

Harvesting or Nurturing? Corporate Venture Capital and Startup Green Innovation

Recently, there has been increasing interest in corporate venture capital (CVC), an important type of venture capital (VC) defined as minority equity investments made by established industrial firms in privately held ventures (Drover, Busenitz, Matusik, Townsend, Anglin, & Dushnitsky, 2017; Huang & Madhavan, 2021; Jeon & Maula, 2022). CVC investors have played a major and increasing role in funding entrepreneurial ventures, participating in 22% of European VC rounds in 2022 (PitchBook, 2023). CVCs have also actively invested in startups focused on green innovation, raising the question of whether it is driven by greenwashing or more substantive reasons; this is particularly crucial for these green startups, raising the important question of whether CVC investments hinder or nurture their green innovations.

This potential link between CVC and venture sustainability is important given the urgency for all parts of society to contribute to sustainability. The message from research and policymakers is clear—only if every actor recognizes the risks and responds with immediate action can we sustain a healthy and livable planet for the next generations (Pörtner, Roberts, Poloczanska, Mintenbeck, Tignor, Alegría et al., 2022). While corporations have engaged in corporate social responsibility initiatives for decades (Orlitzky, Schmidt, & Rynes, 2003; Smith, 2003), recent developments (e.g., the recognition of the climate crisis and the adoption of the Sustainable Development Goals) have created urgency for a more substantial green transition, including green venturing (McKinsey & Company, 2022; World Economic Forum, 2023).

In recent years, the VC industry has also rapidly adopted environmental, social, and governance (ESG) aspects to address sustainability challenges (Botsari & Lang, 2020; PRI, 2022). As a result of their ability to rapidly scale sustainability innovations, entrepreneurial ventures backed by VCs have the potential to contribute to mitigating climate change (Alemany, Ioannou, & Kacperczyk, 2022; Bocken, 2015). Given the extensive investments by many corporations in green innovation, the role of CVCs is particularly interesting. While incumbents and startups play different roles in sustainable development, only through their interactions can the sum be greater than its parts (Hockerts & Wüstenhagen, 2010). Although recent research has emerged on sustainability in CVC (Battisti, Nirino, Leonidou, & Thrassou, 2022; Hegeman & Sorheim, 2021), an understanding of how CVC contributes to ventures' sustainability performance is lacking. This omission is salient due to the potentially important role of CVC investors' contributions to the greenness of ventures, given the different structures, objectives, and resources that affect CVCs' value-adding capabilities for venture green innovation.

This study aims to fill this important research gap by examining how selection and nurturing influence CVC investments and startups' green innovation. Compared to independent VC (IVC) investors, CVC investors both select more innovative firms and help them facilitate more innovation after investment (Alvarez-Garrido & Dushnitsky, 2016; Chemmanur, Loutskina, & Tian, 2014; Park & Steensma, 2013). However, based on institutional logics theory, the CVCs' corporate logic might also hinder the value they can add to ventures relative to IVCs regarding certain innovation dimensions (Pahnke, Katila, & Eisenhardt, 2015). We argue that in our context of green innovation, due to the different institutional logics of CVCs and IVCs (e.g., CVC investments not being driven only by financial reasons such as IVC investments), green ventures are more likely to be backed by CVCs, and CVCs nurture green innovation more due to their strategic motives, norms, and attention base. Furthermore, recognizing the substantial variance

between CVC investors and their parent corporations (Alvarez-Garrido & Dushnitsky, 2016), we argue that, due to complementary resources, shared goals, and related knowledge, both effects are stronger when the parent company is engaged in green innovation than when it is not.

We test our hypotheses using a large sample of young, innovative European ventures that received VC investments from 2004 to 2019. Our research design aims to empirically unravel the selection and nurturing effects of CVC investors. We apply logit, linear probability, and multinomial logit models to identify whether and when CVCs' likelihood of funding is affected by venture greenness. Moreover, we adopt a quasi-experimental approach for the causal identification of CVCs' subsequent nurturing effects on portfolio firms' green innovation by applying difference-in-differences models to a matched sample.

In support of our hypotheses, we find that the probability of CVC investments is greater for greener ventures, and this effect is further amplified for green CVCs. This selection effect of CVC investments being more likely for greener ventures is driven by CVCs with parent corporations active in green innovation themselves (green CVCs), ruling out greenwashing as a major driver of green CVC investments. Surprisingly, regarding nurturing effects, our findings do not provide evidence that all CVCs facilitate the green innovation of their portfolio firms after investments. Only when heterogeneity of CVCs is considered, we find that green CVCs increase venture green innovation compared to nongreen CVCs. We conduct a battery of robustness tests, providing further support for our main findings on CVC selection effects and CVC heterogeneity regarding the nurturing effects, that is, the positive relation between the parent corporation's involvement in green innovation and support for portfolio companies' green innovation.

We contribute to recent calls to examine the roles of alternative VC investor types for sustainable ventures (Bocken, 2015), zeroing in on the role of CVC. Given the complexity and requirement to combine diverse sets of competencies in green innovation (Fusillo, 2023; Orsatti, Quattraro, & Pezzoni, 2020), CVCs that provide their portfolio companies with access to the resources of their corporate parents offer unique value-added support, in contrast to other CVCs. Furthermore, by unpacking the causal link between CVC and sustainability, we offer insights into the broader debate on sustainable entrepreneurship and the role of VC investors as a condition for sustainable development (Fichter, Lüdeke-Freund, Schaltegger, & Schillebeeckx, 2023; Hall, Daneke, & Lenox, 2010). Additionally, we extend the understanding of the mechanisms and value added of CVCs on nonfinancial dimensions for portfolio firms. We also contribute to the theoretical understanding of how institutional logics theory can explain the sustainability impacts between categories (i.e., CVC vs. IVC) (Pahnke et al., 2015; Thornton, Ocasio, & Lounsbury, 2012) but are limited in explaining within-category differences for CVC; thus, additional theoretical mechanisms are needed. We contribute to this theoretical integration by demonstrating how combining institutional logics theory with a resource-based perspective provides future avenues for researching the differences between investor types and accounting for heterogeneity within individual groups of investors (Alvarez-Garrido & Dushnitsky, 2016; Pahnke et al., 2015). The heterogeneity of resources helps explain why investors belonging to the same category, CVC, can have different nurturing effects on their portfolio companies.

Our results also have practical relevance for various stakeholders engaged in sustainable VC and important implications for green startups. While funding can also be obtained from nongreen CVCs, it is important to recognize CVC heterogeneity; only green CVCs nurture green innovation beyond selection effects. Therefore, young ventures focused on sustainability should carefully consider the ability and willingness of CVCs to support them in green innovation.