.14 shows, this seems to hold across sectors. The finding is consistent with comments made during interviews by VCs and entrepreneurs, many referring HTGF as a fund “focused on deep-tech.” One entrepreneur, for instance, explained that “HTGF is really for high-tech ventures: those that come out of

university labs and really do very innovative business models in industries that are newly developing and are super technological. So HTGF is an ‘extra-ordinary fund.’ It is not a fund we are considering [for our fundraising] because what we are building is not super tech heavy and massively innovative” (author’s interview with Mario Geiß, founder at German start-up Freachly 18/02/2021).

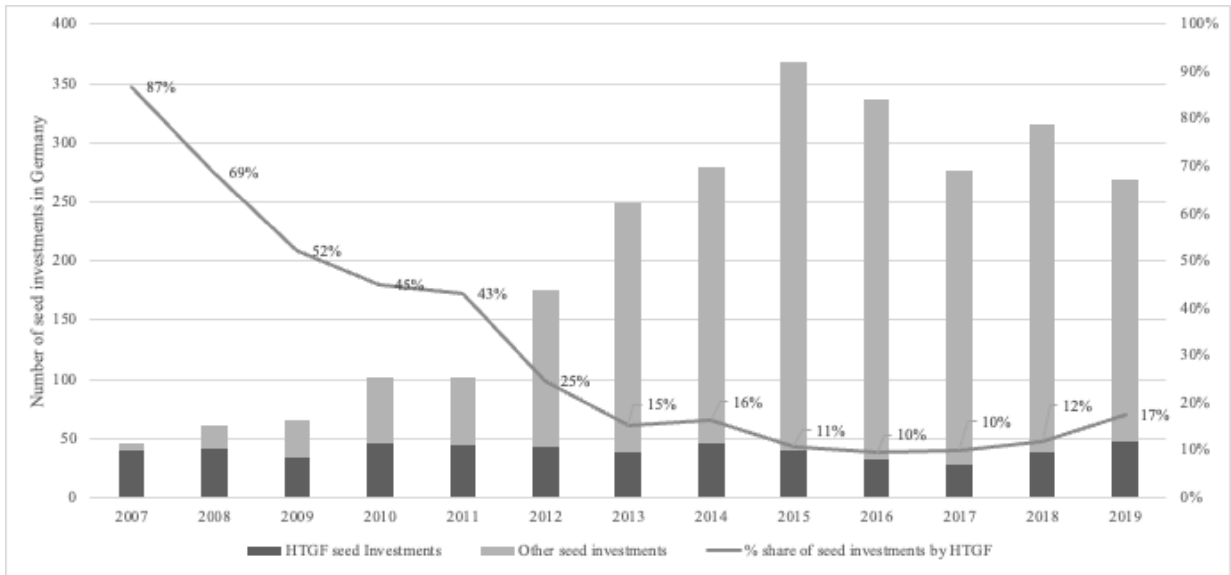
In conclusion, HTGF is not explicitly tasked with investing only in certain technological domains—its investment mandate practically encompasses all sectors. However, its competences and governance have enabled it to invest more than traditional VCs in technology-transfer based companies, where patents are a key driver of the business model. This feature, combined with the fact that it can invest *before* private investors, position it just above the line, towards the upper quadrant in the theoretical framework proposed.

### 4.5.2.5 The results of HTGF: an “incubator” GVC that even makes money

The previous sections have described the unique nature of HTGF. The next shows how these features allowed it to have an important role in the ecosystem as well as to generate good financial returns. In summary, HTGF investments have served as an “incubator” for the ecosystem, de-risking start-ups for private VCs, who typically invest in them later than HTGF. At the same time, it has picked investments well: although its returns are not the best in the industry, they are positive and well beyond original expectations. Finally, the fund has also contributed indirectly to the industry, training both new venture capitalists and start-ups, for the benefit of the private industry.

The main role of HTGF has been fostering deep-tech start-ups in the seed stage and thus reducing the risk for private investors in very high-tech companies. This was indeed its original objective. As several people involved in its policy design have recalled during interviews (Velling, BMWK, 07/01/2021; Informant-GE-GVC-7-NBR, German corporate, 13/01/2021; Brandkamp, HTGF, 02/12/2020), HTGF was launched to invest at the seed stage, because the private market had dried up after the dot.com bubble: “Our objective was to do 40 seed investments per year, in a market where at the time there were no more than 20 private seed investments” (Dr. Von Frankenberg, HTGF, 25/05/2021). Investment data collected by the author confirms this story. Figure 4.15 below shows the number of seed investments in Germany per year, highlighting the contribution of HTGF. At close to 50% until 2010, it’s clear that the GVC’s share of seed investment was very significant at the beginning of the ecosystem’s development.

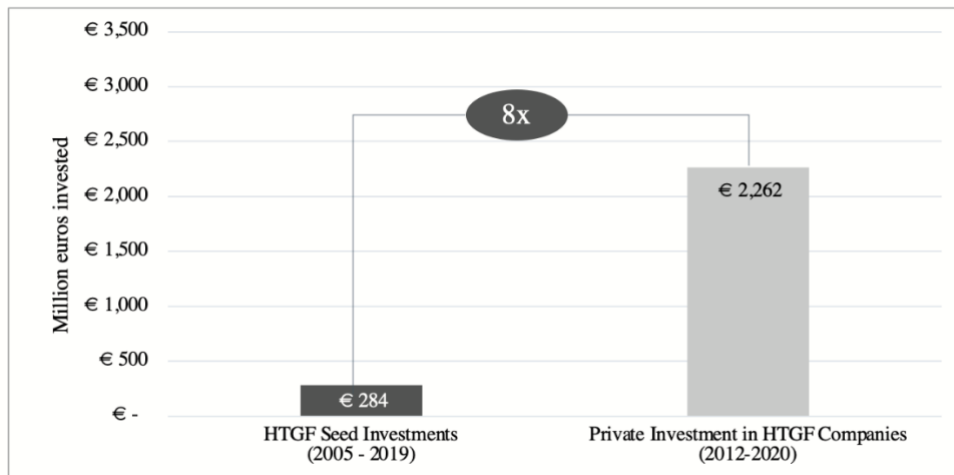
**Figure 4.15: Seed investment in Germany and HTGF’s share**



Source: Dealroom; HTGF data

HTGF did not only invest a lot; it also seems to have invested in companies that later became appetible for the private sector. One of the risks of GVC well-documented by the literature is that it might create a parallel market of publicly subsidised companies that are not attractive for the private sector and therefore become dependent on public financing (Lerner 2009). Indeed, this was one of the issues that Casper (2007) had identified in Germany’s biotech initiatives of the early 2000s. It does not appear to be the case with HTGF: the fund’s start-ups have raised from private investors 8 times the amount of capital that was originally provided by HTGF’s seed investment (Figure 4.16). When considering the fact that HTGF’s capital is partially private, the public money’s “leverage” effect is even higher.

**Figure 4.16: Private capital invested in start-ups that received HTGF seed investments**



Source: author’s analysis based on company investment data from HTGF internal documentation

The picture is consistent also with the commentary of entrepreneurs and private VCs, who reported that, generally speaking, HTGF does not invest in companies that PVCs would not choose, but it invests at *a stage* where PVCs would not invest (Informant-GE-VC-3-TZC 10/05/2021; Informant-GE-VC-1-WOR, German VC, 05/08/2021; Laarman, Emma start-up, 17/03/2021). As one of the most experienced private VCs in Germany explained, now that the ecosystem has developed, start-ups have more choice outside of HTGF but this does not undermine its role: “HTGF takes early technology risk... of course nowadays [2021] if you are a start-up and can take money from Index<sup>108</sup> or HTGF, you take it from Index. But if you take HTGF, it does not mean you will not get Index later on. They are very credible and good partners for private VCs” (Informant-GE-VC-1-WOR, German VC, 05/08/2021). This comment encapsulates well the PAL characteristics of HTGF: HTGF is seen as a partner by PVCs, who recognize its competences and specific role in the ecosystem.

Thus, if one of the main theoretical concerns about GVC is that it might crowd out the private sector (Cumming and MacIntosh 2006; Da Rin et al. 2013), in the case of HTGF the combination of data in Figure 4.15 and Figure 4.16 suggests it is not the case. HTGF has found a niche role in the ecosystem, investing in the riskiest companies at the very early stage, providing, as one PVC put it, “a service to the ecosystem” (Informant-GE-VC-3-TZC 10/05/2021). In other words, by supporting many start-ups early on, HTGF broadened the future investment opportunities for private VCs (Ruessmann, EarlyBird VC, 18/05/2021). HTGF is seen as expanding the options for PVCs for two reasons. Start-ups receive capital that allows them to reach the maturity to become investable by PVCs; but they also receive training and support to prepare for fundraising with private investors. In practice, this means that HTGF provides templates and frameworks for constructing business plans, structuring reporting, and creating the material for presenting to investors (Ott, DTC Ventures, 25/03/2021; and Hielscher, MoBerries 09/04/2021).<sup>109</sup> “Series A investors love to see our start-ups!” explained a HTGF manager (Informant-GE-GVC-1-UTR, HTGF, 24/11/2020). While this might be a self-interested hyperbole, private investors during interviews have also pointed out, unsolicited, that HTGF adds value beyond the capital it provides: “they pick up companies that are less good at selling themselves and help them get ready to fundraise. Especially in the early days of the ecosystem, it was particularly helpful” (Ruessmann, EarlyBird VC, 18/05/2021). This evidence is consistent with the idea that GVCs’ role can be that of “expanding the extensive margin,” as described by Brander et al. (2010b): GVCs can be helpful actors in ecosystems where they lead to more investments in companies that have the same social value but lower private value than those in which PVCs would otherwise invest.

HTGF also defied another concern of the literature—the ability of GVC to make a financial return. The financial performance of the fund has been positive and beyond expectations. The original mandate was to return to investors at least half of the capital invested (Velling, BMWK, 07/01/2021; Dr. Von Frankenberg, HTGF, 25/05/2021). Internal management data, however, shows that this target was already surpassed by far already in the first fund. By 2021 the value of HTGF’s existing investments and of the ones already exited (Total Value to Paid In capital, or TVPI) was higher than the amount originally

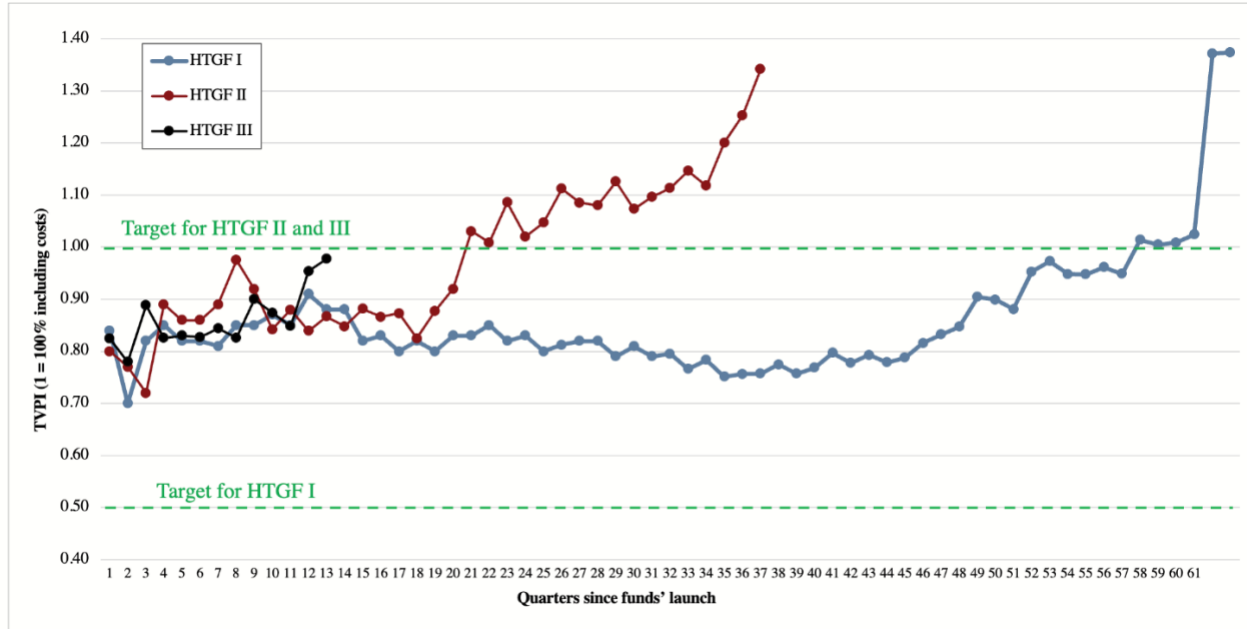
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<sup>108</sup> Index Ventures is one of the most renowned and successful European venture capital funds

<sup>109</sup> Author’s interview with Niklas Ott, co-founder of German VC DTC Ventures, 25/03/2021; and with Terence Hielscher, founder of German start-up MoBerries 09/04/2021

invested for the first two funds, and the third fund was already approaching payback within 3 years (Figure 4.17).

**Figure 4.17: HTGF funds financial performance as measured by Total Value to Paid In (TVPI)**

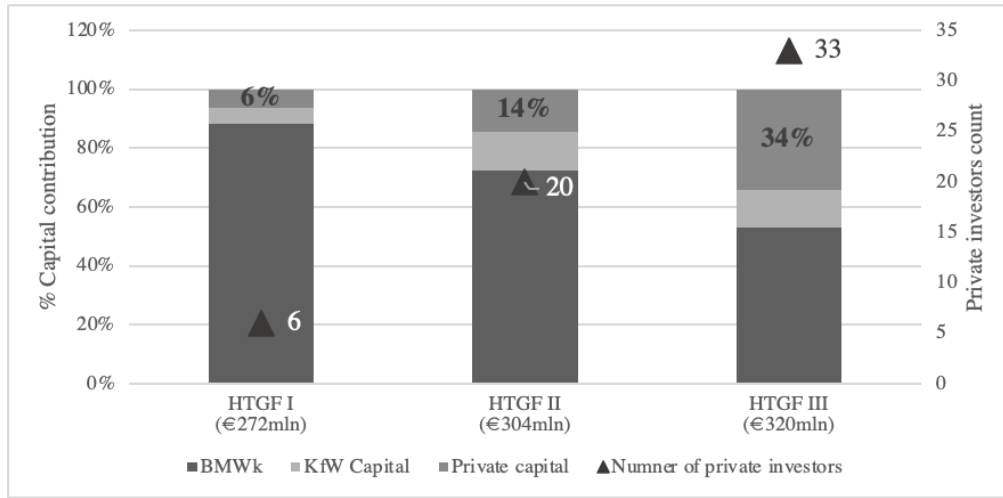


Source: author's analysis on HTGF's internal data as of 2021

It is important to note, as conceded by all members of management interviewed, that HTGF's returns are not stellar: the TVPI for fund 1 and 2 have translated into a 6-8% internal rate of return (IRR), which in private markets would be too low for such a risky asset class.<sup>110</sup> However, according to management, this result still places HTGF in the top quartile of seed funds in Germany (Dr. Von Frankenberg, HTGF, 25/05/2021) and, most importantly, it is consistent with its mission: to take on a higher risk than the private sector would, thus delivering lower returns. As a consequence of this performance, the HTGF team has gradually gained a positive reputation within the German investor community (Hielscher, DTC Ventures, 09/04/2021) and was given the opportunity to raise three more funds. For each of them the target return was moved to 1.0x (vs. 0.5x previously) (Velling, BMWK, 07/01/2021; Dr. Von Frankenberg, HTGF, 25/05/2021). Looking at the composition of investors across the three funds provides further hints that HTGF's investors are seeing value in it. As Figure 4.18 shows, HTFG's fund size has constantly increased, its corporate contributors base is expanding, and so is the private capital they provide. In summary, therefore, HTGF's performance has not been top-of-industry, but the fund has generated enough value to the state and to the corporates to receive increasing support from both the public and private institutions.

<sup>110</sup> A successful venture fund aims to return at least 3x on the capital and a 15% IRR

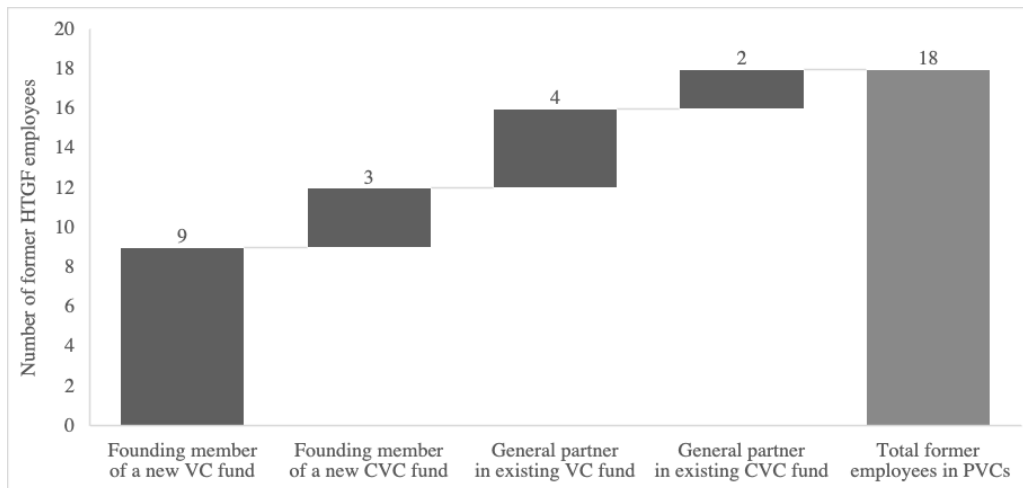
**Figure 4.18: HTGF’s funds size and private investors’ contributions**



Source: author’s analysis on HTGF’s internal data

Finally, HTGF has contributed to the ecosystem in an indirect way. It has constituted a school of venture capital, training investment professionals that have later gone on to become partners in private funds or even to create their own. Despite HTGF’s management’s efforts to retain top performers, 18 investment managers have left the GVC to join the private sector in leadership roles (Dr. Von Frankenberg, HTGF, 25/05/2021). Figure 4.19 illustrates this impact by showing the composition of roles that former employees have taken in the industry. The funds these former HTGF employees joined have cumulatively invested over half a billion euros in the German ecosystem between 2015 and 2019 (author’s analysis on Dealroom data).

**Figure 4.19: HTGF’s former employees’ roles in the ecosystem**



Source: author’s analysis on HTGF’s internal data

Of course, the policy has not been flawless. At least three issues have emerged from the fieldwork, although some have been dealt with by management over time. First, when HTGF first started it had very

standard and inflexible terms for its investment contracts: start-ups had to “take it or leave it” and could not negotiate (Dr. Von Frankenberg, HTGF, 25/05/2021). This approach allowed HTGF to deploy capital quickly, but it made it different from a traditional fund, thus limiting its attractiveness for high-quality start-ups. The terms were therefore relaxed over time to align with market standards. This evolution probably contributed also to a gradual improvement of HTGF’s reputation among VC investors, as recounted in interviews (e.g., Informant-GE-VC-3-TZC 10/05/2021; Hielscher, DTC Ventures, 09/04/2021). Second, HTGF faced a talent retention issue—an important problem to consider in designing GVC policies. As the German VC industry developed, HTGF risked losing its best managers to the private sector (Informant-GE-VC-3-TZC 10/05/2021 and Dr. Von Frankenberg, HTGF, 25/05/2021). Changes to the financial incentive scheme (see Table 4.5), which increased the upside for top-performing managers, were successful in stopping the talent haemorrhage. Policymakers outside of Germany, however, should be aware that this issue is bound to arise for any direct GVC and that comparable high-incentive schemes might be politically difficult to implement under different governance settings. Finally, HTGF might need to re-cast its role in the ecosystem as the industry matures. At the beginning, it represented a significant early-stage investor, and almost the only option for a certain type of high-tech start-ups. By the early 2020s, however, the German ecosystem had developed enough that the private sector became active even at the seed stage. Thanks in part to other public interventions (see section on ERP-EIF EAF), a plethora of business angels has emerged and provides an attractive alternative to HTGF (see Figure 4.15, where HTGF’s share gradually drops from over 80% to around 15%). In such a scenario, there is an increasing risk, mentioned by several interviewees, that HTGF will start suffering from a negative self-selection bias on the part of start-ups. While this does not appear to have been true historically, it might become a more relevant concern as the private sector presence strengthens (Informant-GE-VC-3-TZC 10/05/2021; Ruessmann, EarlyBird VC, 18/05/2021). HTGF, therefore, might need to re-think exactly what is its role and value proposition in a maturing innovation ecosystem.

In conclusion, therefore, HTGF has been a successful example of GVC. Although not perfect, the fund has had a positive impact on the ecosystem development, especially in the early days. Primarily, it has acted as an “incubator” for the ecosystem, investing earlier than private VCs, especially in high-tech and high-risk companies. This aspect makes HTGF an exception compared to the conclusions of the more recent GVC literature, which found that GVCs focused on earlier stages tend to be more reliant on private capital markets for co-investments (Bai et al 2021). In addition, HTGF contributed to the professionalization of the industry by training both start-ups and VC investors. At the same time, the fund generated a good financial performance, which confirms that it operated close to market standards. This track record, in turn, has allowed for policy continuity: the fund has been active for almost 20 years, because both the public and private investors have renewed their support and increased their capital commitments. Most interestingly, HTGF appears significantly more successful than other German direct GVC initiatives carried out before or even simultaneously. The next section will provide this comparison and highlight the differences.

4.5.2.6 Comparison between HTGF and other direct GVC policies in Germany

HTGF was not the first direct GVC policy attempt in Germany, nor was it the only one active during the 2000s. The next section identifies three other such policies that were not as fruitful—the WFG (1970-80s), the TBG (1990s), and the Startfonds (2000s). This within-case comparison helps to understand the institutional predisposition of Germany towards certain typical pitfalls of GVC policies and how instead HTGF’s PAL structure and *modus operandi* contributed to making it a success.

The first case is the *Deutsche Wagnisfinanzierungsgesellschaft* (WFG). This initiative was a paradigmatic example of a public intervention that failed because it tried to push banks to invest in innovation, without understanding the business model dynamics of venture markets and start-ups (Lerner 2009). The public fund was set up in the mid-seventies to stimulate the growth of VC in Germany while the United States was experiencing the birth of the industry. The 50 million DM were provided by 29 banks; however, the Government provided a 75 percent guarantee on the losses (Becker and Hellmann 2005). The results were poor: the fund generated a negative 25 percent IRR and failed to kick-start the ecosystem in Germany. The structure and practices of this fund, however, differed significantly from HTGF in some key respects, consistent with the theory tested in this research. First, WFG invested in a very different way from traditional PVCs. The fund did not use the contracting and governance tools that typically allow PVCs to exert control on companies and align the interests of entrepreneurs and investors (Becker and Hellmann 2005). Second, the team did not come from an equity investment background, “approached their work from a public policy perspective,” and therefore did not have the skills to either evaluate the companies appropriately nor support them in the “hands-on” way that typically distinguishes venture capitalists (Becker and Hellmann 2005). Third, the interference of both government and banks in the management of the fund forced WFG to focus solely on those high-tech companies that were not “bankable.” As reported by the CEO in an interview, employees “were unwilling to pay attention to market aspects... They were only interested in the technological side of a project, in ideas” (Becker and Hellmann 2005). Banks, moreover, mostly “worried about minimizing any risks to their reputation” (Becker and Hellmann 2005), an approach antithetic to venture investing. In short, WFG was a failure but was also very different from HTGF: it operated in a completely different way from PVCs, using a mix of practices deriving from public bureaucracy and banking. It thus suffered from adverse selection and was not able to add value to the companies it had in its portfolio. Arguably, German policymakers at the time “worked with what they had in their hands.” But those institutional elements of the German model were just not compatible with the innovation economy they were trying to promote.

The second prominent case is the *Technologie Beteiligungsgesellschaft* (TBG), a GVC co-investment fund established within KfW in the 1990s.<sup>111</sup> Although the initiative was able to channel over 1 billion dollars to the ecosystem, it was not effective at supporting the growth of a resilient VC industry (Casper 2007). Estimates from interviews suggest the fund might have also lost around half of the capital invested (Velling, BMWK, 07/01/2021). Again, the main difference with HTGF appears to be a misalignment of practices with private VC—it can be placed on the left side of the framework. In particular, TBG provided distorting incentives to private investors, for whom it was easier and more

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<sup>111</sup> Technically the fund was created within DtA, the other German development bank, which was however merged with KfW in 2003.

convenient to let a company fail and obtain capital back from the state than to try to bring it back on track to growth (Velling, BMWK, 07/01/2021; Informant-GE-GVC-5-SUD, TBG, 22/12/2022). As one long-active German VC explained “If you if you give me a 70% guarantee that I get my money back, even if the company goes bankrupt, this necessarily leads to crazy economic developments. Think about it: more or less, I would invest in everything. Because I get the upside and the risk is secured. So this was more or less nonsense... So it was terminated” (Informant-GE-VC-1-WOR, German VC 05/08/2021). With reference to the existing literature on GVC, this was a paradigmatic example of what Lerner called “heads I win, tails you lose” policy mistake (Lerner 2009) and it reminds of the distortive incentives described by several authors in the case of a Canadian GVC initiative, which made investors in these funds almost indifferent about company performance (Cumming and MacIntosh 2006).<sup>112</sup> In Germany, similarly, such perverse incentives, on top of being expensive for the state, certainly did not stimulate the emergence of professional VC investors able to take calibrated risks. Learning from this experience, with HTGF it was decided to internalise the PVC skillset to give independence to the fund, instead of relying on unprofessional private investors. As Mr. Brandkamp, who worked at TBG and later became the Managing Director of HTGF, explains, “TBG was co-investing alongside private lead investors. However, at the time [HTGF was set up], there were no lead investors to collaborate with at seed stage anymore... So the working group realised that what was needed was a new investor from the public side that had the capability to invest alone as a lead investor” (Brandkamp, HTGF, 02/12/2020).

The final example, the *ERP-Startfonds*, is perhaps the most interesting from a comparative point of view, because it was launched at the same time as HTGF. The programme was set up in 2004-5 as another direct co-investment GVC within KfW (author’s interview with BMWK representatives, Informant-GE-GOV-1-UOL and Informant-GE-GOV-2-WHL, BMWK, 23/07/2021). In short, this attempt was also unsuccessful in large part because the organisation, being inside KfW, was encumbered by its governance and banking-derived practices. As BMWK representatives familiar with the activity and results of the fund explained: “the fund probably did not generate positive returns. Our analysis was that the structure and processes of KfW were not suitable for [the VC] process. It created a negative bias that meant that the fund attracted the ‘safest companies’ but not the big winners” (representatives of BMWK, Informant-GE-GOV-1-UOL and Informant-GE-GOV-2-WHL, BMWK, 23/07/2021). To provide just one clear example, interviewees familiar with the process pointed out how follow-on rounds and changes in a company’s strategy—two perfectly normal events in a start-up’s life—were considered “red flags” within KfW and thus often jeopardised the approval of funding.<sup>113</sup> This speaks directly to other typical flaws of GVC programmes: lack of understanding of the entrepreneurial venture process and lack of operational flexibility (Lerner 2009). Perhaps the best confirmation of the causes of failure of the program was the fact that in 2015 it was stopped and radically transformed into a new fund, called Coparion, which instead operates following market practices. Policymakers decided to make three main changes between Coparion and its predecessor, which moved it into the PAL side of the framework. First, the new structure and

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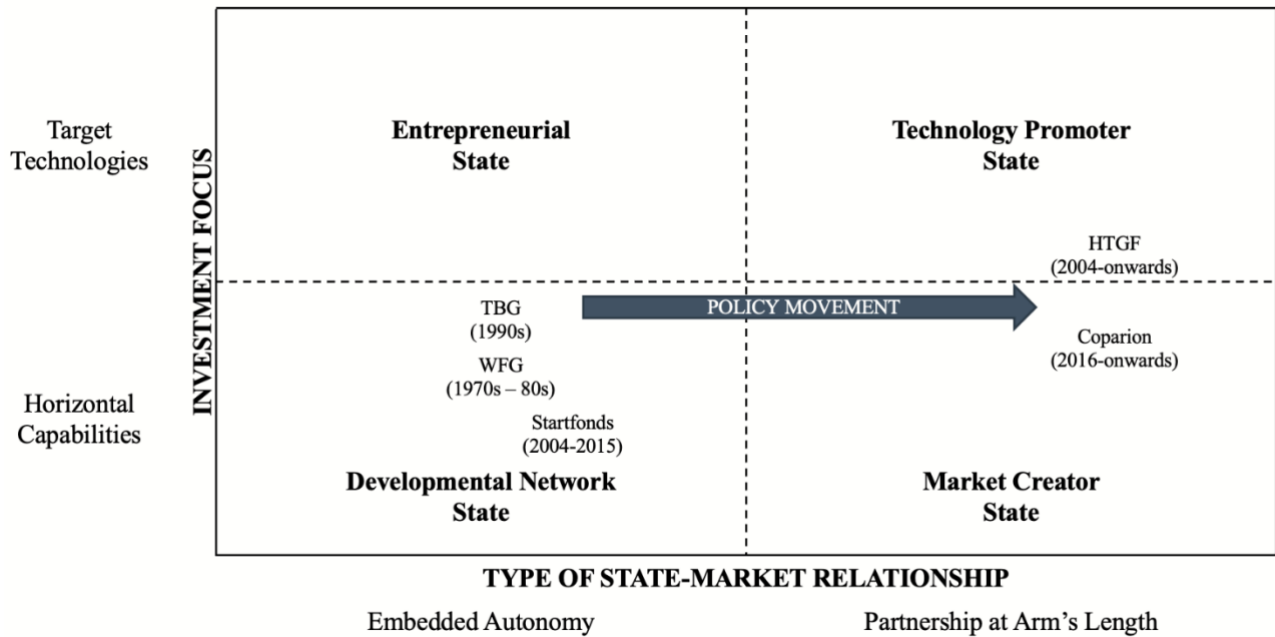
<sup>112</sup> Note that the net impact of this Canadian programme, called LSVCC, are a matter of debate in the literature. See, for instance, Brander et al. 2010b.

<sup>113</sup> Interviewees from current and former KfW staff explained that, to be precise, the programme experienced two phases: initially, it was very free to invest in “almost any start-up;” later, after KfW started to be regulated like other banks and required a separate risk department, the Startfonds investment process became very slow and bureaucratic, leading to the dynamics described above (Informant-GE-GVC-9-PJU, KfW, 20/11/2023; Informant-GE-GVC-5-SUD, TBG, 22/12/2022).

governance, separate and independent from KfW, eliminate the constraints that came from the bank. Coparion replicates a traditional VC fund structure, where all investment decisions are made by internal investment committees, which comprise Coparion's management and the investment professionals. The previous process instead required all investments also to be approved by KfW's risk department, which both slowed down the process and prevented ERP-Startfonds from investing in some of the most high-risk/high-reward companies, which typically drive a venture fund performance (Informant-GE-GOV-1-UOL 23/07/2021 and Informant-GE-GOV-2-WHL 23/07/2021; Principe 2017). In other words, as a BMWK representative put it, "now it is not a public bank that makes the decisions" (Informant-GE-GOV-1-UOL and Informant-GE-GOV-2-WHL, BMWK, 23/07/2021). Second, the management and team were recruited predominantly from the private sector, while ERP-Startfonds' team was all from KfW. While Coparion remains strictly a co-investment fund, the new structure and team competences also allow the fund not to be just "reactive" to co-investment opportunities but also to "proactively" seek them and analyse them, similarly to Bpifrance's approach. This also reduces the adverse selection bias experienced by its predecessor. Finally, Coparion's team is incentivised through a "virtual carried interest," similar to HTGF's (Informant-GE-GOV-1-UOL and Informant-GE-GOV-2-WHL, BMWK, 23/07/2021). All in all, this seems to be leading to a different outcome: as of the second quarter 2021, the fund had invested 172 million euros and had a TVPI of 1.45 (data received from BMWK).

In conclusion, the review of other comparable German GVC programmes provides further evidence that the success of HTGF depended largely on the specific way it was designed. Figure 4.20 summarises these differences through the theoretical framework. The comparison shows also that this design was a significant discontinuity in German innovation industrial policies. The German economic model and institutional practices meant that policymakers originally tried to fund innovation using or replicating the traditional intermediated-banking approach. This failed repeatedly because of the intrinsic biases of the banking model. The risk profile and the financing process are at odds with the high-failure/high-reward dynamics of disruptive innovation, as noted in previous literature. Policymakers eventually realised they needed to introduce a new entity, which operated independently of Germany's traditional development institutions and closer to the market. This was possible because a moment of crisis and high uncertainty after the dot.com bubble created a political opportunity to "start from scratch" and rethink the approach with fewer institutional biases and the involvement of non-state actors. But this policy process was not straight forward. The contrast with *ERP-Startfonds*, which was run at the same time as HTGF, is particularly telling of the risk for institutional path dependency: at the same time as HTGF was demonstrating the opportunities of the innovative model, it was much harder for KfW, with its legacy of processes and practices, to embrace a PAL approach. The German distributed governance, therefore, on the one hand allowed for policy experimentation; on the other, it slowed the learning process: even after a new more effective model was found, it took over 10 years to evolve the practices of KfW and change its own programme.

Figure 4.20: Theoretical framework applied to HTGF and other direct GVC initiatives



4.5.3 Indirect GVC in Germany: the government “delegates” industrial policy

Indirect GVC in Germany is interesting for three reasons. First, because—although with low visibility—it has represented the largest single source of funding to start-ups in Germany (Senior government official, 20/01/2021). Second, because the main programme has been operated, surprisingly, from outside of Germany. And third, because it too offers the opportunity for within-case comparison. In short, after the dot.com bubble, the BMWK decided to delegate to the European Investment Fund (EIF) most of its start-up financing budget, funding a programme that ultimately became the backbone for most of the venture capital funds investing in Germany over the next 20 years. At the same time, KfW also attempted to support private VCs but its model, again constraint by the bank’s rules, proved difficult to implement and was aborted, only to be restarted in 2015 as a national “copy” of the EIF programme. In this case, too, therefore, Germany’s innovation policymakers were successful when they partnered with a non-state actor to circumvent the country’s traditional, bureaucratic institutions of development and adopt a PAL approach vis-à-vis private VCs. This, however, does not mean German policymakers reneged their precepts about state intervention: to the contrary, the new programmes represent an innovative way for the German state to intervene in markets while maintaining an “intermediated” model and prioritising the financial sustainability of the programmes—two core tenets of German development policy.

4.5.3.1 The ERP-EIF Facility: a crucial deal for German and European innovation policy

In parallel to the discussions about the design of HTGF, the same policymakers in BMWK constructed a new scheme aimed at developing a professionalised private VC industry.

The lessons of the late 1990s suggested that relying on the typical CME financing institutions—i.e., banks—for venture capital investments was a dead end. At the same time, the bubble had made it extremely difficult for VC funds to raise capital from private limited partners (LPs). In this context, the goal of policymakers was to use ERP resources to allow new funds to get off the ground and attract investments to Germany (author’s interview with Informant-EU-GVC-2-MBO, EIF, 06/05/2021). The EIF, in the meantime, had been created 10 years earlier with a mandate to do just that, at a European level. Established in 1994, the EIF is an EU institution that has taken a central role in supporting the development of the European venture capital and private equity industry by investing public resources into private funds. It is part of the European Investment Bank Group and, as of 2022, is owned by the European Investment Bank (59.4%), European Commission (30%), and some of the largest national development banks (10,6%), including KfW.<sup>114</sup> The EIF has been investing several hundred million euros every year to support European start-ups through an indirect, “intermediated” model, analogous to Bpifrance FoF’s: the EIF does not invest in the equity of start-ups but rather selects VC teams and helps them raise funds by providing critical initial resources.

The situation in the early 2000s presented opportunities for both BMWK and the EIF. For the ministry, it provided an alternative route to KfW for channelling public capital to the ecosystem, at a time when the governance of the public bank was not willing to take the risk of investing in funds without having a final say on each start-up investment (Senior government official, 20/01/2021). Relying on the EIF, a non-German organisation, was a disruption, but the model was consistent with the German ordoliberal preference for no direct state intervention in the economy as well as with Germany’s historical use of “intermediaries” for development capital allocation—local commercial banks were just being “replaced” with private VC funds. In addition, it provided an immediate leverage effect to ERP resources, because the EIF would contribute its own capital. Finally, such a strong collaboration allowed Germany to significantly strengthen its ties, and influence, on the EIF, since the resources Germany provided were a “huge boost” for the EIF (Mertens 2021; Informant-GE-GVC-5-SUD, TBG, 22/12/2022). For the EIF, the collaboration provided, on top of revenue-generating fees from the resources under management, also a very important endorsement, early in its history, by Europe’s most important and financially conservative economy. Indeed, as of 2021, Germany was still the EIF’s largest client after the European Commission (Senior government official, 20/01/2021).

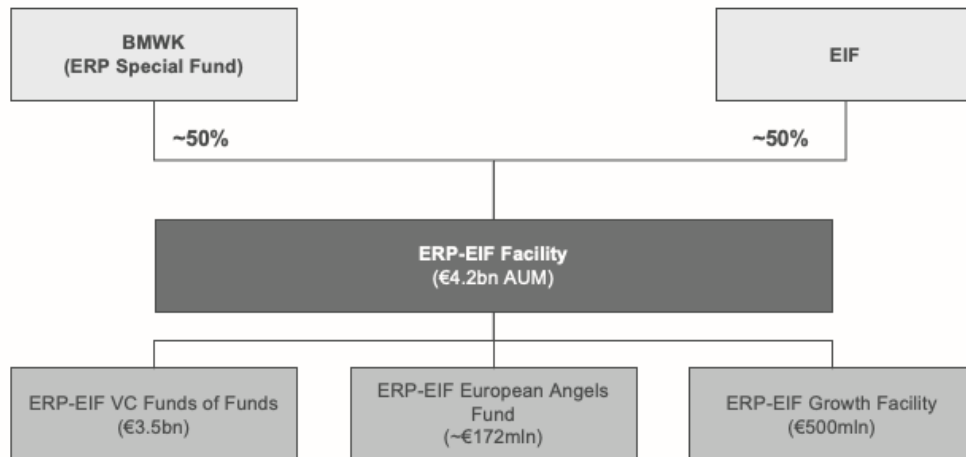
In 2004, therefore, the ERP-EIF Facility was created. BMWK contributed 250 million euros from the ERP Special Fund and the EIF matched one-to-one, bringing the total to 500 million euros. The EIF would be in charge of managing the resources, investing them according to the “mandate” agreed between BMWK and EIF. This mandate required that EIF identified and financed private VCs that committed to investing in German start-ups at least as much as what they received from the Facility. Over the years, the mandate expanded into three different programmes and the resources increased to 4.2 billion euros (as of

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<sup>114</sup> See EIF website: [https://www.eif.org/who\\_we\\_are/shareholder/index.htm](https://www.eif.org/who_we_are/shareholder/index.htm)

2021).<sup>115</sup> The ERP-EIF Facility invested through three instruments that covered the full spectrum of innovation stages: the European Angels Fund Germany (seed), the VC Funds of Funds (all VC stages), and the Growth Facility (focused on later stage companies). The resources are managed by the EIF, following the EIF procedures and *modus operandi*, through its international investment team sitting in Luxemburg. Figure 4.21 below illustrates the structure of the Facility.

**Figure 4.21: ERP-EIF Facility structure**



*Note: information as of 2020, based on interviews and EIF website at the time. EAF had a theoretical maximum budget but shared with the FoF, so that resources not used for EAF were used for the FoF programme. Note that overall split is slightly higher than 50 percent from BMWK because German resources were more than half for the ERP-EIF Growth Facility.*

The ERP-EIF Facility at the time was a ground-breaking partnership between BMWK and the EIF: it paved the way for several other programmes on international, national, and regional level based on the collaboration between pan-European, national, or sub-national institutions and the EIF (Informant-EU-GVC-2-MBO, EIF, 06/05/2021). For one, in 2009 the model was replicated with the Bavarian development bank, LfA Förderbank Bayern, creating the LfA-EIF Facility, which manages an additional 300 million euros through analogous schemes to those of the ERP-EIF partnership.

Germany, therefore, was setting up its most important innovation support programme without any participation of its public development bank. Why? Interviews with officials involved in the decision clarified that, in short, there was incompatibility at the time between BMWK's objectives and KfW's governance practices. BMWK wanted an instrument that would help the industry but that would also be financially sustainable (i.e., making positive returns). As officials explained in interviews, the profitability of ERP programmes is key to the long-term continuity of the policies, because the ERP Special fund works like an endowment, financing its yearly expenditures with the returns on its assets (Senior government official, 20/01/2021). This meant finding a formula to provide capital to the VC industry without having a public entity being involved in cherry-picking start-ups, which had not proven successful. KfW's governance at the time, instead, was not willing to provide financing without having the last word on each

<sup>115</sup> Note that the co-investment ratio decreased slightly since, for one of the instruments, the split is 66-34% (330 million euros from ERP and 170 million from EIF). Figures available also on the EIF website at [https://www.eif.org/what\\_we\\_do/resources/erp/index.htm](https://www.eif.org/what_we_do/resources/erp/index.htm)

single investment (Senior government official, 20/01/2021). At the same time, the public bank was also not ready to invest its own capital in equity instruments, which were outside its “comfort zone” and had exposed them to significant losses during the dot.com (Senior government official, 20/01/2021; Velling, BMWK, 07/01/2021). In other words, KfW could not guarantee a PAL approach. The choice, therefore, fell on the EIF, with no involvement of KfW in the scheme. In a parallel to France, therefore, the presence of the EIF offered a viable route to meet the political determination (in this case of Germany’s technocrats in charge of the ERP) to intervene in innovation, without falling into the pitfalls of the previous policy attempts managed by the more traditional institutions of German development.

### 4.5.3.2 ERP-EIF Facility’s relationship with the market: delegating decisions to private actors

The ERP-EIF policy is one of the starkest examples of a PAL state-market relationship. The BMWK aimed to channel public capital to start-ups by relying on the private sector and by insulating German GVC from political influences and from the German bureaucracy. In short, not only does the Facility rely entirely on private intermediaries to allocate public money to start-ups (like Bpifrance FoF), it is also run completely outside of German public or para-public institutions. This approach has allowed BMWK to act with very high financial leverage on public money (Griffith-Jones and Naqvi 2021) while also stimulating the emergence of professional VC investors, which were historically missing in Germany (Becker and Hellmann 2005; interview with Informant-GE-VC-1-WOR, German VC 05/08/2021). While in practice very non-German, at the same time it reflected a very German and economically orthodox approach: using private intermediaries to avoid direct government intervention in the economy. Such intermediated approach is also part of the reason why the role of public capital in the German ecosystem has been less observable than in France. Under this scheme German start-ups receive funding from private VCs, without knowing how much of that capital originally comes from the German state. This section shows how the three main activities of the ERP-EIF Facility reflect a partnership at arm’s length.

The most important activity, with over 3.5 billion euros under management, is the VC Fund of Funds (FoF) instrument, which represents the main source of public funding to the German ecosystem (Senior government official, 20/01/2021). Just like Bpifrance’s FoF, the EIF team finds, selects, and provides capital to VCs that are looking to create a new fund and are interested in investing in Germany (the fund may or may not be headquartered in Germany). Private funds that receive this money are required to invest into German start-ups at least as much as the resources obtained from the ERP-EIF Facility.<sup>116</sup> Funds also must have a “sufficiently substantiated focus on Germany (ideally backed by track record),” in particular if the team is not based in Germany (Informant-EU-GVC-2-MBO, EIF, 06/05/202).<sup>117</sup> The key implication for this research is that public capital (from both ERP and EIF) is reaching German start-ups but every single deal is decided entirely by private VCs. Importantly, the state here is even less involved than in the French case, as it is not a German public bank that scouts and selects the funds. Although, in theory, the BMWK has a veto power on fund selection, interviewees explained that in reality

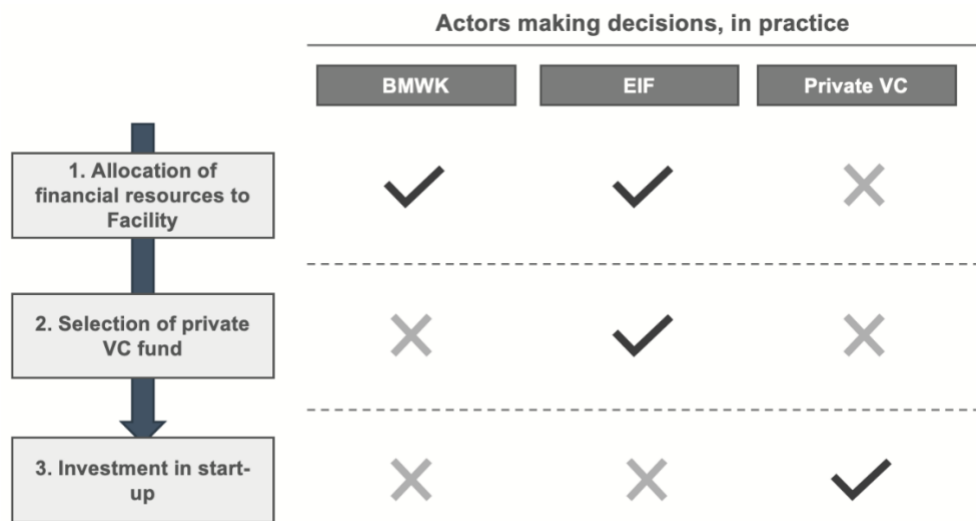
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<sup>116</sup> For investments, net of costs.

<sup>117</sup> In addition, the EIF may decide to provide further resources to that fund, from outside the Facility, and thus without the geographical requirement.

this is typically not executed as the EIF and BMWK are in close contact and the EIF would raise potential issues earlier in the process, before the formal investment decision is made (Informant-EU-GVC-2-MBO, EIF, 06/05/2021; Senior government official, 20/01/2021). In practice, therefore, investment decisions are made by the EIF’s investment team and board of directors, whose main goal is to generate financial returns by selecting competent teams and ensuring market best practices in the fund structure (see EIF mission statement). Figure 4.22 illustrates the investment process and where the decision power lies. It is evident how this governance reflects PAL: the investment operations are clearly separated and independent from German political or bureaucratic influence and the state delegates to private partners all investment decisions.

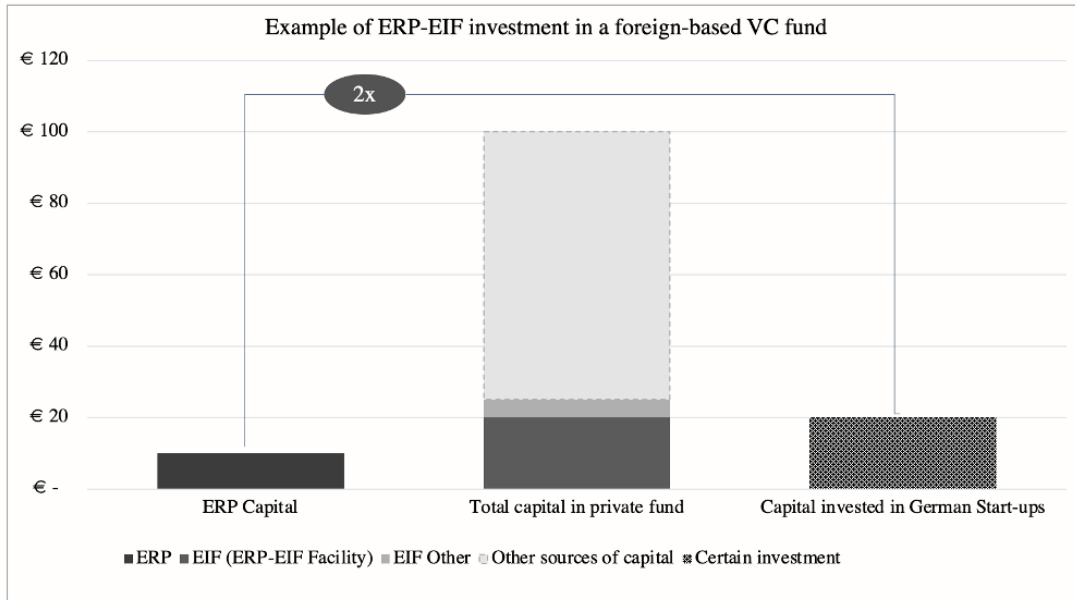
**Figure 4.22: ERP-EIF VC FoF investment process and decision points**



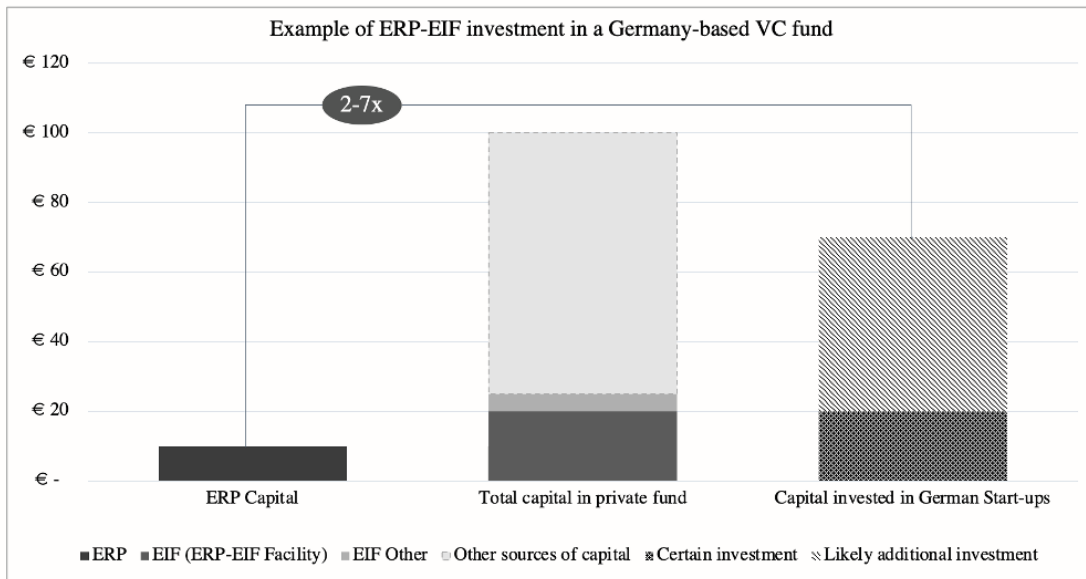
It should also be noted that the model is also financially very efficient for BMWK. At a minimum, the German ecosystem receives twice as much money as BMWK invests—because of the EIF matching. But this “multiple” could be much higher: in case a fund is based in Germany, the total amount invested in domestic start-ups will realistically be significantly higher as the literature finds that VCs tend to invest mostly locally (Chemmanur, Hull and Krishnan 2016). Figure 4.23 provides an example that illustrates the capital flow from ERP to EIF and back into German start-ups. It shows how PAL translates into “financial leverage” for the state.

Figure 4.23: Capital flow via the ERP-EIF VC Fund of Funds

23.a



23.b

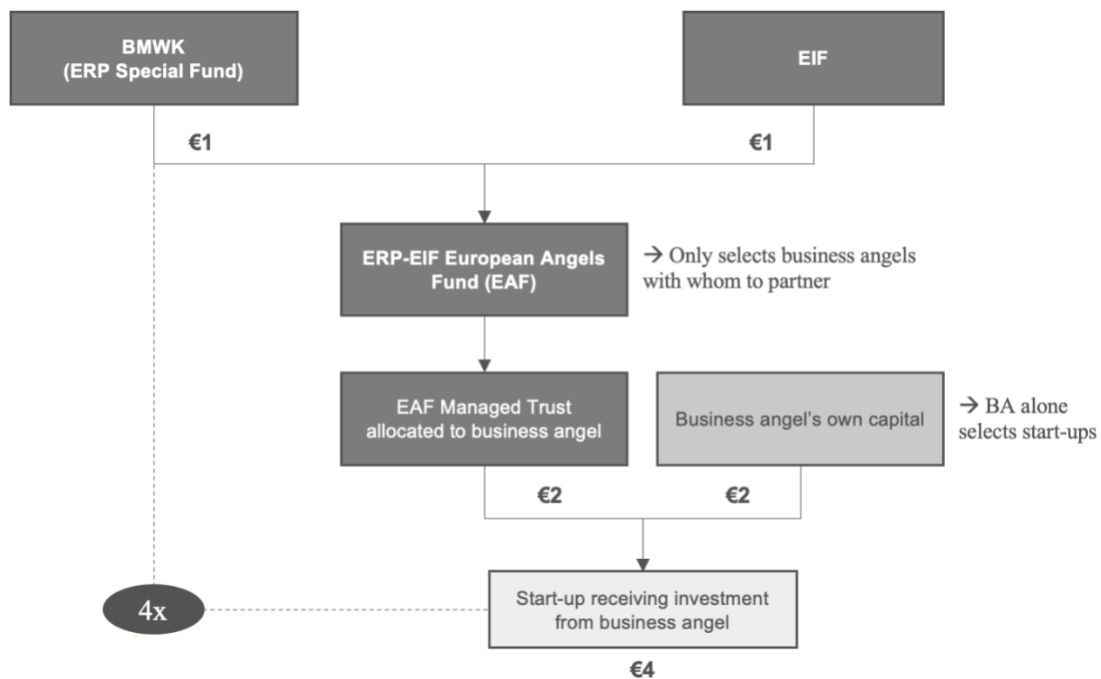


Note: figure 23.b assumes that a Germany-based VC fund would invest 70% of the capital in German start-ups, as literature on the geographic concentration and local nature of VC investments suggests (Chemmanur, Hull and Kirshnan 2016). As reference, estimates are consistent with the multiple between public and private capital reported by Bpifrance for its FoF's activities (5x) (Bpifrance 2023), which is a comparable scheme.

The second scheme through which the Facility invests is the European Angel Fund (EAF) Germany, launched in 2012. The model was meant to stimulate investments in very early-stage start-ups by so-called business angels (BAs)—wealthy individuals that invest their own capital into start-ups. It was a co-investment scheme whereby the EIF selected German BAs and committed to match their investments

any time they invested in a German start-up. Business angels, on their part, were obliged to utilise the EAF resources in all their investments—i.e., they could not cherry pick, which would create a risk of adverse selection towards the Facility (Informant-EU-GVC-2-MBO, EIF, 06/05/2021). Figure 4.24 below shows the mechanism. In this case, for every euro the BMWK (ERP) invested, another three were invested in the same start-up (one from EIF and two from the BA). Again, all investment decisions into start-ups were made by the private sector. Although EAF was later replicated in several other countries, the size of the German investment through this scheme (around 172 million euros) is remarkable.<sup>118</sup> Note that the scheme terminated activities in 2022, having co-invested with around 50 business angels, in more than 400 companies.<sup>119</sup>

**Figure 4.24: Investment mechanism of the ERP-EIF EAF scheme**

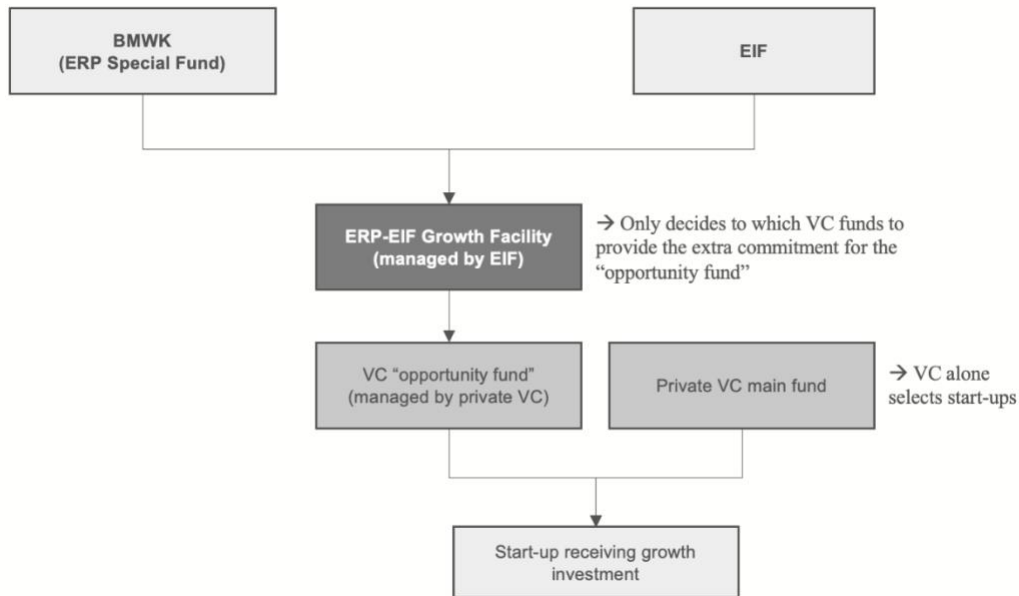


The final instrument is called ERP-EIF Growth Facility. It was started in 2016 and its operational model is a mix of the other two, but with a focus on later stage companies (Informant-EU-GVC-2-MBO, EIF, 06/05/2021). It is a 500-million-euro budget available for VC funds already invested by the ERP-EIF FoF scheme to “top up” portfolio companies with further capital needed for later-stage growth (Informant-EU-GVC-2-MBO, EIF, 06/05/2021). In practice, the ERP-EIF Growth Facility invests into so-called “opportunity funds” set-up by previously supported GPs, allowing them to fund successful portfolio companies in growth stage beyond the capacity of the main funds. This is shown in Figure 4.25.<sup>120</sup>

<sup>118</sup> Consider that at the end of 2016 the EIF reported that the total programme had a 280 million euros budget (including Germany’s) [https://www.eif.org/news\\_centre/publications/eaf/eaf\\_en.pdf](https://www.eif.org/news_centre/publications/eaf/eaf_en.pdf) ; for more recent figures see [https://www.eif.org/what\\_we\\_do/equity/eaf/index.htm](https://www.eif.org/what_we_do/equity/eaf/index.htm)

<sup>119</sup> [https://www.eif.org/what\\_we\\_do/resources/erp/index.htm](https://www.eif.org/what_we_do/resources/erp/index.htm)

<sup>120</sup> Note that when the German Future Fund-EIF Growth was launched in 2021, the investment period of the ERP-EIF Growth Facility was terminated early and the remaining amount made available for other investments under ERP-EIF Facility.

**Figure 4.25: Investment mechanism of the ERP-EIF Growth Facility**

In conclusion, thus, the main GVC instrument in Germany is an indirect investment policy, which is a clear example of PAL. It allows the German state to provide public resources to the industry in a similar fashion to Bpifrance’s FoF but without being involved at all in their management. The state provides the bulk of the capital but in no way does it “pick the winners:” all investment decisions in start-ups are delegated to private venture capitalists and business angels. In doing so, the scheme benefits also from very high financial leverage. These characteristics position the scheme very far to the right in the theoretical framework.

#### 4.5.3.3 ERP-EIF Facility and investment focus: tech agnostic industrial policy

The characteristics of the ERP-EIF Facility explained above foreshadow also its position on the other dimension of the theoretical framework: the delegation of investment decisions to the EIF and to private actors limits, by design, the ability of the state to direct funding towards specific technologies. The evidence in the following section confirms that the policy has indeed been completely technology-agnostic and has focused instead on developing the horizontal capabilities of the venture capital industry in Germany. In so doing, it has mostly reinforced the trend of low-tech innovation that has characterised the growth of the German innovation ecosystem since 2005 (see section 4).

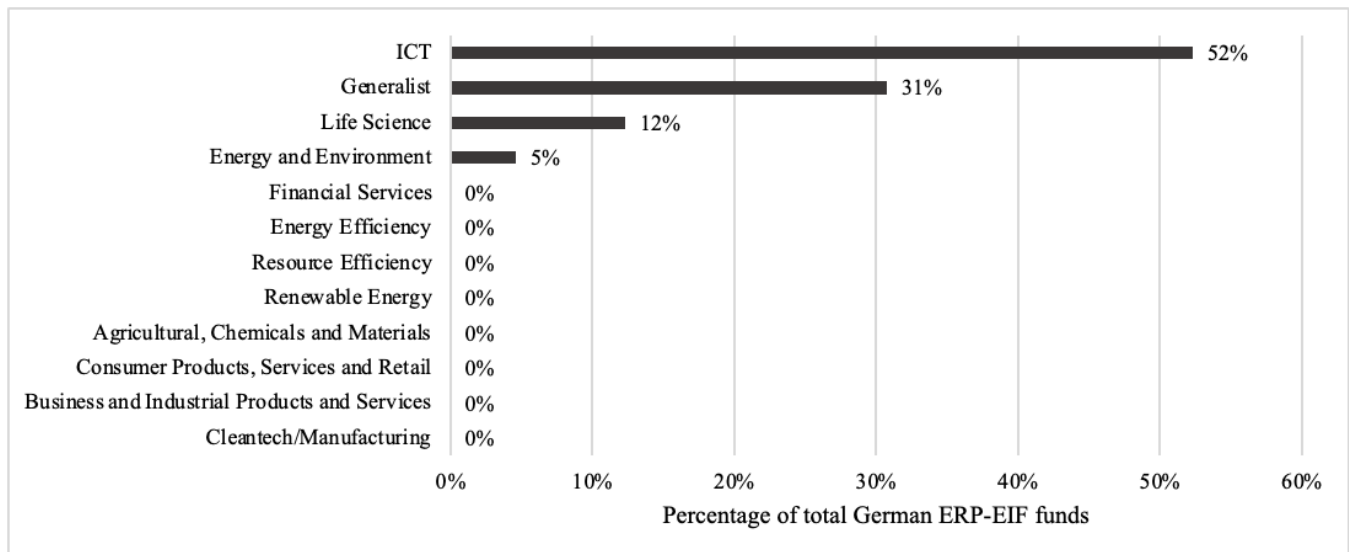
Interviews with key German policymakers and officials involved with managing the EIR-EIF Facility surfaced that the policy was intentionally designed “without a specific target technology/sector focus but rather with a generalist tech/innovation scope ... We focus on promoting competition and innovation and generally follow a sector agnostic strategy” (Informant-EU-GVC-2-MBO, EIF, 06/05/2021). The policy is thus focused on developing the general capabilities of the industry. While EIF management mentioned that they are in regular contact with the BMWK and “consider, within this sector-

agnostic approach, in particular also new sectors and directions,” there have not been any requirements for private VC funds that receive ERP-EIF money to invest in any specific type of technology. BMWK officials have confirmed that they “wanted to delegate our power to decide on the single investment to the professional private fund managers” (Senior government official, 20/01/2021) and that “all our VC programmes are technology agnostic” (representative of BMWK, 02/08/2021).<sup>121</sup>

This neutral stance of the German authorities is complemented by the general investment approach of the EIF, which has historically prioritised high-growth. As a senior official at the EIF explained “Since the late nineties, the two things were always associated: funding SMEs as a way of funding innovation. But from a practical point of view, most of what we [at the EIF] do is funding high-growth SMEs. As of lately we have also expanded our ability to fund R&D projects but somehow there is something in the system that makes us invest in high-growth-firms” (author’s interview with Informant-EU-GVC-4-TVO, EIF, 28/05/2021). This means that, in the case of Germany, the EIF has fundamentally supported the development of the country’s VC industry but it has “not been shaping the strategy and direction of the industry they way Bpifrance does in France” (Informant-EU-GVC-1-ZYO, EIF, 25/11/2020).

Statistics on the funds’ focus confirm this view. Over 80 percent of the funds supported by the EIF in Germany have either a Generalist or a broad ICT focus, as Figure 4.26 below shows.

**Figure 4.26: Sector distribution of EIF-backed VC funds in Germany**



*Source: author’s analysis on EIF publicly available data*

Note that investing in ICT funds can hardly be considered as an entrepreneurial state’s investment to “push the technological paradigm” (Dosi 1982, Mazzucato 2013) as digital and ICT were fully established technologies during this observation period. More broadly, even for those funds that have a precise and “deeper tech” sector focus (e.g., the 5 percent that invests only in Energy and Environment), the operating model of the programme means that it was not a German-state proactive decision to promote private VCs

<sup>121</sup> Author’s interview with Informant-GE-GOV-3-KZL, on 02/08/2021

focused on this sector. Instead, it was the market that proposed these funds to the EIF, which only decided that they met the quality bar to receive ERP-EIF Facility funding.

In summary, the ERP-EIF Facility has had a completely technology agnostic approach. It was never designed to focus on specific innovations and instead aimed at promoting the emergence of professional VCs. The BMWK never tried to imprint a very specific industrial policy direction either. In this sense, German GVC has been even more neutral than the French counterpart, where broad high-level technological priorities have always been present, at least at strategy level (Informant-FR-GVC-7-ZDL, Bpifrance, 16/02/2021). This, together with the EIF's *modus operandi*, rendered the policy largely reactive to private VCs' decisions about sectoral capital allocation, in practice funding any type of high-growth innovative company. The policy, therefore, focused on supporting the development of broad capabilities both in the demand side (entrepreneurs) and supply side (capital providers) of the ecosystem, thus falling neatly in the bottom part of the theoretical framework. As such, it was very complementary to the type of low-tech, business-model innovation that emerged in Germany in the two-thousands, as the next section will explain.

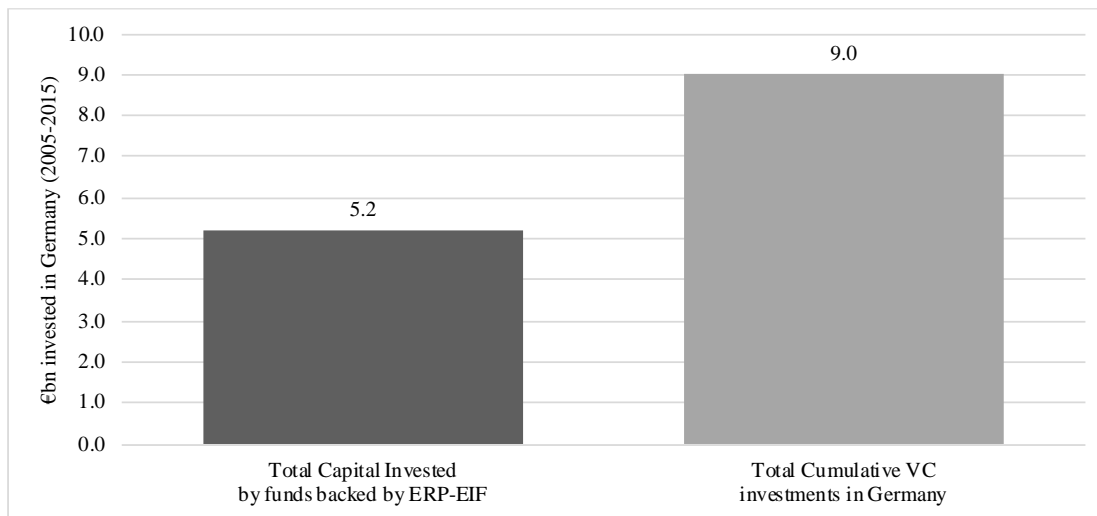
#### 4.5.3.4 The role of the ERP-EIF Facility: the “invisible hand” that helped a private-led ecosystem

In economics, the “invisible hand” is a concept typically used to refer to free-market forces in the economy. In the case of the VC industry in Germany, the term could instead be used for the role of the state through the ERP-EIF Facility. The Facility allowed the German state to intervene in disguise and contribute significantly to the development of the ecosystem, through the two mechanisms already encountered with Bpifrance FoF. The Facility provided complementary public capital to private initiatives, and it imposed international best practices on the nascent German VC industry—i.e., informed conditionality. In doing so, it helped the VC industry attract more private capital through the “critical mass” and “certification” mechanisms already discussed in the French chapter. This section provides further evidence to explain this fundamental model of European GVC interventions, using the prominent example of the ERP-EIF Facility.

First, the Facility is indirectly responsible for a large proportion of start-up funding in Germany. As a senior official at the EIF explained, “Germany is much more of a free market with many private initiatives, especially compared to France and the role of Bpifrance. Germany's market became the most vibrant and successful VC market in Europe from scratch and it did so without a central player like Bpifrance. *However, we as EIF, have been the backbone of the German VC ecosystem.* There is basically no fund that has reached a decent target fund size that has not been backed by the EIF and the ERP programme” (Informant-EU-GVC-1-ZYO, EIF, 25/11/2020; author's italics). The statement is supported by the numbers: by 2021 the policy had supported over 160 intermediaries (VCs or BAs) with a cumulative portfolio of 2,500 start-ups (official statements received from the EIF via Informant-EU-GVC-2-MBO, EIF, 06/05/2021). Although precise like-for-like that is not available, various estimates, such as the one in Figure 4.27, suggest the Facility has been indirectly behind around 50 percent of capital invested and

German start-ups. More in detail, of all German VC funds consistently active in the period 2005-2015,<sup>122</sup> 60 percent were EIF-backed and were responsible for around 64 percent of their deals (Figure 4.28). Although the data also shows a long tail of sporadic investors (with less than one investment per year), the analysis below points to the weight of the EIF within the more professionalised and structured part of the venture industry. It should also be noted that the EIF “contribution” is probably relatively diluted in later years, as American VCs, who rarely receive EIF capital, increasingly invested in German start-ups, more than tripling their deal participation over the period (Dealroom).<sup>123</sup> The weight of the EIF-ERP facility relative to European-only VCs investing in Germany might therefore be even higher.

**Figure 4.27: Capital invested by ERP-EIF Facility funds vs total VC investment in Germany (2005 - 2015)**

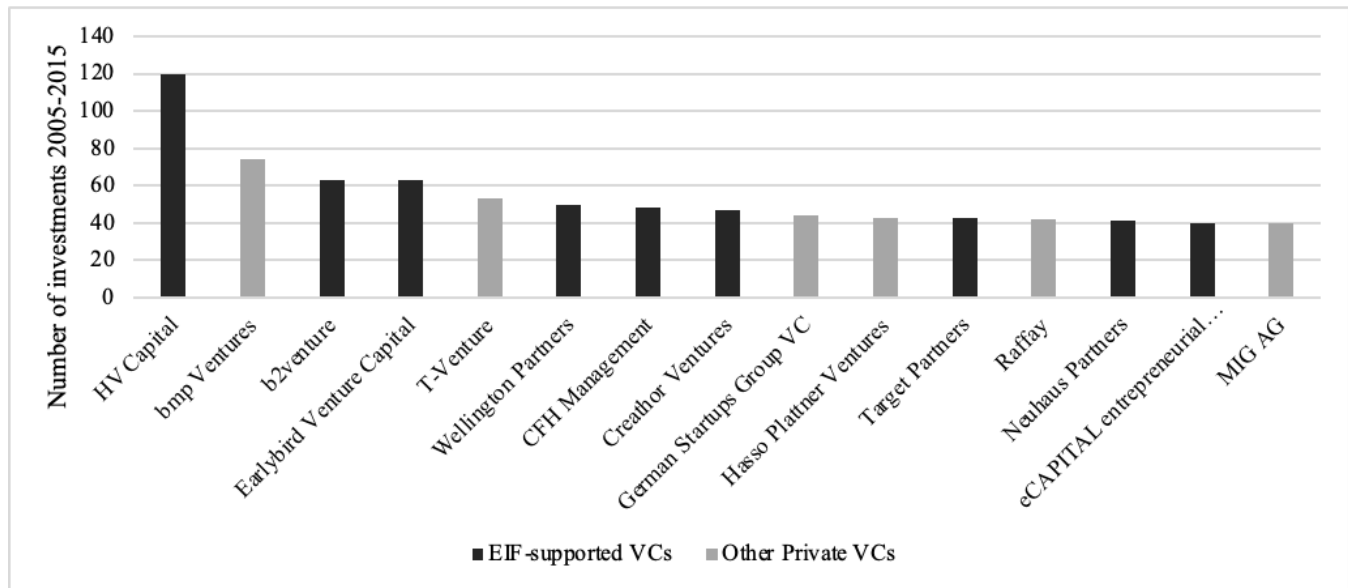


*Source: author’s analysis on Dealroom data and EIF figures from press release; note that, given the nature of the Facility, it is not certain that all the 5.2 billion euros mentioned in the official statement were invested in Germany; the comparison here is thus only indicative.*<sup>124</sup>

<sup>122</sup> Defined as those with more than one investment per quarter

<sup>123</sup> Between 2010 and 2020 VC deals with American investors went from 10 percent to 30 percent (Dealroom data; confirmed also in Bpifrance 2023).

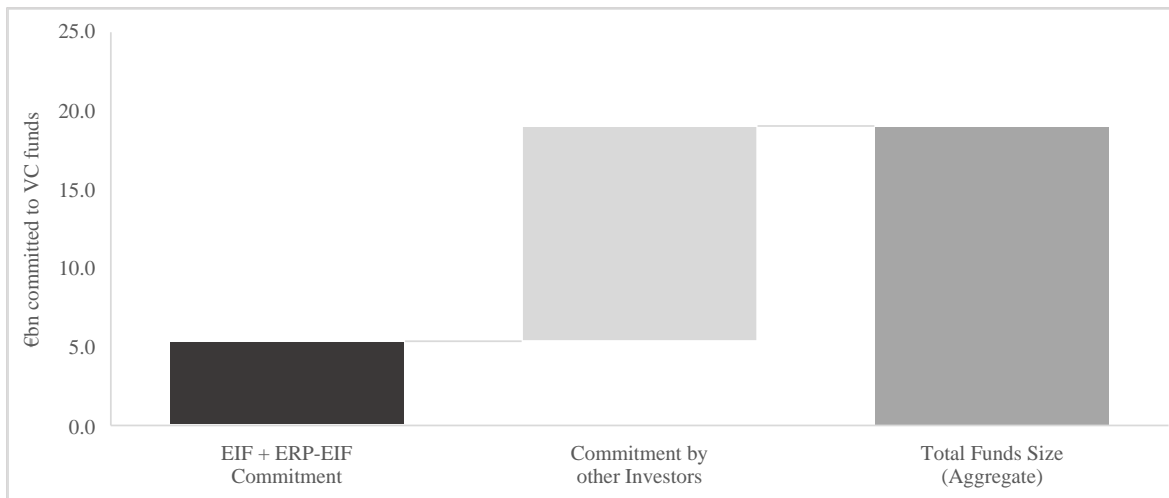
<sup>124</sup> See EIF CEO’s [statement](#): “Since 2004, we have invested in more than 50 German and European venture capital funds together with the ERP Special Fund. These fund investments have mobilised EUR 5.2bn for young and growing innovative companies.”

**Figure 4.28: Share of EIF-supported funds among the most active German VC funds (2005-2015)**

Source: author's analysis on Dealroom, Pitchbook, and EIF data

This data may seem at odds with the relatively small amount of public resources committed by Germany. This apparent contradiction is explained by the “critical mass” effect the EIF model triggers. By providing a commitment for a significant proportion of the capital in the early phases of the process, the EIF catalyses other investors’ commitment to the same fund. Interviews with VCs have highlighted how on this topic quantitative fundraising data alone might be misleading: indirect GVCs’ capital as a proportion of the total fund size achieved at the end of the fundraising does not fully reflect their important role during the process (see interviews materials with leading VCs in Germany and France; eg., founding partner of HV Capital, 05/08/2021; founding Partner of ISAI VC, 12/01/2021; founding Partner of Elaia Partners VC, 26/01/2021). While EIF-ERP capital has represented typically 20-25% of a fund’s assets under management (see Figure 4.29),<sup>125</sup> it has been fundamental in *mobilising private capital* for VC funds in Germany (Informant-GE-VC-1-WOR, German VC 05/08/2021). Its critical mass of capital early-on in the process disproportionately increases the chance of a fund closing, and thus catalyses private-LP capital into those funds to which the EIF commits. This dynamic is even stronger than in Bpifrance’s case as the EIF can also act as the first investors in the fund, before any private LP commits, thus giving “very important signalling” (Informant-GE-GVC-5-SUD, TBG, 22/12/2022). After committing, the EIF also played a proactive role, according to a BMWK official, in attracting private co-investors into the funds it had selected, by doing reference calls with potential private LPs (Senior government official, 02/08/2021).

<sup>125</sup> For data on average ERP-EIF weight on a fund, see: [https://efre-bw.de/wp-content/uploads/Evaluation\\_Finanzierungsstudie\\_RMC.pdf](https://efre-bw.de/wp-content/uploads/Evaluation_Finanzierungsstudie_RMC.pdf)

**Figure 4.29: Proportion of ERP-EIF Facility capital on funds' final closings (aggregate 2004-2020)**

Source: data obtained from management of ERP-EIF facility.

Second, the policy had, in addition to a “quantity” effect, also a “quality” effect, by imposing strict conditionality on VC funds. Several interviewees, both on the public and industry side, mentioned the fundamental role the EIF has had in introducing—or even commanding—VC best practices in Germany (see e.g., Fredrik Bergenlid, partner at German VC Fly Ventures, 20/04/2021). This was particularly important in a country that lacked the institutions and business culture for equity investments (Becker and Hellmann 2005, Casper 2007). The EIF has not simply been providing capital: it has filtered investment teams, spread the US-born institution of the “limited partnership,” and promoted best practices for the contracts that regulate the relationship between LPs and GPs. Interviews with private VCs and EIF officials have highlighted that when a private fund approaches the EIF, this devotes six to nine months to analyse the fund’s team and strategy and negotiate the contracts (author’s interview with Juliane Hahn, founder of German VC Signature Ventures, 10/05/2021; Fredrik Bergenlid, partner at German VC Fly Ventures, 20/04/2021; and with Informant-EU-GVC-1-ZYO, EIF, 25/11/2020). Within this period, it scrutinizes the team’s background and investment track record, analyses the logic of the fund strategy in the context of the market and it ensures that the business plan of the fund is coherent with it (Informant-EU-GVC-1-ZYO, EIF, 25/11/2020). Once the fund strategy and economics are approved, the EIF negotiates the legal structure around the fund and its relationship with the capital providers (LPs). In summary, the EIF—like Bpifrance—ensures that any fund in which it invests follows the limited partnership best practices, both in the relationship with the EIF itself and with other LPs (author’s interview with Chris Wade, founding partner of Isomer Capital VC and former high-tech entrepreneur, 04/03/2021; and with Informant-EU-GVC-1-ZYO, EIF, 25/11/2020 and 20/01/2021). The main contract the EIF and fund managers negotiate is the LP Agreement (LPA). The LPA is therefore the legal tool through which the EIF enforces conditionality on its private counterparts. With the LPA the EIF team tries to ensure: 1) that there is alignment of financial interests between the LPs and GPs of the fund; 2) that LPs are protected and can intervene in case the fund is being mismanaged, and 3) that the fund’s economics and compensation structure is efficient and provides the right incentives to management. In addition, in the case of the ERP-EIF Facility, the EIF also mandates the amount that should be invested in Germany.

Table 4.6 below summarises, in an example based on fieldwork interviews, the type of conditions the EIF and other public FoF might require on the LPA before investing in a fund.

**Table 4.6: LPA key clauses and conditions required by public FoF such as the EIF**

Areas of negotiation	Potential Issues	Typical Conditions Required	Benefit for LPs
<b>TERMS ON GP-LP INTEREST ALIGNEMENT</b>			
<b>1. Management company ownership</b>	Third-party majority ownership (e.g., a bank)	100% owned by GP	GP's and LPs' financial interest are aligned as performance of management company reflects that of fund; GP is not an employee of a third party <sup>126</sup>
<b>2. Conflict of interest</b>	GP can perform other investments outside of the fund activity (e.g., with personal capital or previous funds)	All GP investment activity must be limited to that of the fund	Avoidance of 1) GP external commitments, 2) situations where GP would be tempted into operations that would generate a high personal gain but a risk/loss for the fund
<b>TERMS ON LPs PROTECTION</b>			
<b>3. Investor protection clause</b>	None	LPs majority can change members of fund management	Ensure that LPs can intervene if certain managers are operating unprofessionally
<b>4. No Fault Divorce</b>	None	Qualified LPs majority can transfer capital to another entity or replace management completely	Ensure that LPs are not locked into a fund that is being mismanaged
<b>TERMS ON FUNDS ECONOMICS AND GP INCENTIVES</b>			
<b>5. Management Fee</b>	GP compensation more based on yearly fees than on performance (carried interest)	Up to ~2% <sup>127</sup> of AUM <sup>128</sup>	LPs limit their "fixed costs" and salary-like compensation of management; instead they ensure that management's financial reward is tied to fund performance, through sizeable carried interest
<b>6. Carried interest</b>		~20% of profits after hurdle rate	
<b>7. Hurdle Rate<sup>129</sup></b>	Low (e.g., 1.1x fund size)	Appropriate to risk level (e.g., increased to ~1.2x)	Ensures GPs receive the extra financial reward <i>only after</i> a baseline, commensurate return has been guaranteed to the LPs
<b>8. GP's contribution</b>	In some structures investment teams might have no "stake in the game" (e.g., if they are employees of a third-party company, see 1)	Investment team (usually seniors) required to contribute a small percentage (e.g., 1%) into the fund	Ensures GPs have a "stake" in the fund (not only an upside from the carried interest); in this way GPs can "lose their own money" as well if the fund underperforms

*Note: terms above are based on various insights from interviews across countries and actors in the ecosystem. They should not therefore be interpreted as precise terms requested by the EIF or other FoF from all management teams. Rather, they are only meant to show the levers*

<sup>126</sup> This requirement can be a substantial hurdle for first-time funds, given the costs and time commitment of setting up a new company and receiving regulatory approval for it (e.g., interviews with Spedaliere and Informant-IT-VC-6-KYF). This is why national FoF GVCs are sometimes more flexible on hybrid structures that allow first-time teams to leverage existing management companies for their first fund.

<sup>127</sup> Precise percentage depends on various aspects, in particular fund size. Given the economies of scale for funds operations, bigger funds typically are requested to charge lower management fees.

<sup>128</sup> Assets under management (size of the fund); management fees can also be calculated in more sophisticated ways but the concept is similar.

<sup>129</sup> Hurdle rates can also be expressed in terms of internal rate of return (IRR; historically in Europe between 4 and 8 percent, depending on interest rates levels). Multiple-based rates are typically preferred by early-stage funds, because they have a more uncertain timeline for exits and thus would take a bigger risk by committing to an IRR figure, which depends on timing of investment inflows and outflows.

## Chapter 4: Germany

*that these institutions can use to impose conditionality. The actual terms are negotiated ad hoc and depend on a variety of funds, country, and sector characteristics*

As it should appear evident, the modified clauses increase the accountability of fund managers as well as their stake into the performance of the fund. This is why they are often terrain of difficult negotiations as VCs perceive them as “very demanding” (Informant-EU-GVC-1-ZYO, EIF, 25/11/2020 and 20/01/2021; Julius Ruessmann, VC at Early Bird, 18/05/2021). On the flip side, where the EIF manages to enforce these conditions, the fund terms reduce the risk and increase the potential upside for the LP (see right column of the table). As a veteran LP investor in several European VC funds summarised: “if you have been through an EIF process, other LPs know it has been long, thorough, and that the LPAs has been made favourable to LPs” (Wade 04/03/2021). In this sense, the EIF provides a “certification signal” to the other potential investors.

The ERP-EIF Facility, thus, was a policy tool to import equity investment practices by imposing them on the local private sectors as well as by attracting foreign VCs into Germany. It has been a partnership between the public and the private sector, but one where the public side has had enough competence and independence from the private industry to direct and condition its development, not just succumbing to its interests—a key feature of PAL. As the founding partner of one of Germany’s most successful VC funds explained:

“The EIF has played an instrumental role. I would say until today or yesterday, for a first-time fund it was impossible to be set up without support from the EIF. Because they are an “industry proof:” they prove that terms and LPAs are up to market standards. They only invest if the terms are 100% to their standards. And not all private investors [LPs] are sophisticated enough to understand and evaluate an LPA—it’s complicated, like auditing an annual report. So, if the EIF invests, it sends a signal to these private investors that they can invest too”

Author’s Interview with Informant-GE-VC-1-WOR  
German VC, 05/08/2021

This view is also shared within German policymakers, who consider the collaboration with the EIF to have been strategic not only to provide capital but also to professionalise the industry:

“The EIF contributed a lot to the market, they introduced governance and professional contract structures, which were able to convince international funds of fund investors [to invest in Germany] as well ... [As a VC] you could get ERP-EIF money only if you were prepared to accept these state-of-the-art international conditions—that means you could no longer follow your national level business governance [i.e., different fund structures used across countries] but you had to adapt yourself. For the first years many VCs made comments about how they were forced to accept these conditions that they did not like ... But a few years later, when they tried to raise the next fund, many of them were very grateful that we had forced them to adapt to international structures as this empowered them to attract international money ... In this way, *we contributed a lot to privatising the market* ... So, the mobilising effect of enforcing internationally accepted rules was very successful. And I’m personally convinced that we would have not had this success, this progress, without cooperating with the EIF.”

Senior government official,  
20/01/2021  
(author’s italics)<sup>130</sup>

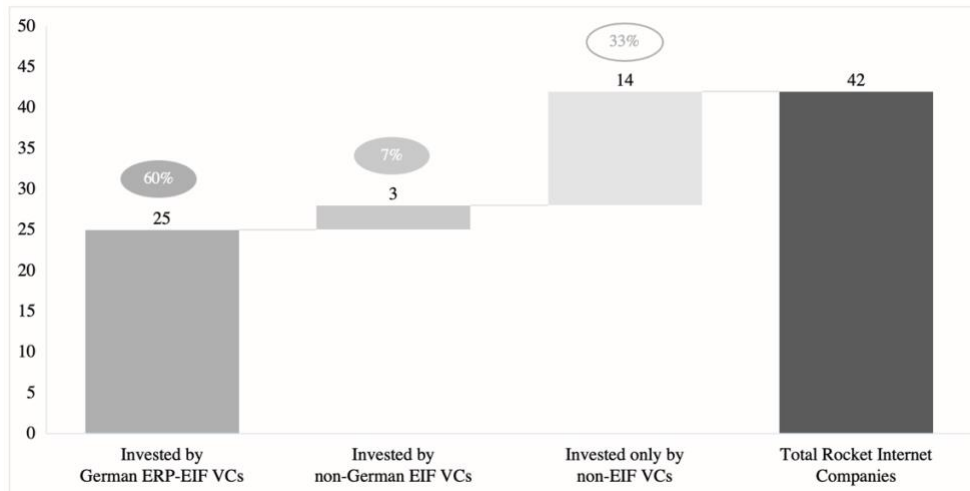
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<sup>130</sup> Informant-GE-GOV-5-EFO

As consequence of this approach—“following” private funds but also obtaining LP-favourable terms from them—it should be noted that the ERP-EIF Facility has also generated a positive financial performance. Although official detailed figures were not available, during interviews policymakers explained that the Facility has generated a seven percent IRR for most of the years and even beyond 10 percent after 2010 (Senior government official, 20/01/2021). These figures are consistent with those reported by EIF officials about the general performance of European funds invested by the EIF (Informant-EU-GVC-1-ZYO, EIF, 25/11/2020). German officials explained that it was this performance that helped convince the government in 2020 to expand its future commitments to this type of instruments and even commit core federal budget capital (see German Future Fund programme) (Senior government official, 20/01/2021).<sup>131</sup>

All in all, therefore, the impact of the ERP-EIF Facility should not be considered in isolation or in contraposition to the private activities that underpinned the birth of the German ecosystem. To the opposite, the Facility has been a complementary partner: it has been providing additional capital to those areas, sectors, and opportunities that the private market identified as most attractive. In this sense, therefore, it has in no way aimed to impose an industrial strategy on the ecosystem but rather reinforced its low-tech orientation in the early days. This is evident from the type of funds it has invested in (see Figure 4.26). Similarly, the Facility’s relationship with Rocket Internet is telling. Although Rocket Internet was a private initiative, its start-ups, in order to expand, often raised capital from private investors supported by the Facility. The analysis of the data (see Figure 4.30) estimates that around two thirds of Rocket Internet start-ups were supported also by EIF-sponsored VCs. Note that from 2019, the Facility also invested directly in Rocket Internet’s own VC fund (Rocket Internet Capital Partners).

**Figure 4.30: Rocket Internet start-ups invested by ERP-EIF intermediaries**



Source: author’s analysis on Pitchbook and EIF public data

<sup>131</sup> For the EIF’s role in the 2020 German Future Fund initiative, see: [https://www.eif.org/what we do/resources/gff-eif-growth-facility/index.htm](https://www.eif.org/what_we_do/resources/gff-eif-growth-facility/index.htm) ; for all the instruments of the initiative, see: <https://www.bmwk.de/Redaktion/EN/Artikel/Economy/future-fund.html>

Thus, this analysis of the ERP-EIF Facility's shows that attributing the growth of the German ecosystem precisely to private or public initiative is misleading. Instead, the two were symbiotic: while a series of private initiatives, chiefly Rocket Internet, emerged spontaneously thanks to the entrepreneurial spirit of specific individuals and companies, the state put in place a measure that helped magnify those initiatives and maximise the externalities for the rest of the ecosystem. It also shows that the state did not act aside from the private market but very much in partnership with it. Interestingly, this synergetic dynamic between the market and the state matches the conclusions of several studies on the birth of the Silicon Valley (Noone and Rubel 1970, Janeway 2012, Nicholas 2019).

In conclusion, the ERP-EIF Facility had an important impact on the innovation ecosystem in Germany, because it contributed, more than any other policy, to importing into the country the institutions and practices necessary for the VC industry to thrive, which were not present in the banking-dominated financial sector in Germany. The policy not only provided a critical mass of public capital to start new VC funds or attract foreign ones to Germany. It also required that those funds operated following practices that could improve the financial returns to the LPs, thus strengthening the reputation of the industry. It did not try to impose a state-led industrial policy in terms of sector focus but it provided public money with strict conditionality on those aspects that mattered to render the asset class more appealing. In this way it let resources follow private initiatives, making the scheme completely complementary to the Rocket Internet-type innovation that was spreading around Germany. Perhaps most telling of the Facility's impact and performance is the fact that German authorities in 2020/2021 decided to double down on this policy. Of the newly established German Future Fund (10 billion euros), the Government decided to allocate a 3.5 billion euros to continuing the collaboration with the EIF.<sup>132</sup>

### 4.5.3.5 Comparison between ERP-EIF Facility and other indirect GVC initiatives in Germany

The fragmented innovation policy landscape in Germany offers the opportunity for a close within-case comparison also for the indirect investment initiatives. Similarly to what shown with HTGF, this comparison offers insights into why operating with a PAL approach made the Facility more effective than comparable programmes and helped it overcome some typical pitfalls of GVC programmes.

At the same time as the ERP-EIF Facility, Germany ran another scheme to support the German VC industry, called Parallel Funds.<sup>133</sup> It differed in three key ways from the Facility. First, it was run within KfW, by “a very, very little team ... with a banking and loans mindset, not a venture capital mindset” (author's interview with a current KfW Capital senior official, Informant-GE-GVC-4-UEU, 08/09/2021). Second, it did not follow the classic LP-GP relationship of private VC. KfW did not even own shares in the private funds it supported. Instead, the programme required PVCs to create, as the name suggests, a separate vehicle (the “parallel fund”) that would request a subordinated loan from KfW (Informant-GE-GVC-4-UEU, KfW Capital, 08/09/2021). Third, each investment of the parallel fund had to be pre-approved by KfW (Senior government official, 20/01/2021; Informant-GE-GVC-4-UEU, KfW

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<sup>132</sup> This is particularly noticeable since the resources for the new instruments come not only from ERP Special Fund but also from the carefully managed German federal budget (Informant-GE-GOV-5-EFO, 20/01/2021).

<sup>133</sup> *Fondsinvestments* programme.

Capital, 08/09/2021). These characteristics had two important negative effects. First, KfW was still involved in the single investment decisions of the “parallel fund.” It later emerged that the public bank’s governance was “cutting the risk,” avoiding the riskiest but also most high-potential investments—which typically drive the profitability of a VC fund. Second, the positive effect of the state’s conditionality on the ecosystem was very limited, at best. Because KfW was not investing alongside all other investors in the fund, there was no best-practice setting and positive externality for private investors that derived from KfW’s contracting. While in the ERP-EIF programme the EIF negotiates the LPA also “on behalf” of private investors (see sections on FoF in this and France chapter), this was not the case with the Parallel Funds programme. In short, KfW was simply providing some extra capital to the industry, and typically to the least risky companies.

Predictably, the results were underwhelming, although interviews with various representatives across Germany’s organisations offered slightly conflicting views on the performance (e.g., Informant-GE-GVC-4-UEU, KfW Capital, 08/09/2021; Informant-GE-GVC-9-PJU, KfW, 20/11/2023). This was largely due to the risk-averse filtering operated by KfW, similarly to the *Startfonds* case. As a senior government official explained, this is the nature of a bank-like institution and of people trained with a banking mindset. In venture capital operations, however, reducing risks translates also into missing the most promising companies (Senior government official, 20/01/2021). The programme was indeed shut down in 2008. This was in part because of its performance but also because of a general retrenchment of KfW from any fund investment activity, in the wake of some financial crisis-related scandals and losses KfW incurred during the financial crisis (Informant-GE-GVC-4-UEU, KfW Capital, 08/09/2021).

Perhaps most insightful for this research is the epilogue of this Parallels Funds’ story: in 2014 KfW decided to restart indirect investments. This time, however, it essentially replicated the ERP-EIF Facility model and embraced a PAL approach: it created a separate entity, KfW Capital, which is the equivalent of Bpifrance FoF’s team.<sup>134</sup> It has the sole responsibility, and the necessary competences, to operate as a fund of funds investor (Informant-GE-GVC-4-UEU, KfW Capital, 08/09/2021). As an official at the organisation recalls, “The main lesson learnt from the Parallel Funds experience was ‘don’t be special’ ... So a clear decision was made by KfW that the new subsidiary had to be a lot more market oriented. That it should act as a market fund of funds and not like a typical promotional bank” (Informant-GE-GVC-4-UEU, KfW Capital, 08/09/2021).<sup>135</sup> In practice, this means that KfW Capital now conducts due diligence on VC teams and buys shares in their fund, just like the EIF and any other institutional investor. After that point, it has no say in the single investment decision: “In my personal opinion, they [KfW management] looked at the EIF and realised that that approach was far more market oriented than believing that KfW in Frankfurt knows it better than the VC, and could decide ‘I want to invest in Company A or company B?’ Why should we [KfW] know better? So, we decided to be very selective in the due diligence we do on the VC teams we invest in but, afterwards, it is not our business... there is no comparative advantage [for KfW to pick companies]” (Informant-GE-GVC-4-UEU, KfW Capital, 08/09/2021). Finally, the team competences have changed: the team grew to 30 people and there was a clear effort to gradually increase the share of professionals recruited from the market, which went from 50 percent in 2015 to 90 percent in

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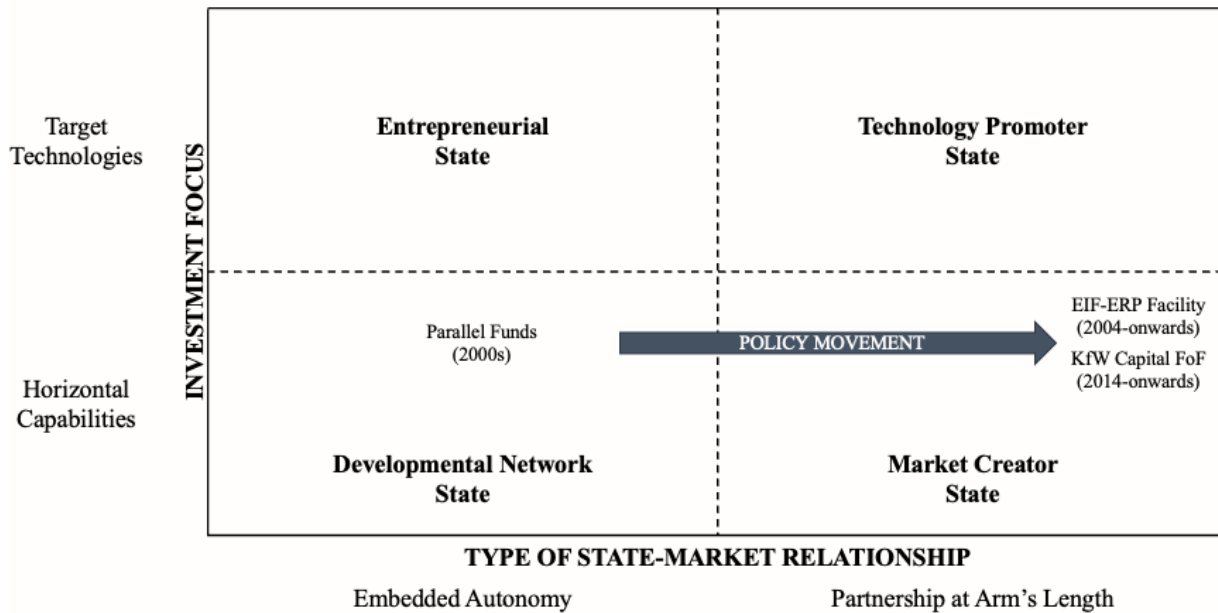
<sup>134</sup> In 2014-2015 KfW first restarted doing FoF internally, but following this new modality; then in 2018 it span off the unit, creating KfW Capital.

<sup>135</sup> The same comments were made by other interviewees within KfW (Informant-GE-GVC-9-PJU, KfW, 20/11/2023).

2021. In summary, KfW eventually also moved to a PAL approach but it took it over a decade to overcome its biases.

In conclusion, the within-case comparison between the ERP-EIF Facility and Parallel Funds highlights that, also in the indirect GVC case, *how* the programme invested made an important difference. Figure 4.31 summarises, with reference to the theoretical framework, the difference between the two indirect GVC programmes described in this section. At a high level, both policies indirectly provided public capital to start-ups via private funds. However, the ERP-EIF programme reflected a PAL approach: the EIF invests in VC funds alongside other private investors but has the competences and capacity to lead negotiations and condition the industry. This has allowed the EIF to spread VC best practices in the German industry. It was a fundamental contribution to fill the institutional gaps in a coordinated market economy that historically relied on bank credit and thus did not have the institutions and business culture for private equity investments (Becker and Hellmann 2005). At the same time, the EIF has avoided common forms of state-capture that earlier literature highlighted. Lerner has recounted how, while “sophisticated investors in venture funds, such as [American] university endowments, make sure that perverse incentives are avoided... unfortunately, governments have not always thought as carefully about incentives... so that the private sector participants do well, no matter if the investment generates a good return or not” (Lerner et al. 2007; Lerner 2009). In Germany, it could be argued that the ERP-EIF Facility has in practice played the role that in the United States is played by university endowments, embracing the latter’s practices and imposing them on the German VC market. To Lerner’s point, however, it is notable that to achieve this, Germany had to outsource the activity to an organisation at arm’s length from the state (the EIF). In short, thus, the German indirect GVC story shows both “how it can be done” but also “how hard it can be to get it right,” especially within an institutional framework historically uncongenial to disruptive innovation investments. Germany eventually found its way to structure the policy: it outsourced the task to the EIF, which allowed BMWK to both maintain limited direct state intervention, through the “intermediated” approach, and circumvent Germany’s traditional development institutions and their biases. Only after the Facility’s first decade of operations the policy learning process came full circle. The creation of KfW Capital eventually introduced a “fully German” programme that reflected the established policy best practices and departed from the model of the country’s promotional bank.

Figure 4.31: Theoretical framework applied to Germany’s indirect GVC initiatives



#### 4.6 Conclusion: GVC and institutional innovation in Germany

In conclusion, in the two decades from the dot.com bubble, the German innovation ecosystem has experienced fast growth. This was not “orchestrated” by the state, like in neighbouring France, but two GVC programmes—HTGF and the ERP-EIF Facility—were crucial complements to private activities. HTGF has intervened in the riskiest and earliest stages of the market at a time when private investors did not venture there. The ERP-EIF Facility, instead, has supplied the critical mass of capital to create private funds in Germany and proactively pushed for professionalising the industry. Importantly, these GVC programmes succeeded where previous ones had failed, because German policymakers eventually learnt how to address the underlying obstacles of the German economic model and institutions. In the German context, GVC policies needed to be operated at arm’s length from the country’s traditional political economy institutions. Thus, HTGF and the Facility were the first programmes not to rely on Germany’s credit institutions (KfW and commercial banks). This allowed the GVCs to focus on filling the institutional deficiencies of Germany, in particular the lack of risk capital. In doing so they supported the private VCs and start-up creation activities that were emerging in the country, rather than merely “financing inventions” with the traditional tools of German development banking. The chapter showed that Germany arrived at this outcome through its very own political and policy learning process. Both HTGF and the ERP-EIF Facility were not simply best practices imported into Germany from other countries. Instead, the policy design was driven by specific national actors and retained core German policy principles—stakeholders’ coordination, financial sustainability, and limited state direct intervention—while avoiding the constraints of German institutions that were incompatible with start-up financing.

The result is that, as the table and figure below show, both the specific policy menu (Table 4.7) and the process to get there (Figure 4.32) were different from France. In terms of policy tools, Germany has a clear equivalent of Bpifrance FoF. Germany also invests directly into start-ups, but HTGF is not a

## Chapter 4: Germany

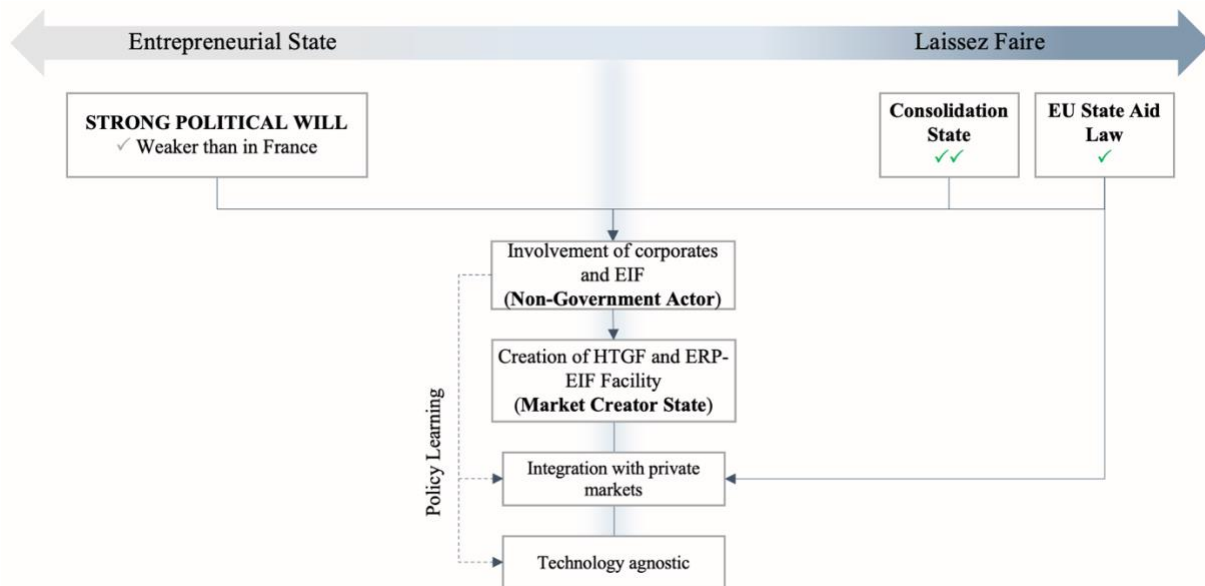
co-investment GVC; instead, its PAL characteristics are due to the involvement of private corporates in the fund governance itself. Its role is similar to Bpifrance direct investments, but more focused on reducing early-stage risk, rather than providing leverage for PVCs. Germany is then missing most of the other elements that make Bpifrance such an omnipresent actor in France’s ecosystem.

However, the chapter showed that, overall, the core principles of Germany’s interventions were consistent with the Market Creator State. How did this happen? Figure 4.32 compares the policy process to France’s and shows that most scope conditions and causal factors were present, although with a different balance. In Germany, EU state aid laws applied just like in France and the forces of the consolidation state were even stronger, given the country’s governing elite’s ordoliberal preferences. On the flip side, there was an initial political mandate and will to intervene in innovation markets (the Schröder’s Partnership for Innovation) but it soon weakened. The momentum was carried forward mostly by the German ministerial bureaucracy, which countered the tendency of Germany’s traditional government agency, KfW, towards classic GVC pitfalls, and pushed for integration with non-state actors (the EIF and private corporates). Policy learning was important in both cases, but while in France it took place within the PDI ranks, in Germany it was driven largely by the ministerial bureaucracy, its interaction with non-state actors, as well as its exposure to a variety of GVC models over the years.

**Table 4.7: Germany’s Market Creator State policy tools “menu” versus France’s Bpifrance**

Policy tools	France	Germany
<b>Indirect Investments (1)</b>	✓ Bpifrance FoF	✓ ERP-EIF Facility (KfW Capital from 2014)
<b>Direct Co-Investments (2)</b>	✓ Bpifrance Direct Investments	✓ (Coparion, only from 2016)
<b>Direct “Solo” Investments (3)</b>	×	✓ HTGF, public-private fund
<b>Financing (4) (grants and loans)</b>	✓ Bpifrance Financing	×
<b>Integration between 1, 2, 3, 4</b>	✓ Bpifrance Innovation Unit	×
<b>Coordination and support</b>	✓ Cross-teams	×
		No comprehensive ecosystem coordination by GVC

Figure 4.32: Causal process to reach the Market Creator State in Germany



The comparison with France thus highlights the argument underlying this thesis: European countries have each followed a different path and used different governance structures to make GVC work, but these models, when successful, all shared the same core principles of a Market Creator State. France's and Germany's approaches are different because they are rooted in the two countries' different comfort with state intervention in the economy: the French state had a long tradition of centralised, interventionist industrial and innovation policy, while German state funding was historically intermediated by local banks. This translated into a greater predisposition of Bpifrance to finance start-ups and VCs proactively. Bpifrance became the one-stop-shop for innovation funding in France, while these functions in Germany were distributed among different actors. More broadly, the France state simply invested more: over the same period (2006-2019) Bpifrance and predecessors invested (with direct and indirect equity) over 10 billion euros in French start-ups, compared to around six billions in Germany (almost three times if adjusting for GDP size). France also invested a larger share directly into start-ups and provided vastly more non-equity financing.<sup>136</sup> The dynamics of policy evolution were also different. In France the GVC approach evolved gradually and it could even be argued that Bpifrance was just the latest evolution in the successive re-organisations of existing French innovation agencies. In Germany, instead, change required a drastic rethink of policy tools and a transfer of GVC activities outside of Germany's traditional institutions—in the case of the ERP-EIF programme, even outside of Germany—to be able to follow a different operating model. Ultimately, however, the two countries arrived to GVC models that share core features. First, all programmes operate at arm's length from politics and with separate governance, staff, and process from the public or ministerial bureaucracy. France achieved this by setting up of a new national PDI. In Germany it originally took the form of a public-private partnership (HTGF) and of a

<sup>136</sup> Author's estimates put Bpifrance's financing to start-ups through non-equity tools at around six billion euros over this period; for Germany precise comparison figures are not available but interviews with German ecosystems' actors suggest this is not a commonly used form of funding for German start-ups.

collaboration with a supranational PDI (the EIF). Second, in neither country the state independently “picked the winners,” without involvement or co-investment of the private sector. Finally, in both countries the majority of resources have been focused on promoting high-growth companies of any kind rather than specific strategic technologies.

This chapter offers three important insights from a theoretical point of view. First, GVC was important for the development of the innovation ecosystem in Germany. Although the interventions were more circumscribed and less manifest than in France, they operated to fill fundamental gaps that made the CME model incompatible with start-up funding—namely high aversion to financing early-stage companies and lack of a professionalised equity investment industry. To be sure, this state intervention in no way detracts from the importance of the private initiatives that sparked the German innovation ecosystem in the 2000s. Rather, the private and public stories were fully complementary, offering a stimulating—albeit audacious—parallel to the well-documented case of the Silicon Valley, where private resources also did not originally flow so naturally to high-risk investments (Noone and Rubel 1970, Saxenian 1996, Kortum and Lerner 2000, Lerner 2009, Mazzucato et al. 2015, Nicholas 2019). Similarly, in Germany spontaneous private initiatives such as Rocket Internet were decisive, but it took public policy—in particular the ERP-EIF Facility—to mobilise a critical mass of public and private capital able to develop a VC industry of a scale that could fund the development of a broader and more robust ecosystem. The insights are consistent with high-level estimates from another recent study that found that, between 2005 and 2015, around 40 percent of start-ups deals in Germany involved direct or indirect GVC (Alperovych et al. 2018).

Second, the case sheds light on the political economy dynamics behind the evolution of GVC in Germany. It showed that Germany’s variety of capitalism had an important impact both on how difficult it was to arrive to effective GVC policies and on their ultimate design. Through within-case comparisons, it offers concrete evidence on exactly how the CME institutional biases lead policymakers to run into classic GVC policy mistakes and how they overcame them (Lerner 2009). In the German context this required circumventing the existing institutions of development, whose model (coordinated, credit-based and fragmented) was not fit for GVC. But German policymakers did not just copy an existing foreign model: they developed new tools that were still consistent with deeply rooted preferences of the German political economy. HTGF’s governance involves all stakeholders of the innovation ecosystem and, in particular, large German corporates. Similarly, the ERP-EIF Facility reflects the German ordoliberal preference for a very low-touch, “intermediated” government intervention that promotes private industry development and market competition. These insights on GVC policy development and learning in Europe enrich the existing literature on GVC policy diffusion, which had looked in particular at the adaptation of GVC policies in East Asian economies (Klingler-Vidra 2018). This chapter on the one hand shows that policy adaptation was necessary also in the context of a European CME economy. On the other, however, it draws attention to policy outcomes, indicating that some policy adaptations can be more effective than others, even within the same institutional context. In this sense, one of the most interesting aspects is the role of centralisation. While France and Germany have two opposite systems (France very centralised, Germany federal), ecosystem growth in both countries accelerated with national-level GVC policies. A similar story emerges in the Italy vs Spain comparison (next chapter). This is consistent with the theory

and with the general tendency of innovation to concentrate rather than spread homogenously. Thus, it emerges that even in countries with distributed forms of government, GVC policy adaptations should refrain from trying to offset this concentration dynamic by distributing resources too thinly across geographies.

Finally, the chapter highlighted that not all GVCs are created equal. The within-case comparisons have shown that in Germany some GVC programmes were more effective than others. The analysis found that the key differentiator was the PAL approach. This has meant autonomy from both political interference and from Germany's traditional development institution—KfW. Indeed, KfW's programmes, which sometimes operated simultaneously to the more innovative ones, underperformed because the bank's credit-focused governance and practices turned out to be incompatible with venture investing. HTGF and the ERP-EIF Facility, instead, operated alongside the emerging private sector. This approach rendered these programmes complementary to the private sector initiatives—such as Berlin's Rocket Internet—that shaped Germany's ecosystem development, including its initial focus on low-tech, business model innovations. The insight is important to inform future small-N and large-N research on GVC. A researcher who runs a statistical analysis on GVC in Europe between 1990 and 2020, for instance, would normally not distinguish between HTGF and Startfonds, or between the Facility's and Parallel Funds' investments (e.g., see Armour and Cumming 2006; Da Rin et al. 2006). But this research has shown that, in practice, these “observations” are profoundly different. At a higher level, this detailed analysis contributes to the renewed debate over the role that industrial policy can have in innovation. For non-liberal market economies, an “entrepreneurial state” (Mazzucato 2013) that autonomously funds innovation may not be enough if the rest of the ecosystem elements are not present. Instead, these countries might need a Market Creator State that carefully eliminates those institutional obstacles that prevent the emergence of VCs and start-ups.

The chapter also offers some more practical insights for policymakers. First, the case of KfW shows that it can be very challenging to set up GVC programmes within institutions that have governance and competences focused on credit provision. *Investment* and *credit* are completely different financing mechanisms, requiring different processes, staff competences, and incentives. The learning from the German story is clear: set up a separate unit. Ultimately this is what KfW did, with the creation of KfW Capital in 2015. Until then, working around KfW's requirements and *modus operandi* had led to overly complicated and inefficient models of public start-up support. The broader lessons here is that “economic development” and “innovation” are distinct policy objectives and that institutions that are effective for the former are not necessarily fit for the latter (Italy, next chapter, provides further evidence). This is an important premise for any policymaker about to embark on ambitious industrial policies of this kind.

Second, beware of simple direct “matching funds.” While it might be tempting to translate PAL into simple public funds that automatically “follow” private investors, providing capital with little or no analysis of their own, this chapter showed that it depends on context. German policymakers' reflection on the early experience of WFG and TBG flagged that for the public to only co-invest when there are no professional co-investors in the industry might be highly risky and not particularly useful for the ecosystem. In an economy that historically lacks the institutions for equity investments, it might be initially better for GVC to internalise the competences to invest and set up the right incentives and

constraints—as Germany did with HTGF—than to rely on immature private investors. As the VC industry matures, the public can step back and outsource more decision making to the private sector. It also follows that a mix of direct and indirect GVC appears as the winning combination. Indirect GVC in countries with shallow private equity markets are fundamental to provide critical mass and signalling for VC funds to attract private capital. While the private industry develops, however, well-designed direct GVC can help both early-days start-ups (giving them access to capital) and private VCs, whose performance can benefit from the de-risking that a government fund can provide.

Finally, policymakers should envisage a path of financial sustainability for GVC initiatives. Aiming for a positive return not only helps align GVC activities with the private sector but also helps the continuity of the programmes, in a field where policies require years to yield results. The positive performance of HTGF and of the ERP-EIF Facility earned the programmes repeated renewals of funding, which guaranteed a 20-year continuity of support to the German ecosystem. At the same time, it is important for GVC's management to set return expectations realistically, so that they are both coherent with the public policy goal and provide a “concrete incentive.” Part of the political success of HTGF, for instance, was that it outperformed compared to expectations. Importantly, the challenging but realistic financial targets of the fund have meant that staff was effectively incentivised. It perceived that performance bonuses were achievable, even while working for a public fund in a highly risky segment of the market. By contrast, setting unrealistic financial goals for these policies could be akin to setting none, if management perceives them as unattainable because inconsistent with the public role of GVC or if the public fund starts behaving purely like a private one, disregarding its public mission of creating positive externalities for the ecosystem.

## Chapter 5 Building ecosystems in Southern Europe: Italy vs Spain

*“We set up a good playing field, with clear rules to play.  
Except, we were missing the ball ... capital formation”*

*Italian venture capitalist*

### 5.1 Introduction: the diverging paths of Italy and Spain

This final empirical chapter takes the analysis to Southern Europe. It answers the question of why Italy, a country historically known for its vibrant SMEs (Piore and Sabel 1983, Locke 1995), lost ground compared to its European peers in terms of developing an entrepreneurial ecosystem, despite a variety of policy attempts. It places Italy’s story in contrast with the insights from the previous chapters and compares it with Spain. This comparison is particularly insightful as the two countries started to diverge in their policy approach since the early 2010s.

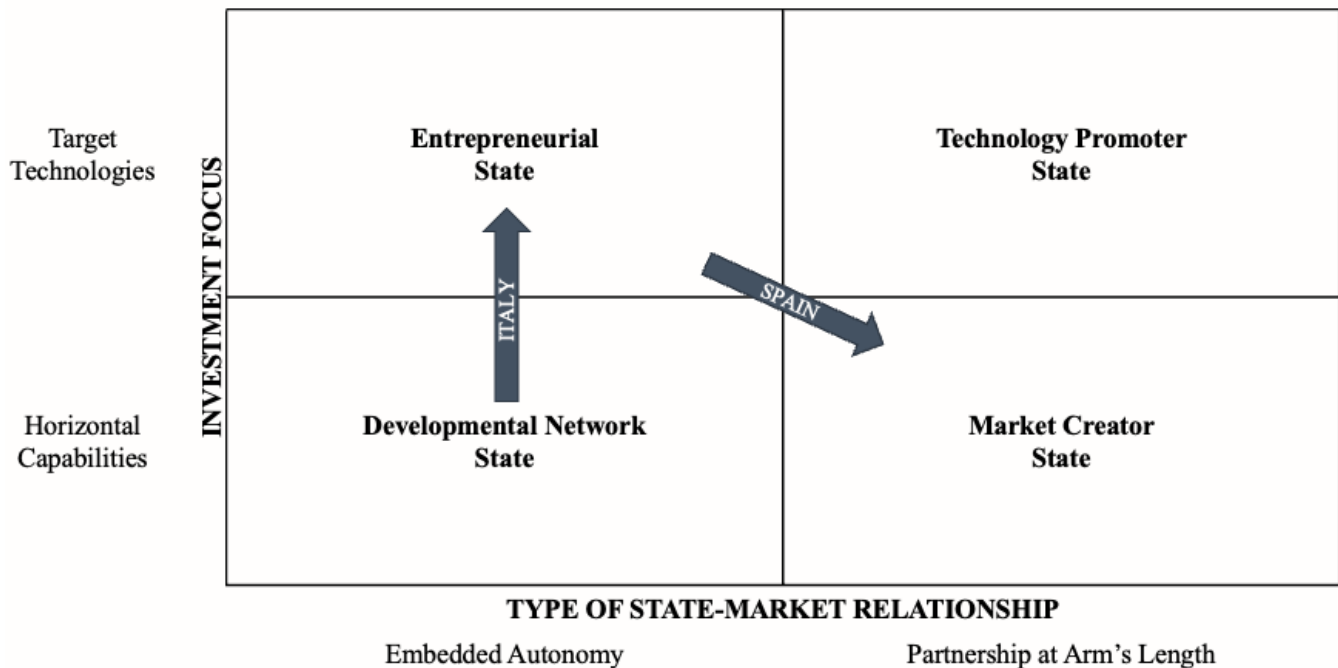
Italy therefore is an important cautionary tale. The country’s difficulties in matching its European peers’ development of the entrepreneurial ecosystem suggest that ecosystem growth was not just a general and natural trend across Europe but that it required some necessary conditions. The chapter contrasts the story of Italy with Spain and highlights two conclusions. First, it casts doubts on the orthodox view that entrepreneurship-friendly reforms (i.e., “setting the table”, see Lerner 2009) are more important than government investment in innovation. The Italy-Spain comparison shows that such reforms, in these advanced economies, were neither necessary nor sufficient. Second, it provides further evidence that *how* GVC policies are structured is a key determinant of success. Both countries invested significant capital in innovative companies but, since 2010, they focused on different types of policy tools. Italy, in other words, helps to understand why GVC policies are so hard to structure effectively.

In short, around the time of the Global Financial Crisis, both countries intervened in innovation and entrepreneurship policy but these efforts materialised in different policy approaches. Italy focused mostly on “setting the table.” Mario Monti’s emergency government and the following centrist executives passed a package of reforms that created the legal concept of an “innovative start-up” and granted these companies lighter bureaucratic/reporting requirements, more flexible labour laws, and significant tax benefits for the companies and their investors. As the political interest waned, however, the momentum disappeared to invest public resources and create new policy tools that could fit in the Market Creator State model. Instead, the most policymakers were able to grant to start-ups was access or extension to existing schemes designed for traditional SMEs, with low PAL and prone to the most common GVC policy pitfalls. Attempts at more modern GVC schemes, although some noteworthy, were timid. Spain, instead, chose an almost opposite approach. Politicians were not able to agree on reforms that would reduce the rigidities and red tape that burdened Spanish entrepreneurs—an overhauling reform was approved only in 2022. On the flip side, Spain injected significant public resources to support the growth of venture capital. It scaled up at the national level Market Creator State-like programmes that had been run for a few years by some central agencies and, especially, in the *comunidad autónoma* of Catalonia. To be sure, Spain maintained also its existing, lower PAL, traditional policy schemes for SMEs. But the new modern GVC policy was sizeable enough, contrary to Italy’s, to make a difference. It emerges that

Spain’s policy combination is the one that resembles France’s the most. Although with a much less coordinated model, its policy menu combines a large indirect GVC with some direct investments and non-equity instruments that are complementary to PVC activities.

The policy evolution of the two countries is shown on the theoretical framework, in Figure 5.1 below. The case of Italy, thus, is particularly insightful because it offers a clear example of how difficult it can be to make the movement towards the Market Creator State and why it took the country close to ten years to adapt its model to the best practices that were emerging in the rest of Europe.

**Figure 5.1: Italy’s and Spain GVC policy movement**



This final chapter thus strengthens the theoretical and policy contributions of this research.

It expands the literature in three ways. First, it offers an important comparative case that questions the importance of framework reforms as the cornerstone of entrepreneurship policies. It shows that in a context where fundamental institutions are missing, changing the existing equilibrium requires a more interventionist approach by the government than simply “setting the table” (Lerner 2009). Second, it complements the growing literature on the Entrepreneurial State by showing how difficult it can be to design GVC policies correctly, adapting them to the local context. The example of Italy shows how easily state-capacity and political constraints get in the way. Third, the chapter offers an original contribution to European comparative political economy, expanding the literature that analyses the dynamics of economic policymaking and industrial policy in Southern European countries (e.g., Locke 1995, Hassel 2014, Hopkin 2015), which fall outside the two main and most studied varieties of capitalism—LME and CME.

The chapter also consolidates some of the key policy lessons from the thesis. Overall, it confirms that the core principles of the Market Creator State are associated with positive outcomes but that the specific implementation of them can vary by country. The Spanish model evolved differently from

France’s or Germany’s but it shares the PAL approach and a focus on horizontal capabilities over target technologies. More specifically, the comparison between Italy and Spain provides further evidence that trying to promote an entrepreneurial ecosystem mostly with debt-based instruments is difficult and that plain tax incentives are not enough to grow a professionalised VC capital industry.

The chapter is structured as follows. The next section shows how between 2012 and 2019 Italy’s ecosystem fell behind Spain’s and provides a high-level overview of how Spain’s policies better aligned to the Market Creator State principles. Section three then proceeds by contrasting the approach of Italy and Spain across each of their main policy initiatives. Section four explains the drivers behind the different policy decisions and includes an epilogue on the latest development in Italy’s GVC policy. Section five concludes.

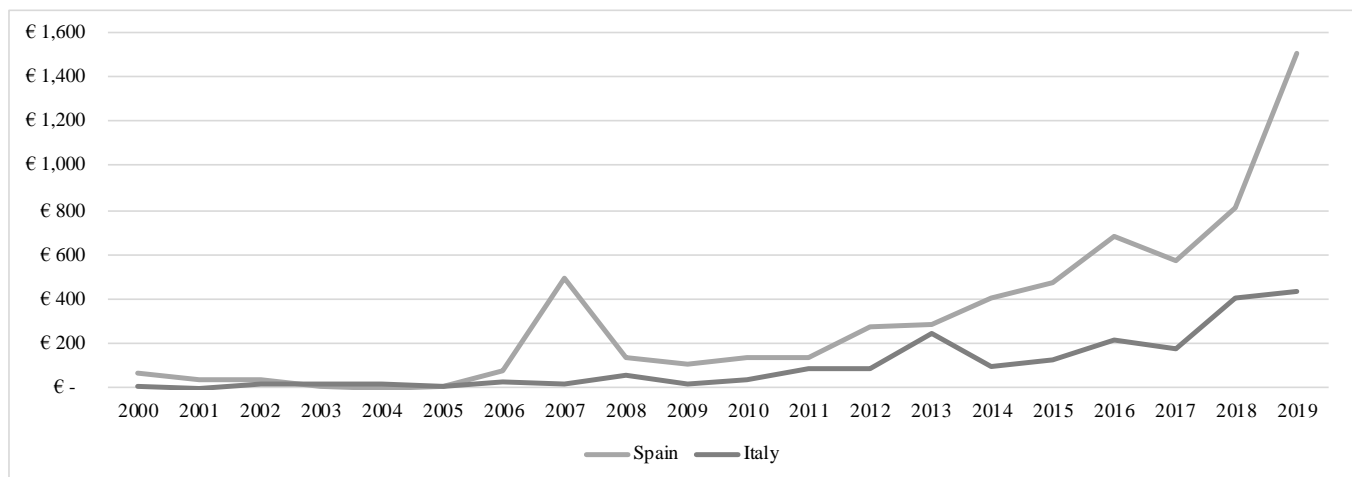
## 5.2 Italy versus Spain: comparing ecosystems

This section shows how Italy’s ecosystem fell behind Spain in the 2010s and introduces the high-level differences in the policy path chosen by the countries.

### 5.2.1 Italy and Spain: diverging ecosystems

By 2019 the data clearly showed that Spain’s ecosystem was growing at a difference pace than Italy’s. The graph in Figure 5.2 shows the relative evolution of VC investments in the two countries’ start-ups. By 2019 Spain had around four times Italy’s amount of capital invested, despite being smaller—80 percent of Italy’s population and 70 percent of its GDP. The different development paths are confirmed also by more robust indicators: Italy trailed Spain on all the metrics of Table 5.1. It is particularly notable that by 2019 Spain had attracted much greater interest from foreign investors and the ecosystem had minted 2 unicorns, while Italy had none.

**Figure 5.2: Total Venture Capital investments over time in Italy and Spain (€mln)**



Source: author’s analysis on Dealroom data

## Chapter 5: Italy and Spain

**Table 5.1: Ecosystem development metrics for Italy and Spain**

	Italy		Spain		CAGR 2013-19	
	2013	2019	2013	2019	Italy	Spain
No. of startups	3,300	9,600	2,500	11,200	19%	28%
No. of unicorns (Private companies worth >\$1bn)	0	0	0	2	<i>n.a.</i>	<i>n.a.</i>
€m of VC funding	282	499	328	1,738	10%	32%
€m of later stage PVC funding	34	118	39	445	23%	50%
€m of foreign PVC funding	49	217	99	873	28%	44%

Source: author's analysis on Dealroom and Pitchbook data

Observers' comments complement the story that emerges from this quantitative data, both about the fast growth of Spain's ecosystem and about its difference with Italy. As Liz Fleming, Chief Ecosystem Development at the Spanish organisation South Summit, recalls, by 2011 Spain was not very developed either: "I arrived in Madrid in 2011 and there was no ecosystem. I don't even know how to describe it: it was like the desert—there was nothing ... There was some business angel activity because there were no seed funds as there was no venture capital industry" (author's interview with Liz Fleming, Chief Ecosystem Officer at South Summit, 13/11/2023). Since then, however, the industry developed quite quickly:

"The difference in the ecosystem from 2011 is huge. The ecosystem is growing like crazy. In terms of VC investments as a percentage of GDP, Spain is the fastest growing in Europe. You can see it in the number of funds: in 2013 there were less than 50, with less than 500 million euros in asset under management. Now there are over 100, with over 2.5 billions."

Author's interview with Jordi Vidal  
Former entrepreneur and Principal at Kibo Ventures  
11/06/2021

Interviewees were also very quick to identify the government action as one of the main drivers for why Spain diverged from Italy:

"[In the past 10 years] the attractiveness of Spain has increased a lot. In the 2000, the average size of a *fund* was 5-15 million euros; now that is the average size of a *deal* in Spain! And Spain has evolved a lot because there has been a lot of government support ... The story in Italy is different: one of the main reasons why Italy is massively behind other European countries and in particular Spain is that the government has never done these efforts."

Author's interview with Carles Ferrer  
Partner at Nauta Capital  
02/12/2020

While statements such as the one above are broadly confirmed by the other evidence collected in this research, this chapter shows that the story is more nuanced. In this period Italian GVC policies were not totally absent. However, they were both timid and misaligned with the Market Creator State model, which Spain instead embraced.

5.2.2 Italy and Spain: diverging policies

During the 2010-2019 period, in short, Italy focused on improving the economic and legal framework conditions for entrepreneurship, through reforms. It instead assumed that the existing financial system and traditional policy tools would be sufficient and appropriate for supporting start-ups. As such, it significantly underestimated the need to build the institutions necessary to create a functioning innovation market in the country. In the meantime, Spain did not address many of its structural obstacles to entrepreneurship, but it launched and expanded some effective interventionist GVC policies.

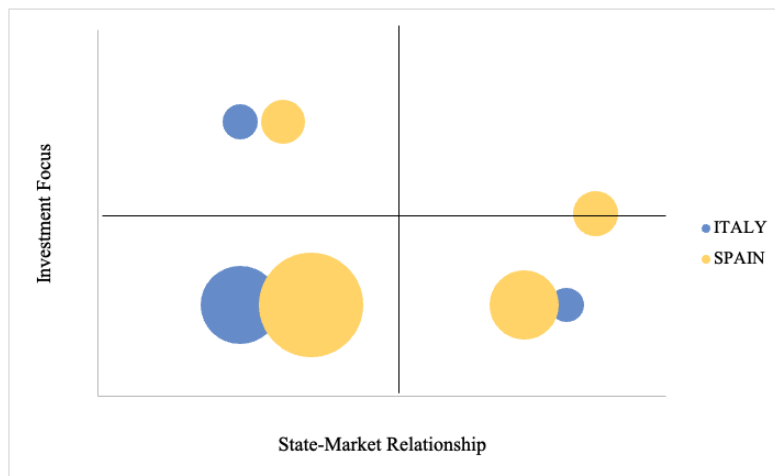
Table 5.2 below shows how the two countries’ policy approaches resonate with the principles of the Market Creator State exemplified in the previous two chapters. It stands out how, compared to the archetypal case of France, Italy has lacked in particular a high-PAL and generalist indirect GVC. Spain, instead, until 2022 had not made significant reforms, but it ticked most of the other boxes.

**Table 5.2: Italy and Spain’s policy approaches to GVC versus the Market Creator State**

Policy Type	France	Italy	Spain
<b>Reforms and Tax Incentives</b>	✓	Pioneering reform in 2012; generous tax incentives	No significant reform until 2023
<b>Indirect GVC</b>	✓	Small, with limited PAL and high-tech focus	Several large, PAL programmes, mix of high-growth and high-tech focus
<b>Direct GVC</b>	✓	Yes; but limited PAL and / or not completely start-up focused	Limited; mostly at regional level
<b>Other Innovation financing (loans, grants, etc.)</b>	✓	Significant programmes; no PAL and low complementarity with VC	Alike Bpifrance non-equity financing

**Figure 5.3: Italy and Spain’s policies within the theoretical framework (2005 – 2016)**

Bubble size is sum of budgets (€m) adjusted for GDP, for all programmes in each GVC policy category



Source: author’s analysis based on data collected from fieldwork interviews and publicly available information from the following institutions: Fondo Italiano, Cassa Depositi e Prestiti, MIMIT, Invitalia, ICO, Enisa, CDTI, ICF.

*Note: Picture is meant to be representative of the relative proportions of budgets (thus adjusted for GDP). It considers the budgets of programmes launched before 2016 as later programmes are unlikely to have material effects before 2019. Same analysis conducted using estimates of yearly disbursements of all programmes in the timeframe 2005-2019 yields a similar picture.*

It is therefore evident that Italy pursued certain innovation support policies, but not the same as its peer countries. Spain, instead, after 2012 followed a path more similar to France's. The picture becomes even clearer when looking at the relative weight—in terms of amounts of resources—the two countries devoted to each measure. Figure 5.3 plots Italy and Spain's policies along the theoretical framework of this research, with bubble sizes representing the amount of resources invested through each GVC policy. Italy is clearly overexposed to the bottom left and top left corners, while Spain edges towards the bottom right (Market Creator State).

Why did Italy fail to replicate what was happening in its EU neighbours? The puzzle is even greater considering that Italy's PDI, *Cassa Depositi e Prestiti*, has been highly integrated in the network of European PDIs and thus certainly exposed to policy learning opportunities. Comparing the story of Italy with France's archetypal process, it transpires that Italy for a long time missed the political push that was a necessary condition for the Market Creator State to emerge. The within-Italy process tracing analysis and the comparison with Spain show that while the other scope conditions were present, Italy and Spain's path diverged when Spain received an exogenous political pressure from the European Commission to set up a policy targeted to developing the private equity and venture capital market. In Italy, absent strong internal pressure groups, innovation policy remained both low salience and constrained by existing institutions and approaches.

In summary, therefore, by 2019 it became evident that Italy's ecosystem was not only lagging behind European frontrunners' such as France and Germany, but also losing ground to Spain. This was largely because the country chose a different approach. It did not make the transition to a Market Creator State model, because it lacked either an internal or external political pressure to overcome the constraints of state aid laws and of the consolidation state (Streeck 2015). As a consequence, its policies to support the start-up ecosystem focused largely on framework conditions and reflected more existing practices than the needs of the emerging ecosystem. The next section will analyse the three main policy areas and show how the different political stories of Italy and Spain led to different GVC models.

### **5.3 Comparing policies: Italian policymakers are timid about the Market Creator State**

Italy and Spain's turning points for innovation policies occur around the years of the Global Financial Crisis. As the Eurozone debt crisis unfolded, the two countries embarked on different paths. Italy avoided an EU-led bailout by replacing the centre-right coalition government with a technocratic government led by former European Commissioner Mario Monti, who sailed the country through the crisis with austerity-inspired reforms. Spain, instead, was unable to avoid the European Commission direct intervention and negotiated a 100-billion-euro bailout plan with precise conditions attached.<sup>137</sup> In this context, different

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<sup>137</sup> See: [https://economy-finance.ec.europa.eu/eu-financial-assistance/euro-area-countries/financial-assistance-spain\\_en](https://economy-finance.ec.europa.eu/eu-financial-assistance/euro-area-countries/financial-assistance-spain_en)

views and approaches to innovation policy emerged. This section will recount how this has unfolded in three core policy areas: reforms, indirect investments, and direct investments.

### 5.3.1 Reforms: Italy is first to “set the table”

Once the peak of the crisis was overcome, in 2012, Monti’s government turned to the “phase two” of its mandate, focused on “returning Italy to growth.”<sup>138</sup> In this phase it promoted a series of reforms and liberalisations aimed at improving the country’s competitiveness. It is in this context that the spotlight was turned, among other topics, on the question of how to facilitate the growth of innovative companies in the country. The process would ultimately lead to the “Start-Up Act,” a landmark piece of legislation that has defined the landscape of Italy’s ecosystem since 2012. The reform was a significant and undoubtedly pioneering initiative, which recognised and drew attention to an emerging phenomenon. At the same time, it reflected some of the limitations that Italian innovation policies retained from then onward. The economic orthodoxy that characterised the government at the time led to prioritising the elimination of structural barriers to entrepreneurship. It limited instead the government’s ambition in envisioning and developing a more interventionist role of the state in innovation, which could align with the Market Creator State principles.

The key actors behind the Start-Up Act were the team within the Italian Ministry of Economic Development (MIMIT) and its Task Force on Start-Ups—a group of experts that supported the government in the design of the package of laws.<sup>139</sup> This was a heterogeneous group of professionals involved in innovation from the private and public sectors as well as academia. Its composition well reflected the nascent stage of Italy’s ecosystem at the time: out of 12 members, only six could be said to be truly involved in start-ups or start-up investing, and most of these were from accelerators/incubators. From the Ministry’s side, the cabinet’s staff coordinated the task force.<sup>140</sup> The Minister Corrado Passera—a Bocconi-trained manager and banker—promoted the approval of the resulting law.

The process started with an open-day meeting in May 2012, where policymakers interacted with the ecosystem representatives and heard their proposals. It proceeded with the production of a report of policy suggestions from the Task Force by the end of the summer (author’s interview with Informant-IT-VC-3-WEE, a pioneer Italian VC, 8/11/2023). An analysis of the paper clearly shows that it had the double aim of informing policymakers on the basic concepts around start-ups and proposing specific policy measures. In summary, the report highlighted that there were important regulation and funding obstacles across the lifecycle of a start-up in Italy and suggested measures to address them (Task Force on Start-Ups, 2012; Informant-IT-VC-3-WEE, Italian VC 8/11/2023). Interestingly, it also made direct reference to other countries’ policy examples—such as the HTGF, already mentioned in this research. The Ministry then translated most of the proposals into a decree and, by December 2012, the main policy measures were voted into law by parliament.<sup>141</sup> In short, the law created the new legal concept of “innovative start-up”

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<sup>138</sup> See: the 2012 main reform was dubbed “Grow Italy” decree.

<sup>139</sup> Ministero dello Sviluppo Economico (MISE), which later changed name into Ministero delle Imprese e Made in Italy (MIMIT)

<sup>140</sup> Stefano Firpo and Alessandro Fusacchia (Chiefs of Policy), and Mattia Corbetta

<sup>141</sup> Law Decree 179/2012 transformed into Law 221/2012.

and granted the companies that matched this definition’s criteria various benefits and exemptions from general company law. To qualify as an “innovative start-up” a firm had to be a small company (yearly revenues less than five million euros), headquartered in Italy, operating for less than 5 years and had to meet one of three criteria: 1) at least 15% of the company’s expenses devoted to R&D activities; 2) at least 1/3 of the employees are PhD students, the holders of a PhD, or researchers (alternatively, 2/3 of the total workforce have a Master’s degree); 3) holder, depositary, or licensee of a registered patent or software (intellectual property).<sup>142</sup> Since then, various governments passed several other minor laws and amendments to improve the Act (Biancalani et al. 2022).<sup>143</sup> Table 5.3 below summarises the demands expressed in the Task Force report and the measures ultimately approved by government.

**Table 5.3: Restart Italy document proposals and measures included in the Start-Up Act**

	In Restart Italy Report	In Start-Up Act
<b>Creation of a separate legal category for start-ups</b>	✓	✓
<b>Reduction of administrative costs</b>	✓	✓
<b>Simplified incorporation process (incl. online)</b>	✓	✓
<b>More flexible labour contracts</b>	✓	✓
<b>Flexible/variable and equity-based compensation</b>	✓	✓
<b>Tax credit for employing skilled professionals</b>	✓	✓
<b>Tax incentives for equity investors and crowdfunding</b>	✓	✓
<b>Access to the public debt guarantees</b>	✓	✓
<b>Dedicated and simplified bankruptcy law</b>	✓	✓
<b>Certification and tax benefits to accelerators/incubators</b>	✓	✓
<b>Support services from the Italian Trade Agency</b>	✗	✓
<b>New direct equity GVC</b>	✓	✗
<b>Expansion of indirect equity GVC</b>	✓	✗
<b>New debt-based public funding</b>	✗	✓

Source: author’s elaboration based on *Restart, Italia!* and the *Start-Up Act* legislation<sup>144</sup>

It is immediately evident that the government responded to most of the demands but shied away from structuring the direct and indirect GVC policies. In its place, it expanded the public guarantees scheme and, a few years later, launched another debt-based policy targeted especially to start-ups—Smart&Start. As one of the key members of the Task Force, commented: “They gave us everything we asked for, *but* public capital in the form of equity. They gave us Smart&Start ... but that is debt and there is no ecosystem in the world that was propelled by debt-based policies” (Informant-IT-VC-3-WEE, Italian VC, 8/11/2023; see section 5.3.3 for more details). In short, thus, the government was very responsive to the demands of the emerging ecosystem but it was more comfortable with reforms than with allocating more resources to start-up/VC-dedicated schemes.

<sup>142</sup> Ibid.

<sup>143</sup> See Decree 30th January 2014, Decree 24th February 2016, Decree 7th May 2019, Decree 17th February 2016, and Decree 28th October 2016 (Biancalani et al. 2022).

<sup>144</sup> Law Decree 179/2012 transformed into Law 221/2012; Restart, Italia! report drafted by the expert task force, available at: [https://www.mimit.gov.it/images/stories/documenti/startup\\_eng\\_rev.pdf](https://www.mimit.gov.it/images/stories/documenti/startup_eng_rev.pdf)

A lot has already been written on the impact of the Start-up Act (Menon et al. 2018, Grilli and Mrkajic 2017, Biancalani et al. 2022). Here I will complement the literature with insights from this research and contextualise the findings within the broader argument of this thesis. There are at least three positive effects of the reform. First, the government initiative, and the publicity that accompanied it, introduced for the first time the idea of innovation ecosystem in the Italian public debate. It contributed to popularising concepts such as “start-up,” “accelerator,” and “venture capital” that had until then been relegated to discussions among industry experts. As one prominent VC and policy advisor,<sup>145</sup> who was not directly involved in the task force, explained, “for the first time, a spotlight was turned on and pointed to this world [i.e., the innovation ecosystem]” (author’s interview with Salvo Mizzi, former CEO of TIM Ventures, Invitalia Ventures, and Enea Tech, 11/01/2024). The observation is also supported by quantitative data (Menon et al. 2018). Second, the combination of the measures objectively streamlined processes for innovative companies: it introduced a legal “armour” or a “sandbox”—as interviews defined it—that “rendered things much easier for those companies, and so it was very welcomed” (author’s interviews with Gianluca Dettori, founding partner of Primo Ventures, 9/11/2023; Gabriele Todesca, Director of Equity Partnerships at the EIF, 25/11/2022; and with Mizzi, 11/01/2024). For instance, Italy scores significantly better than Spain and Germany for the treatment of employee stock options (ESOP) in a benchmarking report popular within the industry, by VC fund Index Ventures.<sup>146</sup> Finally, economics literature and impact reports have mostly identified a positive effect on the target companies. A 2017 OECD report found that those companies that qualified for the “innovative start-up” definition performed better (in terms of traditional financial metrics) and had easier access to bank credit than they would have had the policy not been in place (Menon et al. 2018). Other independent studies found similar results (Biancalani et al. 2022) and even identified positive impacts on the propensity of highly skilled talent to found start-ups (Grilli and Mrkajic 2017). In this sense, it should be noted that a corollary benefit of the policy—and notable within Italian policymaking—was the data transparency and evaluation focus of the law, which, by creating a publicly available record of all innovative start-ups, allowed to conduct many of the studies cited.

The Start-up Act, however, also had some limitations consistent with the insights from this thesis-theoretical framework and Italy’s lag compared to peers. First, the overall policy framework and, especially, the definition of “innovative start-up” signalled some misconceptions about start-ups’ business model and venture markets—one of Lerner’s common pitfalls of GVC. The criteria for qualifying as a start-up were both too generous and biased towards the idea of a small, science-based company (level of R&D, patents, PhD founders and staff). Importantly, there was no indicator that captured the high-growth potential or the scalability of the business model, which are fundamental elements of Silicon Valley-style businesses. It is telling that originally all the benefits ended once the company became older than five years. This was later partially fixed by introducing the concept of “innovative SMEs,” but size-based exclusion criteria are still inconsistent with the idea that successful start-ups become scale-ups and with the policy literature on high-growth firms (Brown et al. 2014, Coad 2014, Kolar 2014, Henrekson and Johansson 2010). In retrospect, this became clear also to some policymakers: Mattia Corbetta, who

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<sup>145</sup> The interviewee is also a [Kauffman Fellow](#)

<sup>146</sup> Benchmarking report can be found at <https://www.indexventures.com/rewardingtalent/when-are-employees-taxed>

followed the drafting of the law and its subsequent expansion and implementations within MIMIT, commented: “our assumption at the time was that a highly innovative company was automatically a high-growth firm. That turned out to be not necessarily the case, highlighting a potential weakness in our policy ... today the literature is discovering that what is most valuable in terms of job creation and growth are *scale-ups*, independently of their innovation intensity” (author’s interview with Mattia Corbetta, former Officer at MIMIT, 07/12/2023, author’s italics). Similar criticisms emerged from interviews with Italian VCs, who commented that, in retrospect, the chosen definition was too detached from the “market” conception of start-ups (Dettori, Primo Ventures 9/11/2023, Informant-IT-VC-3-WEE, Italian VC 8/11/2023, Mizzi, 11/01/2024). Second, the way the policy was structured and the rhetoric around it, signalled the government’s orthodox view that bureaucratic simplification and taxation were the primary issues to resolve, rather than a more decisive action for financial and human talent capital formation both within the private and public sector. As Corbetta explained, “the start-up act is quintessentially about the *enabling conditions*” (Corbetta, former MIMIT, 07/12/2023). This transpires from looking at the list of main measures included in the Act but also from the commentary of the OECD report, which was written independently but in collaboration with the Ministry of Economic Development.<sup>147</sup> The report devotes substantial sections to discussing the broader issues of the Italian economy and even has a section dedicated to the need for “structural horizontal reforms” (Menon et al. 2018). Third, the same OECD report and other analyses showed that the policy had close to no impact on increasing the venture capital available to Italian start-ups (Menon et al. 2018; De Angelis 2018). Since 2012, “innovative start-ups” have better access to credit, and they are more likely than non-qualified companies to receive a VC investment, but researchers found almost no change in the overall supply of VC investments (Menon et al. 2018). Note that this is despite very generous tax incentives for equity investments into innovative companies, which were increased several times over the years to 2020. This evidence speaks to earlier studies that also found a weak relationship between capital gains tax reduction and VC investments (Poterba 1989). Another study interestingly pointed to the surprising fact that start-ups that benefited from state-guaranteed loans were actually less likely to receive venture capital investments, flagging a segmentation effect or even potentially some crowding-out (Giraud et al. 2019, Biancalani et al. 2022). This observation is connected to the first criticism: too broad a definition of “innovative start-up” meant that the group of companies that benefitted<sup>148</sup> This conclusion is also consistent with the existing literature on GVC, which warns that debt-based public schemes often lead to creating a parallel funding market (Lerner 2009) that is disconnected from private venture capital—in other words, far on the left in this thesis’s theoretical framework. A final hint of the government underestimation of the importance of VC industry for entrepreneurial ecosystems is the Start-Up Act’s surprising and disproportionate focus on alternative equity sources: by 2015 the government publicised that it had certified 13 portals for equity crowdfunding (Startup Business 2015). This may be an alternative route for start-ups to raise very early-stage capital. However, it has had no substantial role in any successful ecosystem and does not possess the “value-added” characteristics that allow VCs to help start-ups grow (“treatment effect;” see Lerner

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<sup>147</sup> See introduction and acknowledgements in Menon et al. 2018 and author’s interview with Corbetta on 07/12/2023.

<sup>148</sup> See report from the Chamber of Deputies at:

[https://documenti.camera.it/dati/leg17/lavori/documentiparlamentari/indiceetesti/213/004\\_RS/00000003.pdf](https://documenti.camera.it/dati/leg17/lavori/documentiparlamentari/indiceetesti/213/004_RS/00000003.pdf)

1995, Hellmann and Puri 2002)—in fact, there are reasons to believe it can complicate future investments by VC.<sup>149</sup>

All in all, the Start-Up Act was a very important first step in innovation policy in Italy. At the same time, however, this was a step in the left side of the theoretical framework. It aimed to support technological companies by using mostly traditional public financing tools, very distant from VC practices. It did not fully acknowledge the institutional deficiencies of the Italian ecosystem, in particular the dearth of risk capital, or it assumed that they could be resolved mostly by “setting the table” correctly. The preference for tax cuts for equity investors over a comprehensive GVC programme reflects in part this view. The comparison with Spain questions the validity of this approach, for two reasons.

First, because at the time Spain did not pass any reform that came close to the scope of Italy’s Start-Up Act, despite sharing most of Italy’s model of capitalism’s characteristics and deficiencies. To be sure, an “entrepreneurs’ law” was passed in 2013 but it related mostly to facilitating and incentivising immigration of entrepreneurs and individual investors into Spain. A Start-Up Law comparable to Italy’s was approved only in December 2022. Table 5.4 below shows which of the issues that the 2012 Italian Start-Up Act addressed were still present in Spain while the country witnessed the acceleration of its innovation ecosystem. It is clear that, in the period Spain was not an obviously more hospitable context for start-up creation and growth than Italy, at least based on the factors that the Italian government focused on. As one interviewee who observed the ecosystem development from the early 2010s highlighted, “it is incredible how the Spanish ecosystem thrived and has been attracting so much foreign VC, despite how difficult Spanish law made it for entrepreneurship!” (Fleming, 13/11/2023).

Second, the differences between the Italian Start-Up Act and Spain’s 2022 Start-Up law are telling of the two countries’ approach to innovation and of some of the Italian reform’s original biases. In particular, the details of the Spanish measure reflect a prioritisation of horizontal innovation capabilities and high-growth companies over high-tech focus. Spanish policymakers—similarly to the French—embraced a broader definition of innovation. In Spain, the certification of “innovative start-up” status is not a self-certification based on a few objective criteria as in Italy but it is instead conducted by the public entrepreneurship agency Enisa (*Empresa Nacional de Innovación*), which does not use a narrow definition of innovation.<sup>150</sup> During interviews, the director responsible for this activity explained that it was consciously decided that all types of innovation should qualify: “not only technology-based innovation, but also process, product, and business model innovation. Because the reality is that 80 percent of start-ups are not creating a new technology but are applying existing technology in a new sector, market, etc.” (author’s interview with Jordi Garcia Brustenga, Chief Start-up Ecosystem Promotion Officer at Enisa, 15/11/2023). This contrasts with the Italian “innovative start-up” definition, where the three qualifying criteria, beyond age and ownership status, related largely to R&D capacity: 1) 15 percent of revenues invested in R&D, 2) one third of employees with PhDs,<sup>151</sup> 3) registered patent or software. It is telling that

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<sup>149</sup> Through an equity crowdfunding process a start-ups receives very small investments by a myriad of individuals, who end up on in the company capital structure and thus have shareholding rights. In the normal funding life of a start-up, this can vastly complicate the process and approval for raising further capital down the line by new investors, including VCs.

<sup>150</sup> The Spanish approach is therefore highly centralised, and has a higher risk than the Italian model of introducing bureaucratic hurdles and uncertainty for companies, which will need to wait on the agency’s certification decision. At the time of writing, it is too early to tell whether the process chosen was effective.

<sup>151</sup> Alternatively, two thirds of the workforce with at least a Masters’ degree.

these criteria, which tried to capture innovation intensity and had originally higher thresholds, were later relaxed by lowering eligibility targets, based on advice from various ecosystem representatives (Corbetta, former MIMIT, 07/12/2023).<sup>152</sup> Interestingly, one of the main recommendations of the 2018 OECD report was indeed to “Consider introducing a further eligibility criterion ... which is more market-driven; e.g., it could be linked to raising a significant equity investment from an institutional independent and professional investor. This is in line with the need for a stronger focus on equity investment” (Menon et al. 2018). In contrast, in Spain, the technological aspect of “innovation” component is not enough to be certified: Enisa also has the discretion to evaluate whether the company’s business model is “scalable” (Garcia Brustenga, Enisa, 15/11/2023).

“Scaling is the other issue. Many people think ‘R&D is what makes a start-up.’ Instead, you need another group of competences that are not strictly related to ‘innovation.’ We have seven criteria for this: we evaluate things like the market positioning, the business plan, the management team, the shareholders composition, etc. And we give weight for each ... Overall, this scaling factor counts for 50 percent of the points: without it, a company cannot receive the certification ... This approach comes from our experience providing entrepreneurship loans for a long time: we see many companies that struggle to repay because they are in love with their product but they don’t think of the other competences and of how to scale the business.”

Garcia Brustenga,  
Enisa,  
15/11/2023

**Table 5.4: Comparison between start-up friendly reforms in Italy and Spain**

Measure in Italy’s Start-Up Act	Situation in Spain until 2022	Addressed in Spain’s 2022 Start-Up Law? <sup>153</sup>
<b>Creation of a separate legal category for start-ups</b>	No separate legal category for start-ups	✓ But discretionary certification by ENISA
<b>Reduction of administrative costs</b>	Same as for all companies	✓
<b>Simplified incorporation process (incl. online)</b>	Long/costly (~€3000) incorporation process; no online	✓ As little as €1
<b>More flexible labour contracts</b>	Widespread short-term contracts across the economy	×
<b>Flexible/variable and equity-based compensation</b>	Difficult to use variable and no real equity-based compensation allowed <sup>154</sup>	✓
<b>Tax credit for employing skilled professionals</b>	Deduction of social security costs for companies certified by Ministry of Science	Maintained
<b>Tax incentives for equity investors and crowdfunding</b>	30% tax deduction, up to €60k	✓ Raised to 50%, up to €100k

<sup>152</sup> See, for instance, the changes introduced through the decree’s [conversion law](#) (law no. 221, 17/12/2012)

<sup>153</sup> The Start-Up law also had a series of annexed laws, in particular the “Create and Grow” law and the “Business Climate” law. The table ignores this distinction, for simplicity purposes.

<sup>154</sup> Several interviewees confirmed that until recently companies had to use so-called phantom shares to simulate employee stock option plans (ESOP) (Fleming, South Summit, 13/11/2023; Vidal, Kibo Ventures, 17/11/2023). Spain also appears as a laggard in an benchmarking [report](#) that compares European countries based on their ESOP rules. Italy, in contrast, scores close to the top.

## Chapter 5: Italy and Spain

<b>Access to the public debt guarantees</b>	No access before some equity is built up	×
<b>Dedicated and simplified bankruptcy law</b>	Tough bankruptcy laws	✓ Easier bankruptcy for all companies and “express process” for small businesses
<b>Certification and tax benefits to accelerators / incubators</b>	No certified accelerators/incubators	✓ Some certification for student start-up programs in schools/universities, to create fast-track to innovative-company certification
<b>Support services from the Trade Agency</b>	×	×
<b>New debt-based funding</b>	Already available	Maintained

*Source: author’s elaboration based on Italian Start-Up Act legislation (2012), Spanish Start-Up law legislation (2022) and fieldwork interviews*

In summary, therefore, Italy passed an ambitious start-up friendly reform over 10 years before Spain. Despite many positive elements, the reform had two limitations, which the comparison with Spain highlighted. First, it consolidated a view of start-ups that did not fully coincide with the characteristics of the high-growth firms that typically make up entrepreneurial ecosystems. More broadly, it provided better “enabling conditions” but did not address some core institutional deficiencies of Italy’s ecosystem, in particular the absence of venture capital. The metaphor offered by Mr. Mizzi is perhaps most telling: “we set up a good playing field, with clear rules to play. Except, we were missing *the ball*—i.e., the resources. In other words: the issue of capital formation was not addressed at all” (Mizzi, 11/01/2024). The next sections will show that Italy not only invested less public capital than Spain; it also invested it with modalities less aligned with the Market Creator State.

### 5.3.2 *Creating the venture capital industry: where is the ball?*

This section will show how Italy until 2019 made only timid efforts to seed private venture capital funds and how these suffered from typical problems identified by the literature on GVC. The Spanish ecosystem, instead, took off as the central government, under pressure from the European Commission, learnt the lessons from Catalonia and set up a funds of funds scheme comparable to the EIF and Bpifrance FoF.

#### 5.3.2.1 Italy’s timid attempts at indirect investments

The cases of France and Germany surfaced a very clear policy model for supporting risk capital formation: an independently managed agency that operates a funds of funds scheme. Italy was slower than Spain at embracing this approach, testing the waters for several years with alternative models that either did not

fall in the bottom right corner of the policy framework or did not have enough resources to push systemic change.

The first prominent Italian indirect policy was High Tech Funds (*Fondi HT*), actively investing during 2009-2014. The initiative consisted in the government selecting a handful of private funds to manage a total of 80 million euros, to be matched by private capital, and invest it exclusively in the South of Italy. After a long gestation—four years and three different ministers—the government assigned 60 million euros to four general partners to manage the capital.<sup>155</sup> The programme was certainly very innovative for Italy at the time. It was the first time that Italian public institutions paid attention and pledged resources to venture capital. It is also one of the very few programmes outside of Israel that replicated an effective feature of the country’s famous Yozma GVC: the public sector had a capped return, thus creating increased upside for private VCs involved.<sup>156</sup> However, the measure exhibited at least two criticalities. First, with reference to the theoretical framework, the policy had almost no PAL characteristics. Yes, the state provided capital to private VCs. However, similarly to the Parallel Funds scheme (see Germany chapter), there was no ambition or ability of the government to build and spread VC best practices. This was largely because there was no separate and independent organisation responsible for this activity. It was just a one-off underwriting of shares in funds, undertaken by a department within the Presidency of the Council of Ministers, which had no competences in venture capital or in funds investing. This unsurprisingly resulted in an approach more akin to that of the traditional bureaucracy than to those of the funds of funds schemes described in other cases. Bureaucratic processes slowed down operations: “when we wanted to close a deal, we had to wait three months for the drawdowns, instead of the one month originally agreed. Because the government department had to go through all their 2000 processes ... But in this world, if you are not quick, start-ups die!” (author’s interview with Informant-IT-VC-6-KYF, founding partner of Italian VC, 28/12/2023). The government also set up a dedicated “Steering and Control Committee”<sup>157</sup> that systematically requested from the VC funds evidence of their operational expenses (Informant-IT-VC-6-KYF, VC, 28/12/2023)—a very marginal aspect that had no relevance for the performance of the fund or the effectiveness of the policy but that mattered for public accounting practices. Second, the programme strictly mandated that funds invested only in the southern regions of the country—the type of geographical constraint that the GVC literature warns is contrary to the VC and innovation ecosystem development dynamics (Lerner 2009). In this sense, the *Fondi HT* seems another example of a hybrid of regional development and innovation policies—it is no coincidence that the Department for Development and Cohesion Policies was involved in the governance of the initiative (PCM Decree 18/10/2005).<sup>158</sup> Moreover, there were also signals of biases towards a narrow definition of innovation: the implementation decree explicitly calls for a focus on university spin-offs and requires that the selection process prioritises funds that already have collaboration agreements with universities (PCM Decree 18/10/2005). Unsurprisingly, the results were very mixed. In the short term, as the government resources flowed to the South, start-ups investments in the area jumped,

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<sup>155</sup> Note that the original official budget was higher. However, interviews with VCs involved clarified that the amount actually subscribed by the government in the end was €60 millions. The venture firms selected were: Vertis, Principia, Atlante, and Vegagest. Note that some of these companies changed names, some several times, in the years between the launch of HT Funds and the time of writing.

<sup>156</sup> Decree of the Presidency of the Council of Ministers, 18 October 2005.

<sup>157</sup> “*Comitato di Pilotaggio e Controllo*”

<sup>158</sup> Decree of the Presidency of the Council of Ministers, 18 October 2005.

from almost no deals in 2004-2008 to over fifty in the four years of the HT Fund operations (Informant-IT-VC-6-KYF, VC, 28/12/2023). In the medium-term, however, this emerged to be entirely endogenous to the policy, while the institutions-building impact was very limited. Investments in the South dried up right after the programme was terminated (Dealroom data). Most importantly, only one of the VCs involved created a physical and permanent presence in the South (Informant-IT-VC-6-KYF, VC, 28/12/2023), which in part possibly explains why those GPs stopped investing there after the programme stopped. Given the importance of physical proximity for VC investments, the lack of this requirement in the programme shows the very limited informed conditionality that the government department was able to impose on VCs. More broadly, of the four managers selected, one never began investment activity (but collected the management fees) and another one faced continuous leadership changes and controversies (Informant-IT-VC-6-KYF, VC, 28/12/2023), which are important red flags in VC funds. Thus, if the policy mechanism of indirect investments is to grow and professionalise the institution of VC (see Bpifrance FoF and ERP-EIF), it is hard to argue that the HT Funds were successful at this goal. The government did impose conditions (see example of monitoring committee), but not the ones that mattered for GVC policies. To be sure, this initiative took place in the early days of modern innovation policies in Europe and it could be argued that at the time the public FoF model had not yet consolidated. However, this is only partially true: the HT Funds were launched several years after the ERP-EIF Facility and at the same time as Bpifrance was expanding its VC FoF activities. Spain also had already started to collaborate with the EIF on several FoF programmes (see next section). Other models were thus already in place in Italy's close neighbours.

As the HT Funds initiative was coming to an end, Italy did launch a scheme closer to the PAL FoF model—but still somewhat hesitantly. In 2012, *Fondo Italiano d'Investimenti SGR SpA* (Italian Investment Fund, FII), a management company controlled by Italy's PDI, *Cassa Depositi e Prestiti* (CDP), added VC-fund investments as a new activity for its team already in charge of private equity fund investments. The original amount allocated to venture capital funds of funds was 91 million euros (author's interview with Cristina Bini, Head of VC FoF at FII and now at CDP Venture Capital SGR Spa, 28/12/2023; FII website). Only in 2014-18 163 millions were gradually made available. Although the resources were limited, FII was pivotal for Italian VC. The first five Italian VC funds, aside from the mixed stories of the HT Funds, were all started or consolidated with anchor investments from FII (FII annual reports; author's interviews with Informant-IT-VC-3-WEE, Italian VC, 08/11/2023; Mizzi, 11/01/2024; Dettori, Primo Ventures 09/11/2023). Most interviewees also noted that the FII team possessed PAL-type competences (see e.g., Mizzi, 11/01/2024). The work of FII at the time was also very proactive: the team did not just receive and respond to inbound investment proposals by existing GPs but helped matching professionals in the industry to create new teams from scratch. As management recalls, “we were like bakers working in a laboratory, picking ingredients to make a product; and when the ingredients were not there, we stimulated their emergence. It was like a ‘maieutic’ work: there were very few operators, and we had to stimulate their creation.” (Bini, CDP VC, 28/12/2023). Interviews however also surfaced that FII was limited in its systemic impact by its governance and limited mandate for VC. FII was originally set up to promote private equity, not venture capital (Informant-IT-VC-3-WEE, Italian VC, 08/11/2023; Bini, CDP VC, 28/12/2023). Italian VCs interviewed commented that this

translated both into a lack of differentiation from PE funds investing and into a limited ambition in developing the VC industry (Informant-IT-VC-3-WEE, Italian VC 15/11/2023).<sup>159</sup> In other words, FII tipped its tows into VC as an adjacent asset class to PE, but never embraced the role of aggressively building out a new industry (Mizzi, 11/01/2024), or at least not to the same scale that Bpifrance or the ERP-EIF Facility in Germany did. In practice, this can be seen in how FII's VC allocations significantly lagged behind equivalents in Germany, France, and even Spain over the same period. It is true that in the very early days of a VC industry allocating too much public capital can be counterproductive (Lerner 2009). However, management recalls, it was in the 2014-18 period that more resources (financial and professional) would have helped to scale up the industry (Bini, CDP VC, 28/12/2023). For this whole period, it allocated only 163 million euros to VC (FII's website), when France and Germany were investing several hundreds of millions per year (see previous chapters). A second notable consequence of FII's approach is that it promoted the creation of only a handful of VC management teams. It is hard, *ex post*, to identify the true direction of causality. Management of FII argues that, even if the capital had been greater, there simply were not enough professional GPs in Italy at the time (Bini, CDP VC, 28/12/2023). Operators point to the particularly demanding conditions and requirements that FII required of them (even more demanding than the EIF's, according to some interviewees). All in all, the evidence suggests the truth probably lies in between: the dearth of VC professionals was particularly acute in Italy, and this situation possibly required a more flexible approach than the one CDP allowed the FII. The comparison with Germany's ERP-EIF facility is insightful. German policymakers had a very similar diagnosis about the state of the German venture capital industry in the early two-thousands (very few and not professionalised; see previous chapter). However, they found a solution: they involved the EIF, to attract foreign investors by using the institution's international network, temporarily bypassing the issue of lack of local professionals. Why was FII not more "courageous"? This relates to another difference between this Italian GVC and its European peers. FII has—to this day—a peculiar governance that renders it almost an entirely private organisation. The team is employed by a company (Fondo Italiano d'Investimento SGR Spa), which is owned for 75 percent by private actors, primarily Italian banks.<sup>160</sup> The remaining shares are owned by CDP and the Ministry of Finance. However, CDP, differently from most of its peers in Europe, is itself partially private and therefore more independent from the government: its other shareholders (Italian banks' foundations) can veto any decision that imperils a cautious management of CDP's resources (Bulfone and Di Carlo 2021). This may explain the reticence of the organisation to increase its exposure to venture capital, a risky and immature asset class at the time. Moreover, the funds managed by FII had mostly private capital—another *unicum* among the cases analysed. This means that CDP provided initial resources to FII but then FII had to find the rest in the market. For instance, when the second VC FoF was launched in 2014, it had an original allocation of only 60 million euros (CDP's capital), with no guarantee of the final size of the fund.<sup>161</sup> In a comparative perspective, it appears that FII

<sup>159</sup> Still in 2015, CDP's annual report, describes FII's VC FoF as acting from seed investments to small PE: "The Fund invests in funds whose investment policies are focused on venture capital operations through the financing of seed-stage projects and funds specialised in technology transfer [...], early stage projects [...], and late-stage projects [...], and in funds operating in the *low-mid cap segment* (expansion and growth capital)." (CDP Group [annual report 2015](#); author's italics).

<sup>160</sup> CDP—through its subsidiary CDP Equity—and the Minister of Economics and Finance own the remaining 25 percent. See FII's website, [FII's story section](#).

<sup>161</sup> CDP Group annual report 2015

lacked a political mandate to build the venture capital industry as clear as in the peer countries analysed: the government had neither the theoretical conviction about the importance of this institution for the ecosystem, nor a real channel to impose it on CDP—or at least not without footing the bill. The result is that in those years 2014–2018 innovation investment was not among the key priorities of the stakeholders (Bini, CDP VC, 28/12/2023; CDP’s annual reports 2014–2018). FII was a professional, competent, and fundamental operator in the Italian VC market, but it did not have the political mandate nor the public resources that its European peers had.

Finally, the last of Italy’s indirect GVC initiatives is perhaps the most comparable to one of those encountered in previous chapters. It is called ITATech, it was launched in 2017, and it is a CDP-EIF collaboration, similar to Germany’s ERP-EIF Facility model. The scheme committed 200 million euros, 50 percent from CDP and the other half from the EIF (Todesca, EIF, 25/11/2022). All investments decisions instead were made in Luxembourg by the EIF. With reference to the theoretical framework, this scheme can be placed in the top right quadrant of the framework. It had a very clear elements of PAL, with high insulation from politics but also high competence of the investment teams. However, it was characterised by a fairly narrow technology focus: the resources could be invested only in funds dedicated to technology transfer—a niche and particularly challenging part of the market. As consequence, it is hard to argue that ITATech had the transformational impact of a Market Creator State that the still immature Italian ecosystem needed. However, it favoured the emergence of a few additional VCs.<sup>162</sup>

In summary, in the years during which its peers were embracing a Market Creator State approach which included large FoF schemes, Italy timidly tried various, fragmented and suboptimal models. While Italy had a competent team within CDP and it also initiated some collaboration with the EIF, the political push was never there to focus resources on venture capital and push CDP to take a bigger role in building the industry for this asset class.

### 5.3.2.2 Spain creates the venture capital industry

In contrast to Italy, from the mid-2000s Spain has gradually expanded a series of indirect GVC programmes. Catalonia was a pioneer, which placed Barcelona on the map of European start-up hubs already in the late 2000s. The central government followed, first with a high-tech focused FoF in collaboration with the EIF, and then with a full-fledged national FoF programme in the wake of the 2011 financial crisis.

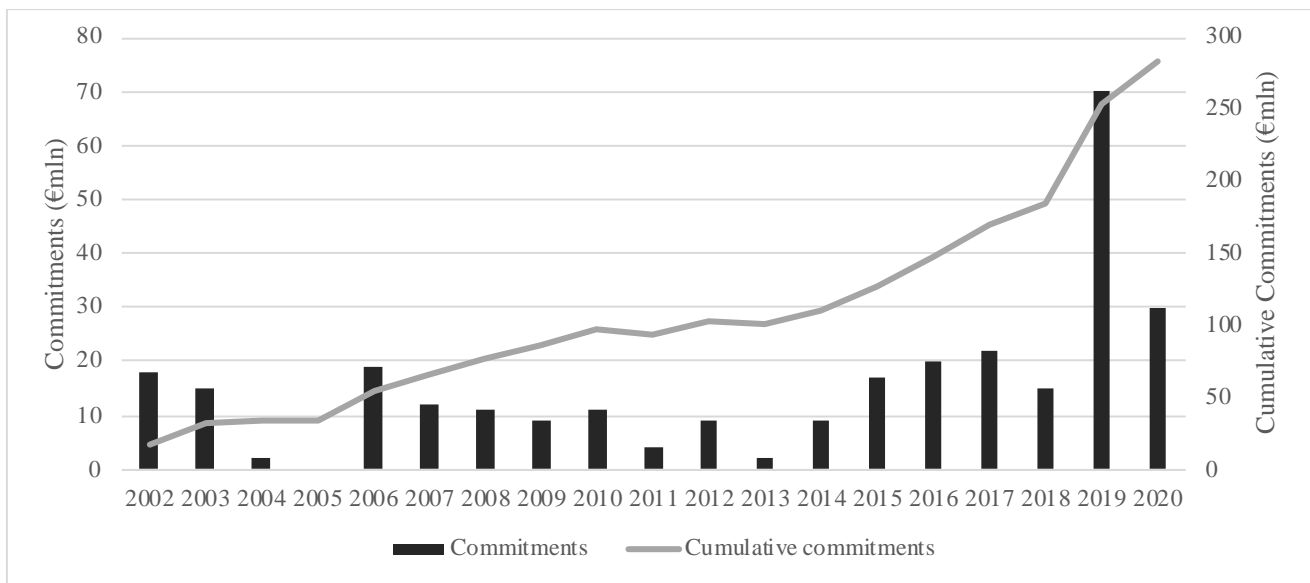
The genesis of the Spanish entrepreneurial ecosystem should be traced to the Catalonian capital and the role of the local development finance institution, *Istituto Català de Finances* (ICF). The institute was created in 1985 to support Catalonian SMEs in general and already in 2002 it launched a dedicated instrument for innovative companies. Differently from the other *comunidades autonomas*, who were doing some direct investments, ICF decided to “try to develop an ecosystem of private venture capital management companies ... this was a time when the word start-up did not even exist in Spain!... And

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<sup>162</sup> At the time of writing the scheme had invested in five funds: Vertis Venture III, MITO, Sofinnova Telethon Fund, 360PoliMI, and Eureka Fund 1. It should also be noted that ITATech-backed funds could operate even just with the public (CDP plus EIF) capital. This distinguishes the ITATech programmes from most other general public FoF schemes but renders it more similar to the French FNA, also focused on seed.

there were only two regulated companies that were investing in start-ups.” (author’s interview with Informant-SP-GVC-2-STs, Senior Official at ICF, 07/04/2021). To get the programme started, ICF collaborated with the EIF and launched a 20 million euro fund (Fond InnoCat) with 50 percent of the capital from ICF, 30% percent from the EIF, and the remainder from large Spanish companies (e.g., insurances). The fund—and its successors—were behind the creation or expansion of close to all of Catalonia’s VC funds. For instance, one of Spain’s most active VCs, with international presence—Nauta Capital—raised its first fund with institutional investors thanks to a first capital commitment by ICF’s InnoCat (Informant-SP-GVC-2-STs, ICF, 7/4/2021). Fond InnoCat invested until 2010 and was later followed by analogous initiatives of increasing size, which accompanied the growth of the Catalan ecosystem. Between 2002 and 2020, ICF committed close to 200 million euros to VC funds, helping to mobilise around three billion euros of total capital to the venture industry (ICF internal materials obtained by author; Figure 5.4). In other words, Catalonia alone by 2020 had invested in venture funds almost as much as Italy’s FII, a *national* initiative, did over the same period.<sup>163</sup>

**Figure 5.4: ICF funds of funds commitments over the period of interest (2002-2019)**



Source: author’s elaboration on ICF internal materials; note that: 1) data exclude ICF commitments to funds managed by ICF itself (i.e., direct GVC); 2) cumulative data is net of commitment reductions over the time period. Seed and VC only funds represent around two thirds of the amounts above, thus close to 200 million.

Aside from the size, interviews with ICF officials and VCs suggest that the organisation had already embraced a Market Creator State approach. The PAL characteristics clearly emerge from Informant-SP-GVC-2-STs comments:

“The purpose of the programme was, of course, to provide capital to emerging innovative companies, but also to create an industry of VC professionals that could invest in these segments. To learn about the needs of our early-stage companies in the

<sup>163</sup> Summing all the public funds sizes mentioned in the previous section, on Italy, yields a higher figure. But those are resources allocated, not actually invested.

## Chapter 5: Italy and Spain

technology space, to provide development capital, and to build relationships with other investors to develop the ecosystem... Nauta is a good example of what our purpose was: to help and be part of supporting the creation of management companies in Catalonia.”

Informant-SP-GVC-2-STS  
Senior Official at ICF  
02/12/2020

Not only has ICF been a partner to the PVCs, it has also imposed conditionality, in part through its close collaboration with the EIF:

“If you are a smaller local institution, you can build on the strong teams, knowledge, and money of the EIF... at the time InnoCat was launched there was very little in terms of ecosystem in Catalonia... So what happened with the EIF is that the different terms and conditions that they defined, the way of structuring the funds, etc.—that was all in line with what we ICF thought we wanted to do... The EIF defined the standard and terms and shared these best practices across Europe ...and I can tell you that sometimes managers see these terms as impositions ... but rules have to be very clear between investors and managers.”

Informant-SP-GVC-2-STS  
Senior Official at ICF  
02/12/2020

ICF’s governance and incentives arrangements further strengthen the arm’s length approach. The organisation is completely separate from the Catalan government and largely self-funded (Informant-SP-GVC-2-STS, ICF, 7/4/2021; Vidal, Kibo Ventures, 17/11/2023). This means it needs to ensure its activities are mostly profitable:

“We have a motivation and incentive to ensure the long-term sustainability of ICF... This translates in everybody in the organisation making investment decisions in a professional way; and this is something that is really in the DNA of all employees, at all levels. Because what we dislike the most is to be perceived by the public and the market as a ‘*regular public institution*,’ in a derogatory sense—meaning one that does not apply rigorous screening to its investment decisions and does not expect a return on its investments ... So, our role is to assure the sustainability of ICF. And this can only happen by being careful where we invest our money. We can make mistakes, of course, but the goal is clear. Then it must also be said that the goals have changed over time: when you are creating a new ecosystem, you cannot expect to generate a multiple of 2x.”

Informant-SP-GVC-2-STS  
Senior Official at ICF  
07/04/2021  
(Author’s italics)

As the theory predicts, ICF’s activities were also not directing technological focus: “Fond InnoCat was completely generalist—it invested in technology and biotechnology and in whatever *they* [i.e., the PVCs] thought was innovative. This is how you develop the ecosystem at the beginning: you let entrepreneurs think about market opportunities and you give them the capital to pursue them” (Informant-SP-GVC-2-

STS, 07/04/2021, author's italics). In short, the ICF indirect investments quickly became the Market Creator State that took care of creating the institution of VC in Catalonia.

At the national level, NEOTEC was a first initiative along this model. It was a collaboration between the EIF and Spain's Centre for the Development of Industrial Technology (*Centro para el Desarrollo Tecnológico*, CDTI). Launched in 2006, NEOTEC had 183 million euros under management to invest in new and emerging Spanish VC funds. Similarly to InnoCat, it received funding from the EIF (27%) and 15 Spanish blue chip companies (40%), on top of CDTI (33%).<sup>164</sup> The EIF also acted as an advisor to the fund's management. By 2019 the 12 funds supported had invested around 760 million euros in close to 290 companies.<sup>165</sup> In 2012, CDTI launched an analogous follow-up programme—called INNVIERTE—that expanded CDTI's involvement in the VC industry, committing over 270 million euros to 14 funds.<sup>166</sup> With regard to the theoretical framework, these programmes fall into the mid/top right corner: the FoF structure and involvement of the EIF place them clearly on the right side. CDTI's focus on high-tech, instead, means that it prioritised “sectors of great relevance for the Spanish economy,” as well as “funds focused on technology transfer from university,” with special attention to life sciences and industrial technologies (CDTI 2020; author's translation). CDTI's funds of funds initiatives can thus be associated to Italy's ITATech, which however launched only in 2017, over ten years after the first Spanish NEOTEC.

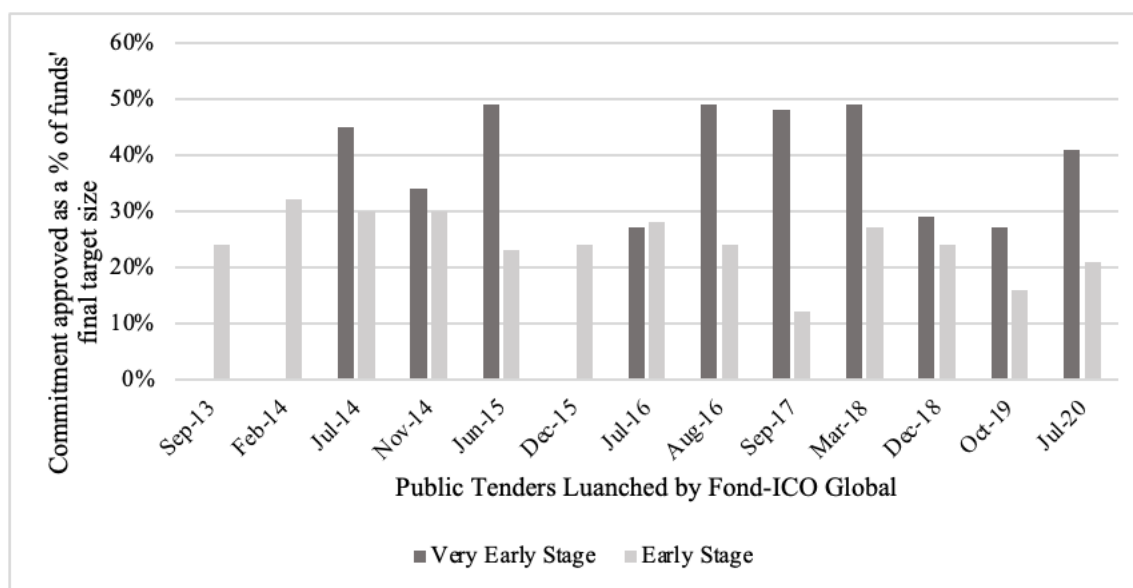
On top of INNVIERTE, another significant national step up in Spain's GVC programmes took place in 2012. In the wake of the Eurozone debt crisis and the EU bailout, Spain devoted 1.2 (later expanded to 1.5) billion euros to a FoF scheme managed by Spain's PDI—*Istituto de Crédito Oficial* (ICO). In short, the scheme—called *Fond ICO Global* and managed by ICO's management company Axis—aimed to reduce Spanish companies' reliance on bank credit by developing venture capital and private equity (author's interview with Informant-SP-GVC-1-WKS, Senior Official at Axis, 05/05/2021). Axis had tip-toed into VC FoF for several years (*Fond ICO Pyme*) but since 2012 it became a real systemic actor in innovation funding (author's interviews with Carles Ferrer, Partner at Nauta Capital, 02/12/2020; Vidal, Kibo Ventures, 17/11/2023; David Sola, Principal at Caixa Capital Risc, 29/09/2021; Informant-SP-GVC-2-STs, ICF, 07/04/2021). By December 2019 it had already committed investments for close to 400 million euros, supporting over 50 different VC GPs (versus around 15 supported by FII and ITATech in Italy). ICO's capital has on average represented around 30% of VC fundraising (see Figure 5.5 below), with the consequential critical-mass dynamics already described in previous chapters. In addition, ICO also collaborated with the EIF on a Spanish version of the European Angels Fund (see Germany chapter for explanation), which released an additional 30 million euros of public capital into the ecosystem, in matching with private business angels.

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<sup>164</sup> Information on this programme is available on the EIF website ([https://www.eif.org/what\\_we\\_do/equity/news/2009-New\\_funding\\_for\\_technology\\_driven\\_SMEs\\_Spain.htm](https://www.eif.org/what_we_do/equity/news/2009-New_funding_for_technology_driven_SMEs_Spain.htm)) and in CDTI's annual reports (e.g., 2019 report page 34, see CDTI 2020)

<sup>165</sup> Note that CDTI annual report refers to 12 funds, while the EIF web page on NEOTEC mentions 14 funds.

<sup>166</sup> Note that, as of 2019, of the 195 million euros invested, 61 were devoted to a PE fund, lowering the total proportion committed purely to VC.

**Figure 5.5: Fond-ICO Global contribution (%) to venture capital fundraising**

Source: author's elaboration on data from ICO/Axis

In many ways, therefore, Fond ICO Global was a way to scale up at the national level the Market Creator State model of supporting innovation through VC that was well-established in Catalonia by that point. Differently from CDTI's FoF schemes described above, Fond ICO Global had no technology focus. As an official at the organisation explained: "Fond Global is completely generalist. We decided to have this approach in part because in Spain as of today that are not so many specialised funds ... but also because, as a public entity, it is very difficult to make a differentiation between sectors, because then you need to explain why this sector and not that." (Informant-SP-GVC-1-WKS, ICO-Axis, 05/05/2021). In other words, with the growing role of ICO in indirect VC investments, FoF GVC in Spain in the mid-2010s evolved from being managed within *the agency for technology* to a PDI focused on enabling all sorts of financing to Spanish private enterprises. On the state-market relationship, the fund upheld the core principles, although with a slightly different and less agile model compared to ICF or international peers. The process to access the Fund's resources is more standardised and, arguably, bureaucratic: tenders are announced a couple of times a year and fund managers have 1-2 months to submit their documentation. The various proposals are scored on the basis of a set of pre-determined and publicly available criteria, so much so that a VC commented that "with the ICO process, I complete their long form and when I get to the end of it I can already estimate what our score will be and where we will stand versus the other VC funds" (Vidal, Kibo Ventures, 17/11/2023). It can therefore be argued that the method largely removes "discretion" from the Axis' team.<sup>167</sup> At the same time, Fond ICO Global presents other important elements of PAL. Interviewees were unanimous in their positive comments on the team's technical competences in funds' investments. Moreover, Axis has also engaged a private, third-party advisor to replicate a separate and independent due diligence on each fund, to ensure that a third-party assessor would come to the same

<sup>167</sup> Note that in the period under study Axis managed also other, smaller indirect VC investment funds, in which it used higher discretion, and thus even higher PAL.

conclusions. Most importantly, Fond ICO Global has strict informed conditionality. First, officials interviewed have highlighted their close cooperation with the EIF in the definition of terms and conditions that it applies. Second, differently from other models encountered, these terms are non-negotiable as they are set before the tender is published. Finally, for investments in foreign funds, Fond ICO Global stands out for its very high requirements: non-Spanish VCs have often been required to invest in Spain twice the amount of capital they have received from ICO (Informant-SP-GVC-1-WKS, 05/05/2021 and ICO/Axis internal materials).

All in all, from the two countries' comparison, it is clear that Italy not only invested significantly less than Spain in building the VC industry through FoF; it was also reluctant to embrace the core principles of the Market Creator State. Table 5.5 summarises this comparison. Figure 5.6 shows the outcome: over the same time period Spanish funds raised over 2 times the amount of capital than Italian ones; adjusted for country size, Spain's fundraising amounts to almost three times Italy's.

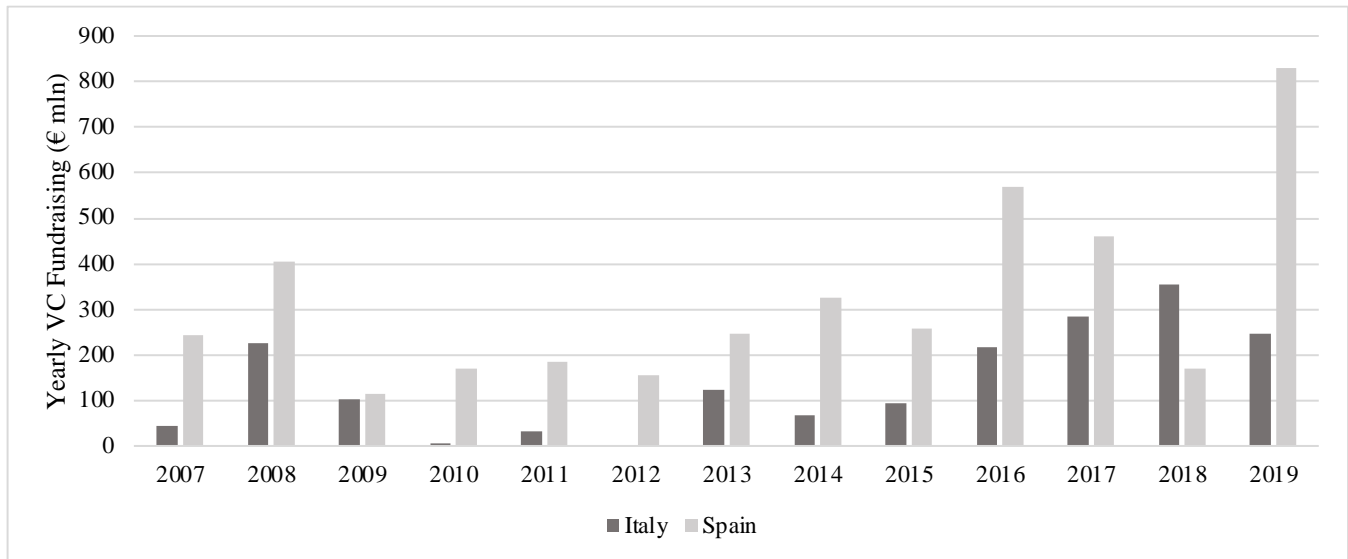
**Table 5.5: Italy and Spain's FoF initiatives in comparison (rounded budgets; VC only)**

Italy	Approx. Budget (€m)	Year Launched	PAL?	Broad Innovation focus?
High Tech Funds	75	2009		✓
FII VC I	90	2012	✓	✓
FII VC II	165	2014	✓	✓
ITATech	200	2017 <sup>168</sup>	✓	▪
<b>Total</b>	<b>530</b>			
<b>Total up until 2016</b>	<b>330</b>			
<b>Spain</b>				
ICF Indirect	180	2002	✓	✓
Neotec Capital Riesgo (CDTI)	175	2006	✓	▪
Innvierte indirect	110	2012	✓	▪
EAF	70	2013	✓	✓
Fond-ICO Global	335	2012	✓	✓
Fond-ICO Global (top-up I)	85	2015	✓	✓
Fond-ICO Global (top-up II)	140	2018	✓	✓
<b>Total</b>	<b>1095</b>			
<b>Total up until 2016</b>	<b>955</b>			

Source: author's elaboration on bottom-up data obtained through archival research and fieldwork interviews.

Note: "Total up until 2016" is shown because indirect investments have at least a 3-year lag period to translate into investments into start-ups. Therefore, this timeframe is more relevant to compare to the total amounts raised by start-ups over the period analysed in this thesis (i.e., until 2019). Fond-ICO figures are an estimate based on total split of commitments between PE and VC for the total timeframe 2012-19

<sup>168</sup> Programme was announced in late December 2016, so considered active since 2017.

**Figure 5.6: VC fundraising over time – Italy versus Spain (€m)**

Source: author's elaboration on Invest Europe data

### 5.3.3 Other GVC instruments: alternative or complementary to venture capital?

This section looks at Italy's other support schemes for start-ups over in the time period. It highlights how the government allocated the majority of resources to programmes with few PAL characteristics and not focused on the high-growth companies that accelerate human capital formation. Most of these resources, thus, were not as complementary to PVC funding as it has been the case in France—but also partially in Spain.

#### 5.3.3.1 Italy's debt and direct equity for start-ups: from debt guarantees to small PE investments

Since the approval of the Start-Up Act, Italy has set up a plethora of heterogeneous funding schemes to support innovative companies. While some were better structured than others, most of the capital was channelled through instruments not properly targeted to high-growth start-ups. In short, most of the resources were allocated to credit-based instruments, blurring the lines between development policy and innovation policy, as noted for KfW in the Germany chapter. Meanwhile, equity-based GVC had limited ambitions and did not fully reflect core PAL characteristics.

The main public investment tool that complemented the Start-Up Act were public guarantees (*Fondo di Garanzia*, FDG) and a debt-based funding programme (Smart&Start, S&S). The FDG policy is comparable to Germany's intermediated lending scheme: the Italian state incentivised Italian banks to provide loans to companies qualified as "innovative start-ups" by providing an 80% guarantee up to 2.5 million euros. Differently from regular companies, start-ups also have access to it free of charge. Over the

2013-2019 period, Italian innovative start-ups received over 1 billion euros through the FDG (MISE 2020).<sup>169</sup>

S&S is instead a more direct, subsidised debt funding scheme, with very advantageous terms for start-ups. Launched in 2015, the instrument is administered by the Italian development agency Invitalia, which provides the financing directly to start-ups. These can use the funding to cover only certain types of “qualified expenses.” Companies first incur the costs and then can claim a refund of up to 70-90 percent from the agency in the form of an interest-free loan.<sup>170</sup> Over this thesis’ analysis period, various governments allocated over 360 million euros to this policy.<sup>171</sup>

Finally, Italy also launched two GVCs investing equity directly into start-ups. Invitalia Ventures was a GVC company wholly owned by Invitalia. This public company managed two funds over the period, an 85-million euro generalist co-investment fund, and a 150 million euro fund launched in late 2018 that could invest exclusively in companies based in Southern Italy.<sup>172</sup> FII also became involved in direct VC investments, with *Fondo Italiano Tecnologia e Crescita* (FITEC). The 115-million fund started operations in 2017, with a dedicated team separate from the funds of funds activities. However, similarly to FII’s FoF activity, observers noted that FITEC also had a private-equity bias. Its operations focussed largely on tech-based traditional SMEs, rather than mostly on high-growth start-ups and scale-ups (Mizzi, 11/01/2024; Informant-IT-VC-3-WEE, Italian VC, 15/11/2023).<sup>173</sup>

All in all, thus, Italy has allocated well over 1.5 billion euros to GVC-like programmes. It is not true, therefore, that Italy simply did not pursue GVC policies during the period. Instead, Table 5.6 below summarises all the schemes and the resources allocated. The next section, however, will delve into their limitations, with reference to the theoretical framework and the other case studies in this thesis.

**Table 5.6: Italy’s debt and direct equity GVC programmes**

Italy	Approx. Budget (€m)	Year Launched	PAL?	Capabilities Focus?
Fondo di Garanzia	1,130	2012		
Smart&Start	365	2015		
Invitalia Ventures	85	2015	✓	✓
FITEC	115	2017	✓	✓
<b>Total</b>	<b>1,695</b>			

Source: author’s analysis based on publicly available documentation<sup>174</sup>

<sup>169</sup> Figure based on 2020 official report by the Ministry of Economic Development (MISE), page 64: [https://www.mimit.gov.it/images/stories/documenti/RELAZIONE\\_ANNUALE\\_2020\\_STARTUP.pdf](https://www.mimit.gov.it/images/stories/documenti/RELAZIONE_ANNUALE_2020_STARTUP.pdf)

<sup>170</sup> The specific refund percentage, like many aspects of the policy, has evolved over time and it also depends on the specific characteristics of the company (e.g., where it is based) and its team (e.g., if it is young, has a prevalence of women, or it includes a PhD holder).

<sup>171</sup> Original funding is detailed in the [2018 report](#) by the Ministry, additional 100 million euros were added in 2020 through [Decreto Rilancio](#)

<sup>172</sup> The South-focused fund was originally set up to perform PE investments but later transitioned to a VC strategy

<sup>173</sup> This hybrid focus finds confirmation in FITEC’s own website, which states that it invests in “Tech Growth (companies with positive EBITDA and solid growth) and Late Stage (high-growth companies with a need to finance the income statement) investments.” Positive EBITDA is a metric more common for a mature SME than for a fast-growing high-tech scale-up, where VC capital is used to fund negative profitability as well as investments.

<sup>174</sup> For FDG, S&S, and Invitalia Ventures, see MIMIT’s annual reports on the implementation of the Start-Up Act; for FITEC, see FII’s website. Note that Invitalia Ventures AUM will later be reduced to 80 million euros, due to one private LP’s commitment reduction. Only

### 5.3.3.2 The limitations of Italy's public funding schemes

It should appear evident that some key programmes above lacked many of the necessary characteristics to align to the Market Creator State paradigm. They also reproduced several of the common pitfalls of GVC identified in the literature. In particular, they relied largely on classic financing tools and failed to distinguish micro-entrepreneurship and development policy from innovation policy. This is somewhat surprising as Italy launched all these initiatives several years after peer countries in Europe had started to introduce the more effective forms of GVC discussed in previous chapters.

Above all, the actual equity-investments funds represented only less than 15% percent of the available resources. The rest was start-up funding that took the form of debt or debt guarantees. This already places the overall Italian GVC efforts on the left side of the theoretical framework, away from PAL. As it transpires from the commentary in the OECD evaluation report, Italian policymakers seem to have believed that, Italy being a heavily bank-reliant economy, an Italian-style entrepreneurial ecosystem could also be more credit-finance based. However, there is a growing consensus in the literature that debt-based public financing for high-tech entrepreneurship is ineffective (Lerner 2009, OECD 1997a, OECD 2004b). Italy provides further evidence for this literature.

More specifically, evidence on the FDG shows that a sort of dualistic market formed, where the “innovative start-ups” that benefited from the FDG were *less* likely to receive VC investments (Giraud et al. 2019, Biancalani et al. 2022, De Angelis 2018). This is consistent with the literature and with the evidence from the German case, as “bankable” companies typically have different business models from innovative high-growth companies. This is further confirmed by the surprisingly low default rate of “innovative start-ups” that accessed the FDG: 6.7%, well below the average failure rate of a VC fund.<sup>175</sup> The reliance on FDG also signals that Italian policymakers at the time did not fully distinguish between economic/regional development policies and innovation policies. The FDG programme for start-ups consisted in simply facilitating access for these type of companies to a tool developed for traditional Italian SMEs. For companies with a more traditional business model, this worked very well (“it is by far the most well-designed and easily accessible tool”; Informant-IT-SU-1-NVV, start-up founder, 07/12/2023). However, it underestimated the deep differences in the institutions needed for developing a new ecosystem of start-ups compared to supporting the existing network of Italian SMEs.

The S&S programme also fell short of the PAL model. First, the approach and process are highly bureaucratic and have no resemblance to the investment process of private VCs. Importantly, the resources can only be used for certain expense items, which adds a layer of complication in disbursing them, with an ongoing exchange of invoices between the company and the bureaucracy throughout the funding period. Moreover, the fact that companies need to first incur the expenses and then receive a (partial)

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85 million euros shown for Invitalia Ventures because, for most of the analysis period, the Southern Italy fund did not exist or was not doing VC investments.

<sup>175</sup> Calculated as non-performing-loan value divided total loans outstanding, in MIMIT's [annual report](#) on innovative start-ups 2022. Note that this comparison with VC funds' portfolio statistics is imperfect as a “failure” for a VC fund does not necessarily mean a company going bankrupt but simply that it returned less than 1x the investment.

reimbursement is inconsistent with the cash-constraint nature of start-ups. S&S, therefore, is at the antipodes of the VC funding method: VCs provide upfront equity investments based on a forecast business plan and ensure alignment between their financial interests' and the entrepreneurs', so that the funds are used to the advantage of both. S&S, instead, entails micro-management by the public agency of the use of funds by the start-up and no risk/reward sharing. These limitations were already obvious in 2018. At the time, a report by the Ministry of Economic Development showed that only 9.2% of the requested funds had been disbursed, and commented:

“This may primarily be the result of difficulties encountered by the startups in finding the necessary funds to pay the costs that would be subsequently be [sic] reimbursed ... It should also be considered that the startups must already have incurred at least 20% of the admitted subsidised investment expenditure and operating costs in order to submit the application for payment”

Ministry of Economic Development  
Report to Parliament  
2018<sup>176</sup>

This was echoed by the comments of one beneficiary entrepreneur interviewed: “There is a lot of bureaucratic complexity. It can make sense for a structured company that already has an administration and finance office but for a small start-up of a few people, it takes days and days away from actual work ... and you need an interpreter to understand the expense refund rules” (author’s interview with Informant-IT-SU-1-NVV, Italian start-up founder). Corbetta, formerly at MIMIT, also commented that “the instrument was *easy for the public administration* as it reflected established public practices in subsidised financing, but with *important complications for start-ups* from an operational point of view” (Corbetta, former MIMIT, 07/12/2023, author’s italics). Such complex administrative processes thus would make the programme prone to the type of negative bias that such innovation support schemes often experience. Some VC interviewees have mentioned this dynamic (e.g., Informant-IT-VC-3-WEE, Italian VC, 15/11/2023) but further and less anecdotal evidence would be needed to verify. Finally, S&S’ additional benefits for special categories of firms suggests a varied mix of policy objectives. In particular, firms based in the South of Italy can receive 30 percent of funding as a grant instead of a loan. Regional development for Italy’s South is, and should be, by far among Italy’s main policy priorities. However, it is a very different goal from creating an innovation ecosystem and the literature shows that mixing the two objectives can be risky (Lerner 2009). The story of Italy’s policies thus resonates with the German one explained the previous chapter. Invitalia, similarly to KfW, is an agency historically devoted to promoting economic development. It has also had an important focus on the South, funding both large-scale industrial projects and micro-entrepreneurship programmes (see, for instance, *Resto Al Sud*).<sup>177</sup> Innovation, in other words, was not historically its core function. It should thus not surprise that Smart&Start “was an evolution of the classic instruments of subsidised credit for self-employment”

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<sup>176</sup> Ministry of Economic Development 2018’s [2018 annual report](#) to parliament on the implementation and impact of legislation in support of innovative start-ups and SMEs

<sup>177</sup> For an example of a micro-entrepreneurship programme for Southern regions, see: <https://www.invitalia.it/cosa-facciamo/creiamo-nuove-aziende/resto-al-sud>. In general, Invitalia is the outcome of the merger between several predecessor development agencies, among which *Società per la Promozione e Sviluppo Imprenditoriale, Imprenditorialità Giovanile, Itainvest, Insud, Ribs, ENI-Sud, Finagra*.

(Corbetta, former MIMIT, 07/12/2023). The S&S programme thus provides further evidence on the importance for GVC of creating dedicated teams, separate from the traditional public bureaucracy.

Invitalia Ventures and FITEC certainly looked more similar to successful programmes in peer economies. However, they still lacked core elements of PAL. Invitalia Ventures could be considered akin to Bpifrance direct investments: it was a publicly managed early-stage fund investing solely in co-investment with private investors. It should also be noted that the fund did not manage only Italian public money: it also raised 35 million euros from private investors and the European Investment Bank (22 million euros; Mizzi 11/01/2024). In this, it was somewhat comparable to the German HTGF. In the Italian context at the time, it was certainly an impressive policy achievement that aimed to reproduce successful foreign GVC models. However, it suffered from three issues that made it not a real PAL. First, it was one step too close to politics and to the traditional bureaucracy. Being a 100-percent subsidiary of Invitalia, the GVC had to abide to most of the mothership's rules and practices.<sup>178</sup> This is in contrast for instance with both Bpifrance and the HTGF discussed in previous chapters, neither of which is so directly connected to a ministry. This created obstacles in particular for talent recruitment. As a former team member explained “the team should have been more ‘market like,’ with specific venture capital competences” (Spedaliere, former Invitalia Ventures, 12/12/2023). The former CEO explained that he was able to attract from outside senior team members that were “top calibre” (Mizzi, 11/01/2024). However, especially at the beginning, part of the team had to be sourced from within Invitalia's ranks or by following their hiring procedures (Spedaliere, former Invitalia Ventures, 12/12/2023). More broadly, the governance of Invitalia Ventures also did not fully reflect that of a private fund. Importantly, it was not team members who formally approved investments, but an external investment committee and board, comprised of appointees from Invitalia and the Ministry, many of which were not close enough to the subject matter to be able to really provided an informed opinion on the investments (Spedaliere, former Invitalia Ventures, 12/12/2023). Another example of contrast between public sector and VC practices was the request by Invitalia that the team member who proposed a certain investment never sat on the board of that company—presumably to avoid conflict of interests, but exactly the opposite of what happens in private funds. This, together with the lack of any form of carried interest or similar financial incentive, meant that the investment team was not accountable to their investment choices and unaffected by the fund's performance—a very common pitfall in GVC designs (Lerner 2009). As Spedaliere, who worked in PVCs before and after IV, explained “this combination makes the fund very different from a private fund, because there is no alignment of interest for the team” (Spedaliere, former Invitalia Ventures, 12/12/2023). In this sense, it is interesting to note that when in 2017 the European Investment Bank decided to contribute to the fund, it set as one of the conditions for its investment that a performance-based component be added to the team's compensation scheme (Spedaliere, former Invitalia Ventures, 12/12/2023). Invitalia Ventures also suffered from the frequent and abrupt evolutions of Italian politics. Between 2015 and 2019 the management company changed 3 CEOs and its operations were frozen for over six months due to these management transitions (author's interview with Informant-IT-GVC-2-CNS, former Invitalia Ventures, 05/12/2023). This is in contrast with its European peers where the leaderships

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<sup>178</sup> In turn, Invitalia is fully owned by the Ministry of Economics and Finance, making it an extension of this Ministry and of that of Economic Development.

survived several governments without operational discontinuity.<sup>179</sup> Finally, Invitalia Ventures also came to exhibit the same regional development bias as S&S (and HT Funds). In 2019 it launched a second fund, which came to represent 65 percent of the company's capital under management. This fund, however, was not truly focused on start-ups but rather on private-equity investments in SMEs in Southern Italy. Invitalia Venture therefore was a courageous and commendable initiative, which introduced co-investment GVC in Italy. However, it is also a perfect example of how the constraint of traditional public administration can encumber these types of policies. As its first CEO commented, the fund experienced the pros and the cons of having political exposure. On the one hand, the political backing and visibility helped it—for instance to raise 13 million euros from large corporates. On the other, it also introduced risks of interference. “With these initiatives it is like with fire: you must stay neither too close, nor too far. When it became a bit too hot, I decided to leave” (Mizzi, 11/01/2024).

FITEC had almost opposite shortcomings. FII's governance, already described, ensured much more independence from politics, given two degrees of separation as well as the direct involvement of private banks in the shareholding structure. CDP was also able to attract a senior investment team with a long and specialised professional experience in the private sector: top management had on average twenty years of private sector investment experience and junior staff had highly technical backgrounds (LinkedIn data analysis). This conceivably granted the fund more autonomy versus its private counterparts. At the same time, however, FITEC was not truly focused on venture capital. Several interviewees mentioned that the fund could almost be considered “not part of the ecosystem” as it was almost exclusively focused on small private equity investments, rather than high-growth scale-ups. In addition, its hybrid governance led to an ambiguous role in the market. Although partially funded by CDP, the fund also competed for fundraising with PVCs, creating “a big market distortion,” according to one investor interviewed (Informant-IT-VC-3-WEE, Italian VC, 15/11/2023). In summary, while FITEC had the *potential* to be a successful GVC in Italy, it was never truly devoted and structured for this cause.

All in all, therefore, these four other programmes (FDG, S&S, Invitalia Ventures, and FITEC) were half-hearted GVC policies, overall did not reflect the Market Creator State characteristics and, especially, ambition. FDG and S&S were adaptations of typical instruments that the Italian public bureaucracy used to fund SMEs or micro-entrepreneurship. Invitalia Ventures and FITEC showed good premises, but each suffered from limitations that prevented them from having a systemic impact on the ecosystem. In many ways, therefore, the Italian experience resonates with two of the key risks in GVC policies identified by Lerner (2009). First, policymakers' tendency not to distinguish between high-growth firms and micro-firms. And secondly, the temptation of merging innovation policy with regional development policy, trying to “spread the wealth” and to offset the “intensely unfair” network dynamics of innovation economics (Lerner 2009).

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<sup>179</sup> Nicolas Doufourq, of Bpifrance, has been in charge since 2013 to the moment of writing. In Germany, the first HTGF's CEO, Michael Brandkamp was in charge 2005-2020.

5.3.3.3 Spain's direct GVC: Enisa and CDTI

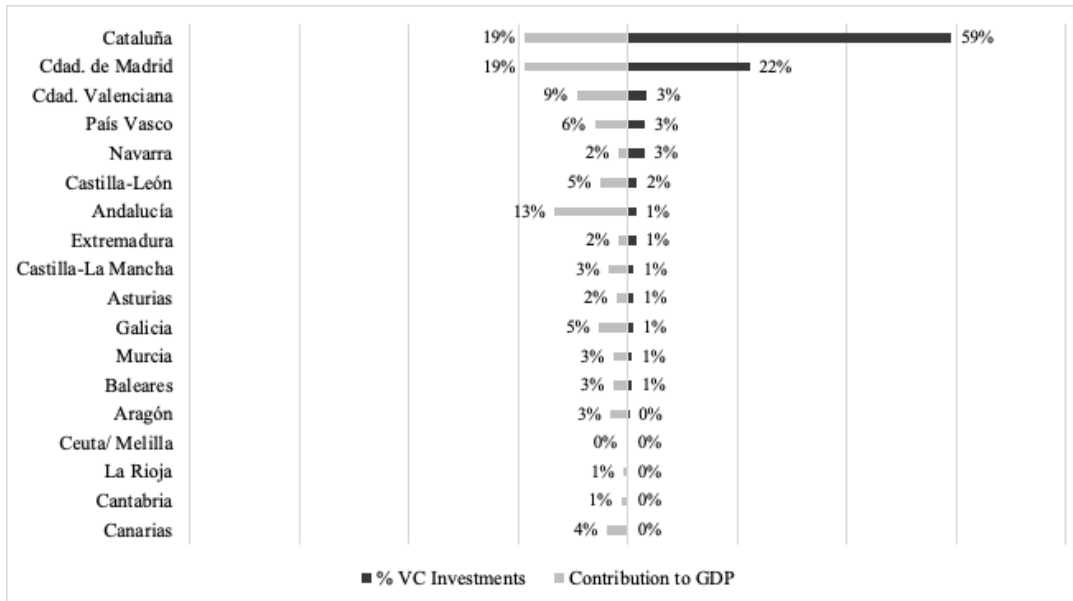
Since the GFC, the Spanish state has supported start-ups directly mostly through non-equity instruments, similarly to Italy. However, the Spanish system has a more clear division of roles, with one agency dedicated to general financial support for entrepreneurship (Enisa), and one focused on funding new technologies (CDTI). Start-ups can benefit from both.

The first noteworthy difference in approach is that until 2019 there was no one-to-one equivalent in Spain of Invitalia Ventures and FITEC.<sup>180</sup> To be sure, in the Spanish federal context—similarly to Germany—over time some local governments (*comunidades autónomas*) had experimented with various local forms of GVC. However, fieldwork interviews confirmed that—with the exceptional case of ICF in Catalonia—none of these schemes had a systemic size or impact (Informant-SP-GVC-2-STS, ICF, 7/4/2021; Informant-SP-GVC-1-WKS, Axis, 05/05/2021). This is confirmed by the numbers: by 2014 the Barcelona and Madrid regions received over 80 percent of VC funding and no other region alone attracted more than 3 percent of total invested capital (author's analysis on ASCRI data, see Figure 5.7). Catalonia's ICF has indeed expanded its direct GVC activities since the late 2000s, allocating around 100 million euros to direct investments by its in-house team. Interviews with management, however, stressed that these instruments were conceived as complementary to their indirect schemes in strengthening the private VC industry: “On a case by case, we decide whether it is best to invest in the fund via our funds of funds or co-invest with that investor through the direct investment scheme; but *either way, the goal is to support the development of new management teams and human capital competences* for investing in innovative companies” (Informant-SP-GVC-2-STS, ICF, 7/4/2021; author's italics). It appears, therefore, that pure direct equity investments in Spain by themselves were not sufficient to propel the growth of the ecosystem. The only region that saw an exceptional development early on, Catalonia, paired some direct investments with a substantial indirect programme (see section 5.3.2).

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<sup>180</sup> In 2019, and more during and after the Covid-19 pandemic, Spain introduced new direct-equity GVCs both within ICO and within CDTI.

Figure 5.7: Regional distribution of VC investments in Spain, versus GDP contribution of *comunidades autonomas*



Sources: author’s analysis on ASCRI VC investment data and GDP data from [datosmacro](https://datosmacro.com)

Spain instead offers non-equity funding comparable to Italy’s S&S. These programmes, however, have been both larger and more clearly complementary to private innovation investments. The most relevant programme is managed by the Spanish entrepreneurship agency Enisa. The agency has been investing into Spanish SMEs through participative loans to the tune of 100 million euros per year (Garcia, Enisa, 10/05/2021; Enisa’s internal documentation). The scheme is a leaner and more market-friendly version of S&S. There are three key differences. First, the investment takes the form of so-called “semi-equity:” the agency awards to a start-up up to 300 thousand euros (1.5 million for more mature SMEs or scale-ups) and has the right to either be repaid the capital in the form of a loan with an advantageous interest payment schedule or convert the loan into equity. The agency never chooses the conversion route as having direct participations in private companies would vastly increase the complexity of managing the programme (Garcia, Enisa, 10/05/2021). However, the hybrid nature of the instrument allows Enisa to fund start-ups that do not have the cashflow to guarantee that they could repay the loans. Second, Enisa does not have a list of “qualified expenses,” nor does it retroactively approve the use of funds on an ongoing basis: “We understand that for a company, the money they receive will be used in a variety of ways, from marketing to innovation to international expansion” (Garcia, Enisa, 10/05/2021). Finally, differently from S&S, Enisa’s considers applications from all companies that apply (since until very recently there was no legal concept of “innovative start-up” in Spain) and evaluates them primarily based on their commercial feasibility. Each company is evaluated based on two broad metrics: 1) quantitative criteria (company’s financials or its business plan) and 2) qualitative criteria. The degree of technology and innovation is just one of the considerations in the latter category, together with factors such as “team” and “clients” (Garcia, Enisa, 10/05/2021). Enisa’s horizontal and technology agnostic approach emerged clearly from the management’s comments on the selection process:

## Chapter 5: Italy and Spain

“With regard to innovation, we are very open to any innovation, because we are trying to help SMEs ... we try to fund innovative things but there is no objective ‘line’ for innovation among the criteria ... In fact, sometimes we get criticised for not being focused enough in this sense, but we want to break this linear conception of ‘R&D equal innovation.’ Innovation is the umbrella and R&D is only one aspect of it.”

Author’s interview with Jordi Garcia  
Enisa  
10/05/2021

All in all, this results in a much higher complementarity of Enisa’s funding to VC investments. Interviewees both from the public and private side commented that “all start-ups in Spain have been or will be financed by Enisa at some point” (Vidal, Kibo Ventures, 17/11/2023; Garcia, Enisa, 10/05/2021). This is because Enisa’s loans do not come with heavy bureaucracy and can instead provide useful leverage to VC investors: “Enisa is one of the pillars in this ecosystem ... Every start-up that is able to raise equity from a VC, a business angel, family-and-friends or similar, they end up also getting an Enisa loan” (Vidal, Kibo Ventures, 17/11/2023). Most importantly, Enisa loans typically come alongside equity investments, expanding the start-ups financing round without further dilution for the entrepreneurs:

“The Enisa loan usually comes in parallel with the equity round ... because in theory they need to see that the company has funds to repay the loan ... but in practice this is not the case because Enisa’s repayments scheme—usually two years—is such that the start-up does not need to start paying back the loan until after it has used up the resources from the equity round. So Enisa banks on the fact that the start-up will raise further equity rounds or develop a profitable business model by the time it needs to start the repayments ... And the repayment terms are very light, so if things go well the start-up does not even notice that it is repaying the Enisa loan”

Author’s interview with Jordi Vidal,  
Kibo Ventures,  
17/11/2023

Enisa’s funding, therefore, is very similar to the scheme utilised by Bpifrance, which entrepreneurs and investors described as a good complement to VC investments. It differs instead from the Italian S&S and FDG as well as from the German KfW intermediated loans, which are more disconnected from the VC funding cycle and thus have attracted in particular SMEs with more traditional business models.

The second large national funding programme in Spain is managed by the technology agency CDTI (*Centro para el Desarrollo Tecnológico*, Centre for the Development of Industrial Technology). This agency’s remit is the creation and commercialisation of new technology in Spain, with a focus on strategic or highly disruptive technologies. As such, its activities focus on the top quadrants of the theoretical framework. Its workforce is structured accordingly, with the vast majority (85%) of its 350 employees holding a university degree in STEMs and engineering (author’s interview with Informant-SP-GVC-4-FYM, CDTI, 22/06/2021). Of the programmes analysed in this research, CDTI is thus the most similar to the American DARPA, with a highly-specialised technical workforce that evaluates technological projects and awards non-equity funding accordingly. Historically, the main programme relevant for start-ups was NEOTEC Grants, a grant scheme launched in 2002 to help companies fund innovation projects. In practice, CDTI awards grants of up to 250 thousand euros to innovative companies,

with a reimbursement dynamic comparable to that of Italy's S&S. The scheme thus clearly falls in the top-left quadrant of the framework. The focus is very narrowly on companies that invest new technologies, as clarified in the official scheme description:

“The NEOTEC Program aims to support the creation and consolidation of *technology-based companies*. A technology-based company (TEB) is a company whose activity is focused on the exploitation of products or services that require the use of technologies or knowledge *developed from the research activity*. The TEBs base their business strategy or activity on the *intensive mastery of scientific and technical knowledge*. The most relevant aspect in the proposals supported in this line must be a business strategy based on the development of technology (*technology must be the competitive factor of differentiation of the company*) ... Companies whose business model is based primarily on services to third parties, without developing their own technology, *are not suitable*.”

NEOTEC Grants  
Programme Description Online  
(Author's italics)<sup>181</sup>

There is also very little sign of PAL, as the programme is managed by a traditional public agency, using non-market tools such as grants. Over the years CDTI has awarded an average of 20 million euros per year in this way, to around 100 companies each year (CDTI 2020; Informant-SP-GVC-4-FYM, CDTI, 22/06/2021). It is interesting to note, however, that since 2013 CDTI has expanded its activities with more of a PAL model. On the one hand, it has doubled down on its FoF activities, with INNVIERTE (see section 3.2.2). On the other, in 2019 it has also created a direct equity co-investment scheme, where the agency invests semi-automatically in the companies that are submitted to it by a list of pre-approved private co-investors (INNVIERTE co-investment facility).

In summary, therefore, in the decade leading to 2019, the Spanish state has made limited use of direct investments into start-ups. Instead, Spanish central agencies Enisa and CTDI have supported innovative companies mostly through loans or grants. The detailed evaluation of each of these programmes is beyond the scope of this research—at a high level, they appear to have been complementary to VC investments and to indirect GVC. However, they were probably not the primary drivers of Spanish ecosystem develop, since both CDTI and Enisa support had been around long before ecosystem growth picked up in the mid 2010s.

### 5.4 Italy versus Spain: Why so different?

Italy's and Spain's approach to GVC, thus, started to diverge in particular after the global financial crisis. At the time, Italy pioneered an approach based on creating framework conditions. Spain, instead, greatly expanded its GVC tools, in particular its indirect investments, engaging its PDI. While Italy did allocate some substantial resources to start-up support, these were largely traditional, debt-based instruments. Why did the two countries choose such different paths? Comparing the two to the process in France showed that the paths diverged because of the absence, in Italy, of a consistent political push and conviction for the importance of structuring an entrepreneurial ecosystem. In this context, policies were captured by

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<sup>181</sup> Find online description at: <https://www.cdti.es/en/ayudas/neotec-grants>

existing bureaucracies or few private players. Spain avoided this outcome largely because the EU institutions involved in national policymaking maintained that political pressure that tilted the balance and enabled a Market Creator State approach. Italy's path indeed aligned to those of its peers only 10 years later, when a political coalition formed around the importance of state support for innovation.

### 5.4.1 Paths to the Market Creator State

When abstracting the story of Bpifrance (Chapter 3), this thesis argued that there were three fundamental counterbalancing forces that led to the emergence of the Market Creator State approach. On one side, the financial crises created impetus for a renewed political interest in industrial policy for innovation. On the other, European state aid laws and the economic ideas of the consolidation state provided a counterweight that led the government to involve France's PDI, whose market competences and mindset tilted GVC policies towards the bottom right corner of the GVC policy framework. This section shows how most of these factors were present in Spain, but not in Italy.

As discussed for the German case, European state aid law is a constant across EU member states, so the constraints certainly applied to Italy as well. This cannot be, per se, a sufficient explanatory variable. What made the difference in various cases, and over time, was the political mandate to find workarounds to these constraints as well as the degree of consolidation state present in the country. In Italy, the net balance of these two forces was such that it led to a different outcome. On the one hand, the "political push" was weak, for at least three reasons. First, the main impetus for start-up focused policies originally came from the initiative of one "technocratic" minister, Corrado Passera. The initiative garnered support from the broad political coalition forming the basis of Italy's then technocratic government, making it challenging to attribute it to a specific political force, beyond the minister's own activism on the matter. Second, this initiative took place in the very last months of the Monti government, the Start-up Act being one of its last decrees. Since then, following the 2013 elections, short-duration governments led to three different ministers in five years, significantly limiting the momentum of innovation policy. As Corbetta reports, "after an initial moment when the policy had ample visibility, there was a prolonged period ... of *'neutral benevolence'* of politics towards this policy and topic. Any following modifications and improvements that were made to the law were enabled by the remarkable ability of MIMIT's General Director for Industrial Policy at the time to garner political consensus on this issue" (Corbetta, former MIMIT, 07/12/2023, author's italics). In other words: no one was able or willing to carry on the political initiative on this front. In this sense, it is telling that even one of the most sizeable initiatives, the 200-million euros ITATech, was launched largely thanks to the collaboration between CDP, the EIB, and the EIF, at a time when both these EU institutions had an Italian leadership, rather than because of a very strong political mandate to develop venture capital in Italy (Mizzi, 11/01/2024).<sup>182</sup> Third, interviews indicated that the political lobbying on the part of the ecosystem's representatives was neither cohesive nor specifically targeted towards advocating for government venture capital (Corbetta, former MIMIT,

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<sup>182</sup> On top of CDP's CEO, Fabio Gallia, the EIF was led by Pier Luigi Gilibert (CEO) and Dario Scannapieco (President of the EIF and vice president of the EIB).

07/12/2023). In the context of a challenging fiscal position of the country and of unstable governments that could not guarantee programme continuity, the Italian PE and VC association (AIFI) and other stakeholders focused—very successfully—their demands towards improving fiscal benefits for investments in innovative start-ups and SMEs, whereas their demands for a more interventionist role on the part of government in VC were not as vocal at that time (Corbetta, former MIMIT, 07/12/2023). This partly changed only towards the end of the decade, after a re-organisation of the sector’s representative organisations.<sup>183</sup> All in all, therefore, the evidence suggests the political momentum for significant innovation policies in Italy was weak for the whole period 2013-2019.

On the other hand, the forces of the consolidation state were very strong. First, Italy was one of the main countries in the eye of the Eurozone debt crisis’ storm. The Monti government avoided the default but, until the general elections of 2018, all governments’ rhetoric and policies broadly adhered to the precepts of financial prudence and spending restraint (Fifi 2023). The climate of economic orthodoxy, therefore, contributed to a prevalent ideological bias against any interventionist involvement of government, including in innovation (Mizzi, 11/01/2024).<sup>184</sup> In this context, as Mattia Corbetta—who continued to cover these topics at the MIMIT during that time period—recalls, “there was no political willingness to allocate billions to something as risky as start-ups, which were long perceived as a niche” (Corbetta, former MIMIT, 07/12/2023). This reasoning also explains the specific choice of certain policy tools: “the guarantees funds, for instance, in theory does not cost anything to the state if ‘things go well’ with the companies [i.e., if companies do not fail and banks do not need to have their losses recovered by the state]. This was indeed the case for many years, with surprisingly low default rates, as evidenced in [MIMIT’s] periodic reporting.” (Corbetta, former MIMIT, 07/12/2023).<sup>185</sup> Second, while in other countries (France, in particular), the government engaged the national PDI to resolve this type of fiscal constraints, in Italy such move was particularly difficult to make. As Bulfone and Di Carlo (2021) have explained, Italy’s CDP holds a peculiar status since its partial privatisation in 2003. The PDI’s new governance—with banking foundations’ veto power—has significantly increased its independence from the government. Moreover, the unique condition of being “an extremely large and financially strong NDB [in a] cash-strapped sovereign” further strengthened its bargaining power vis-à-vis the state (Bulfone and Di Carlo 2021). CDP’s position, paired with weak political willingness, meant that, without a strong political mandate, the PDI did not embrace a Market Creator role in the industry. In the meantime, the other public instruments followed the practices and models that were best known to the bureaucracy and considered “safest,” but that were least compatible with the start-up and VC business model.

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<sup>183</sup> In late 2019 the main Italian VCs launched a new association, VCHub, which had the explicit goal of lobbying for a step-change in public policy. As the official statements from the new organisation at the time stated: “The Italian ecosystem of innovative companies has been deeply influenced by the measures introduced, starting in 2012, by the startup act; but an *effective initial policy in favour of start-ups is not a sufficient* condition for companies to be successful, if not complemented by actions, also in other policy areas, to fully realize the potential of Italian innovative companies ... *VC Hub Italia intends to present to the main stakeholders proposals to enable the creation of capital formation Italy* comparable to that of start-ups in other EU countries, in order to be able to compete and scale internationally”. VCHub, Official Statements, 2019 (author’s translation and Italics), see: <https://startupitalia.eu/121671-20200213-grande-novita-venture-capital-italiano-nasce-vc-hub-italia> .

<sup>184</sup> It should be noted that the same orthodox rigour was not applied to some cases of traditional industries’ rescue plans; see for instance the bail-out of Italy’s oldest bank, Monte dei Paschi di Siena.

<sup>185</sup> This type of reasoning further suggests important misunderstandings about the nature of the high-growth entrepreneurship process, where failures are much more frequent than what these assumptions implied.

## Chapter 5: Italy and Spain

How is Spain's process then different from Italy's? The two countries experienced similar fiscal constraints as they were both at the centre of the European debt crisis. Arguably, Spain was even more under stress as in 2012 the country's fiscal position drove it to accept a 100-billion-euro bail-out plan from the Eurozone member states. In this context, where did Spain find the resources and the political will to increase funding for the innovation industry? Interviews and historical documentation suggest that the answer lies largely in the bail-out process itself. Spain was offered the rescue package to recapitalise its banking system on the agreement that it would have enacted wide-ranging austerity and structural reforms, which the European Commission, European Central Bank, and IMF would have monitored. One of the commitments that Spain explicitly took at the time was to promote measures to reduce Spanish SMEs' reliance on bank financing (Informant-SP-GVC-1-WKS, ICO-Axis, 05/05/2021). This commitment was spelled out in the *Memorandum of Understanding (MoU) on Financial-Sector Policy Conditionality* signed between the Spanish government and the European Commission. Recommendation 27 (section V) of the agreement reads:

“Non-bank financial intermediation should be strengthened. In light of the high dependence of the Spanish economy on bank intermediation, the Spanish authorities will prepare, by mid-November 2012, *proposals for the strengthening of non-bank financial intermediation* including capital market funding and *venture capital*.”

MoU between Spain and the European Commission

23/07/2012

Author's italics

One year later, the detail Spanish reform programme that tracked all the measures and reforms to meet the commitments of the MoU already outlined—at points 2.6 and 6.1.4—the plan and role of Fond ICO Global and of INNVIERTE, which means that they were among the initiatives on which Spanish authorities were held accountable (Kingdom of Spain, 2013).<sup>186</sup> It is clear, therefore, that strengthening the VC industry in Spain was not a marginal policy topic that politicians did not have the interest and courage to take on amidst the financial crisis. Instead, it was an integral part of the financial sector reform programme and therefore carried on with political continuity. In other words, the political push for state intervention in innovation was very present in Spain, albeit partially imposed from the outside. This is in clear contrast with Italy's story.

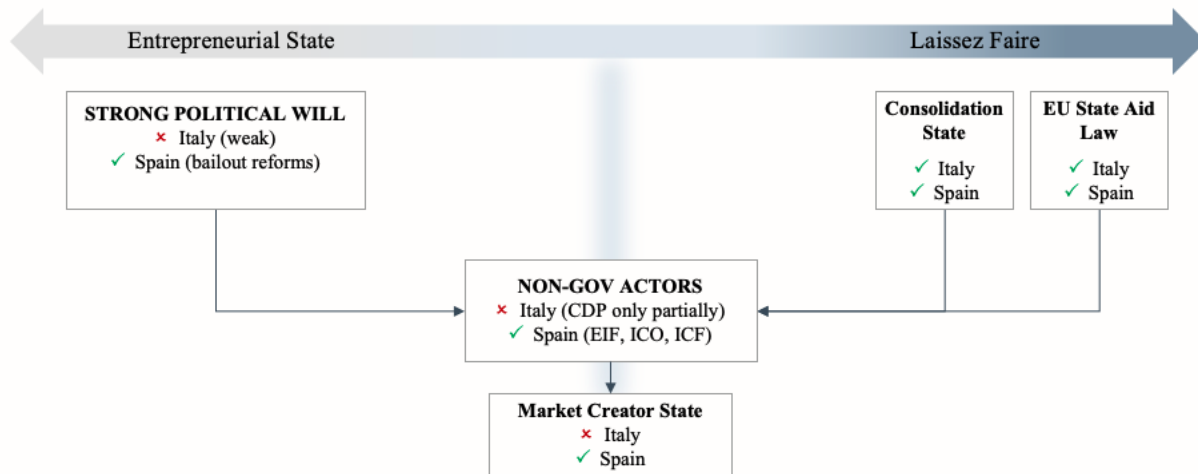
In addition to the political force that this agreement granted to this policy area, there might be other factors that pushed Spain towards designing programmes that prioritised the structuring of the venture capital industry since the crisis. As it emerged from this chapter, it should be noted that Spanish institutions have a particularly long history of close collaboration with the European Investment Fund, which several interviewees underlined (Informant-SP-GVC-2-STG, ICF, 07/04/2021; Informant-SP-GVC-1-WKS, ICO-Axis, 05/05/2021). ICO, Catalonia's ICF, and CDTI all launched GVC programmes together with the EIF already in the early two-thousands. It is therefore likely that such close collaborations, by 2012, had shaped Spanish policymakers' view of how GVC programmes could be constructed.

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<sup>186</sup> Document available at: [https://www.hacienda.gob.es/CDI/programanacionaldereformas/pnr\\_2013.pdf](https://www.hacienda.gob.es/CDI/programanacionaldereformas/pnr_2013.pdf)

All in all, thus, after the financial crisis Italy and Spain took different policy paths towards innovation policies. This is mostly because Italy lacked a political coalition that prioritised the topic and was willing to devote substantial public resources to the cause and to overcome the resistance of the national PDI. In Spain this political pressure came from the general context of financial sector reform required from the country as part of its 2012 bailout deal with the Commission. This, together with years of smaller scale collaborations with the EIF, meant that after 2012 Spain quickly embraced the Market Creator State model, before its southern European peer (Figure 5.8 summarises the difference forces).

**Figure 5.8: Difference in policy process forces in Italy and Spain**



#### 5.4.2 Italy’s epilogue: seeking Bpifrance—Italy’s new National Innovation Fund

The developments in Italy after 2019 perhaps provide the most interesting and confirming evidence of the importance of political conviction for the emergence of the Market Creator State. As a new parliament was elected, within a year Italy had launched CDP Venture Capital, National Innovation Fund (FNI)—Italy’s explicit attempt to replicate Bpifrance.<sup>187</sup>

After the general elections of 2018 a new majority formed, which included the up-and-coming Five Star Movement. This party’s electoral programme included as one of its distinctive points the creation of a new national public bank (point 13). This, together with the party’s general interest for new technologies and innovation, opened the political opportunity window for an overhaul of GVC policies.<sup>188</sup> To be sure, it would be wrong to see the FNI as the sole product of the Five Star Movement’s political will. The project was enabled by the party’s interest and their political weight, but it was designed and advocated for by a part of the entrepreneurial ecosystem, which was just waiting for the right opportunity to push it through (Mizzi, 11/01/2024). Salvo Mizzi, who was the main proponent of the idea and became for a few months advisor to the Five Stars Movement’s Minister of Economic Development, recalls that

<sup>187</sup> In 2018 Luigi Di Maio, minister of Economic Development, explained: “we are not inventing anything new: we took Bpifrance and tried to look at their model.” See: <https://www.startmag.it/economia/bpi-france-m5s-cdp/>

<sup>188</sup> Summary programme available at: [https://dait.interno.gov.it/documenti/trasparenza/politiche2018/Doc/4/4\\_Prog\\_Elettorale.pdf](https://dait.interno.gov.it/documenti/trasparenza/politiche2018/Doc/4/4_Prog_Elettorale.pdf) ; see points 2, 6, 13, 16.

he had already presented the idea several times in 2015-2017 (Mizzi, 11/01/2024). During 2018 the plan was drawn up partially in the Ministry and partially among a restricted group of actors from the ecosystem. The result was the 2018 Innovation Act, a mix of measures that aimed in particular to draw more public and private capital to the ecosystem. Changes included, among others, a further expansion of tax breaks on start-up and VC investments—including for institutional investors such as pension funds, requirements for tax-shielded mutual funds to invest a small part of their AUM in VC, and the creation of the legal definitions of business angels and of “simple investment vehicles.” Most importantly, however, the law triggered the creation of the National Innovation Fund, within CDP.<sup>189</sup>

The process showed both the newfound political determination and the dynamics of the consolidation state at play. First, the creation of the FNI was not straight forward. To achieve it, the Ministry of Economic Development proactively engineered a sale by Invitalia to CDP of the control of the management company Invitalia Ventures. This was achieved through an explicit clause in the 2019 budget law and later a directive from the Ministry to Invitalia, which was originally not so eager to sell this asset (author’s interview with Daniel De Vito, former Chief of Policy to the Minister of Economic Development, 15/01/2024). Second, similarly to France, the need to move these activities to CDP derived in part from budget constraints of the government, which were in contrast with the ambitious policy target of allocating one billion euros to venture capital. “When we said we wanted to put one billion euros for start-ups, and everybody asked ‘where will you find the money!?’” (De Vito, former MIMIT, 15/01/2024). The solution, like in France, was to merge forces with the PDI: this was confirmed in interviews (De Vito, former MIMIT, 15/01/2024) and transpires clearly also from the law. This stated that Invitalia Ventures’ assets could be sold only “on the condition that its resources be expanded by the acquiring entity” (Italian Government Budget Law 2019).<sup>190</sup> On the flip side, this resource sharing led to a further separation of GVCs activities from government as CDP explicitly requested operational autonomy from the Ministry (De Vito, former MIMIT, 15/01/2024). In other words, Italy resolved the consolidation state constraints in the same way as France, by trading off greater resources for GVC for less direct government control on those activities.

The result is that by January 2020, after Invitalia’s 70 percent sale of Invitalia Ventures to CDP,<sup>191</sup> the Italian FNI was launched—after some delays due to another government change in between. An evaluation of this latest GVC initiative is not in the scope of this thesis, largely because it is still too early to evaluate its effects. However, additional comparative insights emerge from analysing its set-up and its first 3-year strategy (Figure 5.9), published in early 2020, especially in contrast with Bpifrance—FNI’s inspirational model. First, it is clear that the FNI was a substantial step-up for Italy’s GVC policies. From launch, it met the ambition of securing one billion euros for Italian start-ups—an amount one order of magnitude greater than what the ecosystem had seen from previous governments. Second, the governance was, at a high level, in line with that of its European counterparts, with the national PDI in charge of operations. Most importantly, the fund had a clear and institutionalised mission to build the venture capital

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<sup>189</sup> All measures available in the 2019 budget law, at <https://www.gazzettaufficiale.it/eli/gu/2018/12/31/302/so/62/sg/pdf>

<sup>190</sup> Original: “il Ministero dello sviluppo economico può autorizzare la cessione, a condizioni di mercato, da parte dell’Agenzia nazionale per l’attrazione degli investimenti e lo sviluppo d’impresa Spa – Invitalia, di una quota di partecipazione, anche di controllo, detenuta nella società di gestione del risparmio Invitalia Ventures SGR Spa – Invitalia SGR ... a condizione che dalla cessione derivi l’apporto di risorse aggiuntive da parte del soggetto acquirente.”

<sup>191</sup> Technically, Invitalia Ventures was purchased by CDP Equity, a 100-percent subsidiary of CDP.

and innovation industry in Italy, on top of the resources to achieve it. Operators agree that it has quickly become a central player in the Italian ecosystem.<sup>192</sup> As this thesis has argued, however, “copying” Bpifrance outside of France may be a risky approach that distracts from the underlying factors that drive success. The key to functioning GVC programmes is not so much the specific model but rather whether it follows the main principles behind the Market Creator State. In this sense, the FNI still seems mostly on the right track, although some concerns exist.

From the point of view of the State-Market Relationship, the organisation clearly aims for a PAL approach but with some frictions. The human capital component has been taken seriously, with an important recruitment campaign that has created a mostly well-regarded investment team (author’s interview with Fabio Mondini de Focatiis, founder of Growth Capital, 24/03/2023; Mario Scuderi, CDP Venture Capital, 05/12/2023), attracting experienced professionals even from the private sector and integrating a piece of the highly technical FoF team of FII. This has allowed FNI to interact at par with other investors in the industry and impose conditionality where needed. At the same time, the details of the governance and operations give mixed signals. In continuity with Invitalia Ventures and differently from most PVCs, the investment committee of FNI is neither formed by the management teams, nor does it take the formal investment decisions—these are formalised by the board of directors. Both in the board and in the investment committee the government can place representatives, through Invitalia, which still owns 30 percent of the FNI (as De Vito put it, “Invitalia is the Ministry’s controller within the FNI’s governance”; De Vito, former MIMIT, 15/01/2024). In addition, there is no clear carried interest scheme that incentivises investment professionals to maintain rigour in their investment practices. To be sure, as we saw with Bpifrance and ICF, organisational cultural factors may play as effective of an incentive, but not enough information is available to determine whether this is the case at the FNI. Most importantly, it should be noted that the 2019 operations did not manage to grant one important element of independency to FNI: a guarantee of constant resource flow. The original law also mandated that at least 15 percent of the yearly state revenues from the profits of state-companies beyond those budgeted should be allocated to the FNI. However, the law was modified last minute, effectively eliminating this automatic resource allocation (De Vito, former MIMIT, 15/01/2024, Mizzi, 11/01/2024).<sup>193</sup> The absence of this long-term institutional commitment means that the FNI will constantly need to fundraise, to continue its operations, either from specific ministries or from private institutional investors. In the first case, the risk is that it will expose itself to additional political pressures and requests. In the second case, it risks competing directly with PVCs for the attraction of private LPs (Spedaliere, former Invitalia Ventures, 12/12/2023).

From the point of view of the investment focus, the FNI has perhaps been slightly more focused on strategic and deep technologies than its European peers. 15 percent alone of the budget is dedicated to technology transfer and the whole 435 million euros of the Accelerators, Corporate Venture Capital, and Tech Transfer funds are focused on specific sectors or technologies deemed strategic. Moreover, as its

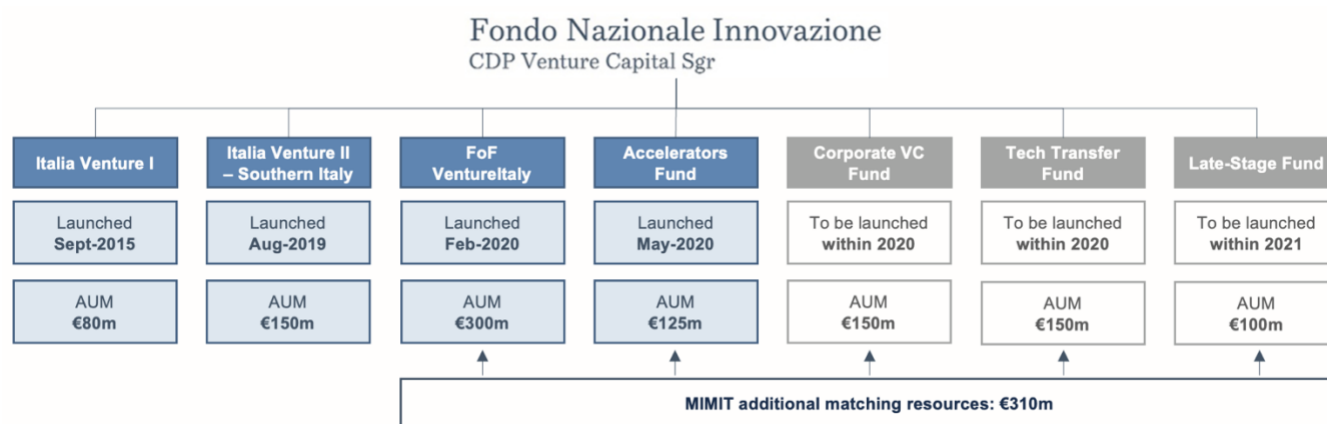
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<sup>192</sup> See for instance the remarks in the official statements of the Italian VC and ecosystem associations in occasion of the new appointments of the FNI’s board of directors: “As an association, we believe that the work done so far has been fundamental for the development of Venture Capital in Italy, which today is one of the engines of innovation. Even more we believe that CDP Venture Capital will be essential to support the sector in the years to come.” Italian Tech Alliance (author’s translation), available at: <https://startupitalia.eu/203298-20230622-italian-tech-alliance-chiede-allesecutivo-di-sbloccare-il-rinnovo-del-cda-di-cdp-venture-capital>

<sup>193</sup> For an early draft of the law, still containing the 15 percent requirement, see for instance: <https://startupitalia.eu/102701-20181228-cosa-dice-la-legge-bilancio-2019-sulle-startup>

main tech-agnostic direct fund (Italia Venture I) ended its activity, it was replaced by a deep-tech only fund. It seems, therefore, that the FNI should be placed higher on the theoretical framework, closer to a Technology Promoter State model. This thesis findings suggest that leapfrogging to this model before there exists in the country a critical mass of capital and talent within the ecosystem might be a particularly ambitious and risky strategy. Future research will be able to evaluate the outcomes.

**Figure 5.9: FNI’s first business plan, planned funds**



Source: business plan highlighted were made publicly available on several outlets in mid 2020. See for instance, the president’s post on Medium, at: <https://medium.com/@francescabria/fondo-nazionale-innovazione-a068c618ecc8>. Note, by the time of writing, the business plan had been mostly implemented, with some modifications and additions also due to pandemic-related interventions.

## 5.5 Conclusion: lessons from GVC in Mediterranean economies

The story of Italy’s GVC, and the contrast with Spain, has provided important new insights and confirmed the findings of the previous chapters. All in all, it further strengthens the theoretical and policy contributions of this thesis.

First, the Italian case showed that—contrary to the arguments of existing literature—“setting the table” is not enough in non-liberal market economies to trigger an entrepreneurial ecosystem. After the Eurozone debt crisis, the Italian technocratic government pioneered a program of reforms to improve the enabling conditions for the ecosystem but shied away from modern GVC interventions. In the meantime, its European peers, including Spain, passed less comprehensive reforms but evolved their GVC programmes. A decade later, this second approach seems to have been more effective. This conclusion goes to the heart of the concept of industrial policy: government intervention needs to be decisive to promote structural change and thus modify the existing equilibrium in an economy (Juhász et al. 2023). Just tweaking the enabling conditions might not be enough to tilt the incentives away from existing actors and activities, without creating new institutions that promote the target sector—in this case the innovation industry. Italy’s story is a cautionary tale.

Second, the chapter has further substantiated the findings from the rest of the thesis. In particular, it confirmed that *how* GVC is structured significantly affects outcomes but also shed lights on the biases that lead to poor designs. The analysis showed that, contrary to some storytelling, Italy allocated some

important resources to start-up support. However, these mostly took the form of debt-based instruments or direct investments with only limited PAL characteristics and, often, a narrow focus on high-tech innovation. This contrasts with Spain, where, over the same time period, the central government vastly expanded its indirect investment support, focusing resources on building the capabilities of the private venture capital industry. In other words, Spain embraced the Market Creator State approach, which did not materialise in Italy until, perhaps, the latest GVC policy—the 2019 National Innovation Fund. However, this chapter again confirmed that the Market Creator State is about principles, not form: its Spanish declination has different features and structure from the French one. Embracing the Market Creator State does not necessarily mean replicating Bpifrance. Whether a centralised, all-encompassing agency is the right answer depends on the institutional configuration of the country. In federal Spain, like in federal Germany, a close equivalent of Bpifrance was politically unattainable. This did not mean, however, that Spain was not able to adopt a similar policy approach, distributing across different but coordinated agencies the responsibilities that in France are condensed in the national public bank. Finally, from the contrast between Spain and Italy, it emerged how the political mandate was as important as policy learning to embrace the Market Creator State. It is hard to argue that Italian institutions, in particular CDP, had not been exposed to the best practices emerging around Europe, including from the EIF. However, the absence of a clear and consistent political ambition to foster the entrepreneurial ecosystem, the timid attempts were stifled by short-term interests, risk aversion, and bureaucratic conservative practices. In Spain, instead, the external push from the European Commission to build out the alternative finance industry provided the fertile political ground for programmes of the Market Creator State kind.

Italy and Spain also offer some very practical insights for policymakers elsewhere. The first is a further cautionary call about the use of debt instruments for start-ups. The story is by now clear: within-case and cross-case analyses suggest that debt instruments *alone* are not the right tool to support start-ups. Italy's case seems to resonate with Germany's, where debt instruments were popular among more traditional types SMEs but less compatible with the start-up model. In Spain too, debt instruments had been around for a long time but the ecosystem really took off only once the central government also put in place a large indirect equity funding scheme. Spain also shows, however, that debt should not necessarily be disregarded completely. Similarly to France, Spain shows that debt instruments can become complementary to equity funding, if they are structured to provide leverage for PVCs. However, policymakers should refrain from the temptation to think that advantageous credit terms to innovative SMEs are the simple solution to creating entrepreneurial ecosystems. Second, the story of the Italian Start-Up Act should make policymakers reflect on the pros and cons of formalising the definition of innovation and of start-ups. In Italy, this move had the positive impact of drawing attention to the ecosystem but also forced the legislator to restrict the concept of “start-up,” leading to a slight misalignment between the original goals and the policy tools implications. Spain has only more recently started to engage with this issue. The features of the Start-Up act also highlight the limitations of fiscal and tax incentives. As the literature had already pointed out, these are among the most demanded policies demanded VC lobbying (Nicholas 2019). Again, however, these do not seem to be a substitute for a proactive structuring of the VC industry. Tax breaks might promote the proliferation of small-size investors and favour business angel activity. But in European countries, where there is a chronic dearth of institutional capital, they are not

enough to overcome the hurdles that the early-days VC industries in the continent face. This is consistent with previous literature that found that changes in capital gains taxation had at best marginal effects on VC volumes (Poterba 1989). Third, the Spanish story brings further evidence on the limitations of a regionally-based GVC strategy. Similarly to Germany, Spain experimented for some time with regional, direct GVC policies. The ecosystem however did not really take off until the central government launched a central, large-scale FoF programme. Catalonia is the exception but indeed here the local PDI paired direct and indirect policies and was already home to one of Spain's largest, most international and economically vibrant cities—Barcelona. In other words, policymakers should realise that, even in federally structured countries, it is unlikely that GVC policies can lead to the creation of a distributed, multipolar ecosystem, due to the concentration and network effects of innovation *clusters* (Audretsch 2018, Chattergoon and Kerr 2022). Finally, as hinted above, the chapter cautions against simply copying foreign models: on the one hand it might not be necessary (see Spain); on the other, copying a structure does not necessarily guarantee the more important underlying working principles, which must instead be more deeply embedded in the vision of the actors and institutions involved. In other words, copying structures is appropriate, as long as they fit with the institutional set up of the country and is not a workaround to embracing the true underlying principles of the Market Creator State.

## Chapter 6 Conclusion

Industrial policy has made a dramatic return to the policymaking agenda in both Europe and across much of the world (Global Trade Alert 2024, see appendix). Environmental and geopolitical challenges have been two determining factors of this comeback. There is a risk in this emergent public policy environment that Europe, whose economic policy since the beginning of the integration process has mostly conformed to orthodox economic frameworks, does not adapt swiftly enough.<sup>194</sup> This thesis, however, shows that beneath the surface, European and member states' institutions over the past two decades have constructed and executed a highly effective form of modern industrial policy for innovation. Offering in-depth case studies of some of the most prominent examples, this research has shed light on its reach, enabling factors, as well as its limitations. All in all, it offers hope for optimism about the ability of European policymakers to develop nuanced industrial policy instruments that are coherent with the principles of the European Union.

By looking across four European countries over a nearly two-decade period, this study has unveiled how and why these GVC policies evolved. In summary, it argued that in the early days of industrial policies for innovation, European countries focused on “funding inventions” through traditional state tools, which proved to be largely ineffective at building the necessary institutions for innovation ecosystems. Since the mid-2000s, key examples emerged of a Market Creator State approach. These policies were highly interventionist but reflect a clear discontinuity with traditional bureaucracy-managed industrial policies. They replicated private venture capital practices and consistently collaborated with PVCs. This was enabled by a very clear separation of GVC agencies from politics and traditional public bureaucracies. In most ways, this allowed GVCs in Europe to operate just like any other investor, but using public money. Moreover, these policies were successful because policymakers resisted the temptation of directing innovation too much, focusing instead on building broad innovation capabilities in the economy. Most capital was invested in a technology-agnostic way. It prioritised creating a critical mass of both PVCs and competent entrepreneurs. It did so by supporting any type of innovative high-growth firm and by following the market on sectoral preferences. To be sure, public preferences for certain sectors and typologies of company remained. But these still translated into instruments that ensured the state was never left to “pick the winners” or to self-select target technologies or “missions” independent of market preferences. Rather, successful European GVCs created a symbiotic relationship with private actors. These agencies had to constantly strike the delicate balance between on the one hand pushing certain policy priorities, and on the other maintaining a reputation as a rigorous investor, which granted them the necessary trust and authority in the market to influence it.

In practice, this has broadly translated into a model built on two key components. One is the strengthening of the PVC industry through a large funds of funds programme which provides capital to the industry while contractually imposing strict conditions on investment management practices. The other is a selective use of direct investments to provide de-risking and/or leverage to existing PVCs, especially

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<sup>194</sup> Both in the case of semiconductors (American and Europe Chips Acts) and the green transition (Inflation Reduction Act vs. EU Green Deal and Net Zero Plan) European institutions reacted to American first moves.

in the most challenging areas of the market where they are particularly scarce. Figuratively, if GVC policies are the ship which sails the waters of innovation, indirect investments constitute the hull and the engine, while direct investments serve as the steering rudder. Without the former, there is no sailing, but the latter is a helpful tool to facilitate navigation.

The cases covered in the research put this theory to the test through an insightful spectrum of European GVCs. France, true to its statist tradition, embodied the most extensive version of the Market Creator State. The national PDI launched in 2013 orchestrated the evolution of France's ecosystem, almost building it piece by piece. However, the research showed how this was far from a dirigiste, top-down activity. Instead, Bpifrance's strength and influence is deeply embedded in its relationship with private actors, representing a clear example of the intimate linkages that bind together French policymakers and business elites. From an industrial policy tradition, Germany could not be more different, and this has resulted in a very different path for its GVC policies. With a federal structure, an ordoliberal economic culture, and a development policy model revolving around the provision of low-interest loans from public and private credit institutions, Germany was not a natural candidate for creating a central public equity investment tool for start-ups. Indeed, Germany never replicated the Bpifrance model. However, over time it converged towards adopting similar principles to Bpifrance. Operating outside of its traditional public institutions, Germany was able to create both direct and indirect GVCs that supported and complemented the emerging private innovation ecosystem in the country. Finally, the comparative cases of Italy and Spain highlighted the limits of the more orthodox economic approach of just "setting the table" through reforms and tax incentives to boost entrepreneurship. This approach assumes that all countries already have the necessary institutions for entrepreneurial ecosystems and that market forces simply need to be unleashed. This research shows that in Europe this approach is unlikely to be successful, because for European economies there is nothing natural about venture capital and start-up business models. If governments want this innovation model, they need to proactively build and structure these institutions. Europe needed the Market Creator State to do so.

The insights from these cases offer important contributions to existing literature. Above all, the thesis provides a theory that offers a convincing explanation for the role government plays in the European entrepreneurial ecosystem. In this sense, the research adds an important building block to the political economy literature on innovation industrial policy. Diverging from seminal work of the developmental state tradition, this thesis offers an analysis and a theory about innovation industrial policies specific to advanced economies, offering an insightful point of contact with the "competition state" argument. At the same time, it defies the predictions of deeply institutionalist literature, which has conceptualised Europe's Varieties of Capitalism as incompatible with the Silicon Valley innovation model.

This work also builds an important bridge between the entrepreneurial finance literature, which finds at best mixed results for GVC success, and the more recent work on the "entrepreneurial state," which has been inspiring a revival of interventionism in policy circles. It does so through analysing the critical case of government venture capital, which has for over a decade been subject to deep scepticism on the role of interventionist policies. The findings do not necessarily contradict this body of work: many of the pitfalls and policy mistakes identified by previous literature have indeed shown up in the prior chapters. However, European countries have also shown how these problems can be overcome, when the

political will to invest in innovation is balanced by non-state actors' involvement and public institutions engaging in policy learning. Thus while, for instance, Josh Lerner's seminal work is often cited for "all that can go wrong with GVC," this research has shown "how it can be done right." By providing very clear and practical examples of policies that have worked and ones that have not, it both qualifies some existing scepticism and tames acritical enthusiasm about the entrepreneurial state as a blanket solution.

As for most case study-based research, this thesis also has limitations, in particular in terms of its external validity. Indeed, the predictions of the theory are dependent on a set of scope conditions which mean that it will not necessarily apply outside of Europe. The argument around the Market Creator State is applicable to advanced economies with a model of capitalism structurally different from that of the classic liberal market economy. In Anglo-Saxon economies, the state might need to be less proactive than in the Market Creator State conception. Moreover, the countries analysed are both part of the European Single Market and also themselves relatively large national economies, thus offering a sizeable domestic and a low-friction cross-border market. Evidence suggests that for small, advanced economies with successful ecosystems, strong linkages to global markets (e.g., Israel, Finland, Estonia, Singapore) have been key and are an aspect policymakers might need to pay particular attention to, regardless of their model of capitalism. Where scope conditions differ, therefore, the Market Creator State might not be the only or best answer for policymakers. Famously, for instance, Mariana Mazzucato has built the theory of the entrepreneurial state largely based on the American case. Further research is needed to verify how different GVC models travel across development stages, geographies, and types of capitalism.

However, because this thesis' approach identifies effective policy mechanisms, rather than a decontextualised menu of policy "best-practices," its core concepts can help explain key aspects of a broader universe of cases—in other geographies, or even in the future within the same countries. For one, the first few years of the Italian Innovation Fund, which is a very clear attempt of embracing the Market Creator State in Italy, have coincided with a rapid catch-up of its innovation ecosystem too.<sup>195</sup> In Finland, explorative fieldwork interviews suggested that several tools utilised by the government were similar to France's and Germany's, although the dynamics of ecosystem development differed. In this Nordic country, the government intervened particularly in very early-stage financing, with direct programmes comparable to Germany's HTGF. The growth in the venture capital industry, however, was largely driven by foreign investors, rather than by a proactive local industry-building effort by the state.<sup>196</sup> Although a public FoF programme exists,<sup>197</sup> the relative small size of the domestic capital market meant Finnish start-ups tapped into foreign funding from early on (author's interview with senior official at Tesi, 02/09/2021). In such a context, the state's role seems to have focused more narrowly on de-risking early-stage investments and facilitating foreign investment into Finland, rather than comprehensively restructuring local capital markets. In this sense, the Finnish story shares elements with Israel's. There too the context was different from that of the core cases in this research, but the policy mechanisms were similar. In this famous case the state's very proactive role in building the venture capital industry is clear.<sup>198</sup> However, it

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<sup>195</sup> Note that more consolidated statistics will be needed to draw conclusions as the first years after the launch of this Italian GVCs coincided with the general pandemic-era growth of VC investments across the world.

<sup>196</sup> Author's interviews with senior officials at Business Finland, Tesi, and Innovestor.

<sup>197</sup> See Tesi: <https://tesi.fi/en/portfolio/funds/>

<sup>198</sup> The role of the state in Israel's innovation industry goes far beyond its proactive efforts to build VC. The state apparatus also provided critical talent and an important first market for Israeli start-ups (see Breznitz 2007).

differs from continental Europe because—like in Finland—foreign investors played a fundamental role from the early days (Breznitz 2007). Israel’s deep linkages with American financial markets, combined with the relative size of the two economies, meant that the country was able to “plug” into the American ecosystem, rather than having to build the full innovation industry from scratch. Similarly to European countries, Israel had a successful and pivotal FoF programme—the Yozma fund. However, this was more successful than previous policies (e.g., Inbal) because it was structured to proactively attract foreign (i.e., mostly American) investors, with their practices and legal structures. Thus, in Israel too, state agencies spread the limited partnership model, but they did so mostly by “importing” American VCs. Above all, however, Israel’s story is consistent with the European Market Creator State model in that it shows the importance of treating “VC as an industry with specific skills to be acquired and capabilities to be nurtured,” rather than merely as a “pool of capital” for innovation (Breznitz 2007). Israel is thus a good example of a country that did not apply the specific GVC policies later employed in Europe but that, through slightly different tools and in a different context, triggered mechanisms consistent with the theory. Conversely, the story of Ireland is an example of where policies that on the surface seemed similar to those of European Market Creator State GVCs, in practice failed because they did not reflect its underlying core principles. Irish start-up and VC policies in the 1990s were also comprised of a combination of direct support and indirect investments via PVCs (mostly by the agency Enterprise Ireland).<sup>199</sup> However, evidence from the existing literature (Breznitz 2007) suggests that key elements of the Market Creator State were missing. Enterprise Ireland was not an innovation-dedicated agency. It thus lacked the focus this research has shown to be key, and this translated into several suboptimal approaches. Above all, Irish policies at the time, in contrast with Israel’s, were never targeted at building venture capital as “an industry,” but rather treated PVCs as financial vehicles to leverage private capital and direct it to start-ups (Breznitz 2007). This contrasts with the FoF models observed in my research, which used informed conditionality to impose market best practices and firmly direct the development of “VC as an industry.” In Ireland, instead, the industry remained “smaller, less professional, and ... intimately linked to established Irish financial institutions” (Breznitz 2007). Moreover, Enterprise Ireland at the time was not structured in a way that reflected PAL. In particular, it was at the same time bureaucratic and omnipresent in the ecosystem. Importantly, the lack of Chinese walls between direct and indirect investment functions created great confusion and contributed to a perverse, quasi-monopolistic dynamic where the ecosystem had to rely on the agency, but the latter was not structured to support it properly and seemed more focused on extracting profit from it (Breznitz 2007). Beyond the details, therefore, the cautionary tale of Ireland in the nineties is another example of the reach of this thesis’ theory. At its core, it argues that for GVCs the devil is in the details, and programmes which on the surface look similar might be built on crucially different principles.

A further limitation of this research is that, arguably, it tells a story which has not fully ended yet. It raises the question of whether GVC in Europe will be successful enough to eventually become unnecessary. The dynamics described in this research are those of a virtuous cycle that should, by its nature, lead to a self-sustainable ecosystem, with a reduced role of government. This is what happened in the success cases of the United States and Israel. Some indeed argue that an “exit strategy” is a

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<sup>199</sup> <https://www.enterprise-ireland.com/en/>

fundamental aspect of a well-designed GVC programme (Lerner 2009). Does Europe have an exit strategy? It might be too early to tell, but the evidence so far is mixed. On the one hand, the structural differences between the European and American institutional investors' landscape—notably, the absence of large university endowments and the smaller weight of private pension funds—make it feasible that EU governments might indefinitely need to provide critical mass of capital in private VC markets. This is not necessarily a problem *per se*. However, the role some of these institutions have gained—competent and reliable “certifiers” of private funds—can indeed be a double-edged sword. It risks creating dependency on indirect GVCs even for those funds that might not need public capital but fear a “negative stamp” if they do not go through a public LP’s scrutiny. On the other hand, some evidence provides reason for optimism. Despite the size of its activity, Bpifrance’s weight in French VC has been decreasing, not growing, over time (Bpifrance 2023). Moreover, on the direct investment side, there have already been examples of how European states can “exit” the venture market. In 2016, the Finnish agency Finnvera “privatised” its early-stage GVC, selling 80 percent to Finnish PVC Innovestor.<sup>200</sup> In Germany, the growing share of private corporate investors in HTGF is perhaps providing an example of a “gradual” exit, with the fund possibly changing its role as its corporate structure also evolves. Either way, the long-term role the state will play in European entrepreneurial ecosystems is certainly up for debate and will offer fascinating opportunities for future research.

Still, this thesis can already provide insightful lessons for policymakers in Europe and globally, who are looking to implement GVC. The European model is based on a careful balance of large indirect investments and focused direct investments, all in deep cooperation with the private sector. When in doubt, co-investment *pari passu* with private investors is a good simple shortcut to reduce both state capture and PVC crowding-out risks. The research also stressed the importance of avoiding too narrow innovation investment targets for GVCs and instead promoting all innovative high-growth firms. Innovation comes in all types and forms and deciding a priori what will be most successful or impactful is as hard for governments as it is for privates. Further, more detailed insights were discussed in each chapter. Here, I will focus on three general and particularly consequential ones.

First, a recurrent theme across cases has been that innovation policies, including GVC, require dedicated institutions. Multiple cases have shown that general “development” agencies, even some of the most renowned and successful ones (e.g., KfW), have practices, governance, and modus operandi incompatible with a Market Creator State GVC. This is particularly true in Europe, where start-ups companies and their financiers (VCs) are not a natural extension of the existing structure of the economy. This likely applies to other models of capitalism that are distinct from the Anglo-Saxon liberal model. As a corollary, policymakers should also be wary of conceiving GVC policies as a strategy for regional development. Entrepreneurial ecosystems are, by definition, a network industry and thus tend to experience agglomeration effects. Spreading thin resources too early on risks achieving neither innovation nor development goals. In this sense, it is noteworthy that even very federalist nations like Germany and Spain ultimately resorted to national level GVCs. Increasing equality between regions is a laudable goal, but it is unlikely to be achieved through GVC.

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<sup>200</sup> For information on the transaction, see Finnvera’s [website](#).

Second, calibrating the incentive structure is key to promote the right role of GVCs in the ecosystem. This research has found that incentives can come in various kinds (e.g., “soft” or formal performance targets). In any case, however, returns expectations for GVC funds must be clear, challenging, *but also realistic*. Clarity and ambition help ensure public investors are rigorous in choosing and analysing investments, reducing the risk of political interference and state capture. But too high return expectations—e.g., if GVCs are expected to deliver top-of-industry IRRs—run the significant risk of paradoxically *reducing incentives* (unachievable targets are the same as no targets) as well as undermining its public mission. The possibility of turning the GVC in just another private-like fund trying to deliver returns in an underperforming ecosystem is a real one. The less developed the ecosystem, the higher this risk is. This research instead found that successful direct GVCs such as the HTGF and Bpifrance Direct Investments have managed to find the right balance between approaching each investment rigorously and taking more risk than the average PVC, by being overexposed, in aggregate, to the riskiest stages or sectors. This was promoted through incentives commensurate to the GVCs’ role in the ecosystem.

Third, GVC policies as conceived by the Market Creator State will always have certain limitations, which are intrinsic to the VC business model itself. Policymakers should thus be very wary of seeing in GVC a catch-all solution to innovation challenges. As many interviews in this research have demonstrated, venture capital is an investment asset class that takes bets on the rapid commercialisation of disruptive innovations. In short: VC goes where large and growing markets are. In this, VC can represent only one, albeit one important, component of a country’s innovation system. However, the *type* of innovations that VC will be able to invest in depends in large part on the other elements of the national system. A striking example of this is again Israel, where the nature of its innovation ecosystem has always been so deeply affected by the country’s military sector and related R&D programmes. The policy conclusion is thus that to expand innovation ambitions, GVC programmes might need to be complemented with other policy tools. In other words, states cannot assume that once they have created VC markets their role in innovation should be over.

Governments instead can have a fundamental role in stimulating R&D and private investment in the most strategic technologies for a country through active policies that take a different form from investments. For example, one fundamental and underappreciated role the state can play is to be a key “buyer,” instead of an investor, in innovative products. So-called dual-use technologies are perhaps the best example of where governments have exercised this strategic role. In these cases, governments have not only partly financed the technologies development but, most importantly, they have acted as anchor clients for their applications. By creating “demand,” they have attracted also private investors to these markets. In this sense, it should be noted how the history of both the Silicon Valley and Israel’s technology ecosystems are deeply intertwined with their respective defence industries (Saxenian 1996, Breznitz 2007, Janeway 2012). The renowned American programme Defense Advanced Research Projects Agency (DARPA) is often misinterpreted as a “simple” GVC. Instead, one of its main differentiators—rarely replicated in foreign imitations—is the involvement of the American Department of Defence, which provides an immediate first market for the technologies funded by the programme. Space is another such field, where public agencies such as NASA and the European Space Agency (ESA) have “created markets” through procurement tools.

## Chapter 6: Conclusion

What does this all mean for the innovation challenges Europe is currently facing? As the green transition becomes an increasingly impellent priority and Europe is discovering its vulnerability in other strategic sectors (e.g., semiconductors), this thesis suggests that trying to repurpose GVC to propel specific industries might be a risky, or inefficient, approach. Force-feeding capital into specific innovations cannot substitute for the presence of market opportunities for that innovation's applications. Instead, if European policymakers want to continue, as they have successfully done so far, to leverage private capital to pursue innovation, they will need to explore more seriously complementary policies to GVCs. Public procurement—and creative variations such as inducement prizes—are concrete “demand pull” policy tools with a successful track record at “directing innovation” towards specific policy goals (Ho and Taylor 2021). So far, however, these have remained largely unexplored within European policymaking. European policymakers should instead start taking seriously instruments such as advanced market commitments and inducement prizes, both of which have been part of the American innovation policy arsenal and have contributed to crucial developments in strategic sectors ranging from defence to space and medicine (e.g., vaccine discovery; see e.g., Williams 2012 and Mitchel et al. 2014). In other words, Europe needs to learn the right lessons from its success at GVC. On the one hand, it should acknowledge how difficult it was for these agencies to find the right balance between intervening in markets and following them—upsetting this balance could be counterproductive. On the other, it should acknowledge that its GVC programmes have contributed to creating an “engine for innovation” but that different policy tools are needed to direct this newfound dynamism towards Europe's new and most impellent strategic goals.

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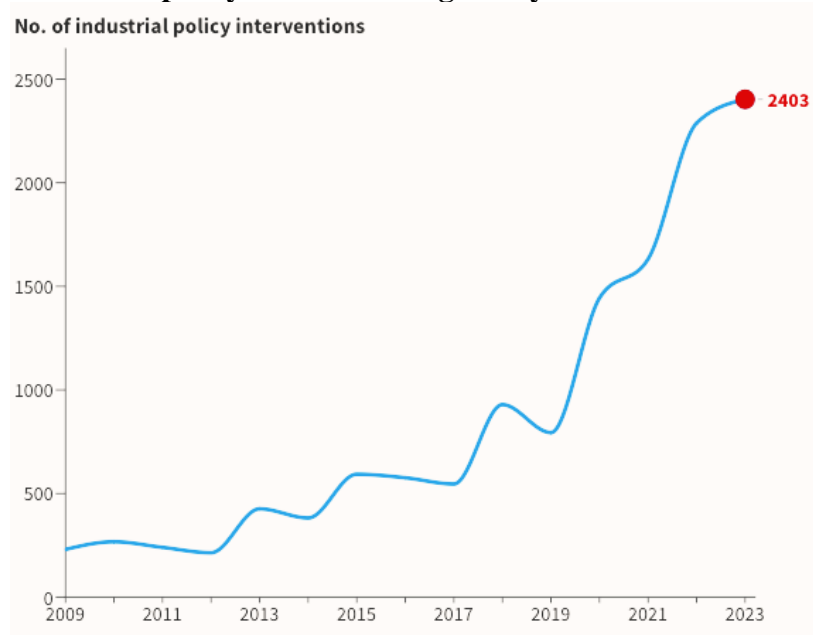
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## Appendices

### Appendix A: private equity and venture capital glossary

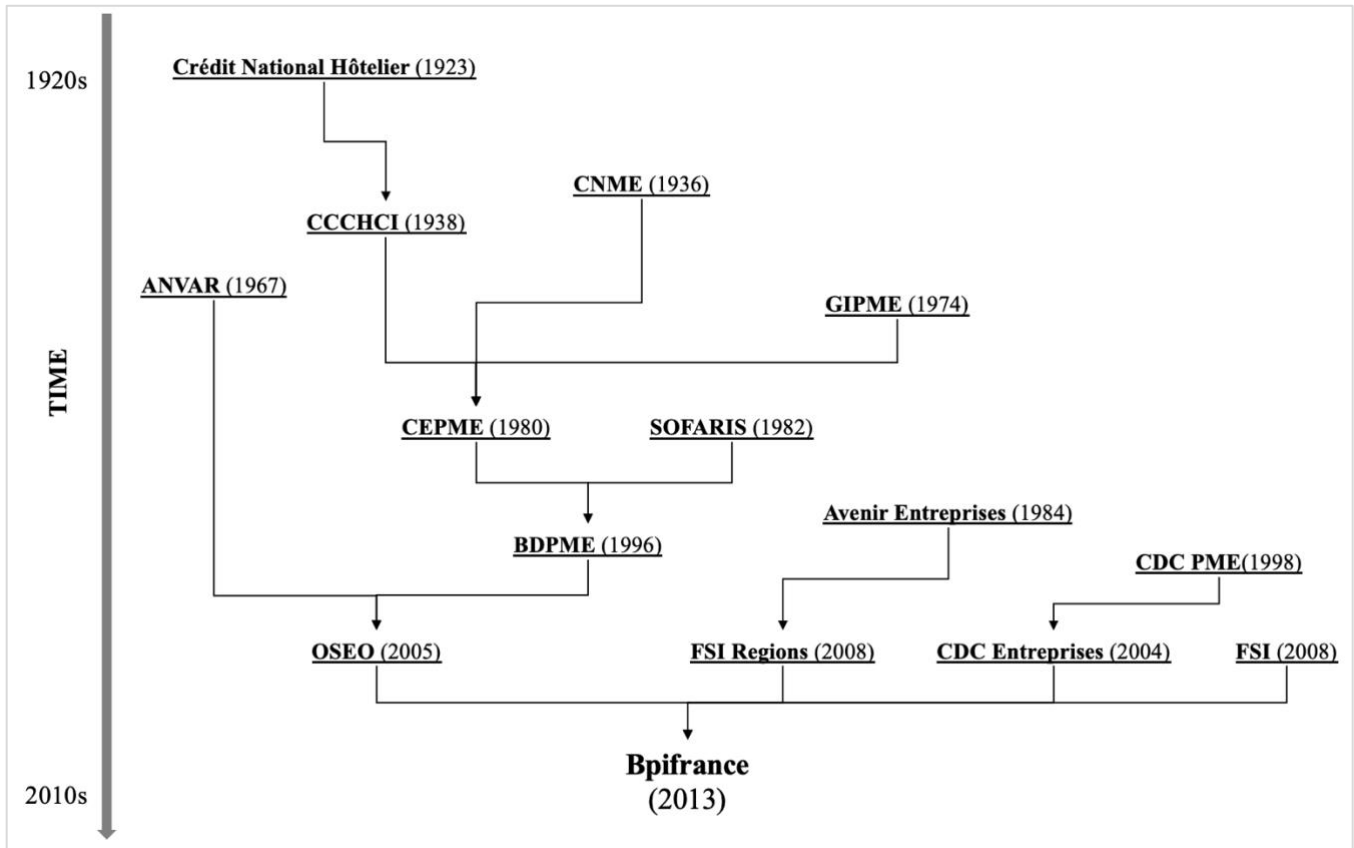
See: <https://ilpa.org/private-equity-glossary/>

### Appendix B: rise in industrial policy interventions globally



Source: [FDI Intelligence](#) and *Global Trade Alert New Industrial Policy Observatory*, 2024.

**Appendix C: Evolution of French agencies for innovation and SME support**



Source: visual based on original from Gaston-Breton 2015

## Appendices

### Appendix D: List of interviewees

Name	Role	Organization	Organization Type	Country	Date
Informant-EU-EC-1-KEO	Senior Official	European Commission	GOV	EU	22/10/2020
Informant-EU-GVC-1-ZYO	Senior Official	EIF	GVC	EU	25/11/2020 and 20/01/2021
Informant-EU-GVC-2-MBO	Senior Official	EIF	GVC	EU	06/05/2021
Informant-EU-GVC-3-VYO	Senior Official	EIF	GVC	EU	21/04/2021
Informant-EU-GVC-4-TVO	Senior Official	EIF	GVC	EU	28/05/2021
Gabriele Todesca	Director of Equity Partnerships	EIF	GVC	EU	25/11/2022
Petri Laine	Partner	Tesi	GVC	Finland	16/08/2021 and 23/08/2021
Henri Grundsten	Director	Business Finland	GVC	Finland	02/09/2021
Harri Hallila	Founder	Synoste	Start-up	Finland	25/08/2021
Laurence Zebus-Jones	Partner	Impact Partnaires	VC	France	23/11/2020
Informant-FR-GVC-1-KYL	Senior Official	Bpifrance	GVC	France	26/11/2020 and 04/12/2020
Massimo Magnifico	COO	EuraTechnologies	Accelerator	France	21/12/2020
Guillaume Aubin	Managing Partner	Alven Capital	VC	France	23/12/2020
Marc Fournier	Managing Partner	Serena	VC	France	25/12/2020
Informant-FR-GVC-2-WTL	Official	Bpifrance	GVC	France	27/01/2021
Informant-FR-GVC-3-WUL	Official	Bpifrance	GVC	France	12/02/2021
Véronique Jacq	Head of Digital Venture	Bpifrance	GVC	France	12/02/2021
Alexandre Dewez	Investor	Idinvest	VC	France	30/07/2021
Hugo Weber	Vice President	Mirakl	Start-up	France	08/09/2021
Matthieu Baret	Managing Partner	Idinvest	VC	France	01/11/2021
Informant-FR-GVC-5-CXL	Investor	Bpifrance	GVC	France	10/12/2021
Bertrand Diard	Founder	Talend / Serena	Start-up	France	05/02/2021
Maïlys Ferrere	Head of Large Ventures	Bpifrance	GVC	France	10/03/2021 and 18/03/2021
Frédéric Mazzella	Founder	BlaBlaCar	Start-up	France	11/02/2021 and 03/03/2021
Jean-David Chamboredon	CEO	ISAI	VC	France	12/01/2021
Informant-FR-GVC-7-ZDL	Senior Executive	Bpifrance	GVC	France	16/02/2021 and 25/02/2021
Antoine Chatelain	Founder	WeCasa	Start-up	France	22/01/2021

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Xavier Lazarus	Partner	Elaia Partners	VC	France	26/01/2021
Informant-FR-VC-8-WXY	Founder	Olbia	VC	France	29/01/2021
Philippe De Marsac	Senior Manager	Scalenov	Accelerator	France	29/04/2021
Informant-GE-GVC-1-UTR	Principal	HTGF	GVC	Germany	24/11/2020
Michael Brandkamp	Former CEO	HTGF	GVC	Germany	02/12/2020
Alexander Von Frankenberg	CEO	HTGF	GVC	Germany	25/05/2021
Informant-GE-GOV-1-UOL	Representative	BMWK	GOV	Germany	23/07/2021
Informant-GE-GOV-2-WHL	Representative	BMWK	GOV	Germany	23/07/2021
Informant-GE-GOV-3-KZL	Representative	BMWK	GOV	Germany	02/08/2021
Informant-GE-VC-1-WOR	Partner	German VC	VC	Germany	05/08/2021
Informant-GE-GVC-4-UEU	Senior Official	KfW	GVC	Germany	08/09/2021
Informant-GE-GOV-4-LVC	Senior Official	SPRIND	GOV	Germany	15/12/2022
Informant-GE-GVC-5-Start-upD	Former Investor	TBG	GVC	Germany	22/12/2022
Julian Fuchs	Founder	Everjump	Start-up	Germany	01/03/2021
Alberto Cresto	General Partner	Lunar Ventures	VC	Germany	06/04/2021
Johannes Velling	Senior Official	BMWK	GVC	Germany	07/01/2021
Terence Hielscher	Founder	MoBerries	Start-up	Germany	09/04/2021
Chris Gamon	Founder	Razor Group	Start-up	Germany	10/03/2021
Informant-GE-VC-3-TZC	Founding Partner	Signature Ventures	VC	Germany	10/05/2021
Informant-GE-GVC-7-NBR	Executive at corporate investor	HTGF	GVC	Germany	13/01/2021
Max Laarmann	Founder	Emma	Start-up	Germany	17/03/2021
Mario GeiS	Founder	Freachly	Start-up	Germany	18/02/2021
Julius Rüßmann	Principal	Earlybird	VC	Germany	18/05/2021
Informant-GE-GOV-5-EFO	Senior Official	BMWK	GOV	Germany	20/01/2021
Fredrik Bergenlid	Partner	Fly Ventures	VC	Germany	20/04/2021
Niklas Ott	Founder	DTC Ventures	Accelerator	Germany	25/03/2021
Shahin Dashti	Senior Investment Manager	Futory	GVC	Germany	26/02/2021
Informant-GE-GVC-9-PJU	Senior Official	KfW	GVC	Germany	20/11/2023
Alessio Beverina	Founding Partner	Panakes	VC	Italy	02/11/2020
Fabio Mondini	Founding Partner	Cross Border Growth	VC	Italy	24/03/2021
Informant-IT-VC-3-WEE	Founding Partner	Italian VC	VC	Italy	08/11/2023
Gianluca Dettori	Founding Partner	Primo Ventures	VC	Italy	09/11/2023
Mario Scuderi	Partner	Invitalia Ventures / CDP VC	GVC	Italy	05/12/2023
Informant-IT-GVC-2-CNS	Investment Manager	Invitalia Ventures / CDP VC	GVC	Italy	05/12/2023
Mattia Corbetta	Officer	MIMIT	GOV	Italy	07/12/2023
Informant-IT-SU-1-NVV	Founder	n.a.	Start-up	Italy	07/12/2023

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Ciro Spedaliere	Founding Partner	Claris Ventures	VC	Italy	12/12/2023
Informant-IT-VC-6-KYF	Founding Partner	Italian VC	VC	Italy	28/12/2023
Cristina Bini	Head of VC FoF	FII	GVC	Italy	28/12/2023
Salvatore Mizzi	Former CEO	Invitalia Ventures and Enea Tech	GVC	Italy	11/01/2024
Daniel De Vito	Chief of Policy	MIMIT	GOV	Italy	15/01/2024
Carles Ferrer	Partner	Nauta Capital	VC	Spain	02/12/2020
Informant-SP-GVC-1-WKS	Senior Official	ICO	GVC	Spain	05/05/2021
Informant-SP-GVC-2-STS	Senior Official	ICF	GVC	Spain	07/04/2021 and 22/04/2021
Jordi Garcia	Chief Start-up Ecosystem Promotion Officer	Enisa	GVC	Spain	10/05/2021
Jordi Vidal	Principal	Kibo Ventures	VC	Spain	11/06/2021
Informant-SP-GVC-4-FYM	Senior Official	CDTI	GVC	Spain	22/06/2021
Carlos Blanco	Chairman & CEO	Encomenda	BA	Spain	07/12/2021
Elizabeth Fleming	Chief Ecosystem Officer	South Summit	EX	Spain	13/11/2023
Informant-SP-GVC-5-TNS	Official	ICO	GVC	Spain	14/11/2023
Tom Wehmeier	Partner	Atomico	VC	UK	02/11/2020
Alston Zecha	Partner	Eight Roads	VC	UK	02/11/2020
Chris Wade	Co-founder and Partner	Isomer Capital	VC	UK	04/03/2021 and 05/05/2021
Thomas Schneider	Partner	Isomer Capital	VC	UK	14/05/2021
George Henry	General Partner	LocalGlobe	VC	UK	23/04/2021
Informant-UK-VC-6-BZC	Principal	Speedinvest	VC	UK	28/04/2021