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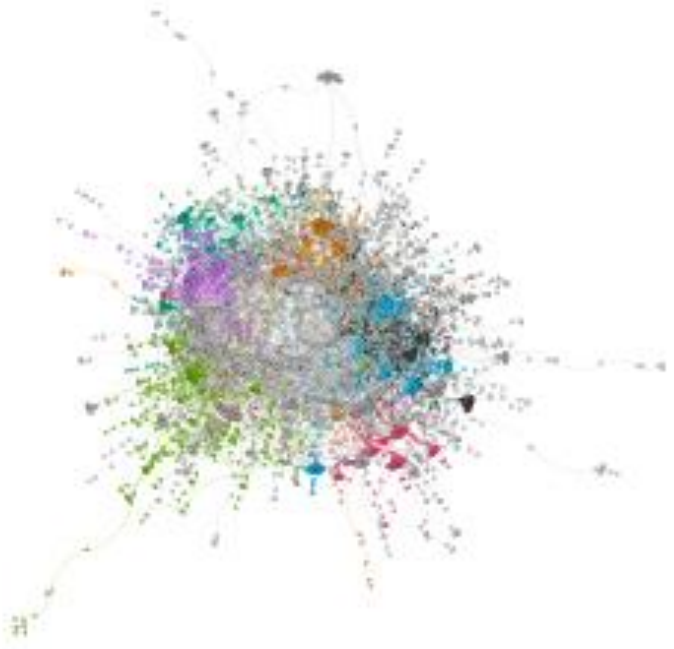
Impact of Venture Capital on Green Innovation



Dimitris Christopoulos
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in collaboration with

Stefan Koeppl, David Dekker, Matthew Smith, George Tzougas & Victor Rosenberg

Financing Decarbonization: Venture Capital

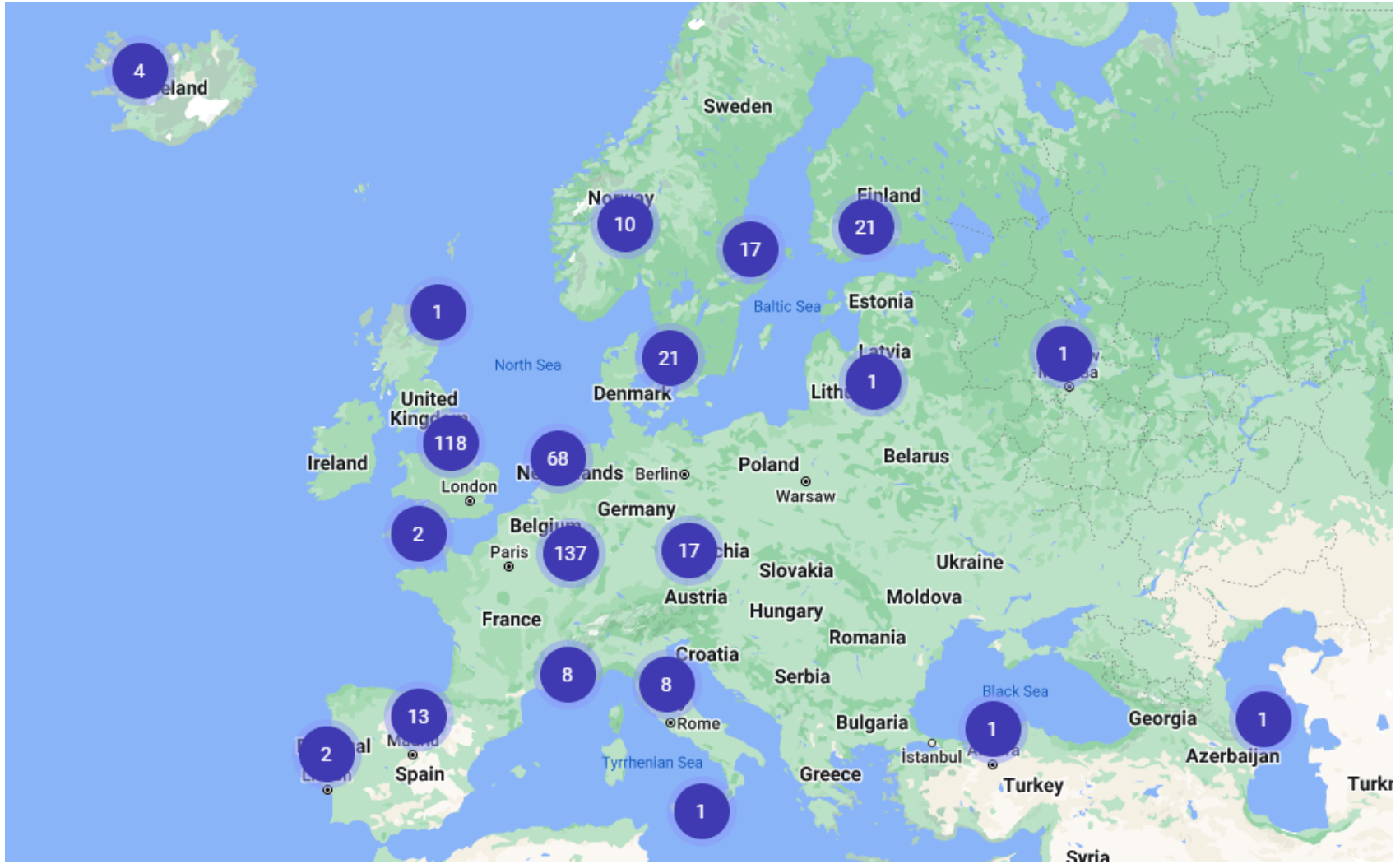
Achieving economic sustainability depends on high levels of invention and innovation:

- Venture capital (VC), is investment capital with an appetite for high-risk expecting equivalent high-rewards
- High risk capital is assumed key in achieving the level of innovation required
- Venture capital is critical to a sustainable future by funding clean-tech start-ups and green ventures

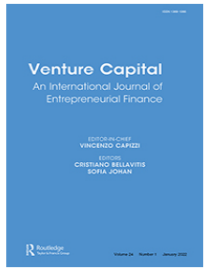
Achieving sustainability also goes beyond risk finance and involves the complex interaction between:

- Accelerating the rate of inventions
- Accelerated innovation
- Business climate
- Global politics
- Regulations & tax
- Markets

Concentration of Clean-Tech Funds & VCs in Europe in 2022



PROJECT 1:
Venture Capital and Clean Tech Investments



Routledge
Taylor & Francis Group

Venture Capital
An International Journal of Entrepreneurial Finance

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tvec20

Syndication networks and company survival: evidence from European venture capital deals

Dimitris Christopoulos, Stefan Koeppl & Monika Köppl-Turyna

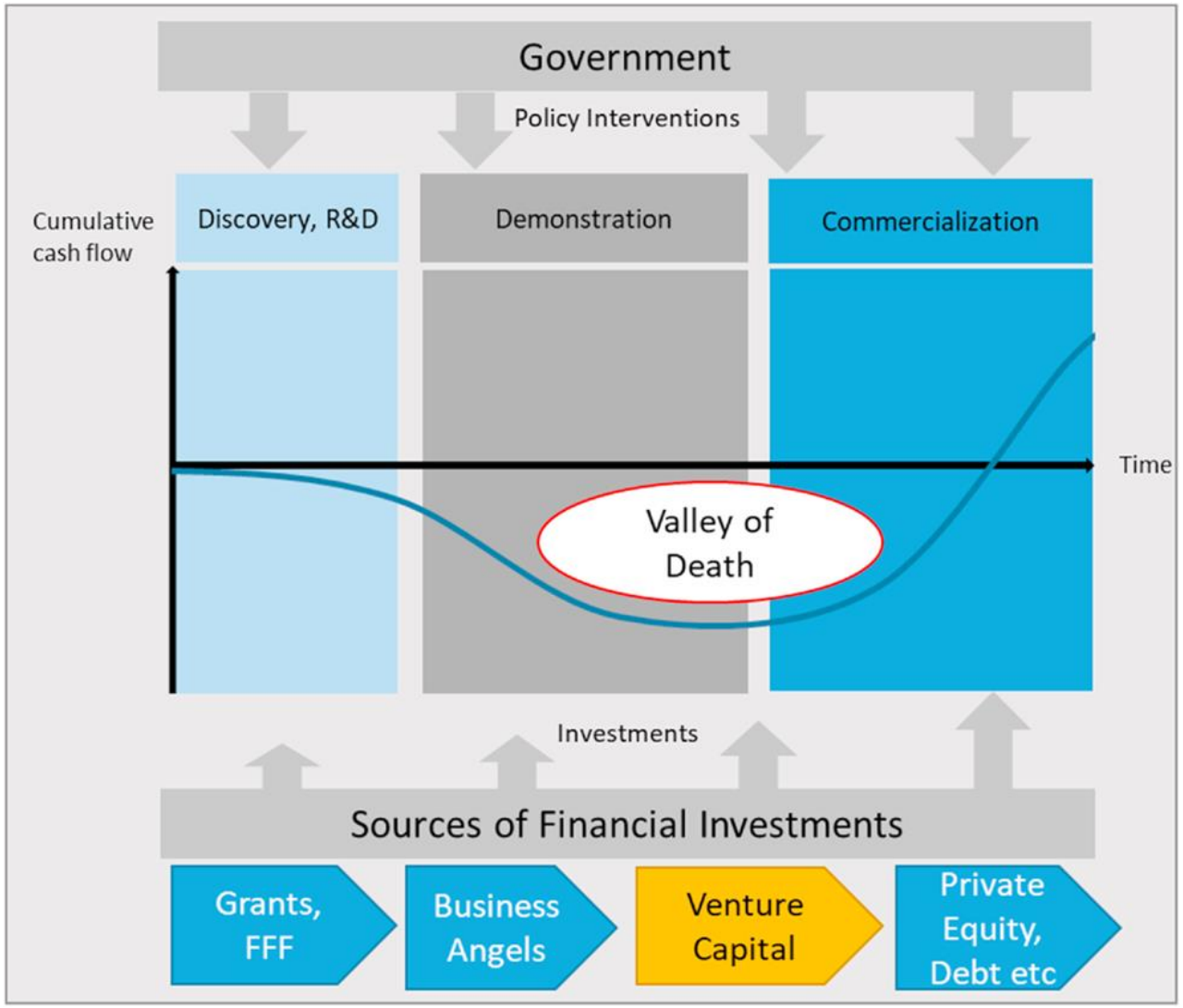
Summary findings:

- Syndicated investments have better chances of success, measured by the survival probability of portfolio companies or by successful exits.
- Network centrality of syndicates is associated to survival between different financing rounds, the former being more important in early-stage investments and in the first round of financing.
- Network ties of investors is associated with the sales growth of portfolio companies, both in the selection and value-added channels.

Project 2
Government vs Private VCs

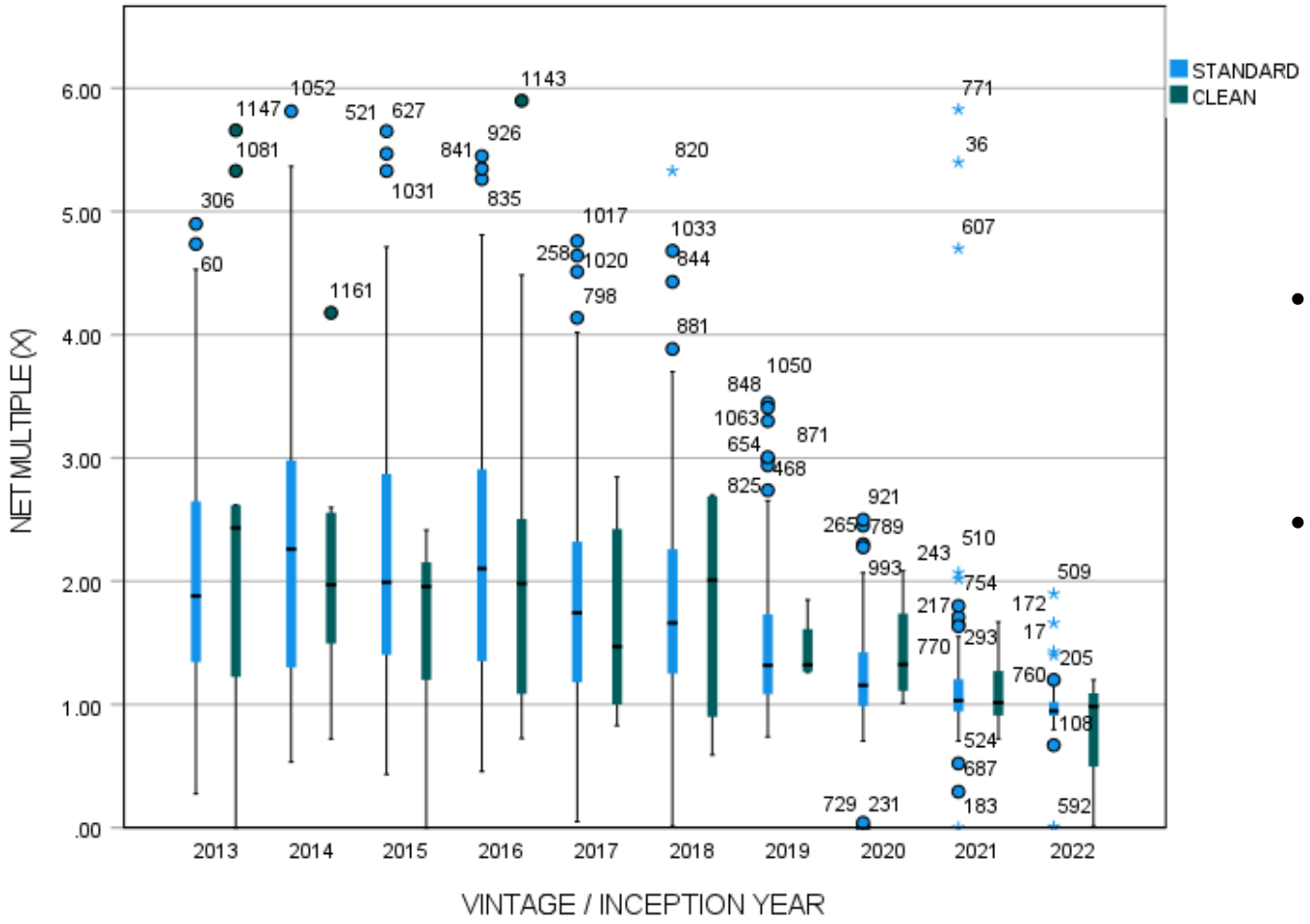
Governments can intervene with policies or funds to support startups survive the “valley of death” via:

- Supporting research that will benefit startups
- Provide tax breaks and regulatory incentives
- Directly invest in startups through managing public VC funds
- Indirectly invest in startups by underwriting Hybrid VC Funds



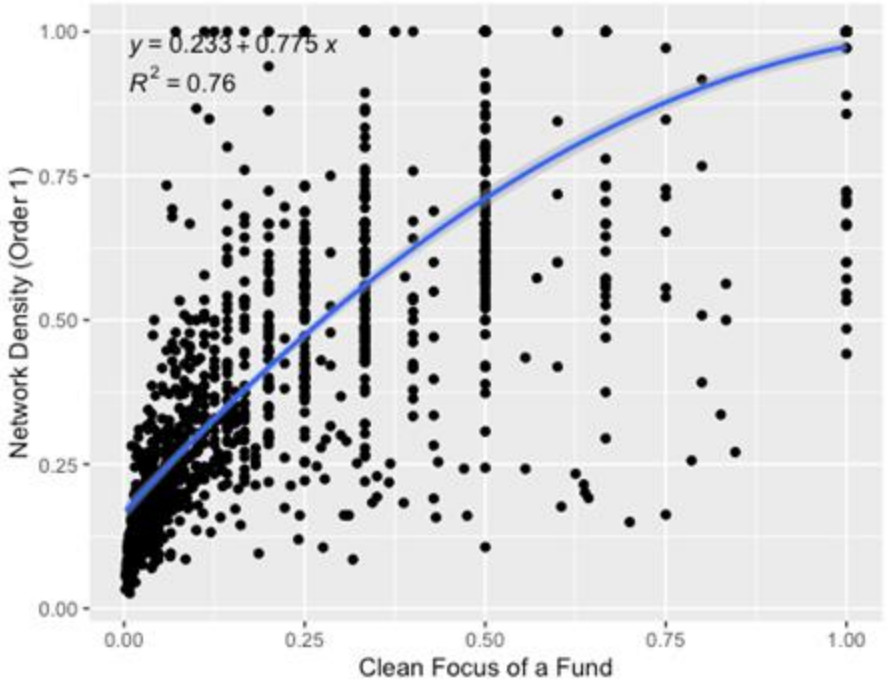
Comparing the performance of "ordinary" with cleantech funds

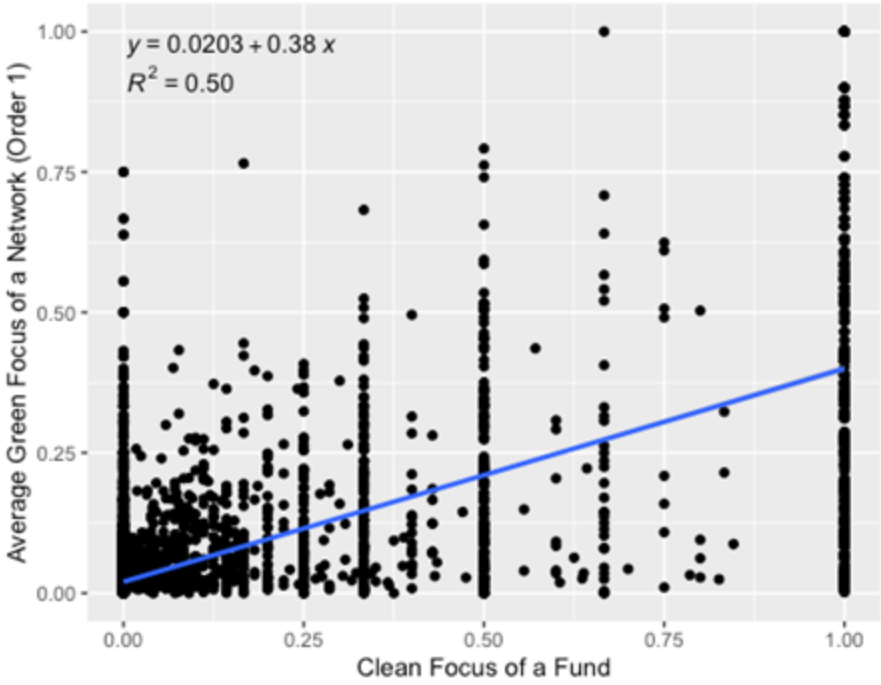
outliers excluded, closed funds, 2013-2022, >10mil$, 1165 cases



- Mean values of performance for *cleantech* higher for half the years under observation
- Variance for clean-tech is lower

Who do green funds syndicate with (are connected to)? Ego networks of funds compared to their level of focus on green ventures





funds investing primarily in cleantech startups have strong relationships with other funds in their sector

PROJECT 3

Clean vs Non-Clean,

GROUP A or GROUP B?

Successful exit probability dependent on VC type			
	GVC	EIF-hybrid	EIF-private
GROUP B	**0.154**	**0.247**	**0.150**
GROUP A	**0.214**	**0.316**	**0.267**

	GROUP A		GROUP B	
	Mean	SD	**Mean**	SD
Number of rounds	**1.863**	2.426	**1.961**	2.187
Stage	**3.434**	2.108	**3.606**	2.104
Deal Size (in Mio Eur)	**22.56**	127	**42.54**	213.8
Total Funding (in Mio Eur)	**82.27**	361.5	**148.4**	729.2
Syndicate Size	**4.632**	4.96	**3.913**	3.303
Industry Expertise	**14.25**	27.87	**4.738**	12.83
Successful Exit	**.2516**	.4339	**.1494**	.3565

PROJECT 3

Key Traits in the Cleantech Startup Landscape

Successful exit probability dependent on VC type			
	GVC	EIF-hybrid	EIF-private
Cleantech	**0.154**	**0.247**	**0.150**
Non Cleantech	**0.214**	**0.316**	**0.267**

Inflated Valuations?

Lower Risk

	Non Cleantech		Cleantech	
	Mean	SD	Mean	SD
Number of rounds	**1.863**	2.426	**1.961**	2.187
Stage	**3.434**	2.108	**3.606**	2.104
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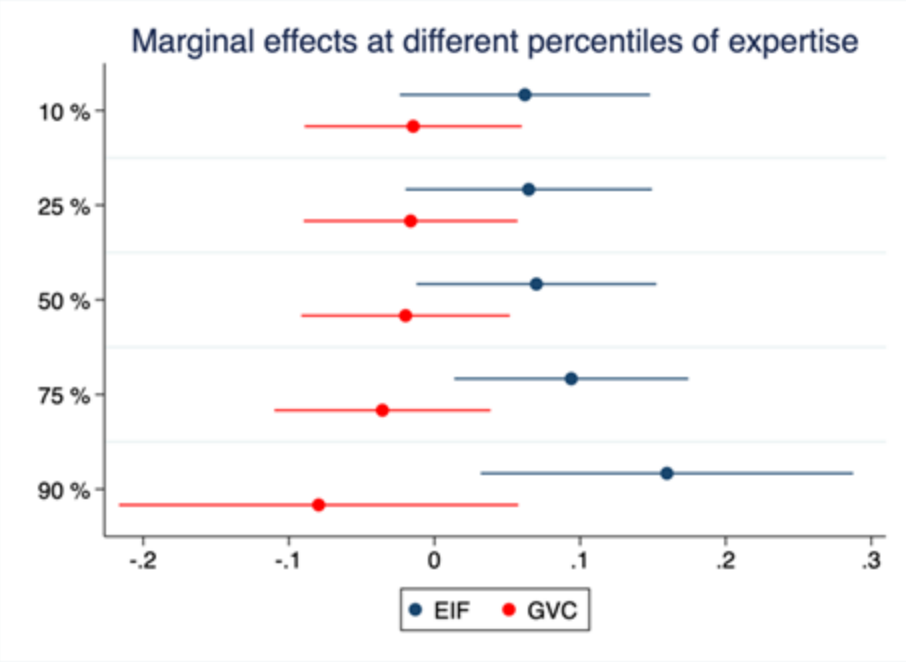
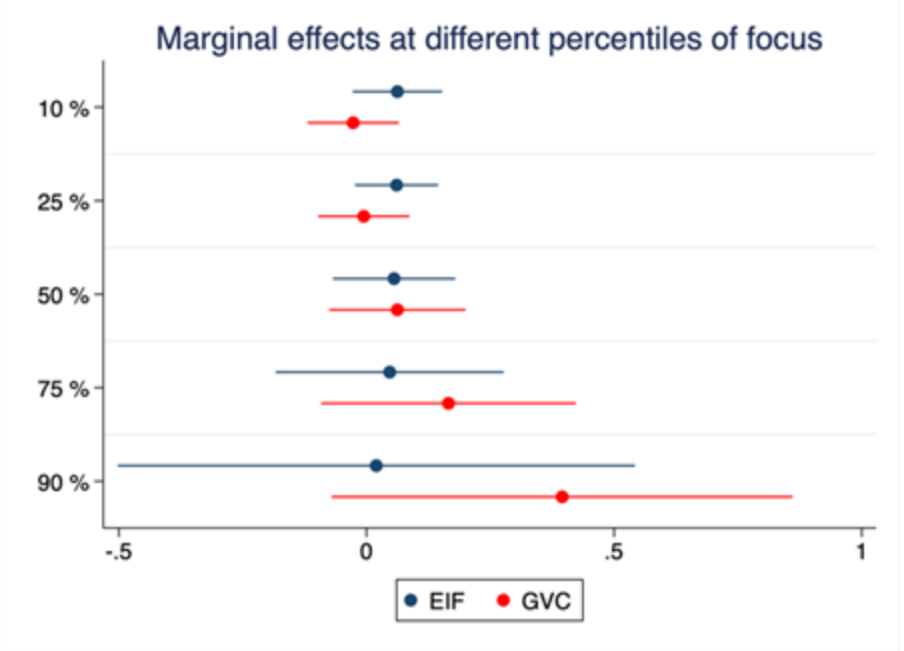
Expertise and focus matters (sometimes) to an exit:

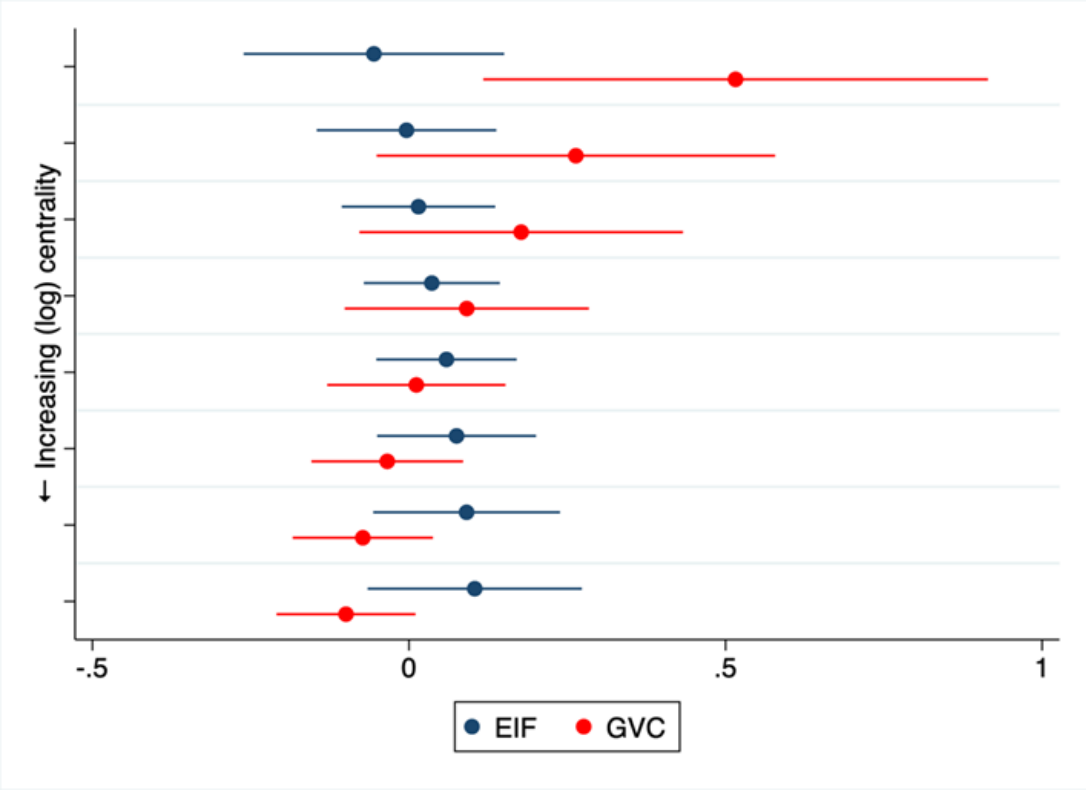
Marginal effects of GVC and EIF investments at different levels of expertise and levels of focus

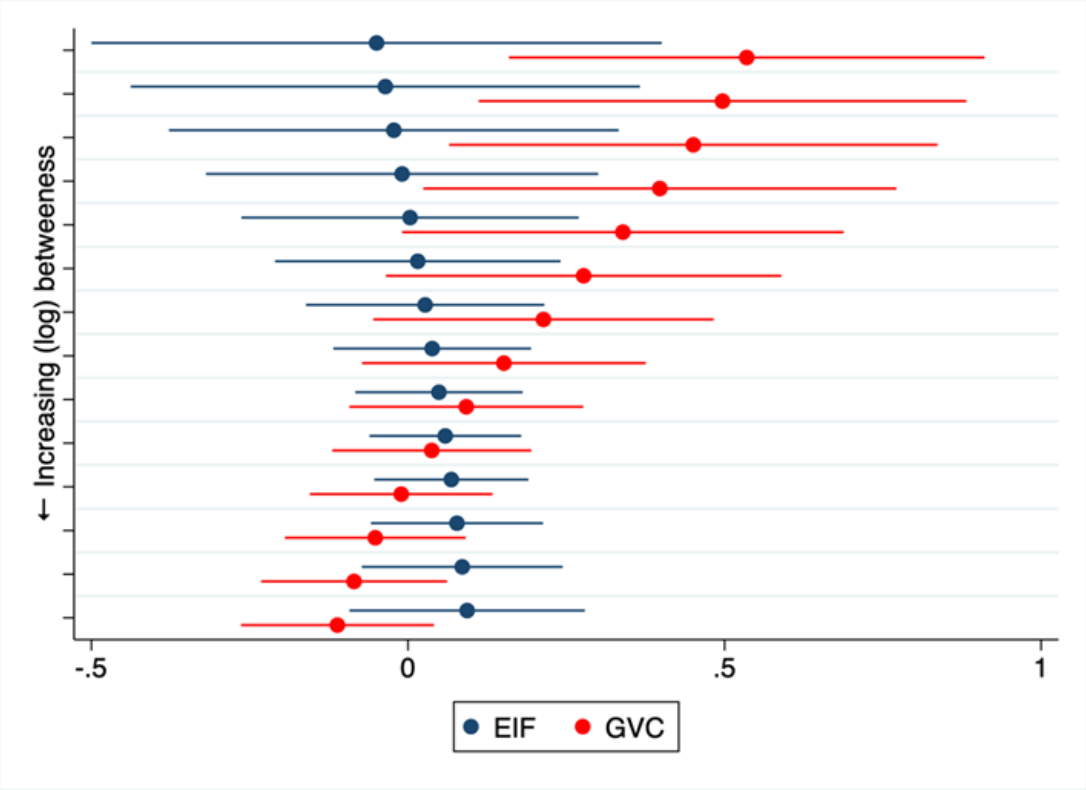




Centrality matters (most of the time) for an exit:

Marginal effects of GVC and EIF for degree and betweenness centrality of funds





While for EIF centrality has little impact

Future of VC funding of cleantech

Cleantech dedicated funds (2013-22)

- concentrate in Europe
- are strongly networked with others in their sector
- GVCs perform well (better than EIF) in cleantech

Cleantech dedicated funds however also

- reach higher valuations on average
- have smaller syndicates – less risk sharing
- have lower expertise on respective technologies

The Complexity Challenge

- Achieving sustainability will depend on getting cleantech innovation right
- Risk finance for clean-tech depends on constantly adapting instruments of finance including EIF, GVC, Hybrids as well as emergent instruments
  - The interaction of these with wider finance instruments is **complex and not linearly predictable**
  - Invention and innovation in cleantech sectors is inherently more complex due to its break-through character, leading to **uncertain estimates of underlying venture risks**

- Clean-tech is idiosyncratic
  - in the *short-term* clean tech is dependent on **government VCs** and support
  - evident risk that in the *medium term* cleantech ventures will stumble on the availability of capital given their higher valuations, i.e. **risk of a sectoral shock**
  - *long-term* risk is cleantech ventures will be **perceived as a high risk, low return sector**, which will stifle implementation and commercialisation of clean innovation

Thank you

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POSTSCRIPT ON UN SUSTAINABILITY GOALS

This work contributes to the UN's Sustainable Development Goals of: Affordable and Clean Energy (7); Decent Work and Economic Growth (8); Industry, Innovation, and Infrastructure (9); Sustainable Cities and Communities (11); Responsible Consumption and Production (12); and Climate Action (13).