

Sustainable Investments: New Drive for Growth amid Geopolitical Fragmentation

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Outline & Motivation (I)

Geopolitical Fragmentation and Sustainable Investment

① Geopolitical Fragmentation and Evolution of Sustainable Venture Investment Flows

- Why sustainable investments?
 - Clean-tech industries are prone to geopolitical risks
 - S&P: “Fragmented markets from geopolitical conflict threaten to throw energy transition off track”
 - We ask: (1) How sustainable investment patterns have evolved amid geopolitical fragmentation? (2) Where is ASEAN standing?
- Why venture investments?
 - Private sector needs to supply 80% of required investments to reach net zero by 2030 (IMF, 2023)
 - In 2019, 25% of private funding in the energy tech space came from early-stage VCs (International Energy Agency, 2020)

Outline & Motivation (II)

Zooming In On ASEAN

② Why ASEAN?

- ▶ “The region's strategic role as a buffer zone amid intensifying US-China competition also helps attract investment from around the world.” (Nikkei Asia, Dec 2023)
- ▶ “ASEAN is prioritizing four major sectors for the region's development: green infrastructure, digital economy, sustainable financing and tourism.” (Nikkei Asia, Oct 2023)

③ Can ASEAN Seize the Opportunity?

- ▶ We document sustainable investment and climate policy landscape of ASEAN
 - ▶ Which industries are attracting sustainable investments in ASEAN-6?
 - ▶ Do these match their policy objectives?

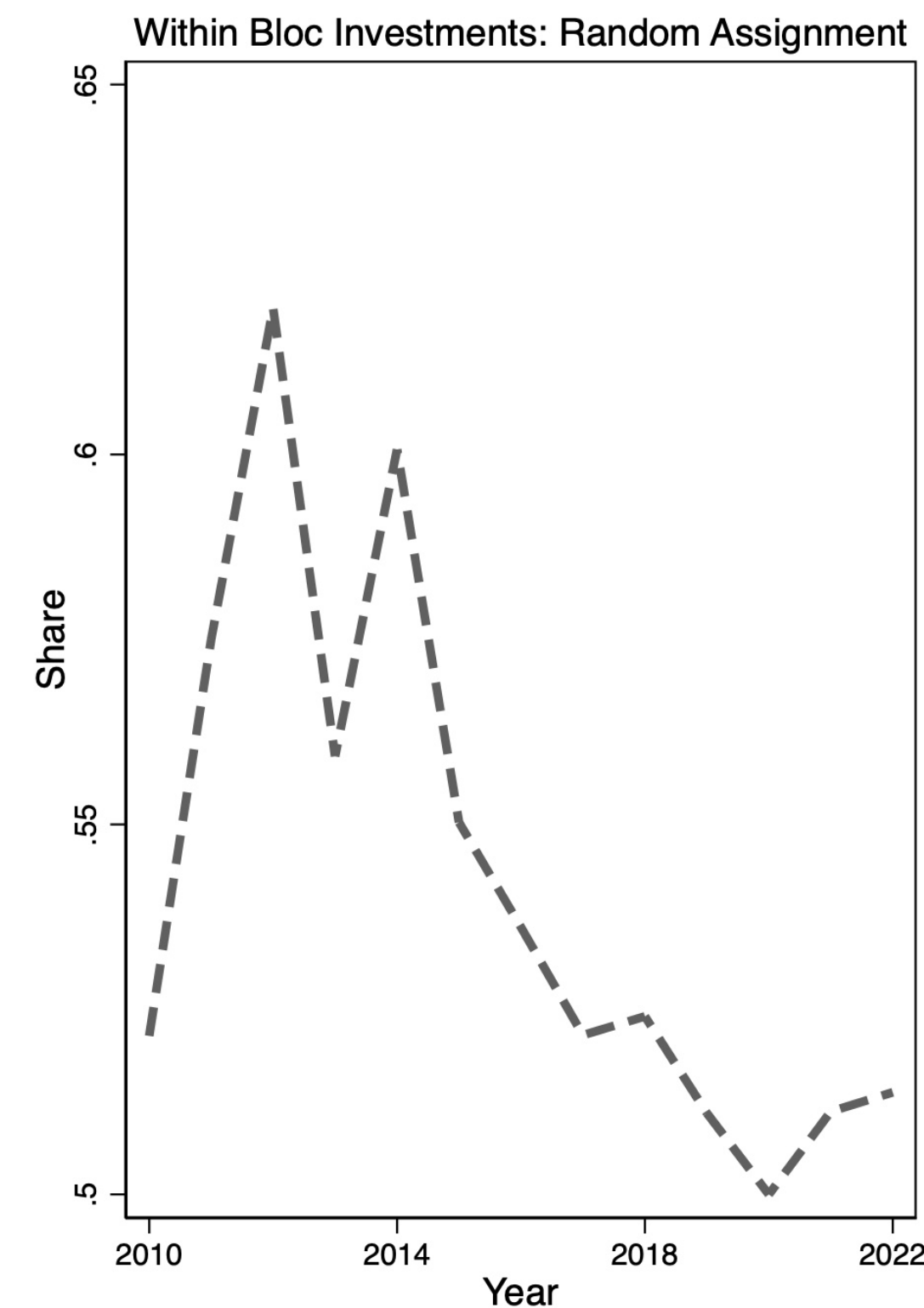
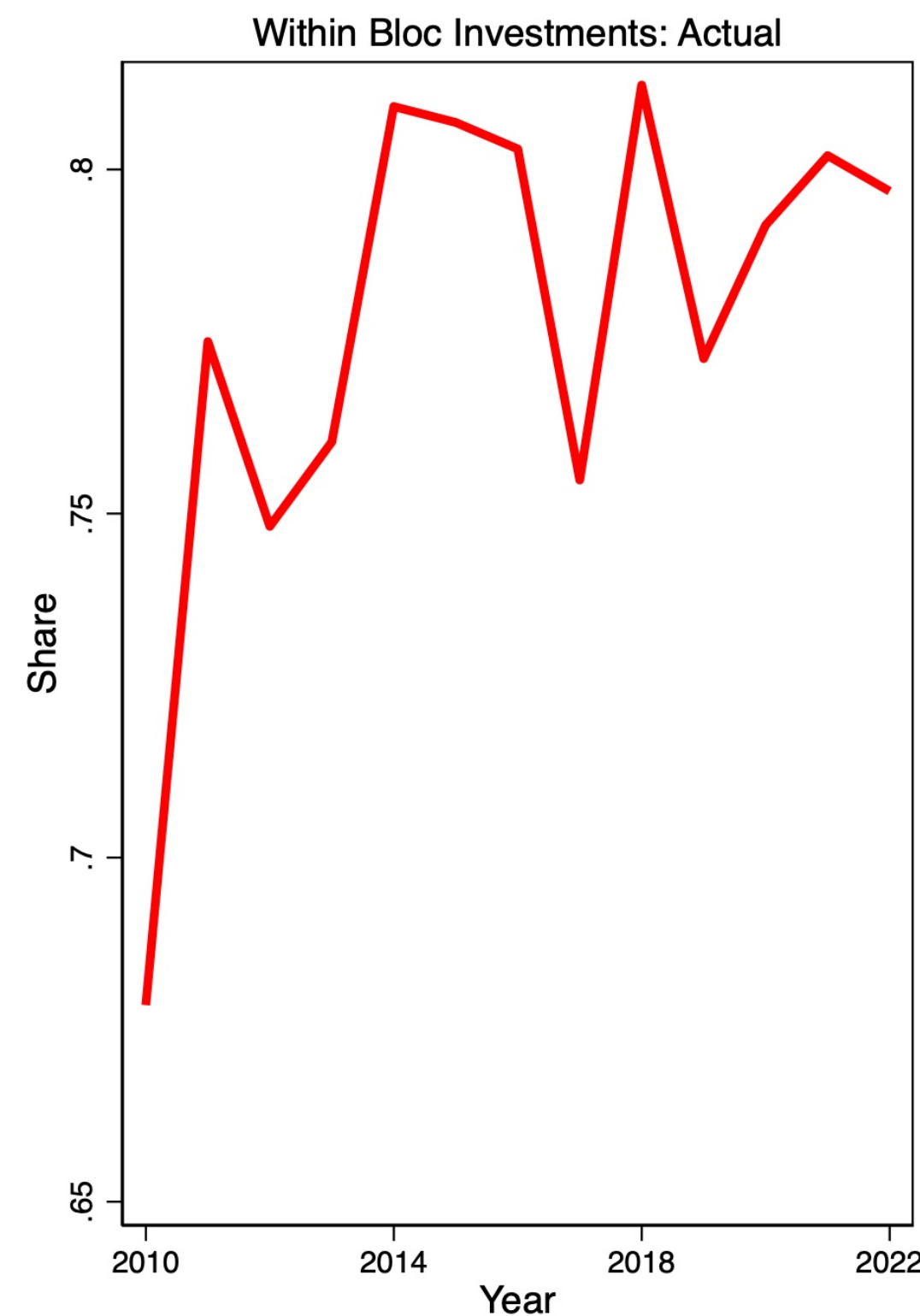
Geopolitical Fragmentation and Sustainable Investment Flows

- The classification of geopolitical blocs follows Javorcik et. al. (2023), which draws reference from UN voting patterns
 - Bloc 1: Countries with similar voting patterns to the US
 - Bloc 2: Countries with different voting patterns from the US
- **Singapore** is categorised under Bloc 1
- **ASEAN excluding Singapore** is categorised under Bloc 2



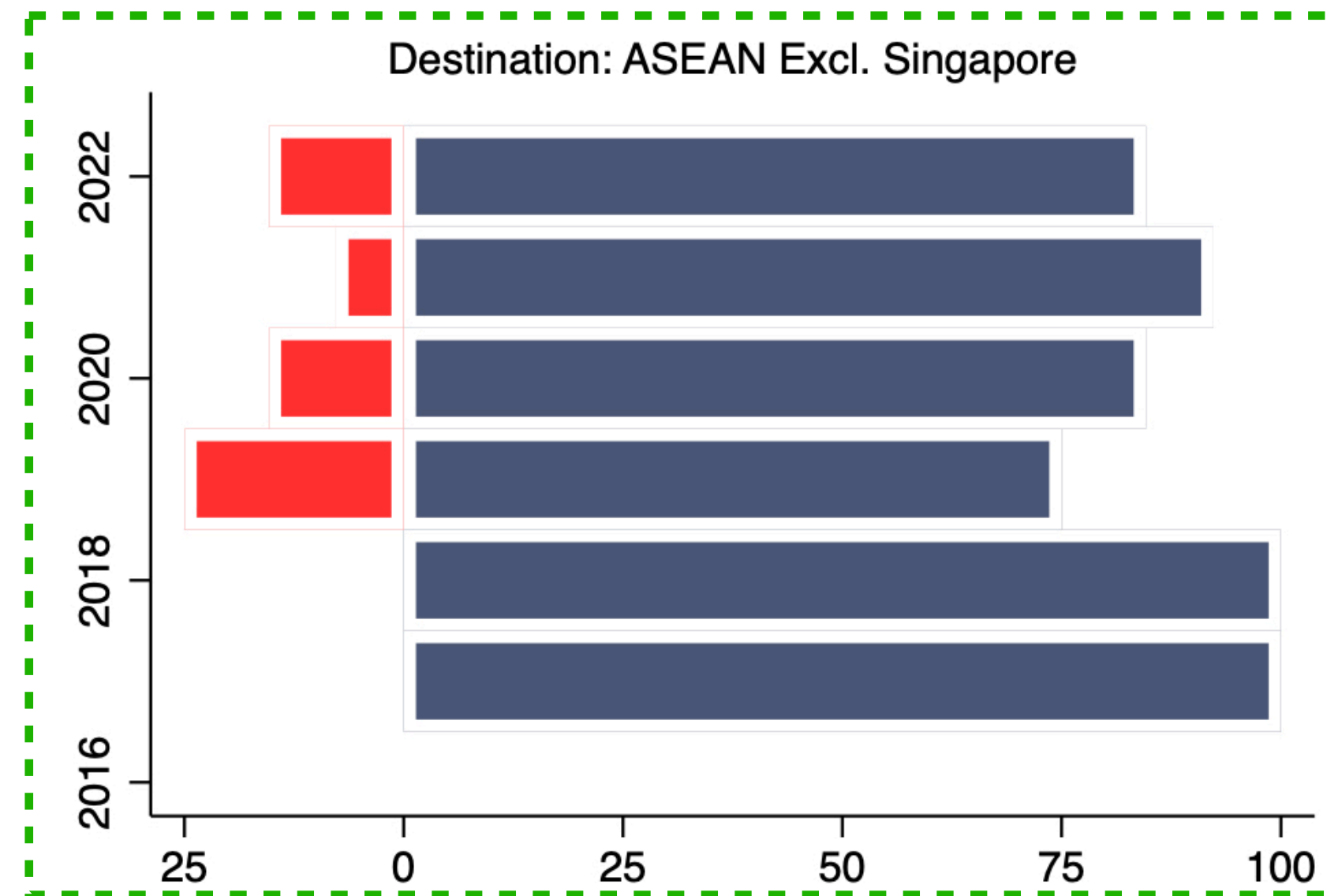
Sustainable Venture Investment Flows to Geopolitically Close Countries

- Data: Crunchbase; Nearly 40,000 deals of over 100 recipient countries from 2010 - 2022; focussing on the sustainability industries.
- Left: Within-bloc investment share observed in data
- Right: Within-bloc investment share if investment relationships are randomly assigned

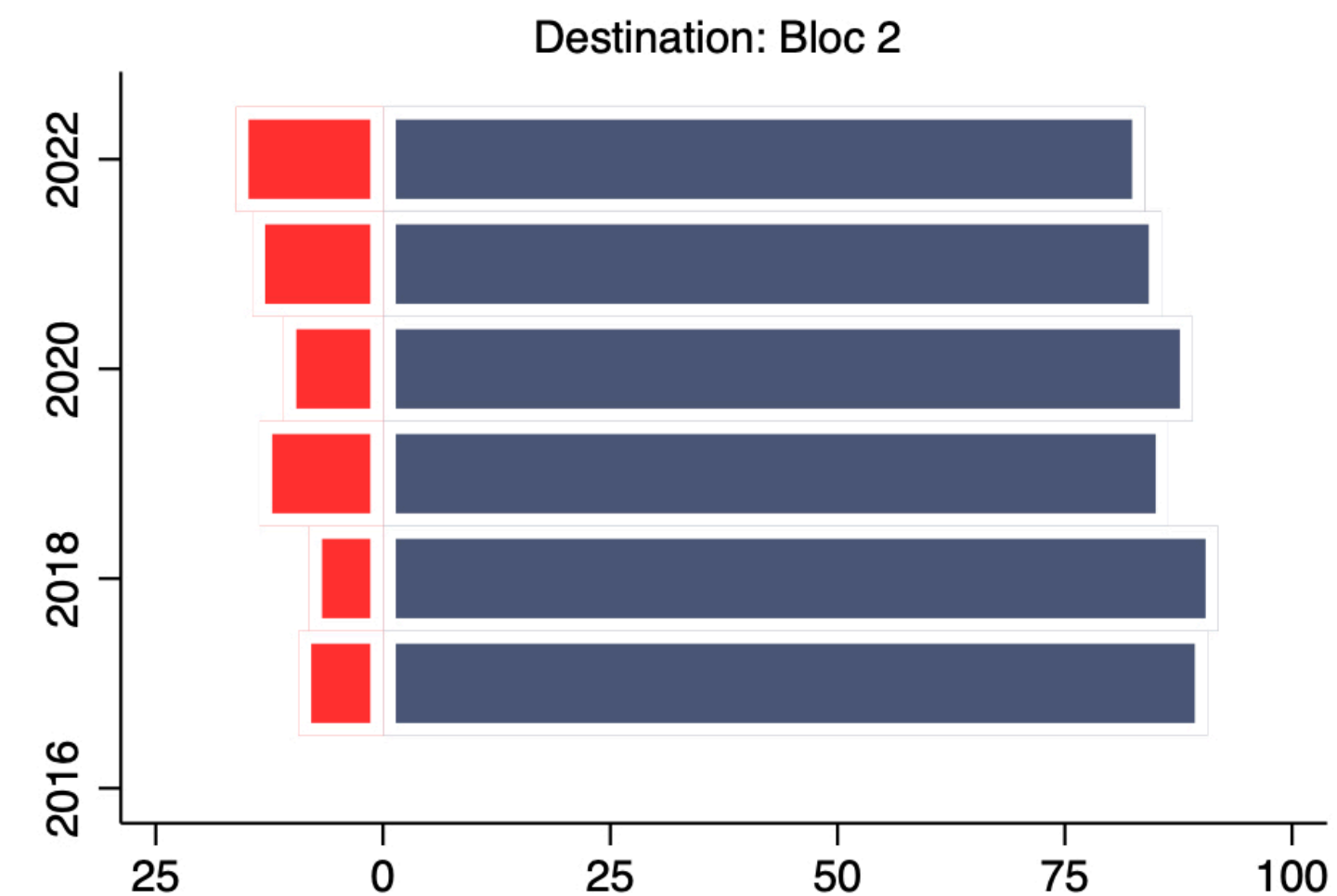
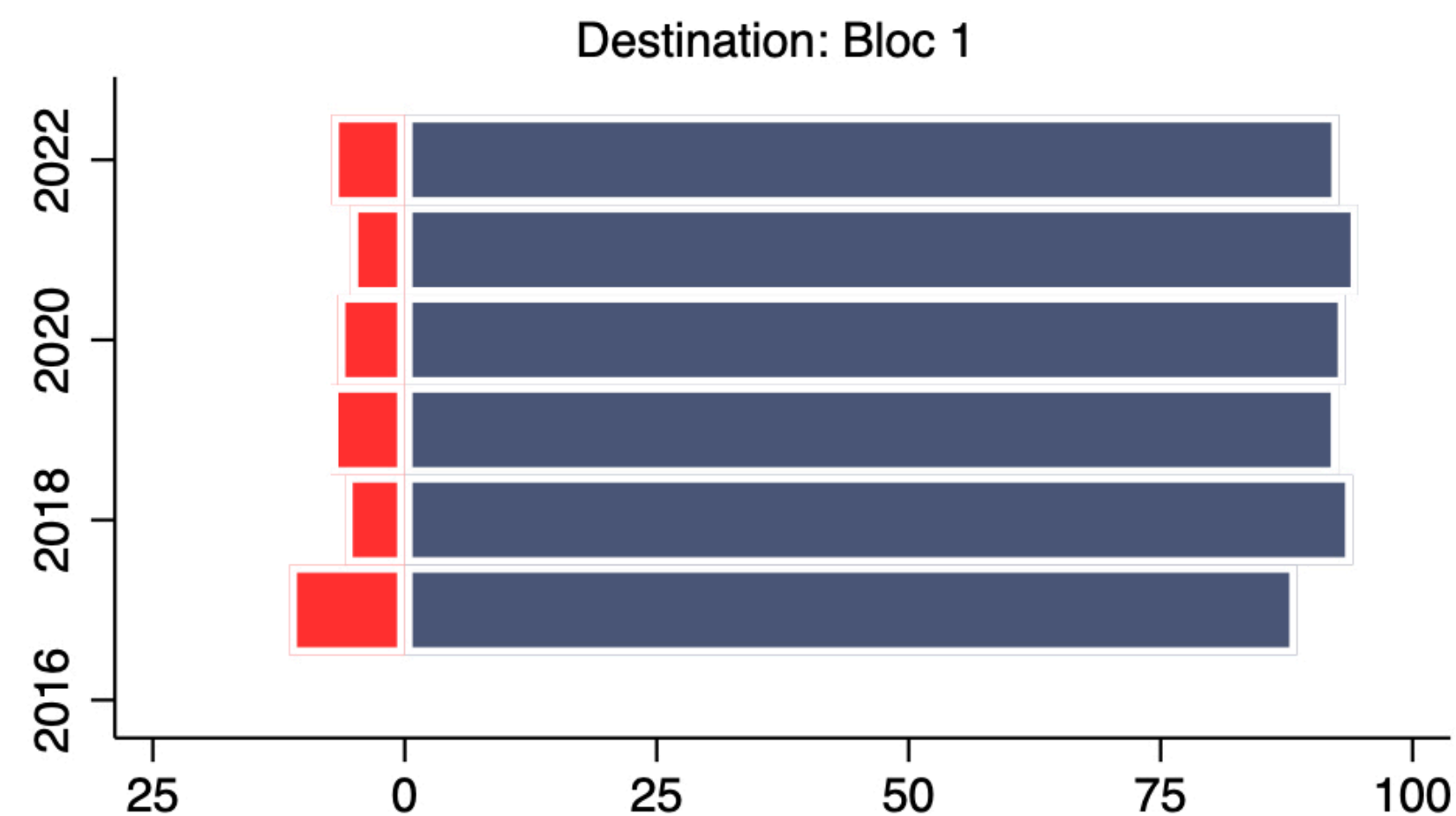


Investments From US-led and China-led Blocs: Comparing ASEAN and ROW

- No obvious increasing or decreasing share of investment from either Bloc 1 or Bloc 2 into ASEAN.



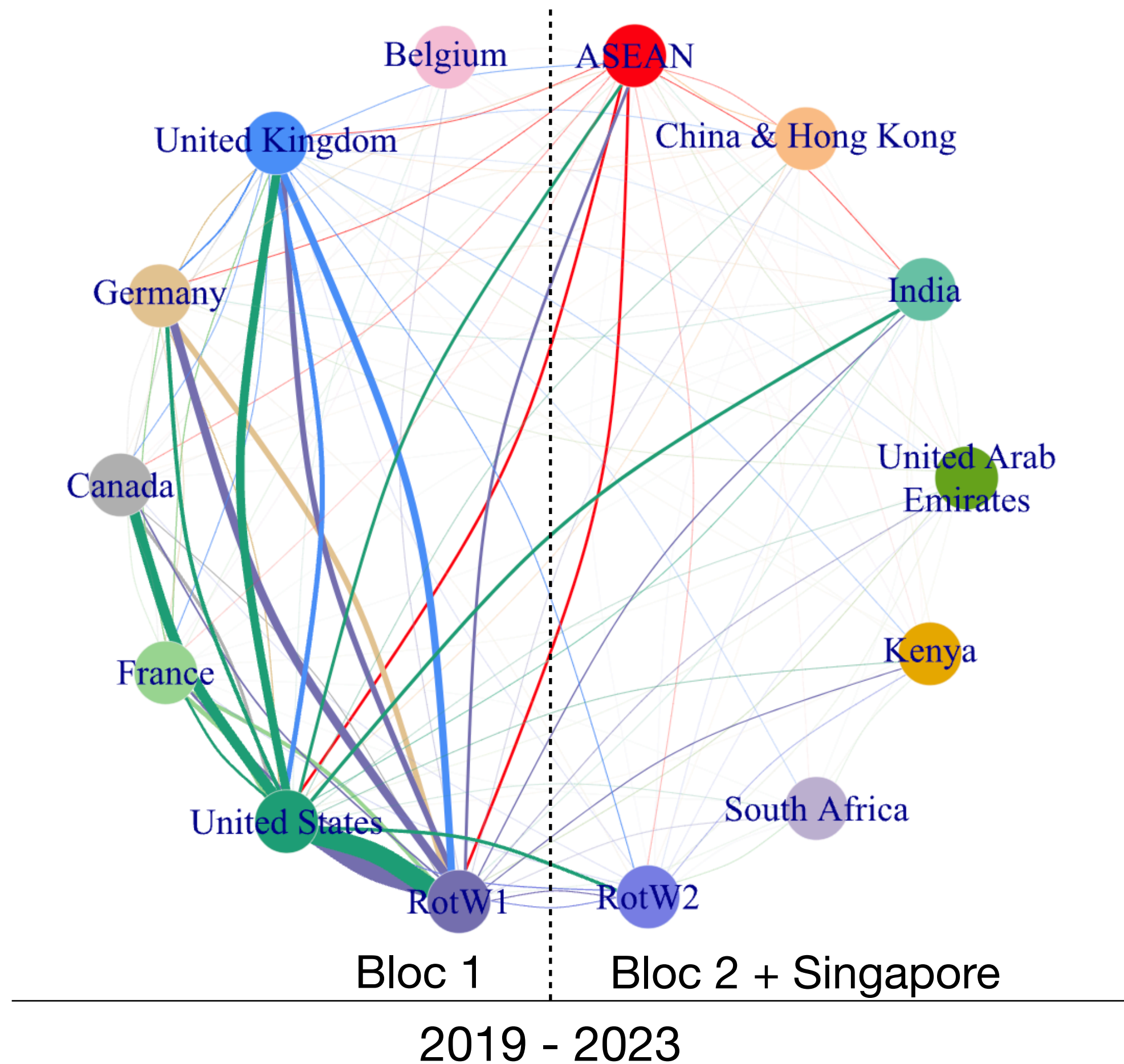
From Bloc 1 ("US-led")
From Bloc 2 ("China-led")



Changing Patterns of Sustainable Investment Network

- Most **positive growth** in investment relations happen within **Bloc 1** (“US-led”).
- Investments between **ASEAN** and **Bloc 1** grew by more than other countries.

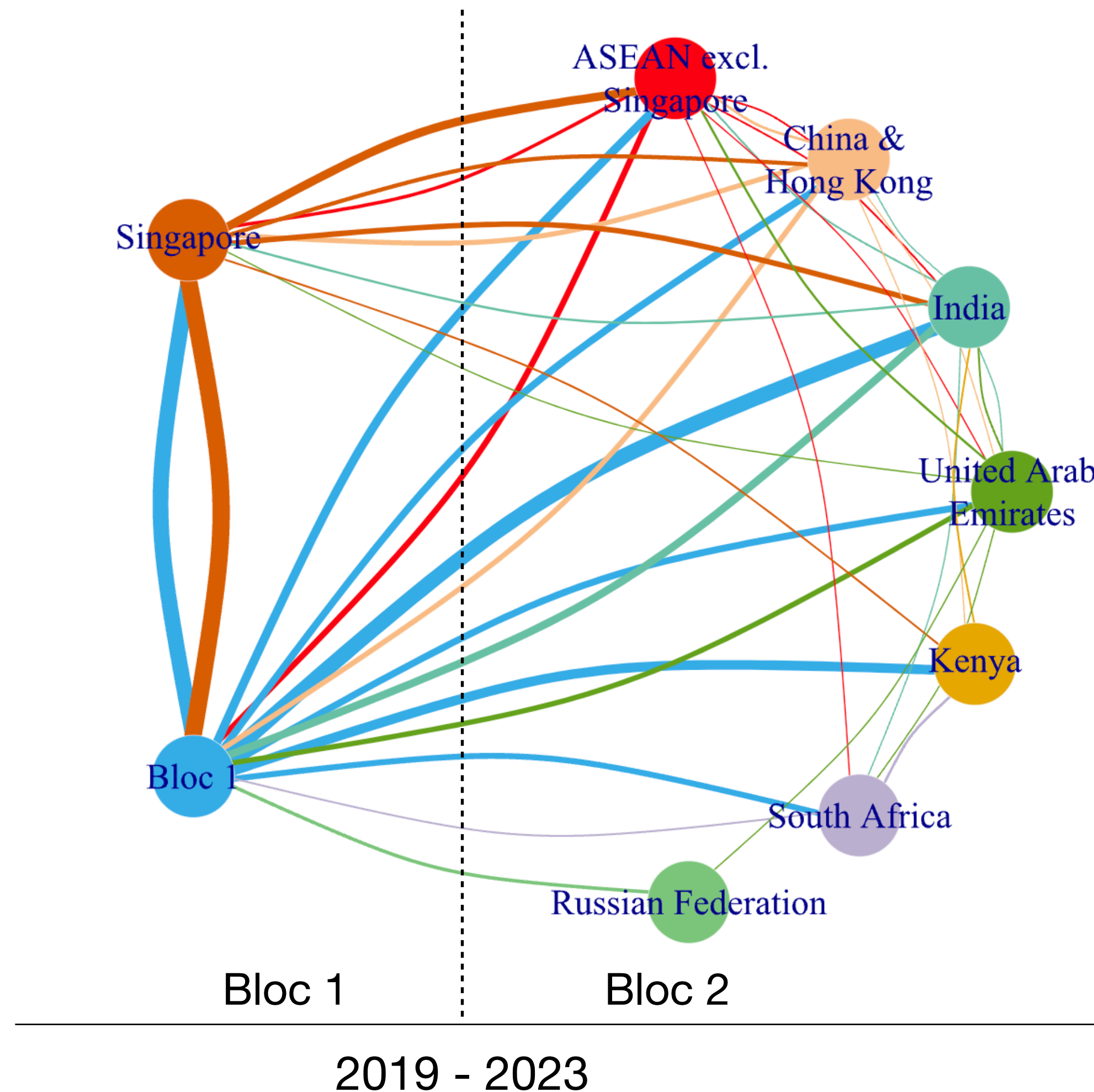
- A Line Represents **Positive Growth** in Investments Between a Country Pair
- Line width proportionate to size of growth



Changing Patterns of Sustainable Investment Network: Focussing on ASEAN

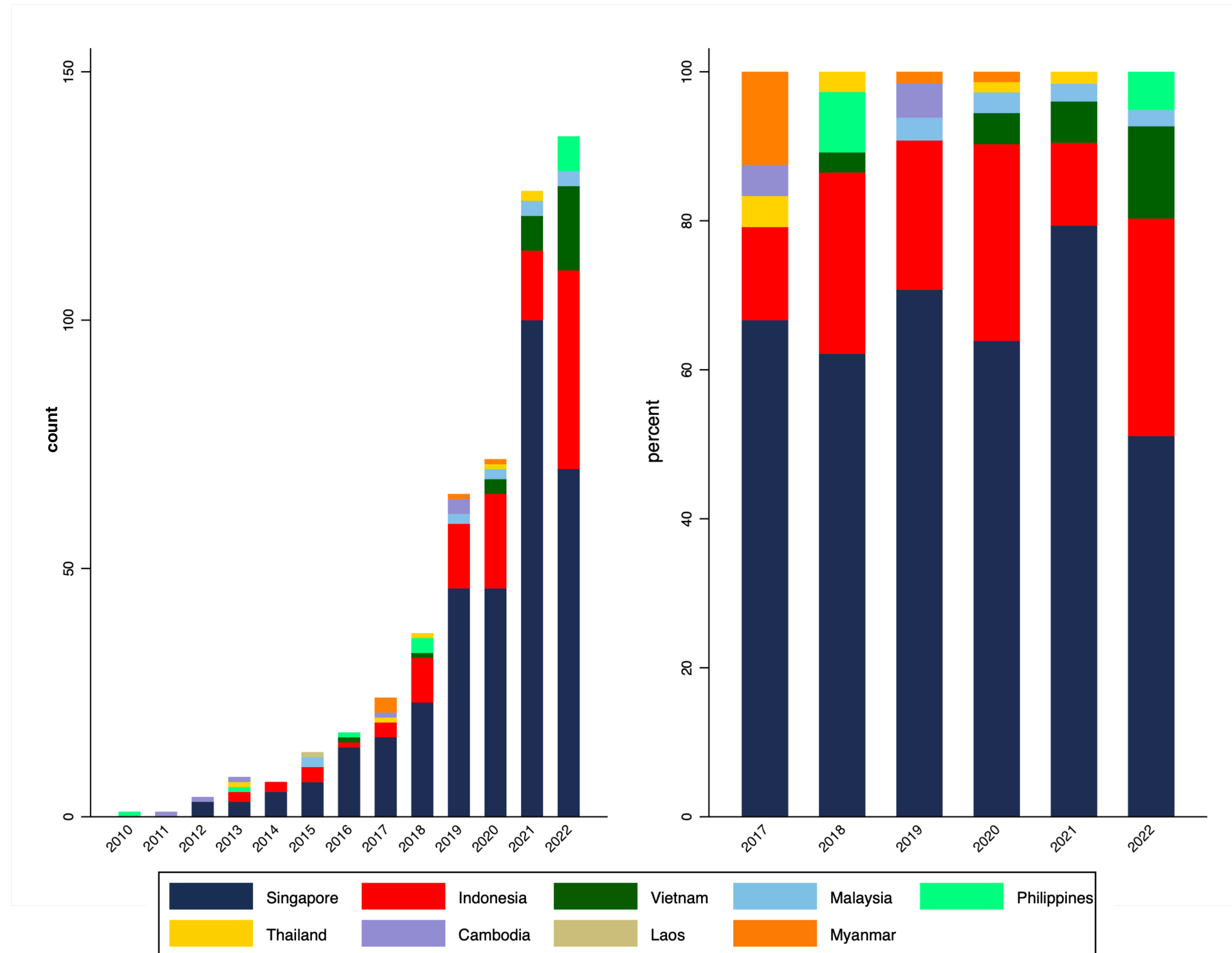
- **Singapore** connects countries in **both Bloc 1 and Bloc 2**.

- A Line Represents **Positive Growth** in Investments Between a Country Pair
- Line width proportionate to size of growth



Top Destinations of Sustainable Venture Investments in ASEAN

- Top investment destinations in recent years: **Singapore**, **Indonesia** and **Vietnam**



Industry Classification

- Deals are classified into six industry groups based on organisation industry descriptions

Industries	Firm Examples
(1) Electric Vehicles	Swap Energy (battery-swapping solutions, Indonesia), Tesla
(2) Solar Energy	Sembcorp (Tuas floating solar farm, Singapore), Sunseap (Singapore)
(3) Minerals and Precious Metals	Rio Tinto (Australia)
(4) Software and IT	H3 Dynamics (decarbonisation of air mobility, Singapore)
(5) Renewable Energy (Non-solar)	Third Wave Power (portable Renewable Power Solutions, Singapore)
(6) Others	Trigasfera (waste conversion solution, Malaysia), Shiok Meats (cell-based meat, Singapore)

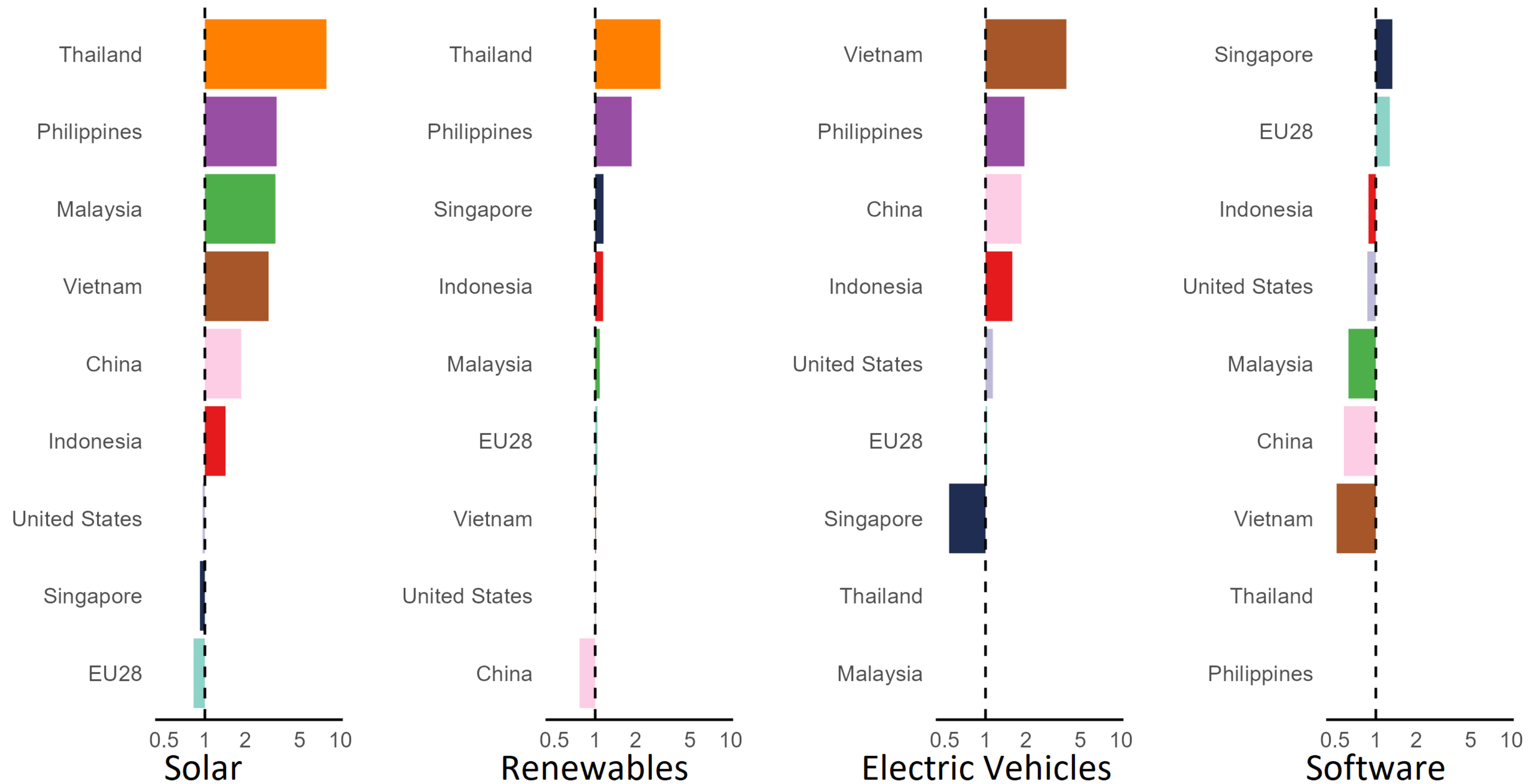
Pattern of Industry Specialization in Sustainable Investments

$$\text{Revealed Industry Advantage in Investments (RIA)} = \frac{\text{Industry } j\text{'s share of investments in country } i}{\text{Industry } j\text{'s share of sustainable investments in world}}$$

- RIA > 1
 - means country *i* has more investments in industry *j*, compared to the world
- Countries in ASEAN are ranked according to their RIA across industries

Pattern of Industry Specialization

- Solar & Renewables: Thailand and Philippines
- Electric Vehicles: Vietnam, Philippines, and Indonesia
- Software: Singapore



Climate Policy and Investments

- **Policy-driven Transition**

- Energy transition will be “driven by public policy rather than by technological innovations and market forces” (Pisani-Ferry and Mahfouz, 2023)
- “The transition represents a negative supply shock, with an accompanying need to finance investments whose profitability cannot be taken for granted.”

- **Historical Clean-tech Venture Capital Boom and Bust**

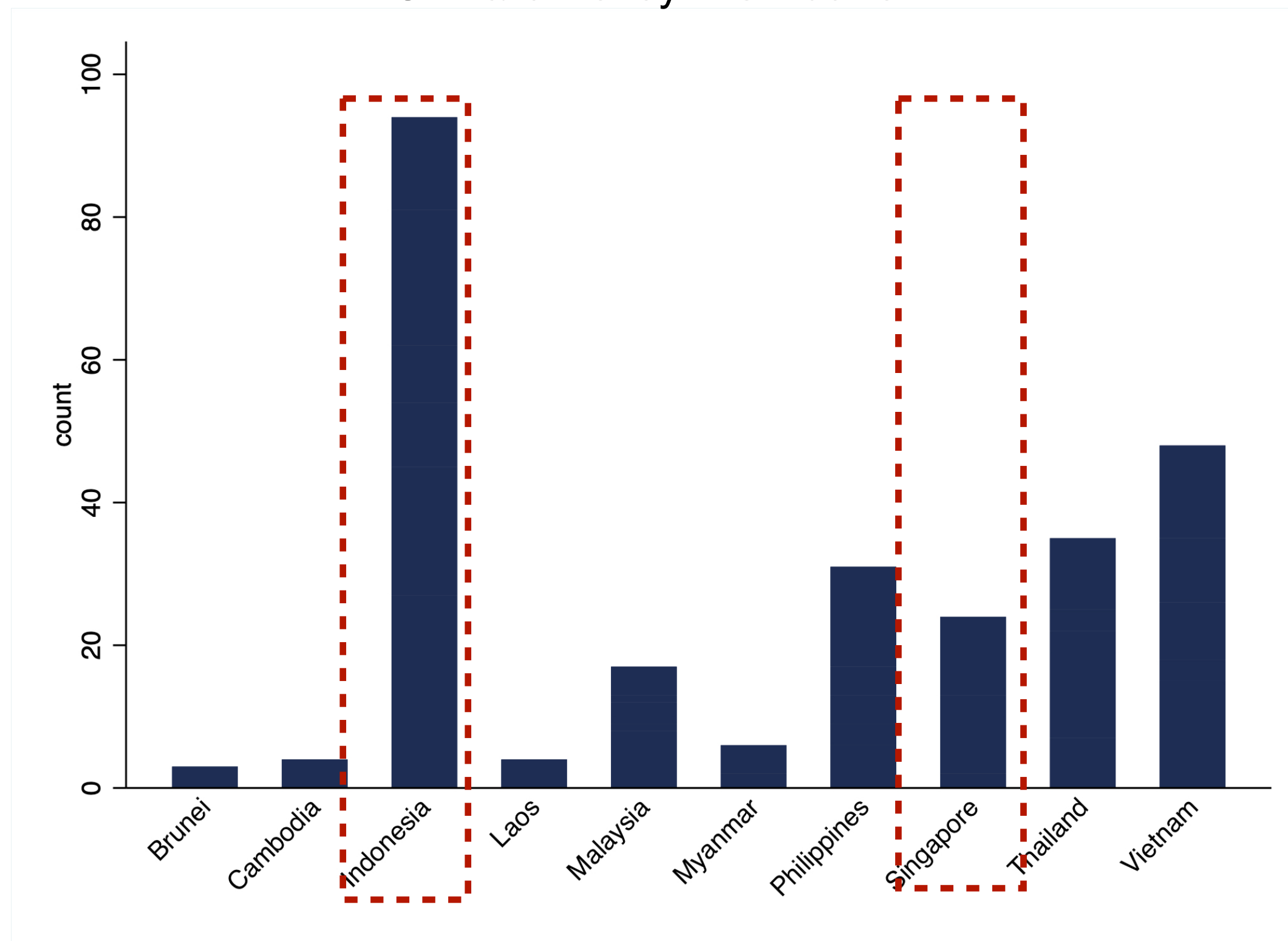
- Over half of more than \$25 billion spent on clean tech start-ups were lost between 2006 and 2011 (Gaddy, Sivaram, and O’sullivan, 2016)
- Long-term positive demand shock is needed (van den Heuvel and Popp, 2023)



Sustainable Investments and Climate Policy Objectives

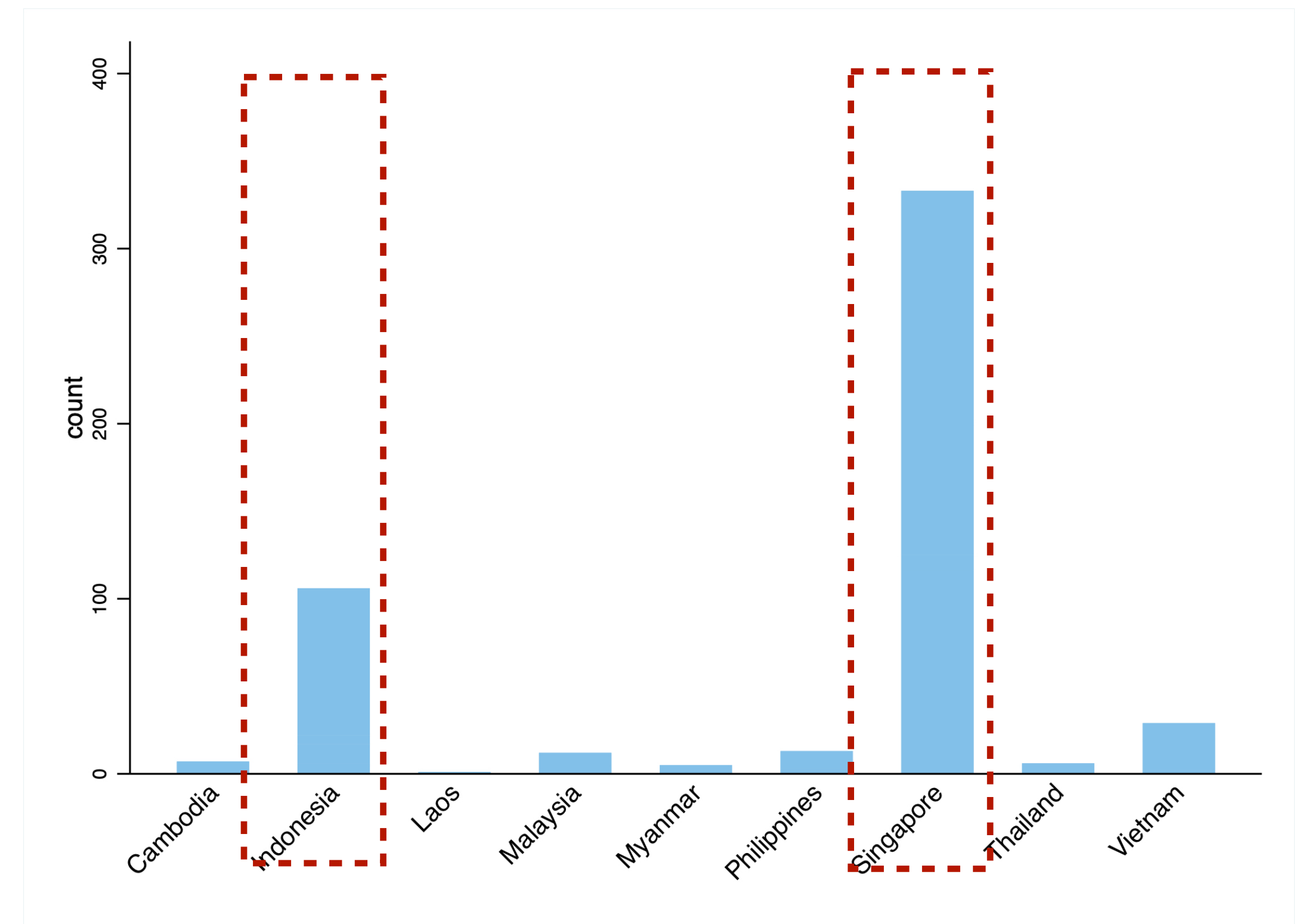
- **Number of investments** is not always proportionate to **number of policies**

Climate Policy Distribution



Source: Climate policy database; ACI calculation.

Sustainable Investment Distribution



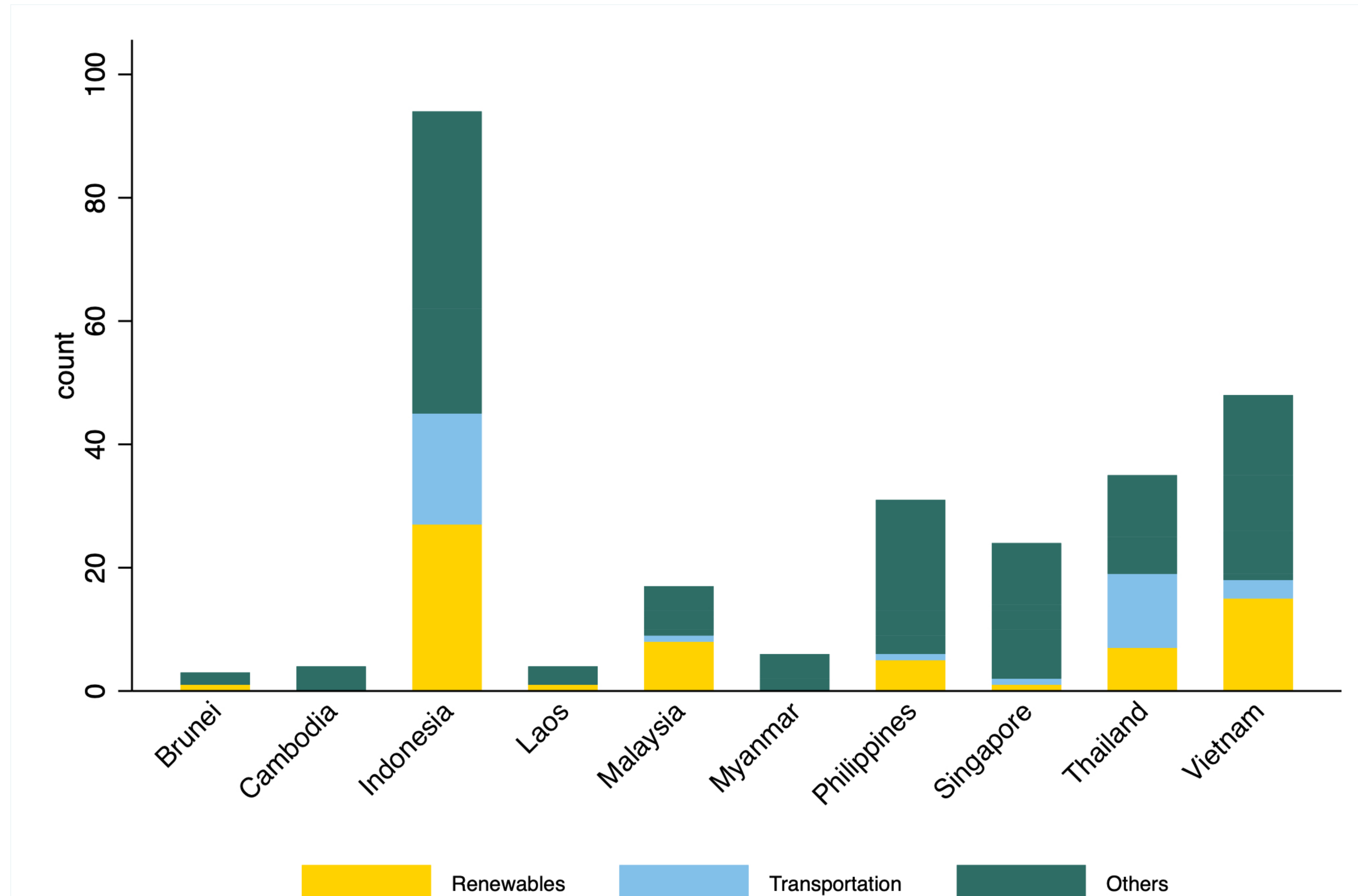
Climate Policies

- Climate Policy Database
 - Policies are grouped according to their sectors.

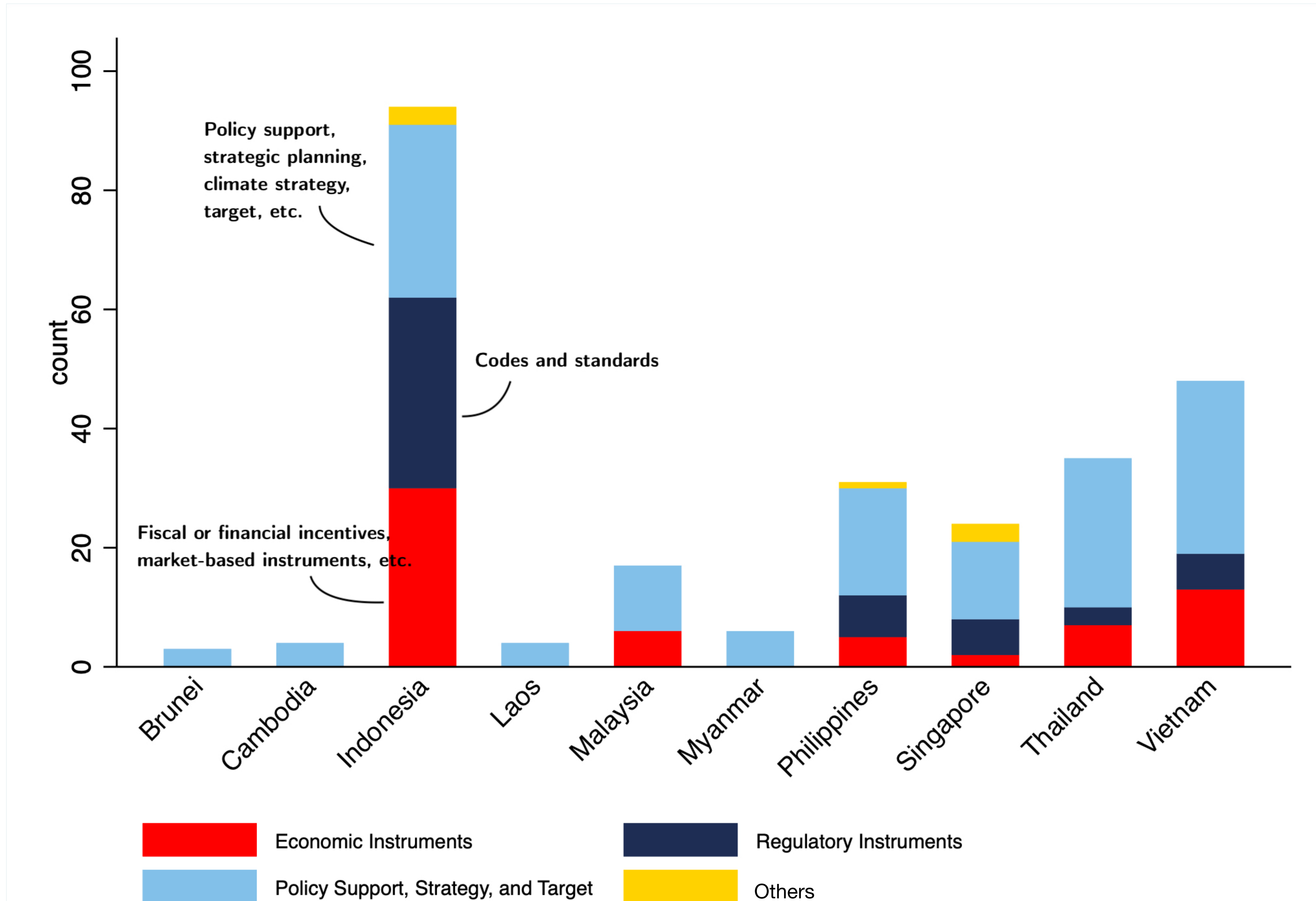
Sector	Policy Examples
Transportation	Presidential Regulation 55/2019 on electric vehicles, Indonesia
Renewables	Alternative Energy Development Plan 2018 - 2037, Thailand
Building	Green Building Code (P.D. 1096), Philippines
Industry	Regulations on Industrial Energy Efficiency, Vietnam
Agriculture	Sustainable forestry development by 2025, Vietnam
General	National Environment and Health Action Plan, Myanmar

Sustainable Investments and Climate Policy Objectives

- **Renewables** and **transportation** are key sectors policies target

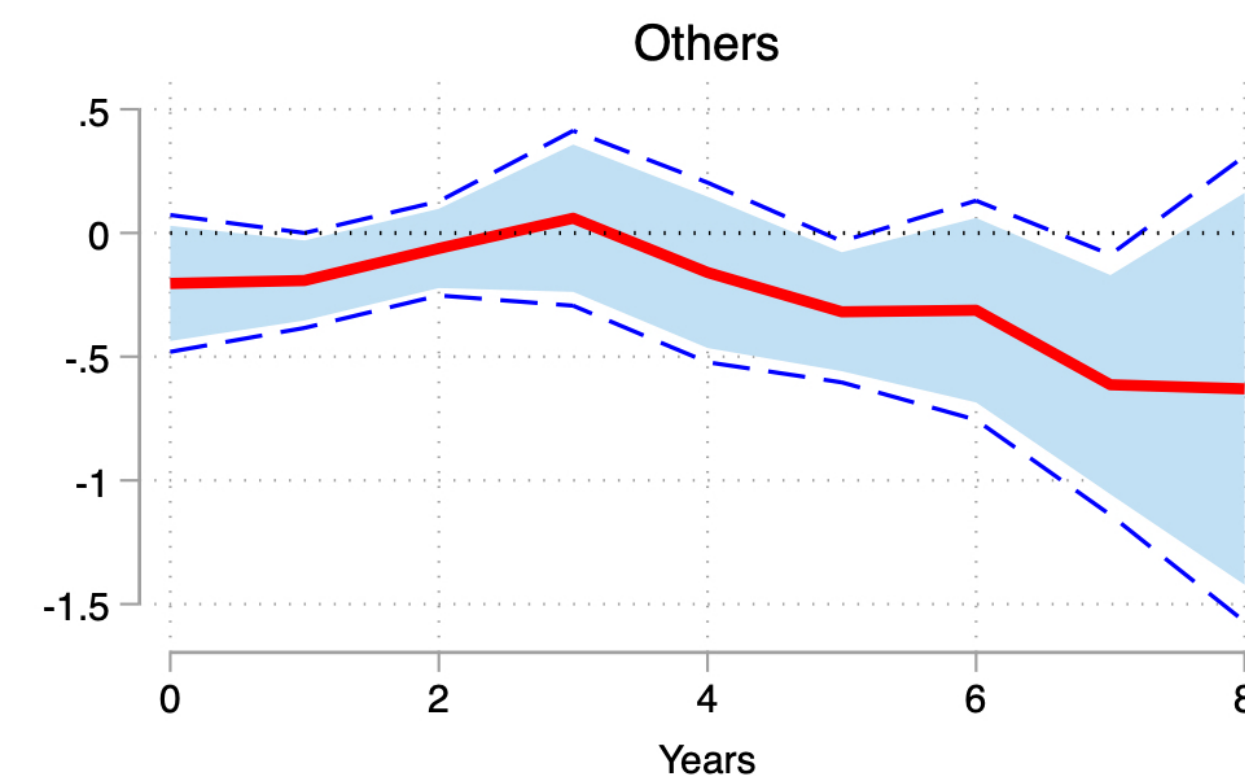
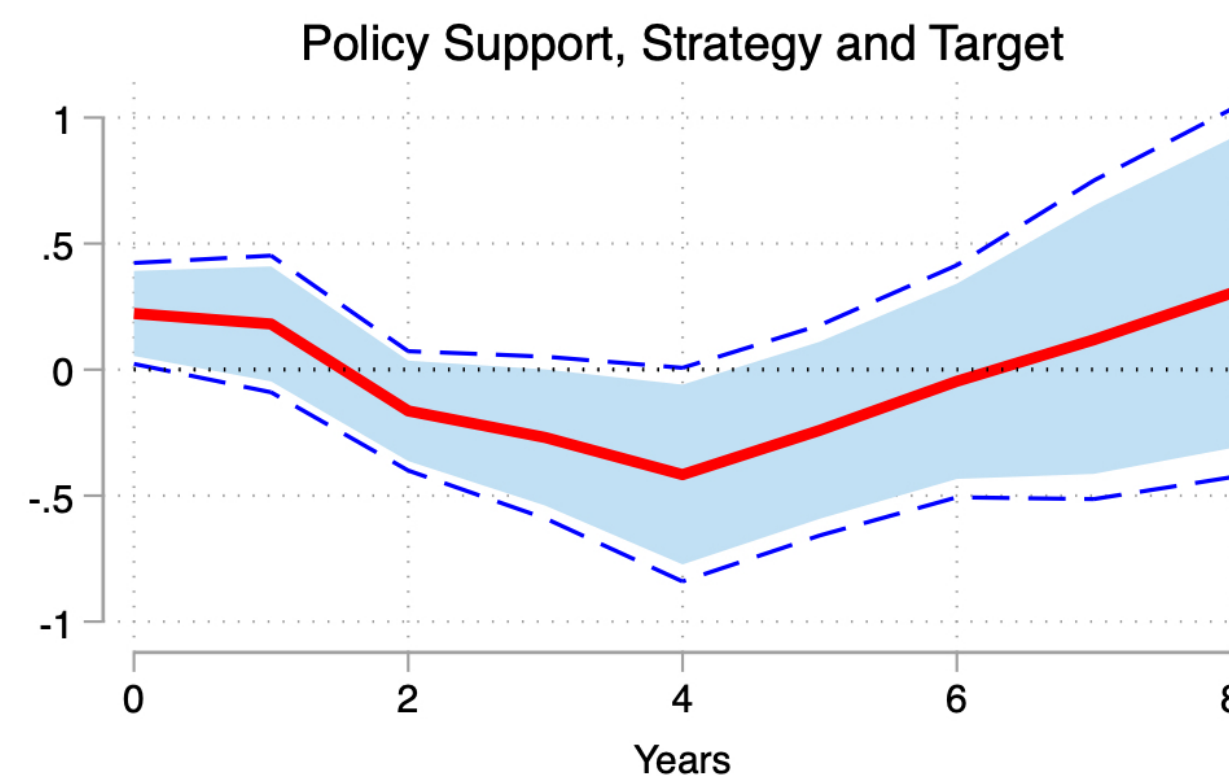
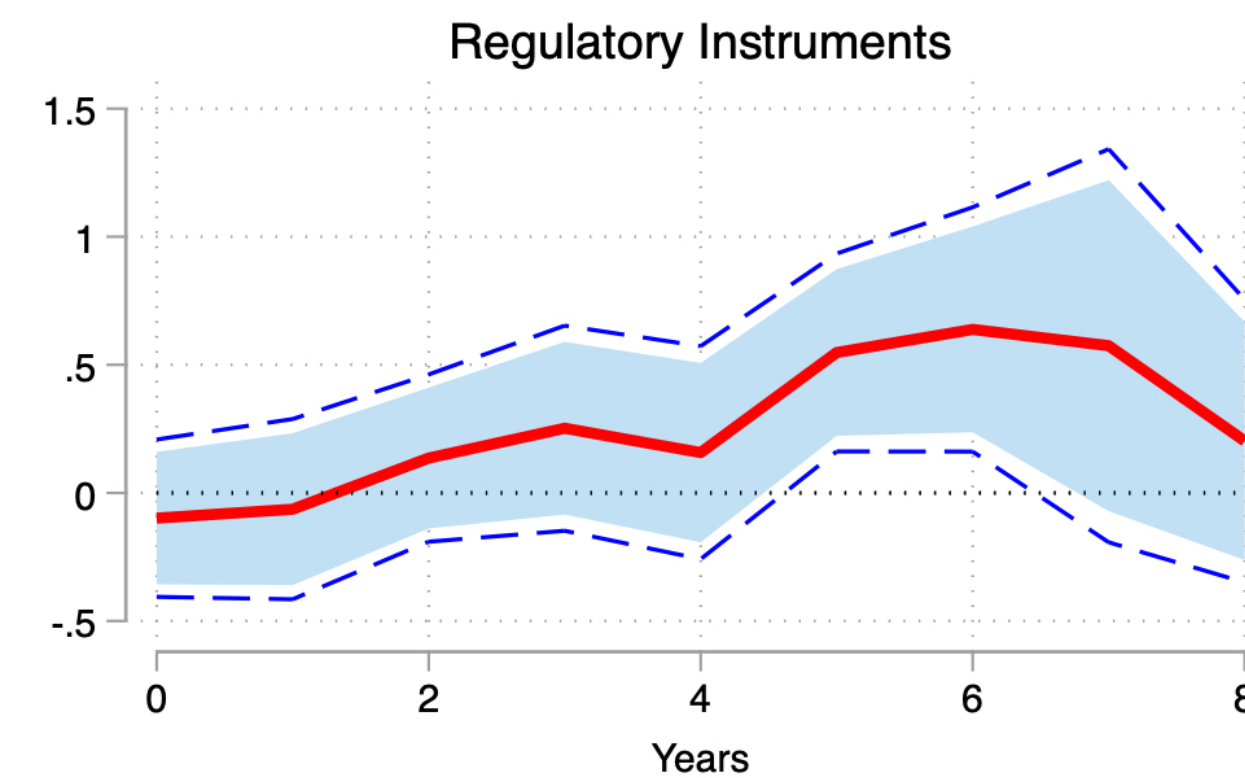
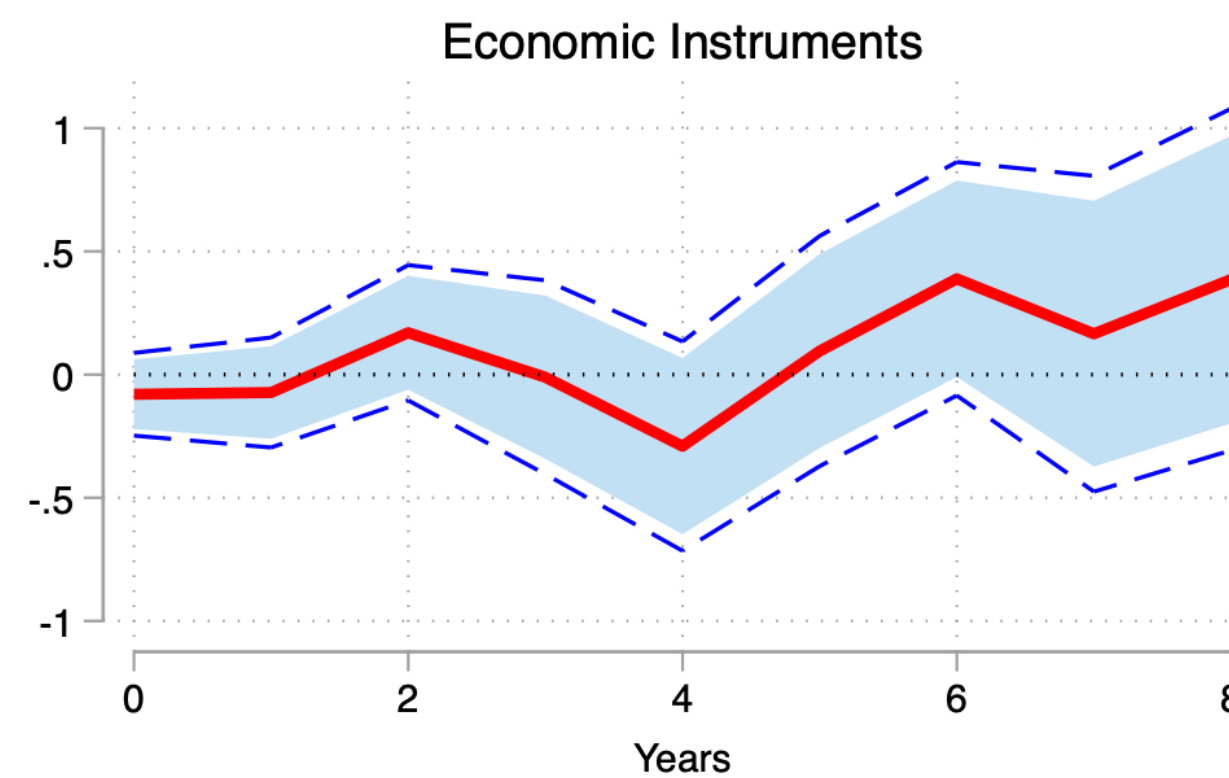


Policy Instruments

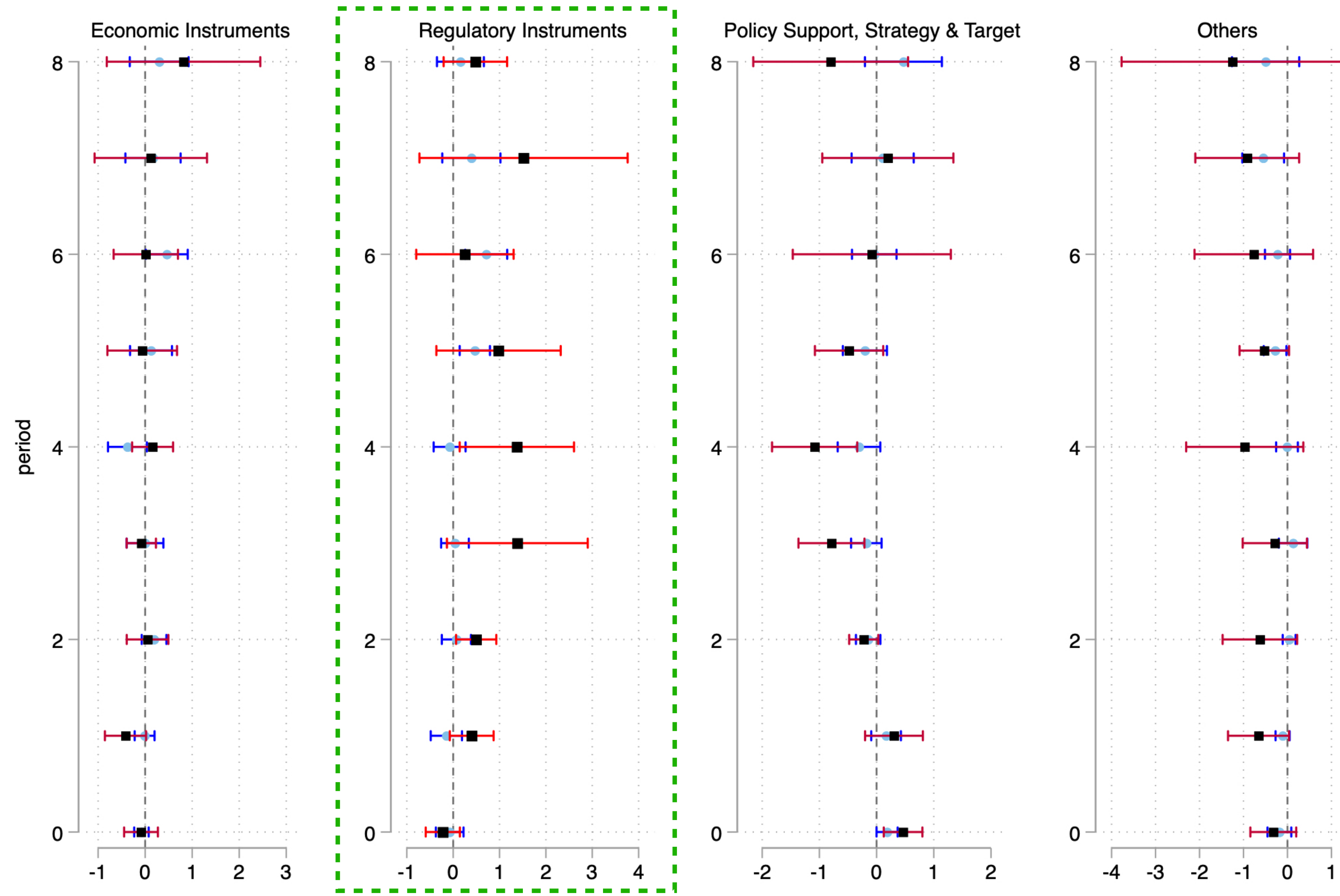


Regulatory Instruments Induce Significantly Higher Sustainable Investments

- How change in number of deals is related to new policy decisions of different instrument types
 - Taking into account macroeconomic conditions (GDP growth, inflation, interest rate)
 - Characteristics specific to a country or industries within a country
 - Common shocks to countries or industries



Regulatory Instruments Induce More Investments in **Electric Vehicles**



■ : Change in number of investments related to the EV industry — : 90 percent confidence band

Conclusion

- ASEAN is well-connected in the sustainable investment network, despite rising geopolitical fragmentation.
- Singapore, Indonesia and Vietnam are the top sustainable VC investment destinations within ASEAN.
 - Solar & Renewables: Thailand and Philippines
 - Electric Vehicles: Vietnam, Philippines and Indonesia
 - Software: Singapore
- Number of policies is not always proportionate to number of investments
- Regulatory instruments significantly induce higher sustainable investments, especially for investments in electric vehicles and renewable energy.

Thank you!