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Cooiman, Franziska

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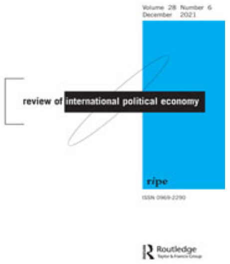

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Veni vidi VC – the backend of the digital economy and its political making

Franziska Cooiman[a,b]

[a]Weizenbaum Institute, Berlin, Germany; [b]Social Sciences and Business, Roskilde University, Roskilde, Denmark

ABSTRACT

Debates on the digital economy neglect its political and financial underpinnings. This article develops the theoretical framework of governing along the investment chain to grasp the backend of the digital economy, that is venture capital and its political underpinnings. Concretely, I focus on the European Investment Fund and how the European Commission uses it to govern along the investment chain into the digital economy. Therefore I conceptualize venture capital from a political economy perspective, situate the European Investment Fund in the European polity, and analyze transformations in the shape of the investment chains, risk-return distribution, and infrastructural power in three distinct periods. I show how in acts of crisis-led institutional innovation, the European Investment Fund has taken a central position in European venture capital investment chains, while skewing the risk-return relationship towards private markets and granting infrastructural power to venture capital funds. This dynamic inhibits the European Investment Fund from taking a progressive and proactive role in European venture capital markets.

KEYWORDS

Venture capital; digital economy; EIF; financialization; investment chains; EU

Introduction

The digital economy is widely regarded as *the* paradigmatic new industry and its business models, accumulation regimes and political power have been meticulously studied within political economy scholarship (Cusumano et al., 2019; Dolata, 2019; Schiller, 2000, 2011; Srnicek, 2017; Staab, 2019). Most scholarly attention has been paid to the American lead firms (see, e.g. Srnicek, 2017; Staab, 2019) and the Silicon Valley based finance-tech nexus (Kenney, 2000; Kenney et al., 2019; Kenney & Zysman, 2016).

The digital economy, however, is fundamentally driven by its underlying financing structure. Venture capital (VC) has come to present the most important source of funding in the digital economy: in Europe 87% of all startup companies founded

CONTACT Franziska Cooiman franziska.cooiman@wzb.eu

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between 2010 and 2020 that reached a valuation of over $1bn – so-called unicorns – received VC financing, increasing from a share of 59% and 23% in the previous two decades, respectively (Atomico, 2021), all of which operate in the digital economy. Globally, as of December 2020, venture capital had backed seven out of the eight largest firms by market capitalization prior to their listing: Microsoft, Apple, Amazon, Alphabet, Facebook, Alibaba and Tencent, which, at the same time, are the lead firms of the digital economy. As a response to the Silicon Valley success story at least forty-five countries across the globe have acted towards building local VC markets (Klingler-Vidra, 2018, p. 21). The vital role of an 'entrepreneurial state' in enabling venture capital has been recognized (Klingler-Vidra, 2018; Mazzucato, 2015, 2018; Taylor, 2016), without however systematically linking the specific form of state involvement to the venture capital market. Klingler-Vidra's work presents a notable exception, however, it focuses on countries of South-East Asia and analytically is primarily concerned with the divergence in VC policies (2018).

In contrast, this article calls for a regional and structural shift of analytical attention: regionally towards Europe, and structurally towards the backend of the digital economy – that is venture capital and its political underpinnings. Just as the user interface we see on the displays of our computers is structured by a layered code on the backend, I argue that the digital economy is fundamentally shaped by its financing structures and that these financing structures are not one-dimensional but take the form of investment chains (Arjaliès et al., 2017), including both private and public actors.

This article covers only parts of the chain that spans between the European Union (EU) government bodies, venture capital, the digital economy and its subjects. The scope is confined to the linkage between European government bodies, one starting point of European VC chains, and the venture capital market over thirty years, beginning with the 1990s. A central node within that chain, and consequently the focus of the analysis, is the European Investment Fund (EIF), the multilateral development bank that links the European Commission to the private VC market. The analysis shows how the Commission harnesses the EIF, and how the EIF harnesses VC funds for governance purposes. It reveals how in acts of crisis-led institutional innovation over thirty years the Commission has established the EIF as a key investor, shifted investment risks away from the private markets towards EU government bodies, and granted infrastructural power to VC firms. In this process the EIF has come to increasingly function as a semi-public asset manager.

The form of economic governance underpinning this transformation, whereby policymakers harness private financial market actors for policy goals to achieve 'more with less', is prevalent in the EU and has been conceptualized as 'governing through financial markets' (Braun et al., 2018; Braun & Hübner, 2018; Epstein & Rhodes, 2018; Mertens & Thiemann, 2018). The term 'harness' signifies the instrumental and indirect relation between the EU and its governance target. Just like a carrier harnesses horses to get somewhere, in this case the commission harnesses the EIF and VC funds to 'get to' the digital economy. The analysis ties this form of European state financialization to the digital economy, phenomena previously debated in separate literatures (a notable exception is: Langley & Leyshon, 2017).

Beyond the empirical effort, the intention is to contribute to a theory of linkages, where the links between spheres rendered as separate, in this case politics, finance and the digital economy, figure centrally. To this end, I propose the theoretical framework of *governing along the investment chain*, which synthesizes a political economy account of 'governing through financial markets' with the notion of the 'investment chain', which was born in a Latourian tradition within the social studies of finance.

The theoretical framework comes with a drawback: the analysis does not include all actors presumably involved in the configuration of European venture capital policy. I do not analyze the role of nation states, national development banks and lobbying groups. The proposition of this article is to analyze the length of the chain, rather than the breadth of any given interaction point. This not only serves the mission of theoretical innovation but is also founded on the claim that the established state-finance links prove valuable in understanding the structure of the digital economy.

The empirical analysis triangulates document analysis, interviewing methods and descriptive statistics. The main data source is publicly available documents from official European sources. These are complemented by VC market data provided by Invest Europe and semi-structured expert interviews, which I list in the Supplementary material (Table 1). I conducted two interviews with senior EIF management to flesh out their agendas and derive operational insights. In addition, I conducted six interviews with VC investors, which mainly serve as background to understand VC investing and the European VC market and do not figure centrally in my analysis.

The article proceeds as follows: the first section develops the theoretical framework of *governing along the investment chain*, linking governing through financial markets, infrastructural power and the investment chain. The second section conceptualizes venture capital from a political economy perspective and establishes its legal-economic set-up. Third, I situate the EIF within the European polity and present its operational mechanisms. The fourth section analyses the historical configuration and transformations of the European venture capital investment chain between 1990 and 2020. In three parts I recount shifts in the investment chain, acts of institutional innovation, resulting risk-return structures and the emergence of infrastructural power, and juxtapose these with gradual developments in the overall VC market. The last section discusses the findings and concludes.

Governing along the investment chain – a theoretical framework

Promoting venture capital to achieve policy goals can be understood as a form of state(-led) financialization. Venture capital firms allow a larger share of profits to be captured by the financial sector, thus meeting a narrow understanding of financialization as put forward by, amongst others (Krippner, 2005, 2011). Venture capital-based governing also, and even more aptly, complies with a broader definition of financialization as: 'the increasing importance of financial markets, financial motives, financial institutions and financial elites in the operation of the economy and its governing institutions, both at the national and the international level' (Epstein, 2005, p. 3).

While the field of financialization studies is thriving (see, e.g. Mader et al., 2020), accounts of the politics surrounding financialization, especially in Europe, are still somewhat scarce. Who are the concrete actors behind financialization? What decisions have they made, against which backgrounds? Recent critiques of European financial policy literatures have especially problematized the undertheorization of the state-finance nexus (Braun et al., 2018; Epstein & Rhodes, 2018; Fastenrath et al., 2017; Haerter, 2020). To address these shortcomings, Braun et al. develop the concept of 'governing through financial markets', a political strategy 'adopted by state actors in pursuit of policy goals that exceed their institutional capacity', and apply it to the European political economy (Braun et al., 2018, p. 104).

The concept describes an indirect mode of economic governance, whereby policymakers use financial instruments to nudge other actors towards the desired end with the 'goal of achieving economic policy goals at minimum fiscal cost' (Braun et al., 2018, p. 104). Braun et al. argue that the EU's preference for governing through financial markets is ingrained into its polity, particularly its lack of fiscal capacities, and amplified by the financial crisis. In acts of institutional innovation, the European Union aims to increase its firepower by building a 'hidden investment state', exercised by public development banks (PDBs) (Mertens & Thiemann, 2019). By providing off-balance sheet quasi-fiscal instruments, PDBs take on a new role within the European polity orchestrated by the EIF and European Investment Bank (EIB) (Mertens et al., 2021).

The agents of this governance strategy are 'monetary technocrats', whose position 'at the boundary between the public and private sphere' (Braun et al., 2021, p. 2) provides them with agency. This notion presents financial integration in Europe as a state-led creative act rather than the widespread motif of deregulating or withdrawing from the markets.

The framework of 'governing through financial markets' allows me to draw a nuanced picture of the state-finance nexus surrounding VC and contextualize it within the European political economy and its historical transformations. The new empirical material contributes to a further exploration of European financialization's peculiarities vis-à-vis the American variant (Schelkle & Bohle, 2021); the latter has thus far received more scholarly attention (Krippner, 2005, 2007; Quinn, 2017).

Nevertheless –however necessary this emphasis on the political side of financialization was and is – it misses out on the economic side. Instead of focusing on direct points of interaction between political and financial market actors, this article follows the reach of governance into the private markets along the 'investment chain', which describes:

> the sets of intermediaries that 'sit between' savers and companies or governments, along with the links between those intermediaries. The investment chain is thus a subset—a particularly crucial subset, we would argue—of the multiple, dense network links that connect actors in financial markets. (Arjaliès et al., 2017, p. 4)

Inspired by Michel Callon and Bruno Latour's notion of translation, the investment chain acknowledges that the substantive role finance, particularly asset managers, play in the economy is only fully captured if one considers the manifold intermediaries involved. As conceptualized by Arjaliès et al. (2017), the chain, however, does not link back to the political sphere and focuses on cultural and social ties between the different intermediaries. Instead, I propose to analyze infrastructural power and risk in the investment chain.

The interplay between public and private actors produces entanglements when *governing along the investment chain*, which have been conceptualized as 'infrastructural power':

> when state actors transact in financial markets for governance purposes they create infrastructural entanglements, which constitute a distinct source of financial-sector power (Braun, 2020, p. 2).

When political actors rely on infrastructures to govern, they create entanglements which financial actors can leverage in the political process. These entanglements become two-way streets: state actors send their capital along these streets to achieve policy goals, and financial actors may use the streets to make demands, positioning themselves as gatekeepers at essential junctions.

The term adds on to work on structural power, whereby the prominence of the financial industry increases the leverage of financial firms vis-à-vis political actors (Young & Pagliari, 2020) and instrumental power, that is the lobbying capacity of finance (Epstein, 2020). In the context of this article infrastructural power is particularly relevant as it points towards the 'crucial set of interactions between private financial actors and public agencies that take place "beneath open and immediate political conflict," on the turf and according to the rules of financial markets' (Braun & Gabor, 2020, p. 241). In other words, the concept focuses on the linkages this article is interested in.

Risk is important for two reasons: first, it allows connecting transformations in VC investment chains to the broader strategy of governing through financial markets. One popular strategy of governments in that context has been to 'de-risk' investments by setting up public-private-partnerships or issuing guarantees (Braun et al., 2018; Gabor, 2021). Second, risk is a core category when conceptualizing venture capital, as discussed in the following section (Rin et al., 2013). I differentiate between the capital gains and fee-based value models to describe the risk-return structures of the different nodes in the investment chain, and between idiosyncratic and systemic risk to differentiate between risk specifically related to the asset class and risk related to the financial system, though both types are interrelated. The capital gains value model describes 'advancing a certain amount of capital in the hope that doing so will later result in a greater amount of capital' (Christophers, 2015, p. 9). It is nominally the riskiest value model in finance as it puts all invested capital at risk. In contrast, the fee-based value model is the least risky, as it does not require paying in capital. Here financial firms 'charge fees for services rendered' like many firms outside the financial sector do (Christophers, 2015, p. 7).

As a foundation of the historical analysis, the next section establishes the very turf and rules of venture capital, followed by situating the EIF within the European polity and presenting its operational mechanisms.

The turf of venture capital investing

In the following, I conceptualize venture capital from a political economy perspective, referring to practitioners' publications, orthodox financial economics and political economy accounts.

Venture capital, a subclass of private equity, provides financing to early-stage, non-publicly-traded companies in return for equity shares (Kupor, 2019). This form of financial intermediation originated in the US, which remains the largest market for VC today. Venture capitalists invested $141bn in US-based ventures in 2020 – a quarter of that amount was invested in European startups (Atomico, 2021).

The term of a fund is typically ten years (Klingler-Vidra, 2016, p. 5). Within this timeframe, startups have to be screened, due diligence conducted, terms negotiated, the startup developed, and finally sold on or floated on public markets. VC funds differ with regard to the investment stages, sectoral and regional focus. Investment stages include seed investments, early-stage or developmental and later-stage or growth investments. Risk of loss is the highest for earliest stages and the lowest for the latest stages (Ghosh & Nanda, 2010, p. 6; Mazzucato, 2015, p. 55).

Venture capital generally is regarded as a relatively patient source of capital. The degree of patience is determined by the investment stage. In particular 'seed stage' investing, the first round of investments a startup receives, was found to demonstrate patience through its long-term orientation and involvement (Klingler-Vidra, 2016). Growth investments typically operate with much shorter time frames. At the same time, the high-risk early-stage investments tend to mostly be made by the state (Mazzucato, 2015, p. 54). Hence, even though VC tends to operate with longer timeframes than traditional financing, its strict exit orientation nevertheless hinders ambitious and uncertain technology development and application (Lerner & Nanda, 2020).

Typically, venture capital funds are organized in the legal form of a limited partnership (Kupor, 2019). Institutional investors, which provide capital to the fund, act as limited partners (LP). Their liability is limited to their paid-in capital. The venture capitalists function as general partners (GP). They are liable and bear full operational responsibility. In practice, however, liability is circumvented by appointing a limited liability company as a general partner. These legal protections in addition to economic benefits, such as tax exemptions and lax reporting requirements, allow a small and homogenous social group – consisting predominantly of white men – to perpetuate their elite power. Consequently, limited partnerships function as 'citadels of privilege' (Soener & Nau, 2019).

The value model of venture capital investing is a mix of the high-risk gain model and the low-risk fee-based model (Christophers, 2015). The venture capitalists/GPs receive an annual management fee of around 2%, a predictable and steady profit source, and a 20% share of the overall profit – described in finance lingo as the 'carry' or 'carried interest' (Kupor, 2019; Thiel, 2014). They only pay in a marginal amount of capital themselves; thus, they have the upside potential of 20% of capital gains, without the downside risk of losing their capital. On the other hand, the capital providers or limited partners do risk their invested capital, hence carrying the full gains risk, while only receiving 80% of potential returns.

The return side of the equation is equally skewed. Overall, the venture capital sector in Europe generated net returns of almost 16% in 2020 with an investment horizon of five years (Atomico, 2021), making it one of the most lucrative investment opportunities available in Europe, especially in times of low interest rates, expansionary monetary policy, and asset price inflation. In theory, all LPs participate in these profits; in practice, these returns are distributed unevenly (Nicholas, 2019, p. 306). In a recent study with US-based funds, the top quartile of funds was found to earn average returns of 44% per annum while the bottom 50% underperformed public market returns. This phenomenon is generally attributed to variations in general partner expertise and networks (ibid.). Consequently, few investors can build up significant power positions within the venture capital-startup ecosystem (Lerner & Nanda, 2020). A vicious circle emerges, allowing these few to collect more capital, be more attractive for high-potential startups, and, with their network and experience, effectively not only pick but create winners, which again increases returns and overall attractiveness.

As a consequence of this risk-return structure, venture capitalists tend to focus on a specific set of technology-oriented firms. As Silicon Valley guru Peter Thiel argues, venture capitalists should 'only invest in companies that have the potential to return the value of the entire fund' (Thiel, 2014, p. 86). The argument goes that due to the risky nature of VC investing (startups are young, work with unproven technologies, or in new markets) only a few startups can realize their business idea. Therefore, these few must be able to compensate for the losses of the others and generate attractive returns that offset the high risk. This logic is established in the field, circulating under the terms 'rule of the long tail' (Nicholas, 2019, p. 1), 'law of power' (Thiel, 2014, p. 84), or 'unicorn hunt' (Lenhard, 2021).

This logic explains why digital business models are so attractive for VCs. Though, contrary to Thiel's narrative, the main investment risk is carried by the LPs and not the venture capitalists, this only further encourages the VCs to make costly bets on platform business models. With sufficient firepower, VCs can use the scalability of digital goods and the network effects underlying platforms – that is, the tendency to become more attractive with more users – to build monopolists in markets where the winner takes all, thus radically maximizing their upside and essentially inscribing the financial logic of VC into emerging businesses (Langley & Leyshon, 2017) while neglecting risks of failure in these highly competitive markets. Therefore, the range of innovation that venture capital can and does generate is limited (Lerner & Nanda, 2020). Instead of new technologies, venture capitalists increasingly focus on proven applications in the software and services sector, competing for a few markets with large amounts of capital. Generally, nearly all VC flows into the tech sector and the digital economy (Rothstein, 2021). However, within the digital economy established and predictable technologies, such as software applications, receive by far the most funding (Atomico, 2021). So-called 'deep-tech' with longer development cycles and higher uncertainty structurally fall through the cracks of the VC model, as they would require more patience than VC has to offer.

Adding to the turf of VC investing, the next section situates the EIF within the European polity and presents its operational mechanisms as a foundation for the historical analysis of governing along the investment chain.

The EIF within the European polity

The European Investment Fund (EIF) is a unique institution within the European polity. Its main shareholder, the EIB, is the largest multilateral development bank globally. In contrast to the EIB, the EIF does not function like a typical development bank, whose main business is lending and guarantees (Griffith-Jones et al. 2018). Despite its naming, the EIF does not resemble public venture capital funds (e.g. Yozma in Israel, Sitra in Finland) or sovereign wealth funds (e.g. the Norwegian oil fund), either. These invest and manage a set amount of capital provided by one public entity, often times relatively independent of day-to-day political guidance. What makes the EIF unique is that it manages more and more mandates for others; only a fraction of its yearly investments stems from its own capital base. Thus, this section argues that the EIF increasingly functions as a semi-public asset manager, stretching, if not bursting a traditional understanding of development banks. The qualifier 'semi-' points to the fact that the EIF is not exclusively funded by public bodies, that it aims for profitably and is market-based.

Not only operationally but also in legal terms, the EIF is more than the mere extension of its main shareholder, which it is often portrayed as in the literature (see e.g. Mertens & Thiemann, 2019, p. 14). Though the EIB does appoint the Chief Executive, the EIF is financially and legally autonomous and was granted the status of a multilateral public development bank in its own right (EIF, 2004b).

Figure 1 (Supplementary material) applies the theoretical framework of 'governing along the investment chain' to the case of the EIF. It shows how a diverse set of political actors use the EIF to reach VC funds, ultimately targeting startups and the digital economy.[1]

The EIF has two statutory objectives, namely to 'foster EU objectives, notably in the field of entrepreneurship, growth, innovation, research and development, employment and regional development' and 'to generate an appropriate return for shareholders, through a commercial pricing policy and a balance of fee- and risk-based income' (EIF, 2015b). This dual role serves to avoid public market interference and has set the ground for the emergence of public-private infrastructural entanglements and the strategy of governing through financial markets.

Next to the EIB (69.89%), the EIF's shareholders comprise the European Commission (EC) (21.55%), and several private and public financial institutions from across the EU member states, the United Kingdom and Turkey (8.56%). After a recent capital increase its share capital is now €7.37bn. The EIF is governed by its board of directors, which consists of representatives from its different shareholder groups, that is, the EIB, the EC, and the financial institutions, and the chief executive, who is nominated by the EIB and appointed by the board (EIF, 2015b).

The EIF's main political framework is set by the Commission's investment plans, such as the Investment Plan for Europe ('Juncker Plan'), or its successor 'InvestEU'. The investment plans specify the EU budget for investments and connected high-level policy goals. The concrete role of the EIF is then discussed trilaterally between the EIF and its main mandators, the Commission and the EIB. For instance, in its operational plan 2021–2023, the EIF writes:

> The EIB Group will be the key implementing partner of InvestEU with responsibly for the management of 75% of the budgetary capacity of each of the policy windows part of the mandate. […] For planning purposes, the EIF is assumed to manage 40% of the EIB Group budget throughout the four windows [of InvestEU]. The EIF's final share and product mix but also the size of the InvestEU budget may still evolve. (EIF, 2021d, p. 2)

The European Parliament authorizes the investment plans and holds annual review meetings of the EIB group's activities; apart from that, it has no direct say in the EIF's activities (European Parliament, 2021). The democratic legitimacy of the EIF is limited. The Commission itself is criticized for its democratic deficit. Its members are nominated by national governments and hence already only indirectly representative of their European constituents (Jørgensen et al., 2006). Similarly, the EIB is governed indirectly by EU member state governments. These two weakly-legitimized institutions mandate the EIF and set political objectives, which tend to be rather weak, for instance, only specifying regional focus and leaving decisions over the sector, the type of business and its founding team to the VC funds.

European citizens thus are not democratically represented in investment decisions and cannot hold the EIF accountable, and even less so the VC firms that actually spend the public money.

The EIF employs 526 employees (EIF, 2021e). Next to administration and middle-office, the two main operational divisions are Mandate Management and Equity Investments & Guarantees (EIG), which function as back- and front- offices, respectively (EIF, 2021b). Both are split by region (central vs. regional) and operations (equity vs. guarantees).

In any of its operations the EIF interacts only with financial intermediaries: with banks to issue guarantees and with VC funds for equity investments – this differentiates the EIF from the EIB, which interacts directly with recipients of loans and guarantees. Within the EIF this indirect setup is understood to be particularly suitable for three reasons: first, because it is efficient in terms of the number of employees needed at the level of the EIF; second, because it leverages private money; and third because this market-based allocation of capital, as one interviewee put it, by definition does not distort the market and instead just enables private market participants to 'tak[e] more risk oftentimes, ge[t] better conditions, a better environment of connected ecosystems' (Interview #8).

The notion of leverage is, however, ambiguous. In finance, the term leverage technically refers to taking on debt when acquiring a financial asset, assuming that the additional returns will exceed borrowing costs; in other words, with debt leverage investors can multiply the potential returns from their investment. Yet, the EIF does not refinance *via* bonds on the financial markets but takes on equity investing mandates. In equity investing the term only holds in a literal/physical understanding, describing how a small input may create a proportionately larger output. When the Commission harnesses the EIF and the EIF then harnesses VC funds to leverage their own capital, arguably both sides, meaning the EIF and the VC funds, could benefit from a larger output. In an interview an investment professional argued that indeed the VC funds were provided free leverage by the EIF (Interview #4). Politically, the question is who directs the investments and who they benefit. Debt leverage is so attractive because investors do not share operational power and potential profits; they just pay back debt and interest rates. In contrast, when all parties provide equity the question of for whose benefit the investments work is more contested and depends on the investment terms, which I elaborate upon below when discussing the EIF's two main operational divisions.

The first division, mandate management, is responsible for the relations with mandators and the development of new financial instruments. All mandators have designated contact persons at the EIF, leading to a dense network between the EIF, the Commission's Directorate Generals (DGs)[2], the EIB, and national development banks (NDBs)[3] with frequent and direct contact. Mandate development may be initiated by the EIF or the mandator, but it is often a two-way process: 'everything is now a bit blending […] because things are converging' (Interview #8). The EIF monitors the financial markets and proposes adequate financial instruments to address specific needs, and policymakers come up with 'fantastic ideas', which the EIF then connects to the market:

> we are transitioning what they want to do from the policy standpoint, what they want to achieve, and we see what channel is appropriate to do that and we connect the private market with the policy. And this is where the mandate is born. The mandate is nothing

> else than a transposition of this policy into operationalizing this whole idea into a delivery, which is investing, or which is financing. (Interview #8)

The resulting mandates specify the desired return objective, regional focus, sector, stage, risk profile, and fees. Across mandates, the Commission requires a minimum of thirty percent of 'purely independent private money' per EIF investment and overall a minimum of two-thirds to be invested in EU member states (Interview #7). Currently, the EIF manages around 160 mandates (Interview #7). In that whole process, the EIF behaves like an asset manager, agreeing with its mandators on the investment strategy and risk preferences for their assets and offering a range of financial instruments – the only differences being that it primarily handles public budgets, not private or public wealth/financial assets.[4]

In mandate management the EIF indeed serves as an agent of governing along the investment chain: it translates policy goals into financial instruments, which it channels into the financial markets. As suggested by the notion of infrastructural power this dynamic resembles a two-way street. The EIF not only translates policy goals into financial instruments but also presents financial market participants' needs vis-à-vis the Commission. In this process, agency lies with the EIF as it develops the financial instruments it deems most appropriate and suggests these to policymakers, who may not have the same professional expertise. Similarly, private actors convey the market's need to the EIF and suggest adequate instruments, influencing the EIF and leveraging their close position.

The second main operational division, equity investing and guarantees (EIG), is the EIF's front-office and handles guarantees and equity, i.e. private equity and venture capital operations.[5] The VC subdivision within EIG employs 41 'investment professionals' with backgrounds typical for the investment industry: asset management, mergers and acquisitions, entrepreneurship, auditing, and transaction services. These 'investment technocrats' execute what the back-office agrees with the EIF's mandators, serve as the voice of the private market actors and present the private market participants' needs to the mandating division. Their daily jobs consist of reviewing and conducting transactions, monitoring them, and executing specific mandates. Typically, the EIF functions as lead investor and negotiates the investment terms, including management fees, stage, sector, investment horizon, profit sharing ('carried interest'), payout, and return targets and signals the fund's quality to other potential investors (Interview #7). The EIF conducts its own due diligence process to assess a fund's quality and employs an algorithm to match incoming applications with the different pots of money.

Once an investment is made, the monitoring process is based on regular review meetings with VC firms, where the overall developments of the fund are discussed without going into the details of the investments made.

> I am not going to say what they need to do with the company. That is their job. I am paying them a management fee to grow these companies, to pay returns. (Interview #7)

Operational decisions on startups and investment terms are left to the VC funds, while the EIF defines loose criteria, if any.

> If we have criteria that need to be followed, we will set KPIs, and we will track the KPIs. […] Most of the time, the only hard criteria are on the geographies they need to invest in. […] And most of the time, they comply; if they do not, you could take them to court, but if it is a good performing fund, all other investors will not like that. Most of the time, we

just say, 'look you have breached the contract; we will not invest in your next fund'. (Interview #7))

While sanctioning in response to non-compliance is theoretically possible, it does not happen because the EIF seeks to avoid putting off other investors. This dynamic points to infrastructural entanglements between private markets and the EIF. To fulfill its return requirements, the EIF needs access to VC funds and enjoy a good reputation among co-investors – both of which may require the EIF to make concessions vis-à-vis private sectors; in other words, it grants infrastructural power to financial actors. This dynamic also manifests in the unequal distribution of investment volumes. Between 2011 and 2019 funds operating in the European core, in particular in France, the UK and Germany, received a disproportionate amount of EIF funding, as indicated in Table 3 (Supplementary material).

After establishing the analytical prerequisites, namely situating the EIF in the European polity and conceptualizing VC from a political economy perspective, the next section analyses the emergence and development of governing along the investment chain in European VC markets and its political and economic implications.

Historical analysis

The historical analysis serves two goals: on the one hand to contextualize the emergence of 'governing along the investment chain' as a policy approach in European VC; and on the other, to derive at the implications of changes in the shape of the investment chain regarding risk and return and power dynamics.

1990s: founding period

The 1990s laid the foundation for European VC policy, a development which was encouraged by the technology boom of the time and an increase of VC volumes across the globe, as well as sluggish economic growth.

The Commission founded the EIF in 1994 to 'create an institution that would take risks in support of EU policy objectives' (European Commission, 2012, p. 19). At the time, this meant quite literally guaranteeing EIB and Commission loans for trans-European network projects (TENs) and SMEs. These operations would have been against the EIB's statutes, so the foundation of a new institution that was distinct but affiliated was an effective way to overcome legal limitations. In the founding proposal, the EIB and the Commission argued that the Commission would act as a 'kind of guarantor for the fund's Community objective, while the public-private nature of the fund would clearly demonstrate that it strengthened market mechanisms' (Bussiere et al., 2008, p. 223). The European Council had to assent to the proposal, and all member states ratify the act, to amend the EIB statutes so that it could found the EIF. The institution's borderline public/private nature served to attain consent among member states in light of tight budgets and a strong belief in the rule of the market.

Initially, the EIF had an authorized capital of 2bn European Currency Units (ECU), of which 40% was held by the EIB, 30% by the European Union (represented by the Commission), and 15% by 58 financial institutions –15% remained unsubscribed, as not enough financial institutions had shown interest (ibid.).

After a two-year pilot period of only issuing guarantees, in 1996 the fund was authorized to allocate up to 20% of its paid-in capital to VC investments. The paid-in capital equaled 20% of the total subscribed capital. Consequently, the EIF was no longer only carrying risks for other EU institutions by guaranteeing TENs or EIB loans but actively involved in financial operations with the risk of losing its capital. The risk-return distribution was simple: the EIF had a fixed amount of capital, in this case ECU 80 mm, which it could use for VC investments; once these funds were depleted, it would have to wait for potential returns and could re-invest these. The overall downside risk was limited to the authorized 20% of paid-in capital. Thus, the EIF acted as a traditional limited partner in VC funds carrying the risk inherent to the capital gains value model (Christophers, 2015).

In response to high unemployment rates the EU asked the EIB and EIF to develop further financial instruments targeting SMEs and startups. Consequently, the EIB and the Commission mandated the EIF with the European Technology Facility (ETF) and the European Technology Startup facility (ETF startup), respectively. At this point the EU's approach to govern along the investment chain became more pronounced. The ultimate target was more employment, which was to be achieved by mandating the EIF to invest in VC funds, who would invest in startups that, ultimately, would employ people. The investment chain lengthened to include the EIB as mandator, and risk dynamics shifted once these mandates had come into play. The EIF's role transformed from a traditional institutional investor, risking its capital and capital gains, to a fund-of-funds or asset manager with a fee-based business model. The EIF's own operations became less risk-prone, as fees are a highly predictable, stable value model in finance (Christophers, 2015). Instead, the main risk of the investment chain was now carried by its mandators. In the ETF and ETF startup, the downside was confined to ECU 125 and 150 mm, respectively. The position of VC funds in the investment chain did not change. They continued to receive a yearly management fee and thus were shielded from financial losses while partaking in potential capital gains *via* the 'carried interest'.

In summary, the 1990s saw the establishment of the EIF amidst record levels of overall VC investments and sluggish economic growth. After a short period of investing its own resources the EIF shifted to a fee-based model. As a funds-of-funds the EIF started investing the capital of its mandators and earned a management fee for that. As a consequence, capital gains risks were from now on carried by the EIF's mandators. The EIF's primary mandators at the time were the Commission and the EIB. In the 1990s the relative share of the EIF in European VC market was marginal.

2000s: embedding and idiosyncratic risks

Against the backdrop of the highly ambitious goals of the Lisbon Agenda and a decreasing EU budget relative to GDP, the EU opted to increasingly use financial instruments as these promised private market leverage and potential returns (Mertens & Thiemann, 2019). In the process, the EIF's role in indirect economic governance and in the European VC market became more pronounced.

Responding to the overlap between the EIB and EIF in VC operations and the disparity between the EIF's infrastructure guarantee business and its SME operations, the EIF underwent a major structural reform in 2000. From now on, the EIF was to handle all European SME operations, a cornerstone of the Lisbon Agenda, while infrastructure guarantees were transferred to the EIB (EIF, 2001). Besides organizational considerations, one reason for the reform was that the EIF had struggled to attract buyers for the 30% of its shares which had been reserved for financial institutions. The fund's profitability was below initial estimates and therefore not attractive for the financial markets (Bussiere et al., 2008, p. 225). With the reform, the EIB increased its holdings to 60% and became the EIF's majority shareholder, together now forming the 'EIB group', which was not foreseen in the EIB's statute. The tripartite structure was kept to maintain the close link between the EIF and the Commission, which continued to hold 30% of EIF shares, while other financial institutions kept only a small minority (ibid.). That the Commission was willing to go against the statutes a second time shows its determination and willingness to innovate institutional forms to make its policy goals work. The EU polity encourages these kinds of ex-post adaptation of existing legislation as the joint decision-making process presents a high hurdle for new legislative efforts (Jørgensen et al., 2006).

Over the following years, the EIF took on more mandates by the EIB and the Commission, and in 2003 received its first mandate from a non-shareholder: the 'European Recovery Programme (ERP)-EIF Dachfonds' by the German Ministry for Economic Affairs, a fund-of-funds targeting German technology-focused VCs (Bussiere et al., 2008, p. 246). This reinforced the EIFs transformation into a fee-based business model and contributed to building a vital position in the VC investment chain. It also complicates the picture when analyzing the investment chain. The EIF is harnessed by different public actors for their potentially diverging policy goals and resembles an asset manager more than a public development bank.

The dot-com bubble bursting in 2000 severely impacted European VC markets and constituted the first economic crisis the EIF had to face. As a result, the EIF's share in the VC market's fundraising jumped from low permilles in the 1990s to an average of 8.1% in the years 2000–2004 (see Supplementary material Figures 2 and 3). This more substantive role, however, was not temporary, but permanently needed, as an expert group report to the Commission argues:

> The cost of and time needed for due diligence in seed and early-stage deals makes these investments often unattractive compared to later-stage deals and buyouts that provide more attractive risk-return profiles. The resulting market failure seems to be fairly permanent and the conclusion over the years has been that for the foreseeable future public incentives will be needed to correct it. (European Commission, 2005, p. 5)

This crisis-induced focus on early-stage deals brought a second risk-return shift: the EIF explicitly started to absorb private-sector risks, investing in areas that the private market did not deem lucrative instead of merely participating in these markets. Once the startups would overcome the high-risk early phases, the private sector could take them on and profit from the EIF's initial investments. The higher risk of failure in the early stages of investment is inherent to the venture capital model, is normally carried by the private sector and serves as a justification for the high returns prevalent in the sector. This shift of idiosyncratic VC risks towards the EIF's mandators is thus a noteworthy transformation.

In light of the still-sluggish VC markets and the long journey ahead to fulfill the Lisbon Agenda's ambitions, in 2007 the General Meeting increased the EIF's share capital by 50% from €2bn to €3bn (EIF, 2008). Under the Commission's 'Joint European Resources for Micro to Medium Enterprises' (JEREMIE) program, the EIF set up several new regional funds-of-funds to develop the markets on Europe's periphery. Institutionalizing cooperation with national development banks, government agencies, and private financial institutions, JEREMIE was established to promote 'the use of financial engineering instruments to improve access to finance for SMEs *via* Structural Funds interventions' (EIF, 2021c; European Commission, 2015). In other words, periphery countries would receive additional EU funds if they used financial instruments to grow their economies. The JEREMIE funds were managed by the EIF and jointly governed by the EIF and the Commission (European Commission & European Investment Fund, 2006).

Just as European VC markets started showing signs of recovery from the dot-com bust, in 2007 the Global Financial Crisis (GFC) hit, once again severely curbing VC fundraising and investments. As a consequence of weakened markets and an increase in operations, the EIF's share of total VC fundraising jumped from an average of 9% in the years 2000–2008 to 21% in 2009 (see Supplementary material Figures 2 and 3). The EIF became Europe's largest institutional VC investor.

In summary, the Lisbon Agenda's high ambitions and the EU's limited fiscal capabilities led the EU to aim to do 'more with less' by governing off-balance sheet *via* the EIF and leveraging private sector money. The EIF became the Commission's main policy arm in this strategy and started acting as a semi-public asset manager. As a consequence, the EIF became deeply rooted into the European polity, cooperating with Commission DGs, national state agencies, and development banks. Two crises had the Commission take on additional VC risks and established the EIF as the largest institutional investor and vital node in the European VC investment chain.

2010s: infrastructural power and systemic risks

When the GFC and Eurozone crises severely hit the European economy, the Investment Plan for Europe (or 'Juncker Plan') reconfigured Europe's state-finance nexus and institutionalized public risk absorption mechanisms. The EIF was assigned the implementation of all SME operations of the Juncker Plan. The new and increased mandates were complemented by a second increase in share capital (EIF, 2014b).

In addition, the Commission and the EIB set up the European Fund for Strategic Investment (EFSI) to overcome the 'investment gap' created by the renewed post-crisis 'market failure' and finance operations that 'have a higher risk profile than projects supported by EIB [group] normal operations' (Regulation (EU), 2015).

With the EFSI a second risk shift took place: the new funds explicitly aimed to absorb the systemic risks of a highly financialized economy to keep the venture capital market going. This transformation is quite significant in light of the substantive share the EFSI made up in the EIF's operations in the following years (see Supplementary material Figure 3). A product of financial engineering, the EFSI is set up not as a fund but as a:

> guarantee provided to the EIB Group from the EU budget and a capital contribution provided by the EIB. This financial structure enhances the risk-bearing capacity of the EIB Group, allowing it to finance more high-risk projects or riskier tranches of projects without deteriorating its asset quality, and therefore without threatening its AAA credit rating–a fundamental element underpinning the sustainability of the Group's business model. (EIF, 2016b, p. 2)

For venture capital investing the EFSI mainly implied that the EIF could invest more and take larger shares than it normally did. The crisis impaired private investors trust into the financial markets. Consequently, VC funds struggled to raise funds. Here the EIF stepped in and provided a larger share of the whole VC market and within individual funds, sometimes providing as much as 90% of a fund's capital (Interview #7). The risk inherent to the financial system that normally is carried by all participants, is thus, in parts, carried by the EIF.

This strategic shift may well play into a vicious circle: as previously discussed, the strategy of using VC markets for policy goals is a form of state-led financialization; financialized economies are unstable and crisis-prone (Sen, 2020); crises require more state-support, which in the EU's current institutional setup tends to imply an accelerated use of financial instruments and markets; ergo more financialization. In addition, temporary crisis-combatting measures have tended to institutionalize, solidify and thus further stabilize financialization, as demonstrated by the extension of the EFSI, which was originally intended to run until 2017, until 2021 and its seamless supersession by InvestEU (EIB, 2021, p. 41).

As part of the Juncker Plan the EIF started its first large-scale fund-of-funds program, 'VentureEU', which was financed by EFSI and the Commission and presented as a 'confidence-building signal that aims to attract private money back into the European VC system' (European Commission, 2016). The idea had its genesis in complaints by private VC market participants on the EIF's substantive role in the market:

> Because the market was saying that on the venture capital site, that they were too dependent on the EIF, we said, "Okay, we do not want to be the Caesar in Rome, that says: You can live, you can die." So, we wanted to bring more funds-of-funds on the market that would invest into venture capital funds. (Interview #7)

This exemplifies how venture capitalists were closely linked to the political sphere *via* the EIF and how the EIF quickly translated their needs into new mandates. Investing into funds-of-funds lengthened the investment chain that the EU was harnessing for governance purposes by one node. An additional layer of private funds could insert itself into the chain, charge management fees and participate in carried interest, thus reducing the overall amount potentially returned to the fund-of-funds' limited partners, such as the EIF. Therefore, the risk-return relationship has further shifted to the benefit of private market participants. Also, this lengthening of the chain reduces the EIF's capacity to control the chain, and hence also the Commission's capacity to govern. A fund-of-funds only reports on its investments into funds, and not the investments of these funds into startups.

As the overall VC market in Europe grew and recovered from the dot-com bubble bursting and the financial crisis, few funds established themselves as winners and obtained significant power positions. When asked about the role of the EIF in the negotiation of terms with VC funds, one interviewee argued:

> Historically [we had] a lot [room for maneuver in fee negotiations]. Now with the venture capital market developing well in Europe more and more really good, successful managers they can dictate the terms themselves and then it is a matter of, whether we still need to be in with public money […] Under our return obligations sometimes for the risk that we take, during a first-time teaming in Greece or Portugal, we might want to continue investing with Holtzbrinck VIII or some of the more established managers that have a history of delivering track-record. Because we need their returns to offset the risks that we take elsewhere. (Interview #7)

Here, we can observe the co-emergence of two forms of financial sector power. On the one hand, the few well-known and highly successful funds, such as Atomico or Holtzbrinck Ventures (HV), obtained structural power in the digital economy as they had the resources, expertise, and network to pick and create winners. On the other hand, these funds obtained power over the EIF and, indirectly, its shareholders by providing the financial infrastructure for the Commission's indirect mode of governance. As the governance model was market-based while at the same time aiming for political objectives, such as building up less-developed markets, the EIF came to depend on the returns of high-performing funds, which hence could effectively 'dictate the terms'.

The example the interviewee gave was the German VC firm HV, which is among the most well-known and established VC firms in Europe. The following calculation exemplifies a possible return calculation. The EIF invested in HV's funds V (2012; fund size: €175 mm; EIF: €35 mm), VI (2015; fund size: €285 mm; EIF: €35 mm) and VII (2018; fund size: €306 mm; EIF: €35 mm) – all of which are ongoing. Presumably, HV receives a minimum management fee of 2% every year and 20% carry. Management fees would sum up to €15mm p.a., of which the EIF would pay €2.1 mm every year. The annual return rate of the top-performing quartile of funds is 44% p.a. Assuming each of HV's funds runs for 8 years, that would imply overall returns of €14bn, of which €2.8bn would go to HV, and €1.9bn to the EIF. The EIF can make a relatively reliable profit by investing into HV funds and relies on these profits to compensate for riskier investments. HV thus has more room for maneuver when negotiating with the EIF.

In summary, the second decade of the new century saw the establishment of new risk-sharing devices and a further reconfiguration of the state-finance nexus under the Juncker plan as response to the GFC. The EFSI allowed scaling up EIF VC operations and taking on private sector risks on a whole new, systemic scale. VentureEU was the first pan-European funds-of-funds program run by the EIF, allowed more returns to be appropriated by the private sector and indicated increasing private-public entanglements. These entanglements together with the overall development of the European VC market had a few winner-VC firms emerge, who obtained infrastructural and structural power, which in the case of VC investment chains are closely linked.

Discussion

The EIF has come to hold a central position in the European political economy: as a key policy arm of the Commission in its strategy to govern along the investment chain; as a translator between European government bodies and VC funds; and as a central node in the European VC investment chain. Acts of institutional innovation over three decades and two major crises enabled and reinforced the pronounced role of the EIF, reshaping the investment chains and its risk-return distribution.

Institutionally, the (re-)configurations of the EIF confirm the tendency of the EU polity towards institutional innovation, as discussed for instance in the work of Mertens and Thiemann (2018, 2019). First, the EIF was founded in 1994 to overcome legal limitations in the EIB's statutes. Second, against the backdrop of the Lisbon Agenda's ambitious goals and the hesitant private market take-up of EIF shares in light of lower-than-expected profitability the EIB became the EIF's majority shareholder, which enabled the EIF to focus and expand its operations. Following the GFC, the EFSI constituted a third institutional reconfiguration. Set up as a separate guarantee fund, the EFSI enabled the EIF and EIB to take on riskier projects without impacting its AAA ratings, which the EIB in particular needed to refinance on the financial markets.

Along with these institutional reconfigurations, the shape of European VC investment chains transformed. The position of the EIF became more and more central over the observed period. First, in the 2000s the EIF started to manage mandates from external state actors, such as the fund-of-funds of the German Ministry for Economic Affairs, and different DGs and cooperated with NDBs, in particular under the Commission's JEREMIE program. Consequently, the EIF became deeply rooted both on a European and national level and became the largest institutional investor in European VC. Second, as part of the Juncker plan the EIF introduced a funds-of-funds program, which extended the investment chain by one nod and increased the share of profits accrued by private VC funds.

All along the EIF was founded to take on risks. At first, the EIF took on EU policy risks by guaranteeing SME and infrastructure project loans. After three years, the EIF started equity investing from its own means and carried the capital gains risk. From 1999 onwards the EIF took on mandates by other political bodies. The EIFs value model transformed into a fee-based model, and the capital gains risk was henceforth carried by its mandators. In the 2000s, in the aftermath of the dotcom bubble bursting, the EIF began explicitly taking on the idiosyncratic risks of the VC asset class by disproportionately focusing on early-stage investments – the riskiest investment stage. In response to the GFC the EFSI enabled a fourth shift, which comprised taking on the systemic risks of a financialized economy. Consequently, VC investors value model was de-risked.

The EIF is set to continue to gain relevance in the European VC market, amplified by the third major crisis in its short history – the Covid-19 pandemic. The operational plan for the coming period forecasts €6.2bn of equity investments for 2021 (EIF, 2021d) including means from EFSI's pandemic successor, the European Guarantee Fund (EGF). A fourth capital increase was announced in February 2021, resulting in €7.37bn of authorized capital (EIF, 2021a).

Overall, the discussed transformations are ambiguous and put the EIF at a crossroads. On the one hand, its central position in the European VC market may equip the EIF to achieve progressive policy goals. The EIF could move away from merely addressing market failure and, instead, proactively target specific investment areas and take on those risks that in fact are needed to initiate a socio-ecological transformation. Indeed, under the European Green Deal 30% of the EIF's volumes are to be invested sustainably. The EIF's profitability orientation may, however, counter a truly progressive agenda. As the EIF depends on the relatively predictable high profits to sustain its market-based nature, VCs can lever their political power to counter strict regulations and controlling. In addition, the current set-up, which balances risky investments in new markets with less risky investments in winner VC funds, could translate into a setup where climate-friendly VC funds are balanced with aggressive hyper-growth-oriented ones, while potentially only taking into account the climate effects of the former.

The very proposition that has granted the EIF its central position takes the edges off that position and inhibits a truly proactive and progressive role of the EIF. In other words, in its current market-based setup the EIF, in fact, cannot become (a democratic and socio-ecologically-minded version) of Caesar in Rome, but depends on the goodwill and returns of powerful VC investors. In this vein, the EIF is further reinforcing its role as a semi-public asset manager. Already in 2020, the EIF started the Asset Management Umbrella Fund (AMUF), which explicitly positions the EIF as investment manager for private institutional investors. In addition, in 2021, the EIF announced Google to be its first corporate investor, granting Google easy access to its immense network in the European VC market. In both cases the EIF functions as a handmaiden to private capital and continues to contribute to VC's success story in Europe.

This paper has several implications beyond the empirical understanding of the dynamics surrounding the EIF. Regarding debates on governing through financial markets, the analysis points to the urgent need to consider the shape of investment chains instead of merely focusing on interaction points. Two results are noteworthy in particular. First, my analysis of the EIF shows how financial actors' business models, particularly regarding risk-return, impact potential outcomes of governance. The EIF's de-risking strategy has enabled problematic tendencies in VC, such as the narrow range of innovation or the built-in need for aggressive business models in winner-takes-all markets. Second, the analysis reveals how governing through financial markets creates new interaction points and infrastructures, which financial market actors can leverage to adapt policies in their favor.

Regarding debates on the digital economy, the analysis points to the crucial need for a shift in focus towards understanding the structure of the digital economy (monopolistic, platform business models, focus on software) as fundamentally shaped by the underlying financing structure.

Together these implications ask for a new perspective on political answers to the digital economy. A political angle should revolve not merely around regulating emerging economic entities but also, in the spirit of this paper, problematize the EU's role in stabilizing a highly financialized system and develop alternative financing structures. The EU, *via* its EIF-engagement, takes the edges off financialization by stepping in in times of crisis. However, this does not reach the economy broadly but rather primarily secures a few privileged actors, namely those financial actors that the EU has grown so entangled with. Startups are not necessarily reached by these measures and have to defer to the rule of VC. Instead of this EU-enabled VC regime, democratic and truly long-term forms of financing new businesses are needed.

Notes

1. Please note that due to the limited scope of this paper and to reduce complexity figure 1 does not represent core-periphery dynamics prevalent in mandating relations. The volumes the EIF executes for different EU member states are highly unequal.
2. The EIF works with and for: the Directorate General for Economic and Financial Affairs, the Directorate General for Internal Market, Industry, Entrepreneurship and

SMEs, the Directorate General for Research and Innovation, and the Directorate General for Regional and Urban Policy (EIF, 2020b). The responsible Commissioner currently is Valdis Dombrovskis, Commissioner for Financial Stability, Financial Services and Capital Markets Union and Vice President of the von der Leyen Commission (EIF, 2020c).

3. NDBs in the lingo of the EU are termed 'national promotional institutes' (NPIs).
4. As discussed in the historical analysis the new EIF AFUM program is an exception: here the EIF manages private money purely for profit.
5. Quantitatively the guarantee business takes the largest share in the EIF's operations. In 2020 the EIF signed €9.1bn in guarantees and €3.6bn in equity. This analysis focuses on equity to unravel the political underpinnings of VC and the digital economy. Guarantees typically target SMEs and follow a different financial logic.

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Notes on contributor

Franziska Cooiman is a Doctoral Researcher at Weizenbaum Institute and Roskilde University. She studies the political economy of venture capital in Europe.

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