The Conditional Viability of Rational Sustainability: Evidence from Venture Capital *

Othman Alolah[†], Raymond Kim[‡], and Fatima Shuwaikh[§]

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Abstract

This paper investigates the viability of rational sustainability, a framework that reconciles the dual pursuit of sustainability and financial success. Startups backed by Corporate Venture Capital (CVC) and Independent Venture Capital (IVC) investors provide a novel setting to test this question, as they operate under conditions that should, in theory, allow for both long-term sustainability and financial success. Using the Facebook-Cambridge Analytica data scandal as an exogenous shock within a triple difference-in-difference framework, we find CVC-backed startups improve startup sustainability goals, while maintaining successful financial outcomes. This may be due to greater CVC influence through investment experience and fund size, underscoring the role of corporate investing in rationally sustainable goals.

JEL classification:

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[†]Othman Alolah is with MBSC and Imam Mohammad Ibn Saud University oalolah@mbsc.edu.sa

[‡]Raymond Kim is with Northern Arizona University, W.A. Franke College of Business (raymond.kim@nau.edu.). *Corresponding author.

[§]Fatima Shuwaikh is with Leonardo de Vinci University fatima.shuwaikh@devinci.fr

1 Introduction

Rational sustainability introduces a framework that reconciles the dual pursuit of sustainability and financial returns, allowing investment practices to systematically achieve superior environmental, social, and governance (ESG) outcomes while maintaining financial viability. However, recent evidence that ESG strategies often underperform traditional investments (Bolton and Kacperczyk, 2021; Pástor, Stambaugh, and Taylor, 2022) raises a fundamental question: Can rational sustainability exist? This paper seeks to answer this by identifying conditions under which rational sustainability should be viable and testing whether it holds in practice.

Startups with both CVC and IVC investors provide an empirical testing ground for rational sustainability. These startups operate under the influence of strategic investors (CVCs) who align investments with corporate sustainability and innovation goals, as well as financial investors (IVCs) who primarily prioritize financial returns. If rational sustainability is achievable, we may observe CVC-backed startups achieving superior ESG outcomes while maintaining financial competitiveness relative to purely IVC-backed startups.

To quantify ESG outcomes, we incorporate the Startup Sustainability Index (SSI) and Startup Sustainability Alpha (SSA) as key metrics. SSI captures how effectively startups integrate ESG principles into their operations, providing a standardized measure of sustainability performance. SSA, defined as the deviation of a startup's SSI from its syndicate average, isolates the incremental ESG contribution of each startup, allowing us to assess whether CVC-backed firms not only exhibit stronger sustainability performance but also drive greater ESG improvements relative to their investment syndicate. These metrics enable a more precise evaluation of CVC influence on sustainability outcomes.

Corporate Venture Capital (CVC) provides a compelling setting for this investigation due to its unique characteristics, including longer investment horizons, integration of non-financial goals, and access to parent company resources. For instance, Chemmanur, Lout-

skina, and Tian (2014) emphasizes how CVCs integrate innovation and strategic goals, while Dyck, Lins, Roth, and Wagner (2019) highlights the capacity of institutional investors to influence ESG practices in their portfolio firms.

Using a unique, hand-collected data set of ESG-rated startups backed by CVC and IVC, we measure the impact of an investment syndicate using a Startup Sustainability Impact (SSI) rating. Initial results indicate that a greater share of CVCs in an investment syndicate is associated with higher SSIs. However, the potential endogeneity concern is selection bias where CVC investors merely select startups that were already on a trajectory to improve sustainability outcomes, rather than drive those improvements themselves.

To address endogeneity, we first examine startups with both CVC and IVC investors. Since IVCs invest primarily on the basis of financial returns, their presence as investors ensures that these startups were attractive independent of ESG considerations. This allows us to test whether greater CVC influence on a syndicate generates stronger sustainability outcomes in firms with both CVC and IVC backers. Examining startups with both types of VCs, we can isolate the role of CVCs in actively driving ESG improvements rather than simply selecting firms with high sustainability potential.

Building on this, we introduce a novel metric, Startup Sustainability Alpha (SSA)—defined as the deviation of a startup's SSI from the syndicate's average SSI. If CVC-backed startups show higher SSA relative to syndicate peers, this indicates that CVCs are enhancing ESG outcomes, distinguishing between selection effects and active improvements.

Finally, we employ a triple difference-in-difference framework, using the Facebook-Cambridge Analytica scandal as an exogenous shock on startups in the data analytics space. If CVC backed data analytic startups improve their post-shock SSI more than other data analytic startups, this suggests that CVCs are actively influencing ESG decisions under heightened external scrutiny, offering stronger causal inference on the role of strategic investing in driving sustainability outcomes. In fact, this is exactly what we find after data analytic firms had a negative impact on their social and governance mechanisms after the Cambridge Analytica

shock. Firms that were backed by CVCs improved their social and governance mechanisms, relative to their peers.

Results consistently demonstrate that CVC-backed startups outperform their peers across multiple ESG dimensions. These findings suggest that rational sustainability is inherently embedded in the strategic objectives of CVC investments, with significant implications for investment policies, fund management practices, and the broader field of sustainable finance.

This research contributes to the understanding of strategic investing in sustainability by highlighting CVC's distinctive characteristics, such as longer investment horizons, incorporation of non-financial goals, and alignment with parent corporations' broader objectives. These attributes uniquely position CVC to advance ESG practices, bridging the gap between financial and sustainability priorities. By examining how ESG outcomes evolve within CVC and IVC ecosystems, this study informs future investment strategies, corporate decision-making, and policy frameworks aimed at fostering sustainable finance.

2 Motivation and Literature

The integration of environmental, social, and governance (ESG) objectives into investment practices has been shown to influence financing costs and corporate behavior. However, questions remain about whether such practices can deliver meaningful ESG outcomes while maintaining financial performance. This paper examines whether rational sustainability, defined as the strategic integration of broader corporate objectives to achieve superior ESG outcomes, is a viable framework for addressing these challenges.

2.1 ESG, Cost of Capital, and Profitability

A robust body of research demonstrates that firms with strong ESG profiles benefit from lower financing costs. Chava (2014) and Goss and Roberts (2011) show that superior ESG ratings reduce loan spreads, as lenders favor firms with lower environmental and reputational

risks. Hartzmark and Shue (2023) highlight that ESG-driven capital reallocations lower costs for green firms but may inadvertently disincentivize transformative change among brown firms. Houston and Shan (2022) add that banks can propagate ESG standards through lending relationships, particularly when lenders possess stronger ESG profiles than their borrowers. These findings establish a clear link between ESG practices and financing advantages.

Despite these benefits, ESG investments often fail to deliver superior financial returns. Bolton and Kacperczyk (2021) and Pástor et al. (2022) provide evidence that ESG strategies frequently underperform traditional investments on a risk-adjusted basis. Additionally, while ESG engagement lowers downside risks, as shown by Hoepner, Oikonomou, Sautner, Starks, and Zhou (2018), it does not consistently translate into higher profitability. Sharfman and Fernando (2008) observe that lower equity costs and increased debt capacity for firms with improved environmental risk management stem primarily from tax advantages and financial structure shifts, rather than operational efficiency.

These findings suggest that while ESG practices confer financing advantages and risk mitigation benefits, their ability to generate superior financial returns remains limited. Moreover, the tendency to prioritize signaling over substantive change, as Hartzmark and Shue (2023) note, underscores a critical gap between ESG goals and meaningful outcomes.

2.2 Strategic Investing as a Mechanism for Rational Sustainability

Investors play a significant role in shaping the ESG performance of firms, as institutional investors have been shown to drive substantial ESG improvements in their portfolio firms (Dyck et al., 2019). Long-term investors, as documented by Kim, Kim, Kim, and Park (2019), encourage sustainability practices by actively monitoring and supporting firms' ESG initiatives, while Gloßner (2019) highlights that engaged investors can improve corporate social responsibility (CSR) practices, particularly in firms with weaker initial ESG performance. Liu, Xiong, Gao, and Zhang (2023) further demonstrate that investor pressure can

lead to meaningful ESG advancements, underscoring the role of capital in fostering sustainability.

Corporate Venture Capital (CVC) provides a unique investment framework that integrates sustainability objectives within a strategic, long-term investment approach. Unlike Independent Venture Capital (IVC) investors, who primarily focus on financial returns, CVC investors align their investment decisions with broader corporate priorities, including innovation, competitive positioning, and sustainability goals (Chemmanur et al., 2014; Gompers, Gornall, Kaplan, and Strebulaev, 2021). This dual focus enables CVC investors to incorporate ESG considerations into their portfolio firms, as ESG-aligned investments have been shown to enhance innovation, mitigate risk, and improve both financial and reputational outcomes for firms (Bolton and Kacperczyk, 2021).

Unlike IVCs, which prioritize short-term financial performance, CVCs operate with longer investment horizons and have access to extensive industry expertise, supply chain networks, and operational support from their parent firms Hellmann and Puri (2002). This strategic alignment allows CVC-backed startups to achieve ESG improvements more effectively than their IVC-backed counterparts. By leveraging corporate resources, CVC investors can facilitate the adoption of sustainability-focused business models, support the development of green technologies, and promote responsible governance structures.

This study examines how CVC investment influences ESG outcomes in startups, exploring whether CVC-backed firms demonstrate superior sustainability performance. By integrating ESG considerations within a strategic investment framework, CVC investors may serve as a key driver of rational sustainability, aligning financial success with broader societal and environmental goals.

2.3 The Next Step: Rational Sustainability

The literature highlights a gap between ESG investing's promise and its mixed outcomes, particularly regarding financial returns and measurable societal impact. Edmans (2023)

critiques ESG for often prioritizing labels over long-term value creation, while Edmans (2024) introduces "Rational Sustainability" as a framework emphasizing evidence-based approaches and trade-off recognition. This concept shifts focus from box-ticking exercises to embedding sustainability within core business strategies.

Building on these insights, this study evaluates whether rational sustainability, operationalized through the strategic focus of CVC investors, can bridge this divide. Unlike traditional ESG approaches, which often reward incremental improvements (Hartzmark and Shue, 2023), rational sustainability integrates ESG objectives with corporate strategy, prioritizing long-term outcomes over superficial metrics. By examining the differential impact of CVC and IVC investments on ESG outcomes, this paper offers actionable insights into sustainable finance and strategic investing.

3 Data

3.1 Overview

This study integrates venture capital investment data from Thomson Reuters Refinitiv Eikon with environmental, social, and governance (ESG) risk metrics to examine the role of CVCs in driving sustainability outcomes. The Eikon dataset covers the investment activities of independent venture capitalists (IVCs) and corporate venture capitalists (CVCs) from 2000 to 2023, including details on investment rounds, firm names, investment dates, investment amounts, and investor composition. However, Eikon does not systematically list parent names for CVC investors, requiring us to hand collect and verify parent firms for accurate matching with sustainability metrics.

This data is combined with RepRisk, which provides ESG ratings for private companies and venture capital firms. RepRisk ratings assigns letter grades ranging from AAA to D, reflecting a firm's ESG risk profile. To facilitate quantitative analysis, I have developed a Startup Sustainability Index (SSI) by converting these letter grades into a numerical scale,

where AAA equates to 10 and D to 1. This transformation enables a more precise assessment of startups' sustainability performance. The SSI evaluates real-time ESG risk exposure using external sources such as news reports, regulatory filings, and NGO assessments, providing an objective measure of sustainability performance that does not rely on firm self-reporting.

3.2 Data Methodology

To accurately link our VC dataset with ESG ratings, we first only keep venture capital and startups based in the US. Then we standardize names, match on first words, and implement Jaro-Winkler similarity scoring. Firm names are standardized by converting them to lowercase and removing common suffixes such as "Inc.," "Ltd.," and "Corp." to ensure uniformity across datasets. Firms are then matched based on identical first words, ensuring that names like "Google Ventures" and "Google Capital" are considered similar before applying further comparison. The remaining portion of the name undergoes Jaro-Winkler distance scoring, a lexical similarity measure optimized for short-text comparisons, which prioritizes common prefixes and accounts for minor spelling variations. As a final step, matches are checked manually for accuracy.

The dataset was standardized to at a monthly level to match RepRisk ratings. Each startup-venture investor pair in each funding round was assigned a unique identifier. For instance, if a venture funding round consists of 5 venture capital firms, then there would be five unique identifiers for that particular funding round. Each identifier represents a unique combination of startup, investor, funding round, and RepRisk scores.

Fixed-effects panel regressions were employed to control for unobserved heterogeneity across companies and time periods, ensuring that the estimated impact of CVC participation on ESG outcomes is not driven by firm-specific or macroeconomic factors. Errors are also clustered at the relationship level (VC-Startup pair) to correct for heteroskedasticity and within-group correlation at the VC-Startup level.

3.3 CVC Metrics

CVC investors influence portfolio firms (Chemmanur et al., 2014), and following this literature, we define two measures of CVC participation: *CVC Flag*, which equals one if a VC-startup relationship is with a CVC, and *Strategic Ratio* measures the percentage of CVCs within a VC syndicate in a funding round k for startup i.:

$$Strategic\ Ratio_k = \frac{\sum_{j \in k} Corporate\ Venture\ Capital\ Firms_j}{\sum_{j \in k} Venture\ Capital\ Firms_j} \tag{1}$$

$\sum_{j \in k} Corporate\ Venture\ Capital\ Firms_j$ is the sum of unique CVC investors within syndicate k. $\sum_{j \in k} Venture\ Capital\ Firms_j$ is the total number of unique investors in syndicate k. These measurements examine whether CVC investors influence ESG progression in portfolio companies more effectively than IVC investors.

We also examine the extent to which a startup's ESG performance is driven by its venture investors. The *Startup Sustainability Alpha* (SSA) is defined as:

$$\begin{aligned} Startup\ Sustainability\ Alpha_{i,k,t} = {} & Startup\ Sustainability\ Impact_{i,k,t} \\ & - Syndicate\ Sustainability\ Impact_{k,t} \end{aligned} \tag{2}$$

The SSA is the difference between the SSI and the Syndicate Sustainability Impact. The Syndicate Sustainability Impact is defined as:

$$Syndicate\ Sustainability\ Impact\ _{k,t} = \frac{1}{N_{k,t}} \sum_{j \in k} VC\ Sustainability\ Impact_{j,t} \tag{3}$$

This measure reflects the average ESG orientation of its venture capital investors in a particular funding round. A positive SSA indicates that the startup exceeds the ESG standards of its investor group, while a negative value suggests underperformance relative to its syndicate's benchmark.

To explore the influence of Corporate Venture Capitalists (CVCs), additional metrics were formed to capture different dimensions of the relative prominence of CVCs within the investment syndicate k. They include measures such as the average number of companies in which syndicate CVCs have invested *(Portfolio Size: # of Startups)* compared to the syndicate average, and the total average amount that syndicate CVCs have invested across their portfolios *(Portfolio Size: $ Invested)* relative to the syndicate average. The metrics also account for the average fund size of CVCs *($AUM)* compared to other syndicate members and the proportion of total syndicate investment attributable to CVCs in a given portfolio firm *(Total Invested in Startup)* . Additionally, they measure the average investment amount by CVCs in the portfolio company relative to the syndicate average *(Average Invested in Startup)*, and the relative experience of CVCs *(Average Age of VCs)*, assessed by the difference between their founding year and the deal year. Together, these CVC influence metrics examine the characteristics of CVCs associated with improved sustainability outcomes in CVC and IVC backed firms.

4 Empirical Findings

When analyzing the impact of CVC involvement on startup sustainability outcomes, Figure 1 compares startups receiving CVC-backed funding rounds with those whose funding rounds are exclusively IVC-backed. Focusing on startups whose first round of funding occurred after January 2007, the figure highlights two distinct ESG trajectories. Startups that do not receive CVC backing exhibit a steady downward trend in sustainability outcomes both before and after a funding round. There is no clear break in trend for month 0, suggesting their ESG trajectory is not significantly impacted by funding rounds. On the other hand, startups with a CVC investor in their funding round exhibit a different pattern. While ESG scores decline before funding, after a funding round this trend appears to stabilize, with some periods showing a slight improvement or slower decline relative to non-CVC startups.

This suggests a potential break in trend due to CVC involvement, possibly indicating that CVC investors play a role in stabilizing or improving sustainability outcomes.

Next, Figure 2 compares the spread between startup sustainability and their syndicate investors after a funding round. Figure 2a focuses on CVC-backed startups after a CVC backed funding round, showing a clear uptrend in spreads after receiving CVC investment in a funding round. Figure 2b presents the same spread for non-CVC backed startups after a funding round, where spreads initially increase but later decline.

Taken together, these results suggest CVC investors may influence portfolio firms towards stronger sustainability outcomes. In order to test this hypothesis, we implement the following empirical model:

$$\begin{aligned} \textit{Startup Sustainability Impact}_{i,t} = \alpha_{Industry} + \gamma_t + \beta_1 \textit{Strategic Ratio}_{i,k,t} + \beta_2 SSI_{i,k,t-12} \\ + \beta_3 Age_{i,t} + \beta_4 \textit{Number of VCs}_{i,k,t} + \beta_5 \textit{Successful Exit}_{i,t} \\ + \beta_6 Disclosure_{i,t} + \beta_7 \textit{VC AUM}_{i,t} + u_{i,k,t} \end{aligned} \tag{4}$$

Control variables follow the literature (Chemmanur et al., 2014; Gu, Huang, Mao, and Tian, 2022) as Table 2 examines the ESG performance of startups backed by CVC and Independent Venture Capital (IVC) investors. Using panel regressions, the dependent variable is the Startup Sustainability Impact (SSI), which measures the ESG outcomes of each startup over time. Key explanatory variables include the Strategic Ratio, defined as the proportion of CVC investors in the syndicate, and a CVC Flag, a dummy variable indicating whether the primary investor is a CVC.

Table 2 coefficients on β_1 are all positive and significant, ranging from 0.152^{***} in Column 1 to 0.069^{***} in Column 4 and also positive and significant for CVC Flag in Columns 5 and 6. These findings suggest that CVCs are systematically more effective in identifying and supporting startups with higher ESG potential. However, an important limitation of this analysis is the potential endogeneity arising from CVCs selecting startups that are already

poised to improve their ESG performance, aligning with their corporate goals. Negative coefficients on successful exit (acquired or IPO), valuation disclosure, and VC AUM also suggest findings are less supportive of rational sustainability.

Other notable differences include the **higher number of investors per syndicate and lower Syndicate AUM Average** for dual-backed startups, indicating that these startups may attract a **larger but financially less concentrated** set of venture capitalists. The t-statistics in the final column provide evidence of whether these differences are statistically significant, with higher absolute values suggesting **stronger statistical evidence of a difference** between the two groups.

4.1 Endogenous Selection Bias I

To address the endogeneity concern raised in Table 2, Table 3 examines only startups that have CVC and IVC investors. IVC participation indicates greater financial returns (Chemmanur et al., 2014; Tian, 2012), concentrating on maximizing returns for their investors. This approach contrasts with CVCs, and their dual participation helps satisfy the conditions of rational sustainability, ensuring that any observed ESG impacts from CVC involvement are not solely due to CVC's selecting stratups with strong pre-existing ESG trajectories. Summary statistics in Table 1 suggest significant differences between CVC only or IVC only backed firms, compared to startups with both types of investors.

The β_1 values in Table 3 are positive and significant, similar to Table 2, indicating that a higher proportion of CVC investors is associated with improved startup sustainability. However, the β_1 coefficients in Table 3 are smaller compared to Table 2. For instance, in Table 3 Column 6, the coefficient of 0.046** is about a third smaller than Table 2 Column 4's coefficient of 0.069***. A notable difference is that *Successful Exit* is positive and significant, which supports rational sustainability in that firms with stronger ESG performance may be more attractive for exits or IPOs. Results are consistent when using industry x time fixed effects, ensuring that results are not driven by industry-level ESG shocks that evolve over

time, providing a cleaner estimate of the relationship between CVC investments and startup sustainability.

4.2 Endogenous Selection Bias II

Next, Table 4 introduces a novel metric, the Sustainability Alpha (SSA), defined as the spread between a startup's SSI and the average SSI of its syndicate. This metric isolates the incremental ESG contribution of startups relative to their peer group, reducing the possibility that CVCs merely select startups aligned with their ESG goals. The SSA makes a better causal proxy than raw SSI as it helps measure startup-specific deviations from syndicate expectations.

Table 4 results confirm prior findings that CVC investments are associated with improved startup sustainability performance, as indicated by the positive and highly significant coefficients on *Strategic Ratio* across all specifications. Results remain robust even when controlling for past SSA trends, which is also strongly significant in Columns 5 and 6. This suggests that CVC influence on startup sustainability persists beyond prior ESG commitments, rather than merely reflecting a continuation of pre-existing trends. Also, successful exit, valuation disclosure, and VC Aum does not appear to drive ESG deviations, suggesting that CVC involvement explains ESG improvements.

4.3 Facebook-Cambridge Analytica - Triple Difference-in-Difference

To further address endogeneity, we use the Facebook-Cambridge Analytica (*FB-CA*) data scandal as a quasi-natural experiment. This 2018 scandal, which exposed misuse of personal data and raised public scrutiny of corporate ESG practices, particularly in data analytic sectors, provides a setting to examine whether CVC-backed firms respond differently to heightened ESG pressures compared to non-CVC-backed firms. Table 5 employs a triple difference-in-difference framework, leveraging variation across time (pre- vs. post-scandal), industry (data analytics vs. non-data analytics), and CVC exposure (proxied by the pro-

portion of CVC investors within a startup's syndicate, Strategic Ratio).

$$\begin{aligned} SSI_{i,t} = \alpha_{industry} + \gamma_t + \beta_1 \times Strategic_{i,k,t} \times FB\text{-}CA_t \times Data\ Analytics_{i,t} \\ + \beta_2 \times FB\text{-}CA_t \times Data\ Analytics_{i,t} + \beta_3 \times Strategic_i + \Gamma' X_{i,t} + \epsilon_{i,t} \end{aligned} \tag{5}$$

$FB\text{-}CA_t$ equals 1 for the years following the Facebook-Cambridge Analytica scandal (April 2018 and later) and 0 otherwise. β_1, the key triple interaction term captures whether data analytics startups with greater CVC involvement exhibited different ESG responses compared to their counterparts with fewer or no CVC investors. By incorporating these multiple layers of comparison, the model helps mitigate concerns that ESG changes may be driven by broader ESG trends, industry-wide shifts, or syndicate-specific dynamics, rather than the actual impact of increased scrutiny on data practices post-scandal. The exogenous shock provides a natural experiment to assess whether CVC-backed startups were better positioned to adapt to external pressures on ESG performance, particularly in areas of social responsibility and governance.

The results show that the triple interaction term is positive and highly significant across all specifications. Breaking down ESG into its subcomponents, the effect is strongest in the social (0.178) and governance (0.122) categories, consistent with the nature of the scandal, which primarily raised concerns about data privacy, ethical oversight, and corporate accountability. The environmental category also shows a positive effect (0.061), though smaller, likely because the scandal was not directly linked to environmental issues.

The double interaction term, *FB-CA*×*Data Analytics* is negative and significant for social and governance scores, suggesting that, on average, data analytics firms saw relative declines in ESG scores post-scandal. However, this decline was offset or reversed among firms with higher CVC involvement, as indicated by the positive and significant triple interaction term. This finding supports the interpretation that CVC investors helped mitigate the negative ESG impact of the scandal for their portfolio firms. Overall, these results provide further evidence that CVC investors play an active role in helping data analytics startups navigate

ESG pressures in response to external shocks, particularly in social and governance metrics.

4.4 CVC Influence

Tables 6 and 7 examine the characteristics of CVC investors within a syndicate to determine which factors drive their influence on startup ESG performance. Rather than treating all CVC investors as homogeneous, these tables analyze how differences in CVC portfolio size, investment amounts, assets under management (AUM), and experience relative to the syndicate average impact ESG outcomes. By incorporating these detailed syndicate-level CVC characteristics, this approach helps uncover which dimensions of CVC involvement are most relevant for sustainability improvements.

Table 5 focuses on the Startup Sustainability Impact (SSI) as the dependent variable, revealing that relative CVC influence, measured by syndicate-average CVC AUM and total investment in the startup, is positively associated with ESG performance. Specifically, CVCs with higher AUM relative to their syndicate peers exhibit a significant positive effect on ESG outcomes (0.161**), suggesting that larger CVC funds may be more influential in driving sustainability outcomes. The total investment by CVCs relative to the syndicate also shows a positive relationship (0.114*), indicating that financial commitment by CVCs may play a role but is not the sole driver of ESG influence.

Table 6 extends the analysis using Startup Sustainability Alpha (SSA) as the dependent variable, and results reinforce the importance of CVC AUM (1.485*). Additionally, the relative experience of CVCs in prior investments appears to play a role, as more experienced CVCs tend to have a greater ESG impact compared to their syndicate peers (0.238*). These findings suggest that not all CVCs contribute equally to ESG outcomes—those with more capital, greater investment intensity, and deeper experience within their industry seem to be the most influential in shaping startup sustainability performance.

5 Conclusion

Rational sustainability offers a middle ground between ESG enthusiasts who advocate for broad-based impact investing and skeptics who question its financial viability. As Alex Edmans suggests, sustainability must be embedded in long-term profitability rather than treated as an ideological pursuit. However, the fundamental question remains: Can rational sustainability exist in practice? Our study leverages a unique quasi-natural experimental setting to explore this question, examining startups backed by both Corporate Venture Capital (CVC) and Independent Venture Capital (IVC) investors.

Through a series of rigorous empirical tests, we provide conditional evidence supporting the viability of rational sustainability. First, by restricting our analysis to firms with both CVC and IVC investors, we mitigate selection concerns that CVCs merely pick startups already on an ESG trajectory. Second, we introduce Startup Sustainability Alpha (SSA) to isolate the incremental impact of CVCs beyond baseline syndicate sustainability norms, confirming that ESG improvements extend beyond simple selection effects. Third, our triple difference-in-difference framework, using the Facebook-Cambridge Analytica scandal as an exogenous shock, demonstrates that CVC-backed startups in data analytics were better positioned to adapt to external ESG pressures, particularly in social and governance dimensions. Lastly, examining the characteristics of CVC investors within syndicates, we find that CVCs with higher AUM, deeper prior investment experience, and greater relative financial commitment exert the strongest influence on sustainability outcomes.

Taken together, our results indicate that rational sustainability can exist, but only under specific conditions. CVCs do not universally enhance ESG outcomes; rather, the scale, expertise, and strategic commitment of the CVC investor matter. These findings contribute to the broader ESG-finance debate by demonstrating that sustainability and financial returns are not inherently at odds—but their alignment depends on the structure and incentives of the capital providers. Future research should explore whether these findings extend beyond

venture capital to private equity, institutional investors, and public markets, refining the conditions under which rational sustainability can be achieved at scale.

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Appendix

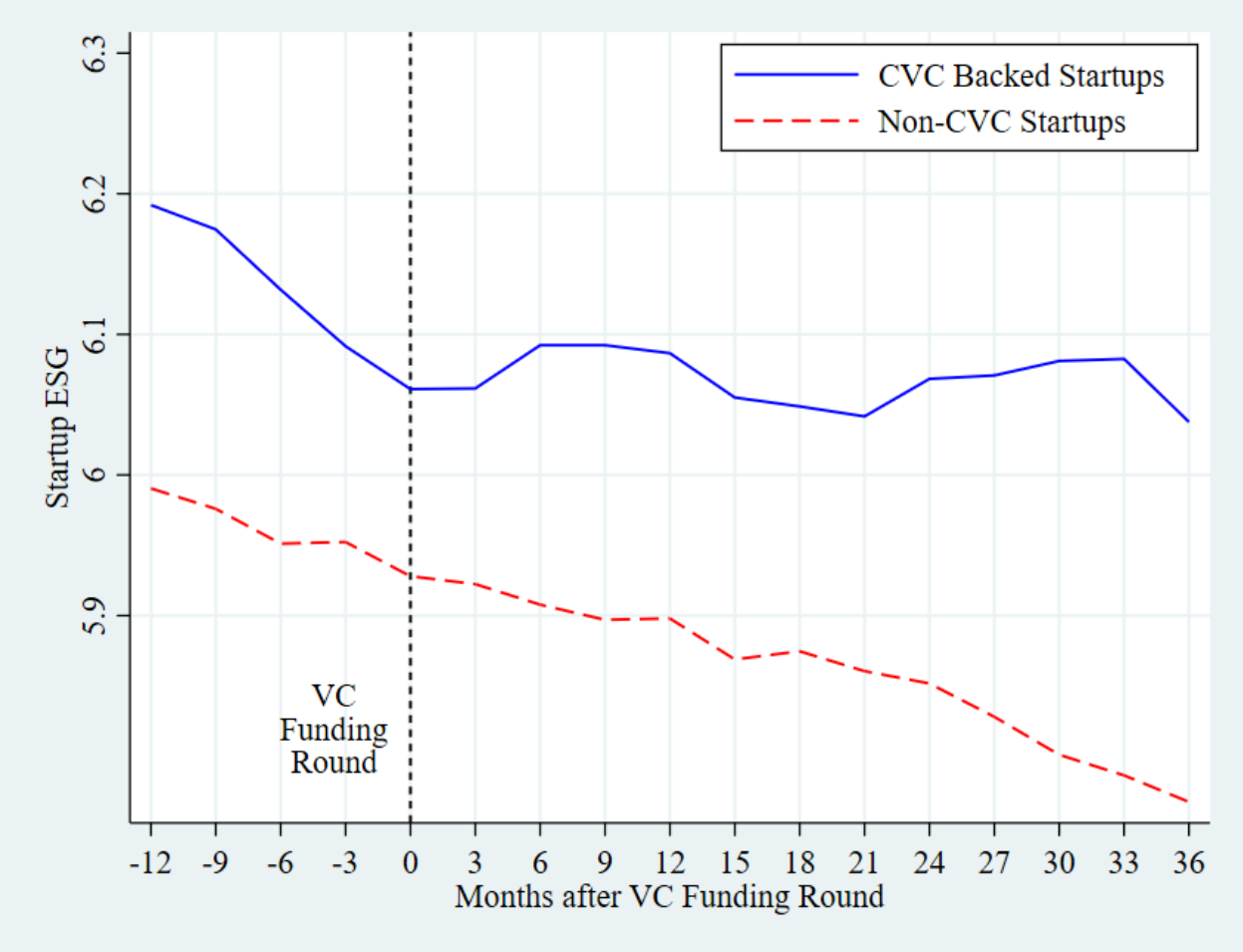
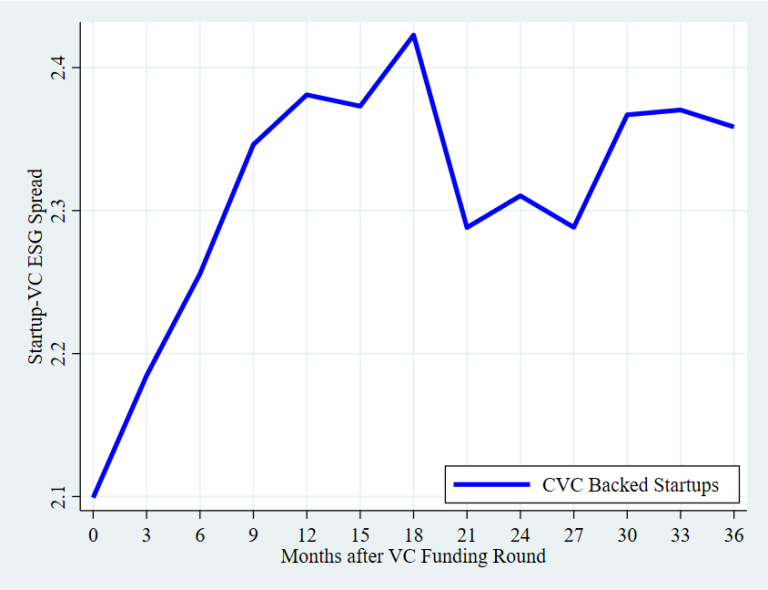
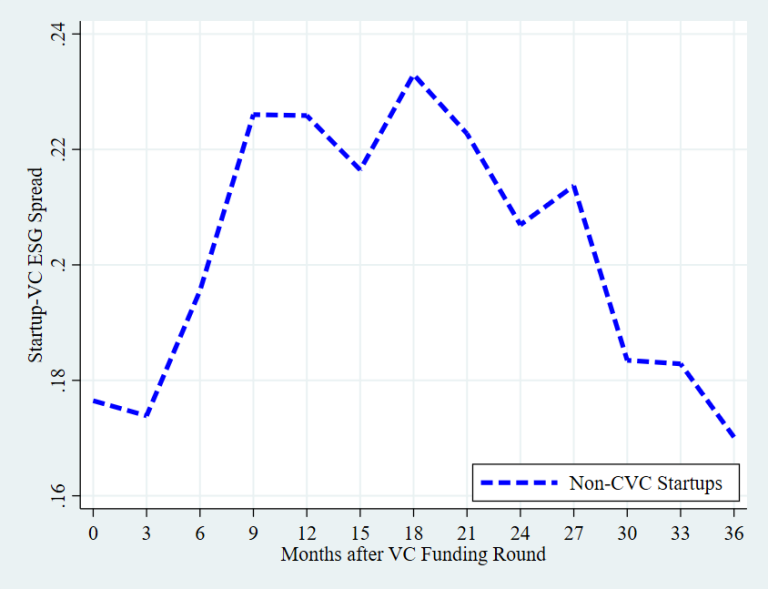


Figure 1. Startup Sustainability Impact After VC Funding Rounds
This chart shows the average ESG performance of startups from one year before to three years after their first funding round, which occurred after January 2007. Startups with at least one CVC investor are categorized as CVC-backed, while others are classified as non-CVC-backed (IVC-only). ESG performance is based on RepRisk ratings, with time measured in months relative to the funding round (month 0).



(a) Spreads After CVC-Backed Syndicate



(b) Spreads After Non-CVC Syndicate

Figure 2. Startup-VC Sustainability Spreads After VC Funding Rounds
This figure illustrates the ESG performance spreads between startups and their syndicate investors over time, measured as the difference between the startup's ESG score and the average ESG score of its syndicate. Panel (a) shows spreads for startups backed by at least one CVC investor, while Panel (b) shows spreads for startups funded exclusively by non-CVC (IVC-only) syndicates. Time is measured in months relative to the first funding round (month 0), and the spreads track the alignment or divergence in ESG performance post-investment.

Table 1. Summary Statistics

This table reports summary statistics for startups backed only by Corporate Venture Capital (CVCs) or Independent Venture Capital (IVCs), compared to startups that have received funding from both CVCs and IVCs. The number of observations (Obs) and mean values for each variable are categorized by type of investor backing. The final two columns report the difference in means between the two groups, along with the corresponding t-statistics from two-sample t-tests.

	CVC or IVC Backed Startup		CVC and IVC Backed Startup		Two-Sample t-Test	
	Obs	Mean	Obs	Mean	Diff	t-Stat
Startup Sustainability Impact	1,189,608	8.95	172,872	9.02	-0.072	-45.1
Startup Sustainability Alpha	745,920	0.23	143,136	0.73	-0.504	-150.0
Strategic Ratio	1,189,608	0.02	172,872	0.17	-0.148	-520.0
Syndicate Sustainability Avg	745,920	8.71	143,136	8.29	0.414	136.0
Environmental Score	1,189,608	0.98	172,872	0.99	-0.008	-29.4
Social Score	1,189,608	0.92	172,872	0.92	0.008	11.8
Governance Score	1,189,608	0.95	172,872	0.97	-0.026	-49.7
Startup Age	1,189,608	21.13	172,872	21.33	-2.420	-5.0
Successful Exit	1,189,608	0.48	172,872	0.50	-0.017	-12.9
Valuation Disclosure	1,189,608	0.08	172,872	0.06	0.013	19.1
Average # of Investors	1,189,608	9.20	172,872	12.65	-3.453	-210.0
Syndicate AUM Avg ($M)	1,111,656	10,380	151,704	5,420	4,961	86.3

Table 2. Strategic Investing and Startup Sustainability Impact

This table reports panel regressions examining the impact of corporate venture capital (CVC) investing on startup environmental, social, and governance (ESG) performance. In Columns (1)-(6), the dependent variable is the Startup Sustainability Impact (SSI) rating of startup i at time t. *Strategic Ratio* is k, the proportion of CVC investors in VC syndicate, while *CVC Flag* is a dummy variable with a value of 1 when the venture capitalist j is a CVC. Control variables include lagged SSI scores, log of startup age, number of venture capital investors, successful exits (acquired or IPO), valuation disclosure status, and VC assets under management (AUM). Fixed effects are at the industry and time levels, and standard errors at clustered at the relationship and time levels. Each relationship is defined as a unique Startup-VC relationship in an investment round, and the panel structure is at the relationship and month-year level. The data encompasses the post-2007 period, starting one year before each firm's initial financing round. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. T-statistics are reported in parentheses.

	Dependent Variable: *Startup Sustainability Impact* $_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strategic Ratio$_{k,t}$	0.152***	0.202***	0.096***	0.069***		
	(5.9)	(6.36)	(4.97)	(3.97)		
CVC Flag$_{j,t}$					0.030***	0.021***
					(3.56)	(2.89)
Lagged SSI$_{i,t-12}$			0.527***	0.613***	0.527***	0.613***
			(30.57)	(36.4)	(30.58)	(36.4)
Age$_{i,t}$		-0.005	0	0	0	0
		(-1.14)	(-0.15)	(-0.05)	(-0.12)	(-0.03)
Number of VCs$_{i,t}$		-0.065***	-0.038***	-0.035***	-0.037***	-0.034***
		(-6.47)	(-6.58)	(-6.58)	(-6.45)	(-6.5)
Successful Exit$_{i,t}$		-0.115***	-0.048***	-0.044***	-0.049***	-0.044***
		(-9.12)	(-5.58)	(-5.63)	(-5.6)	(-5.65)
Disclosure$_{i,k,t}$		-0.044***	-0.038***	-0.028***	-0.038***	-0.028***
		(-2.51)	(-3.76)	(-3.1)	(-3.77)	(-3.11)
VC AUM$_{j,t}$		-0.009***	-0.004***	-0.003***	-0.004***	-0.003***
		(-4.56)	(-3.12)	(-3.03)	(-3.1)	(-3.02)
Observations	1,046,973	966,752	932,779	923,565	932,779	923,565
Industry x Time FE				✓		✓
Industry FE	✓	✓	✓		✓	
Time FE	✓	✓	✓		✓	
Relationship Cluster	✓	✓	✓	✓	✓	✓
Time Cluster	✓	✓	✓	✓	✓	✓
R^2	0.22	0.23	0.43	0.63	0.43	0.63
Within R^2	0.00	0.01	0.26	0.34	0.26	0.34

Table 3. Strategic Investing: CVC and IVC Backed Startups Only

This table reports panel regressions examining the impact of corporate venture capital (CVC) investing on startup environmental, social, and governance (ESG) performance. In Columns (1)-(6), the dependent variable is the Startup Sustainability Impact (SSI) rating of startup i at time t. *Strategic Ratio* is k, the proportion of CVC investors in VC syndicate, while *CVC Flag* is a dummy variable with a value of 1 when the venture capitalist j is a CVC. Control variables include lagged SSI scores, log of startup age, number of venture capital investors, successful exits (acquired or IPO), valuation disclosure status, and VC assets under management (AUM). Fixed effects are at the industry and time levels, and standard errors at clustered at the relationship and time levels. Each relationship is defined as a unique Startup-VC relationship in an investment round, and the panel structure is at the relationship and month-year level. The data encompasses the post-2007 period, starting one year before each firm's initial financing round. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. T-statistics are reported in parentheses.

	CVC and IVC Backed Startups Only Dependent Variable: *Startup Sustainability Impact* $_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strategic Ratio$_{k,t}$	0.073***	0.066***	0.065**	0.052**	0.048**	0.046**
	(3.1)	(2.94)	(2.35)	(1.97)	(2.41)	(2.41)
Lagged SSI$_{i,t-12}$					0.388***	0.464***
					(17.24)	(15.98)
Age$_{i,t}$			-0.035***	-0.033***	-0.026***	-0.023***
			(-5.21)	(-5.58)	(-4.73)	(-5.01)
Number of VCs$_{i,t}$			-0.092***	-0.089***	-0.063***	-0.053***
			(-4.33)	(-4.34)	(-3.28)	(-2.91)
Successful Exit$_{i,t}$			0.098***	0.088***	0.056***	0.051***
			(4.94)	(4.72)	(3.59)	(3.5)
Disclosure$_{i,k,t}$			-0.031	-0.026	-0.046	-0.035
			(-0.82)	(-0.72)	(-1.4)	(-1.14)
VC AUM$_{j,t}$			0.003	0.003	0.002	0.002
			(1.07)	(1.05)	(1.04)	(1.21)
Observations	126,740	126,740	109,212	108,874	107,036	106,714
Industry x Time FE		✓		✓		✓
Industry FE	✓		✓		✓	
Time FE	✓		✓		✓	
Relationship Cluster	✓	✓	✓	✓	✓	✓
Time Cluster	✓	✓	✓	✓	✓	✓
R^2	0.34	0.69	0.35	0.71	0.43	0.75
Within R^2	0.00	0.00	0.01	0.02	0.14	0.19

Table 4. Strategic Investing and Startup Sustainability Alpha

This table reports panel regressions examining the impact of corporate venture capital (CVC) investing on startup environmental, social, and governance (ESG) performance. In Columns (1)-(6), the dependent variable is the Startup Sustainability Alpha (SSA), or the sustainability rating of startup i minus the sustainability rating of the VC syndicate at time t. Other variables follow the definitions outlined in Table 2. Fixed effects are at the industry and time levels, and standard errors at clustered at the relationship and time levels. Each relationship is defined as a unique Startup-VC relationship in an investment round, and the panel structure is at the relationship and month-year level. The data encompasses the post-2007 period, starting one year before each firm's initial financing round. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. T-statistics are reported in parentheses.

	CVC and IVC Backed Startups Only Dependent Variable: *Startup Sustainability Alpha* $_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strategic Ratio$_{k,t}$	2.854***	2.839***	3.019***	2.999***	0.827***	0.595***
	(8.8)	(8.82)	(8.64)	(8.59)	(7.75)	(7.32)
Lagged SSA$_{i,t-12}$					0.762***	0.842***
					(37.97)	(52.06)
Age$_{i,t}$			0.063	0.067	0.01	0.005
			(1.59)	(1.68)	(0.79)	(0.56)
Number of VCs$_{i,t}$			-0.258**	-0.25**	-0.053	-0.023
			(-2.27)	(-2.21)	(-1.47)	(-0.75)
Successful Exit$_{i,t}$			0.069	0.06	-0.013	-0.013
			(0.57)	(0.49)	(-0.36)	(-0.44)
Disclosure$_{i,k,t}$			0.085	0.084	-0.013	-0.016
			(0.56)	(0.55)	(-0.26)	(-0.42)
VC AUM$_{j,t}$			-0.039**	-0.038**	-0.007	-0.003
			(-2.14)	(-2.13)	(-1.34)	(-0.7)
Observations	106,101	105,921	92,488	92,143	90,595	90,262
Industry x Time FE		✓		✓		✓
Industry FE	✓		✓		✓	
Time FE	✓	✓	✓		✓	
Relationship Cluster	✓	✓	✓	✓	✓	✓
Time Cluster	✓	✓	✓	✓	✓	✓
R^2	0.37	0.47	0.39	0.49	0.74	0.84
Within R^2	0.15	0.17	0.18	0.21	0.65	0.75

Table 5. Triple Difference-in-Difference: Facebook-Cambridge Analytica
This table reports the triple difference-in-difference sustainability impact of strategic investing in data analytics and data processing startups following the Facebook-Cambridge Analytica data scandal. *Cambridge Analytica* represents an event starting in March 2018 while Data Analytics represents startups with a 4 digit SIC code in the Data Analytics and Processing space. Other variables in Columns (1)-(6) follow the definitions outlined in Table 2. Fixed effects are at the industry and time levels, and standard errors are clustered at the relationship and time levels. Each relationship is defined as a unique Startup-VC relationship in an investment round, and the panel structure is at the relationship and month-year level. The data encompasses the post-2007 period, starting one year before each firm's initial financing round. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. T-statistics are reported in parentheses.

	Dependent Variable: *Startup Sustainability Impact* $_{i,t}$			
	Overall (1)	*Social* (2)	*Governance* (3)	*Environ* (4)
Cambridge Analytica$_t$× *Data Analytics*$_{i,t}$× *Strategic Ratio*$_{k,t}$	0.302***	0.178***	0.122**	0.061***
	(2.5)	(2.97)	(2.31)	(3.85)
Cambridge Analytica$_t$× *Data Analytics*$_{i,t}$	-0.02	-0.075***	-0.028***	0.016***
	(-0.8)	(-5.54)	(-2.93)	(3.81)
Strategic Ratio$_{k,t}$	0.281***	0.08***	0.086***	-0.026***
	(6.01)	(3.65)	(5.15)	(-2.73)
Age$_{i,t}$	-0.001	-0.011***	0.007*	0.001
	(-0.06)	(-2.81)	(1.81)	(0.47)
Number of VCs$_{i,t}$	-0.09***	-0.04***	-0.01**	-0.002
	(-7.07)	(-8.61)	(-2.36)	(-1.39)
Successful Exit$_{i,t}$	-0.173***	-0.069***	-0.037***	-0.011***
	(-7.56)	(-9.21)	(-4.39)	(-5.1)
Disclosure$_{i,k,t}$	-0.071***	-0.052***	0.011	-0.015***
	(-2.67)	(-4.56)	(1.22)	(-3.11)
VC AUM$_{j,t}$	-0.01***	-0.001	-0.004***	-0.001
	(-3.03)	(-0.86)	(-3.4)	(-1.66)
Observations	358,573	358,573	358,573	358,573
Industry FE	✓	✓	✓	✓
Time FE	✓	✓	✓	✓
Relationship Cluster	✓	✓	✓	✓
Time Cluster	✓	✓	✓	✓
R^2	0.22	0.16	0.15	0.27
Within R^2	0.02	0.02	0.01	0.01

Table 6. CVC Influence on Startup Sustainability Impact

This table examines the influence of corporate venture capital (CVC) on the Startup Sustainability Impact (SSI) rating of startup i at time t. *Relative CVC Influence* is a ratio of syndicate k's CVC average to the entire syndicate average. For instance, "# of Startups" is the average number of startups that CVCs in syndicate k has invested in, compared to the average of the entire syndicate. Control variables include log of startup age, number of venture capital investors, successful exits (acquired or IPO), valuation disclosure status, and VC assets under management (AUM). Fixed effects are at the industry and time levels, and standard errors at clustered at the relationship and time levels. Each relationship is defined as a unique Startup-VC relationship in an investment round, and the panel structure is at the relationship and month-year level. The data encompasses the post-2007 period, starting one year before each firm's initial financing round. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. T-statistics are reported in parentheses.

	CVC and IVC Backed Startups Only Dependent Variable: *Startup Sustainability Impact* $_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Relative CVC Influence$_{k,t}$ *(Portfolio Size: # of Startups)*	0.022 (1.11)					
Relative CVC Influence$_{k,t}$ *(Portfolio Size: $ Invested)*		0.009 (0.6)				
Relative CVC Influence$_{k,t}$ *($AUM)*			0.161** (2.13)			
Relative CVC Influence$_{k,t}$ *(Total Invested in Startup)*				0.114* (1.7)		
Relative CVC Influence$_{k,t}$ *(Avg Investment in Startup)*					0.044 (0.97)	
Relative CVC Influence$_{k,t}$ *(Average Age of VC)*						0.072 (1.62)
Observations	15,120	15,120	3,033	14,070	14,070	15,120
Controls	✓	✓	✓	✓	✓	✓
Industry x Time FE	✓	✓	✓	✓	✓	✓
Relationship Cluster	✓	✓	✓	✓	✓	✓
Time Cluster	✓	✓	✓	✓	✓	✓
R^2	0.71	0.71	0.76	0.71	0.71	0.71
Within R^2	0.04	0.03	0.23	0.04	0.04	0.04

Table 7. CVC Influence on Startup Sustainability Alpha

This table examines the influence of corporate venture capital (CVC) on the Startup Sustainability Alphampact (SSA) rating of startup i at time t. *Relative CVC Influence* is a ratio of syndicate k's CVC average to the entire syndicate average. For instance, "# of Startups" is the average number of startups that CVCs in syndicate k has invested in, compared to the average of the entire syndicate. Control variables include log of startup age, number of venture capital investors, successful exits (acquired or IPO), valuation disclosure status, and VC assets under management (AUM). Fixed effects are at the industry and time levels, and standard errors at clustered at the relationship and time levels. Each relationship is defined as a unique Startup-VC relationship in an investment round, and the panel structure is at the relationship and month-year level. The data encompasses the post-2007 period, starting one year before each firm's initial financing round. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. T-statistics are reported in parentheses.

	CVC and IVC Backed Startups Only Dependent Variable: *Startup Sustainability Alpha* $_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Relative CVC Influence$_{k,t}$ *(Portfolio Size: # of Startups)*	0.161 (1.13)					
Relative CVC Influence$_{k,t}$ *(Portfolio Size: $ Invested)*		0.238* (1.69)				
Relative CVC Influence$_{k,t}$ *($AUM)*			1.485* (1.95)			
Relative CVC Influence$_{k,t}$ *(Total Invested in Startup)*				0.7 (1.52)		
Relative CVC Influence$_{k,t}$ *(Avg Investment in Startup)*					0.348 (1.14)	
Relative CVC Influence$_{k,t}$ *(Average Age of VC)*						0.007 (0.03)
Observations	13,426	13,426	2,413	13,216	13,216	13,426
Controls	✓	✓	✓	✓	✓	✓
Industry x Time FE	✓	✓	✓	✓	✓	✓
Relationship Cluster	✓	✓	✓	✓	✓	✓
Time Cluster	✓	✓	✓	✓	✓	✓
R^2	0.54	0.55	0.80	0.57	0.56	0.54
Within R^2	0.06	0.08	0.64	0.05	0.05	0.05