New Foundations for International Macro Policy

Mundell-Fleming 60 Years Later

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The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF, its Executive Board, or management.

Mundell (1963) & Fleming

Mundell-Fleming laid the groundwork for the analysis of floating regimes after the collapse of Bretton Woods in 1973

1. Do monetary policy and flexible exchange rates achieve domestic goals (i.e., employment, price, and financial stability) after shocks?
    - Impact of exchange rate on trade balance and output?

2. Are foreign exchange intervention & capital controls needed to achieve those goals?

Mundell (1963) & Fleming

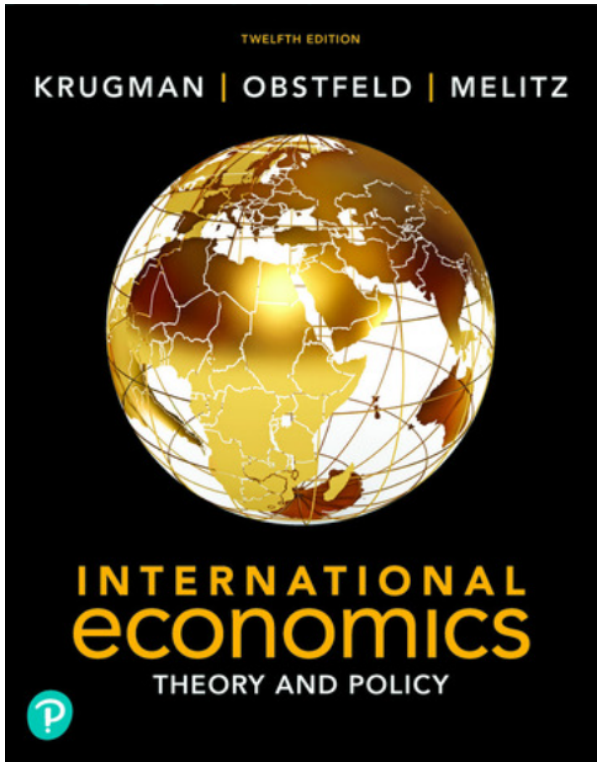
Mundell-Fleming laid the groundwork for the analysis of floating regimes after the collapse of Bretton Woods in 1973

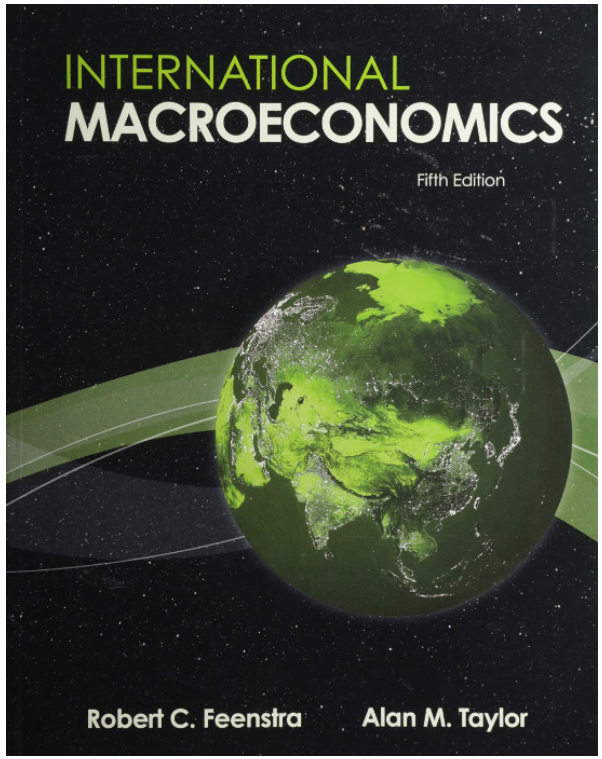
1. Do monetary policy and flexible exchange rates achieve domestic goals (i.e., employment, price, and financial stability) after shocks? YES
   - Impact of exchange rate on trade balance and output?

2. Are foreign exchange intervention & capital controls needed to achieve those goals? NO

How is Mundell-Fleming Used Today?

- Undergraduate textbooks by leading economists in international finance continue to use Mundell-Fleming





What about Policy Analysis?

- Remains a workhorse, but with growing caveats
  - Does not capture some key shocks and frictions affecting emerging markets and developing economies
  - Growing literature focuses on these novel elements

- So policy analysis complements Mundell-Fleming with other models and evidence

- IMF's Integrated Policy Framework (2020 onwards):
  - Shocks and frictions outside the Mundell-Fleming model, and the interactions between different frictions
  - Role for FX intervention, macroprudential measures, and capital controls

Have the Key Insights Changed?

1. Do monetary policy and flexible exchange rates achieve domestic goals after shocks?
   - Impact of exchange rate on trade balance and output
2. Are FXI & capital controls needed to achieve those goals?

- Informed by new research on pricing and financial frictions
  - Illustrated by some of the diagrams from the IMF's IPF conceptual model (Basu, Boz, Gopinath, Roch, Unsal, 2020)

- New insights should inform the next generation of textbooks

Trade Pricing Friction

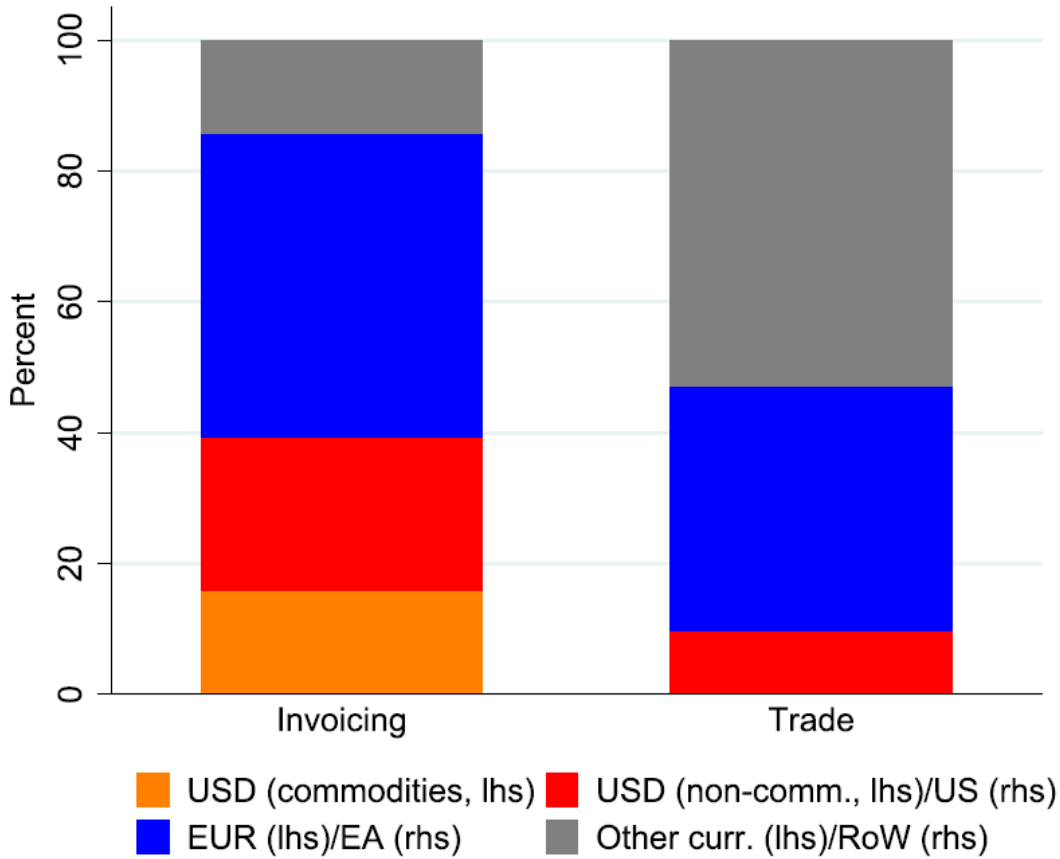
Literature on Price Stickiness

- Early analysis: Mundell (1963), Fleming (1962), Friedman (1953)
- In producer currency: Dornbusch (1976), Svensson and van Wijnbergen (1989), Obstfeld and Rogoff (1995), Galí and Monacelli (2005)
- In local currency: Betts and Devereux (2000), Devereux and Engel (2003), Bacchetta and van Wincoop (2000), Chari et al. (2002)
- In dominant currency: Goldberg and Tille (2008, 2009), Gopinath et al. (2010), Barbiero (2019), Gopinath et al. (2020), Boz et al. (2020), Amiti et al. (2020), Basu et al. (2020), Egorov and Mukhin (2021), Mukhin (2022)

- Aggregate demand externality: Farhi and Werning (2016)
- Terms of trade externality: Gali and Monacelli (2005)

Dominant Currency Paradigm

- There are around 180 currencies; only very few are used in international trade, finance, and official reserves.

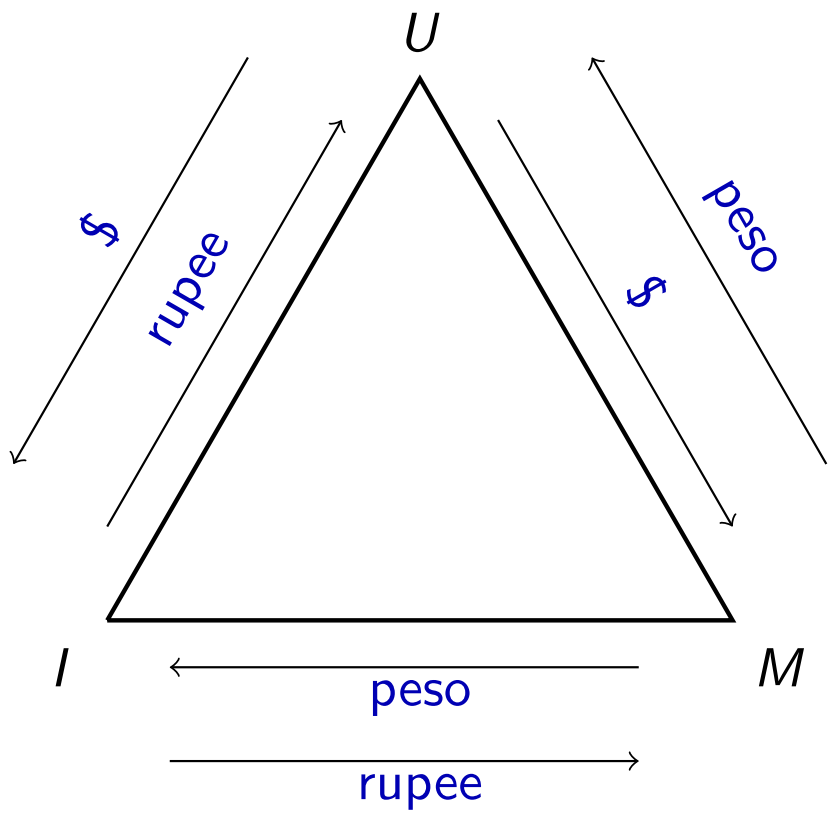


Source: Boz et al. (2020)

Three Regions: U, I, M

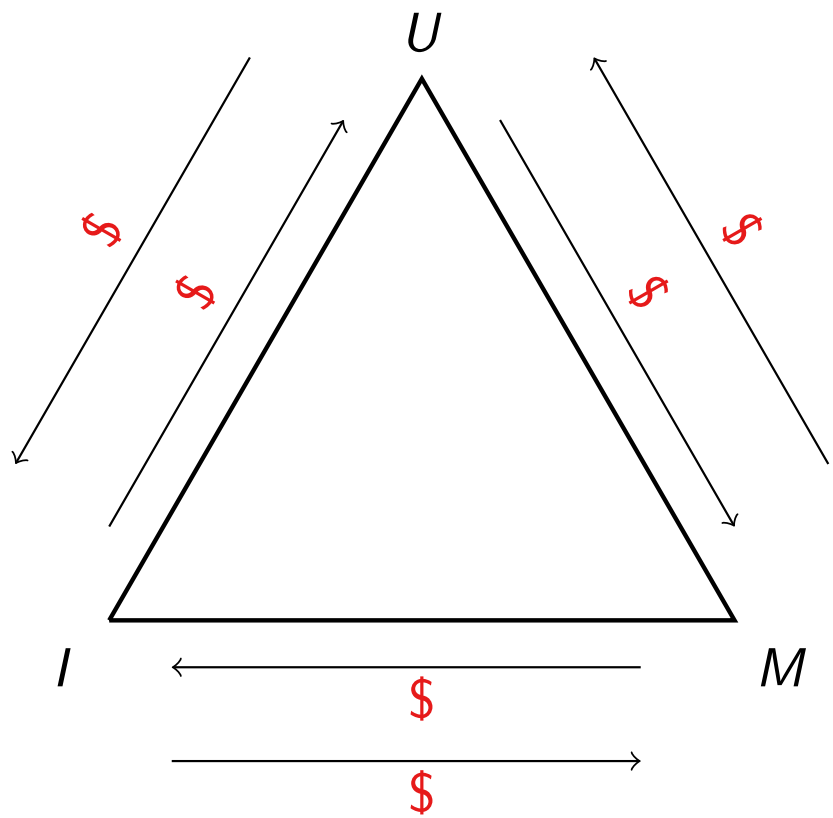
Textbook

Depreciation $\Rightarrow$ Imports $\downarrow$, Exports $\uparrow$



DCP

Depreciation $\Rightarrow$ Imports $\downarrow$, Exports $\leftrightarrow$



Exchange Rate Passthrough

Table 2: Studies of ERPT by currency of invoicing

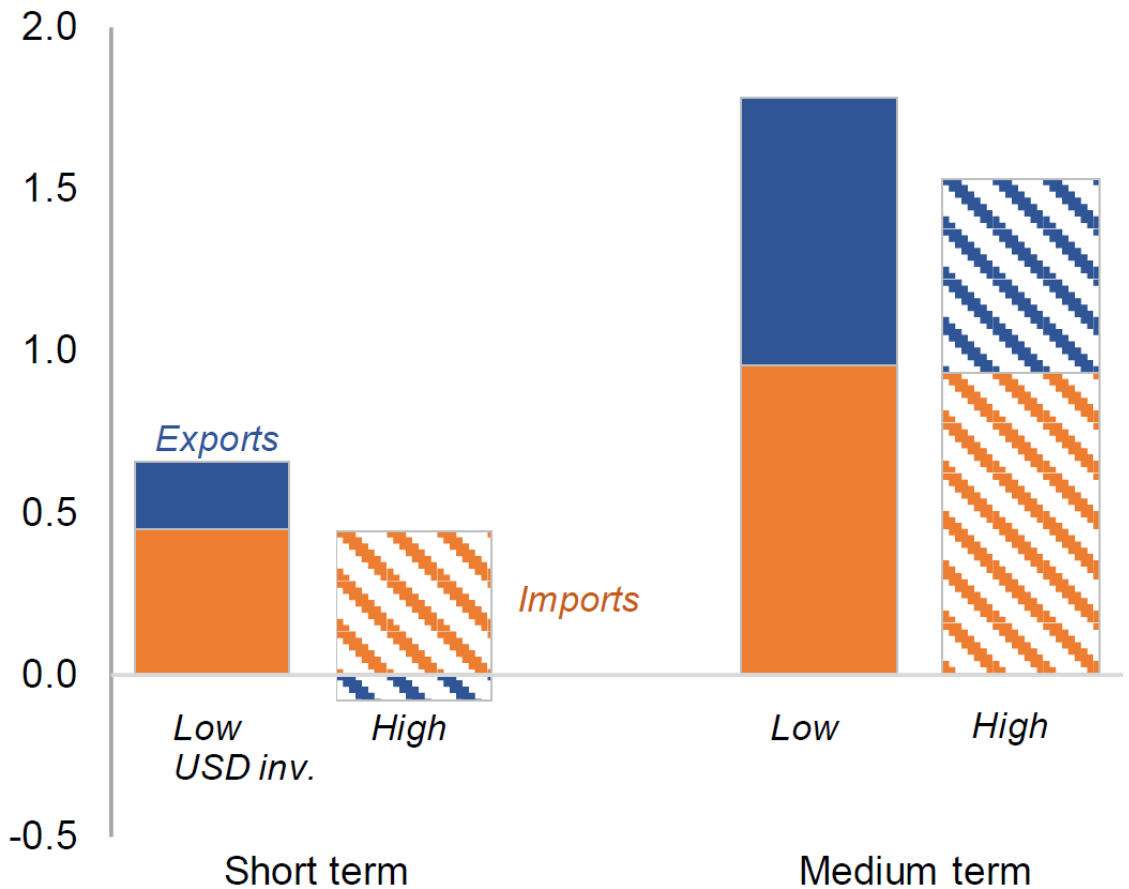
Authors	Country	Type of prices	Granularity
Amiti, Itskhoki, and Konings (2020)	Belgium	Export prices	firm×HS8 product
Auer, Burstein, Erhardt, and Lein (2019)	Switzerland	Export prices	transaction level
Auer, Burstein, and Lein (2021)	Switzerland	Import and retail prices	UPC level
Barbiero (2020)	France	Export and import prices	firm×HS8 product
Chen, Chung, and Novy (2018)	UK	Import prices	firm×10-digit product
Corsetti, Crowley, and Han (2020)	UK	Export and import prices	firm×HS8 product
Crowley, Han, and Son (2020)	UK	Export and import prices	firm×HS8 product
Devereux, Dong, and Tomlin (2017)	Canada	Import prices	transaction level
Goldberg and Tille (2016)	Canada	Import prices	transaction level
Gopinath, Itskhoki, and Rigobon (2010)	US	Export and import prices	HS10 product
Gopinath et al. (2020)	Colombia	Export prices	firm×HS10 product
Cravino (2017)	Chile	Export prices	firm×HS8 product
Fitzgerald and Haller (2013)	Ireland	Producer prices	firm×8-digit product

Source: Dominant Currency Paradigm: A Review (2022)

Expenditure Switching

Effect of 10% Depreciation

- Takes place mainly through imports and not exports in the short-term

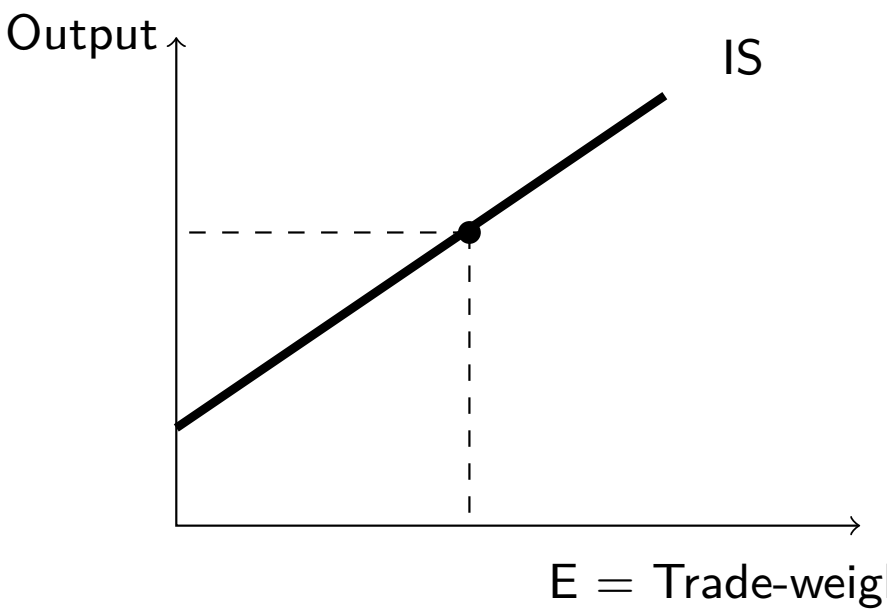


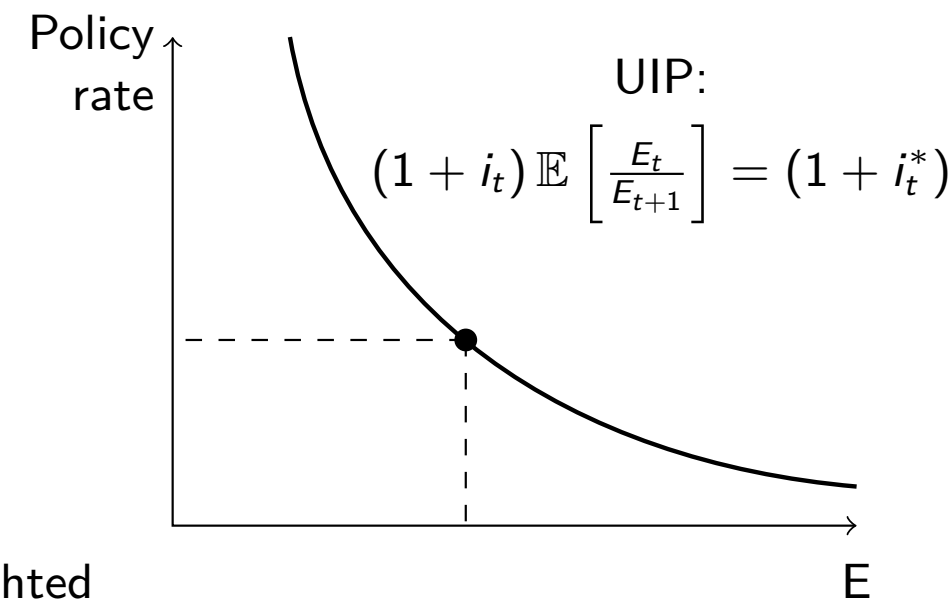
Source: Adler et al. (2020)

Impact on Open-Economy IS Equation

Change in slope and axis

- Relevant exchange rate is ~~trade~~ invoice-weighted

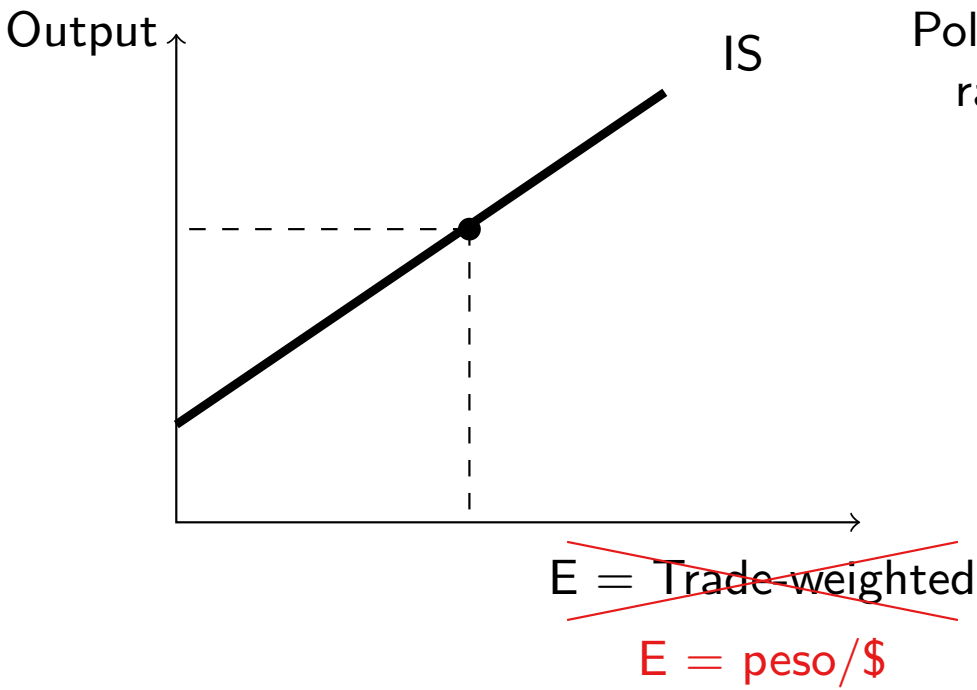


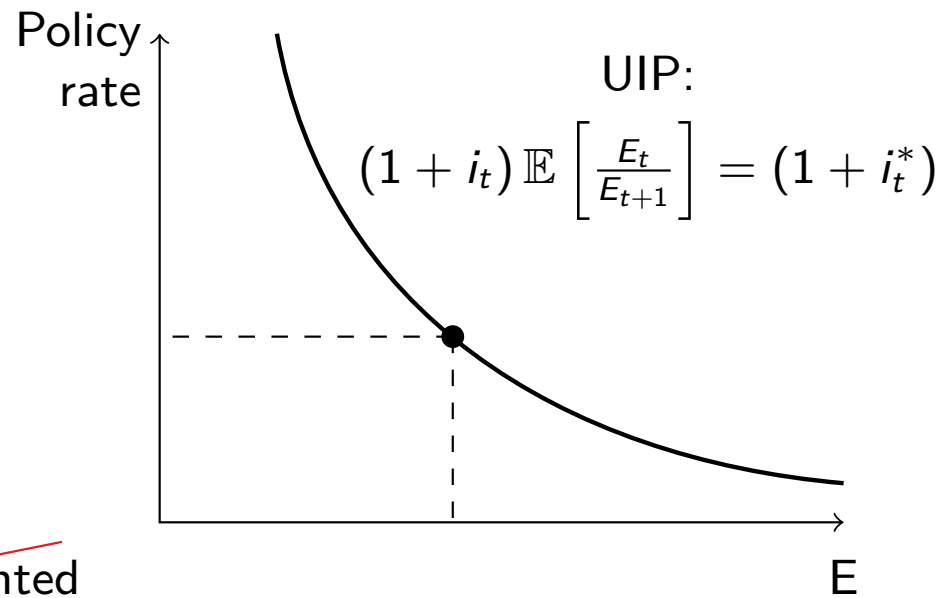


Impact on Open-Economy IS Equation

Change in slope and axis

- Relevant exchange rate is ~~trade~~ invoice-weighted
  - Usually, exchange rate against $

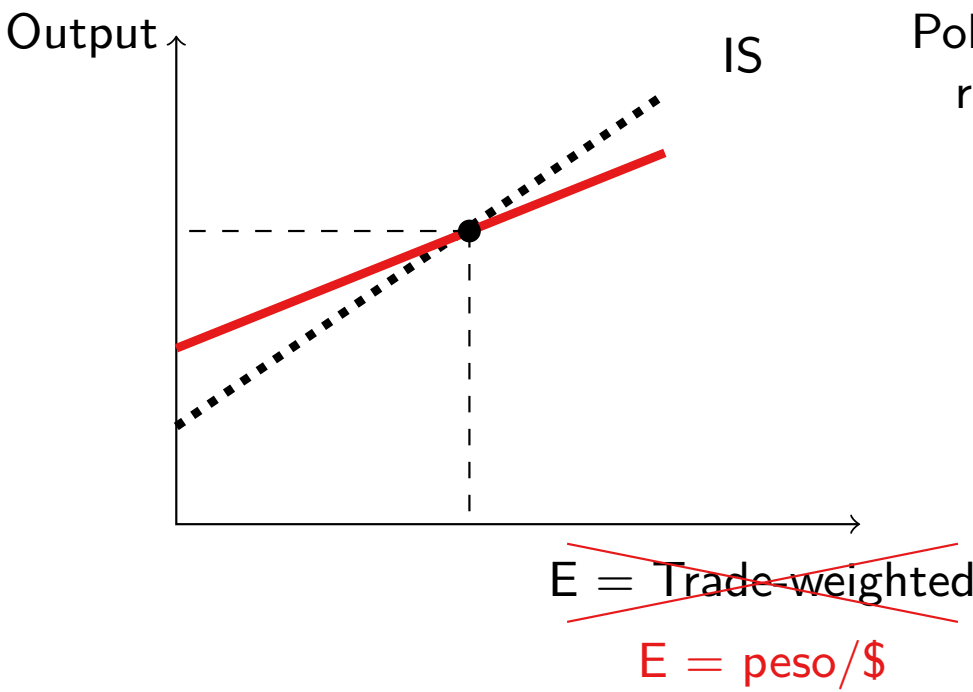


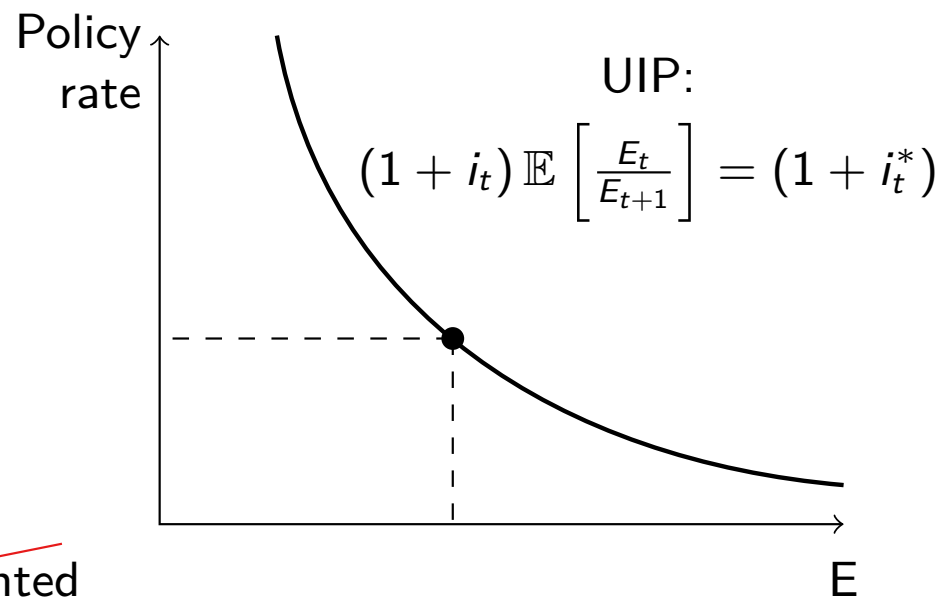


Impact on Open-Economy Policy

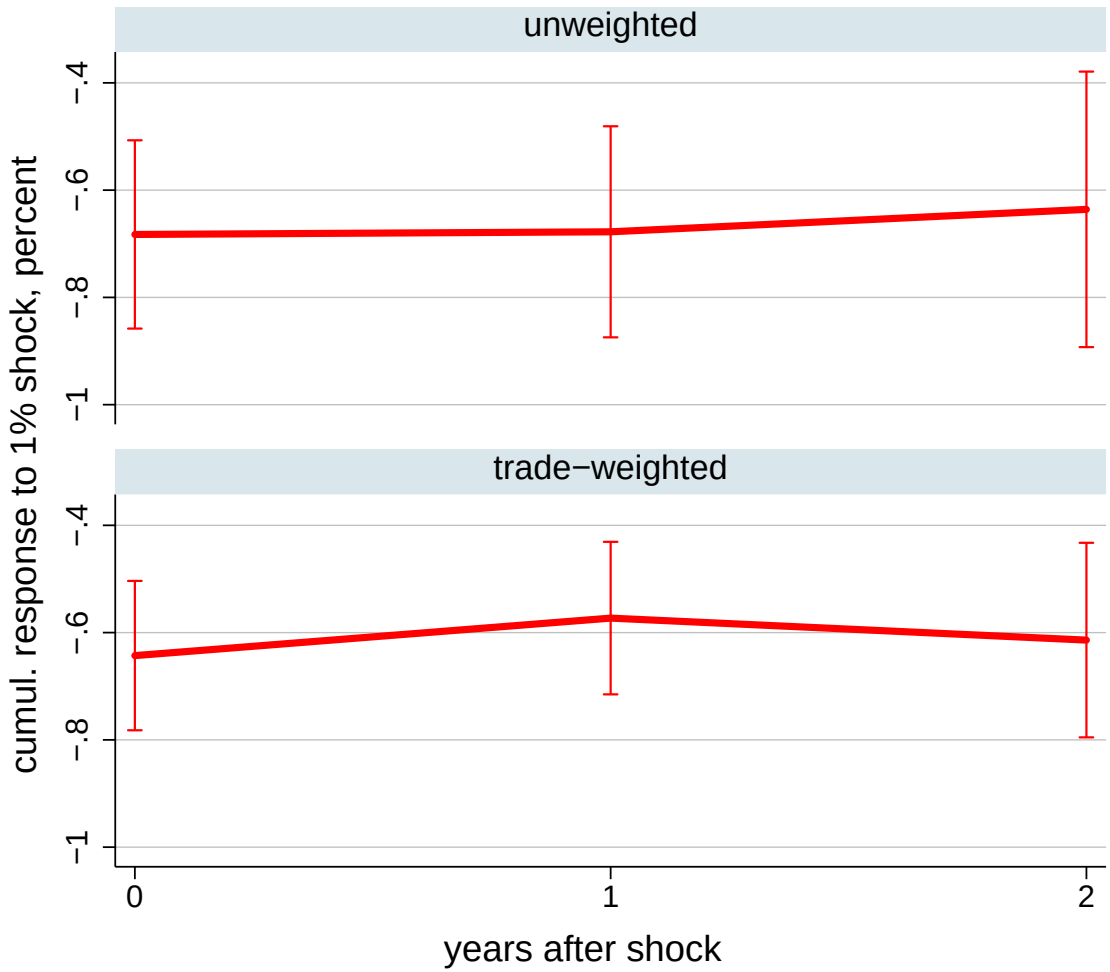
Only partial stabilization

- Relevant exchange rate is ~~trade~~ invoice-weighted
- Depreciation against USD $\Rightarrow$ Stabilize home output gap, Cannot stabilize export gap





Response of ROW trade to 1% USD appreciation



DCP: Takeaways

1. Do monetary policy and flexible exchange rates achieve domestic goals after shocks?
   - Yes $\rightarrow$ No
   - Impact of exchange rate on trade balance and output: smaller
   - Asymmetry: USD appreciation reduces global trade, including non-US-related trade, causing additional spillovers

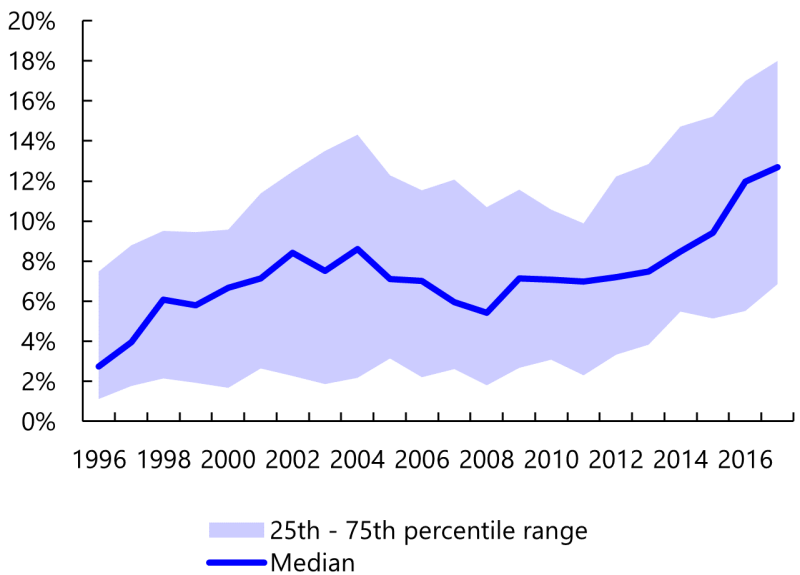
2. Are FXI & capital controls needed to achieve those goals?
   - No
   - Policy rate continues to target producer price inflation
   - FX intervention, capital controls cannot mitigate DCP friction

Financial Frictions

Frictions in Borrowing

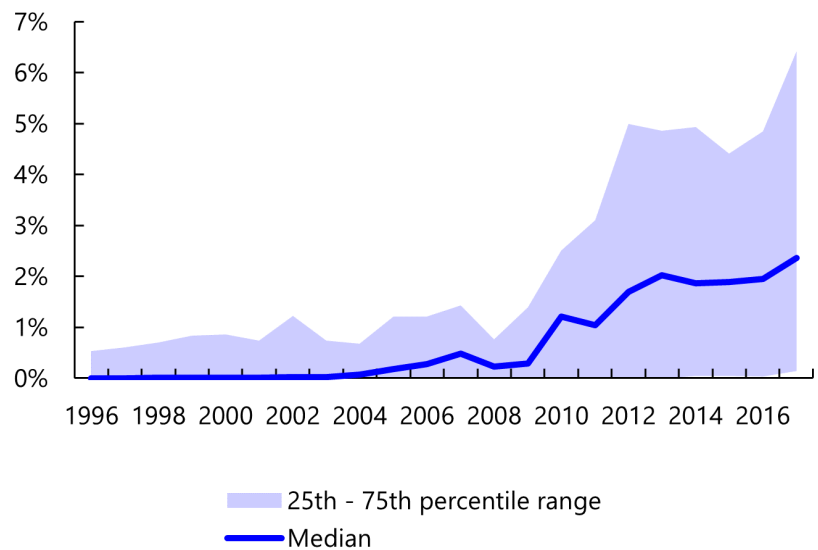
- How do key insights change for economies that borrow externally:
  - In foreign currency (FX, and especially USD)?
  - In local currency (LC) on shallow markets?

External FX Debt



Source: Benetrix, Gautam, Juvenal and Schmitt (2019). This chart includes the following countries: Argentina, Brazil, Chile, China, Colombia, Egypt, Guatemala, Hungary, Indonesia, India, Sri Lanka, Morocco, Mexico, Malaysia, Pakistan, Peru, Philippines, Poland, Russia, Thailand, Tunisia, Turkey, Uruguay and South Africa.

External LC Debt



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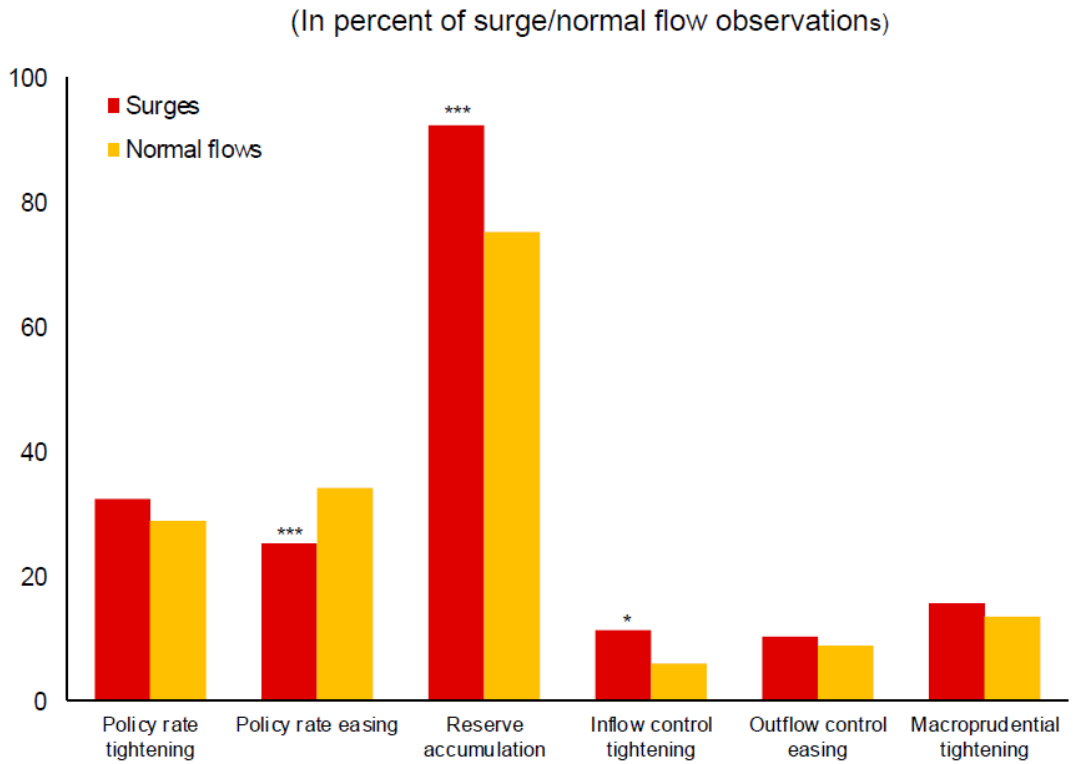
Financial Market Frictions

- External debt limits
  - Positive: Calvo et al. (2004), Mendoza (2006), Mendoza and Smith (2006)
  - Normative: Bianchi and Mendoza (2010), Bianchi (2011), Korinek and Jeanne (2011), Benigno et al. (2013), Korinek Sandri (2016)
  - Sticky prices: Farhi and Werning (2016), Schmitt-Grohe and Uribe (2016), Korinek and Simsek (2016), Basu et al. (2020), Bianchi and Coulibaly (2021)
  - Pecuniary externality
- Shallow markets (imperfect substitutability of assets)
  - Positive: Kouri (1976), Gabaix and Maggiori (2015), Itskhoki (2021), Kalemli-Ozcan Varela (2021), Itskhoki and Mukhin (2022)
  - Normative: Cavallino (2019), Fanelli and Straub (2021), Basu et al. (2020), Bianchi and Lorenzoni (2022)
  - Financial terms-of-trade externality

Global Financial Cycle

- Transmission of US monetary policy and credit conditions
  - Rey (2013, 2015, 2016), Passari and Rey (2015), Bruno and Shin (2015), Obstfeld et al. (2019), Kalemli-Ozcan (2019), Miranda-Agrippino and Rey (2020)

How Emerging Markets Respond to Inflows in Practice



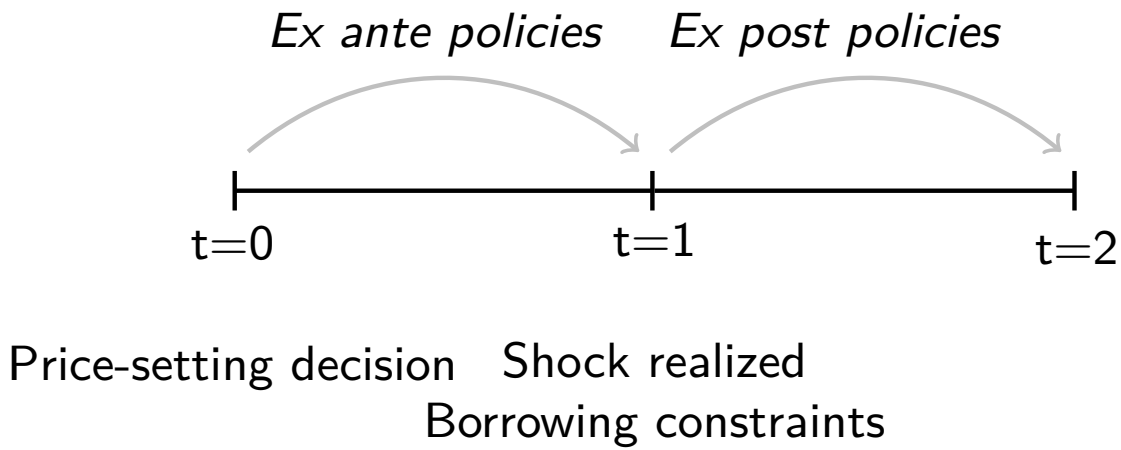
Source: Ghosh et al. (2017)

- Tend to use policy rate, FX intervention, capital controls

What should be the optimal response?

Shocks and Characteristics Matter

- Next, examine optimal responses to:
  - Fundamental commodity price shock
  - Non-fundamental taper tantrum



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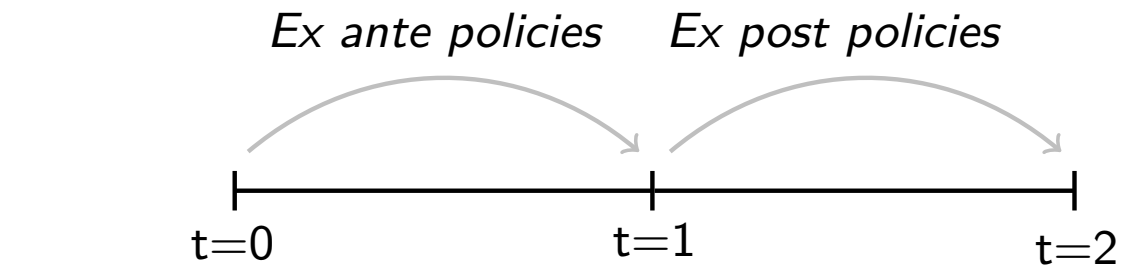
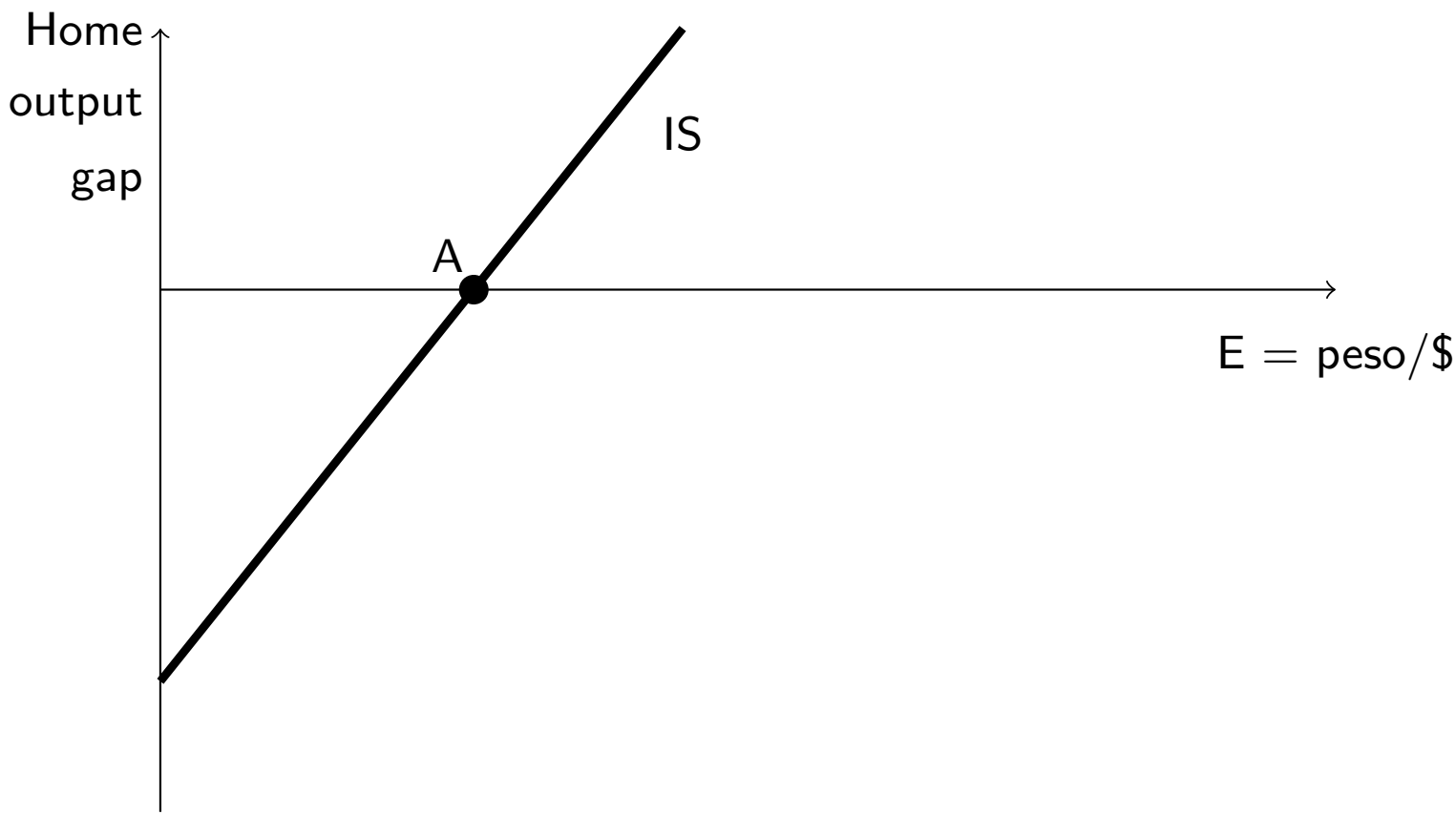


Adverse Commodity Price Shock

- Decline in wealth $\Rightarrow$ Reduce imports $\Rightarrow$ Shift IS curve



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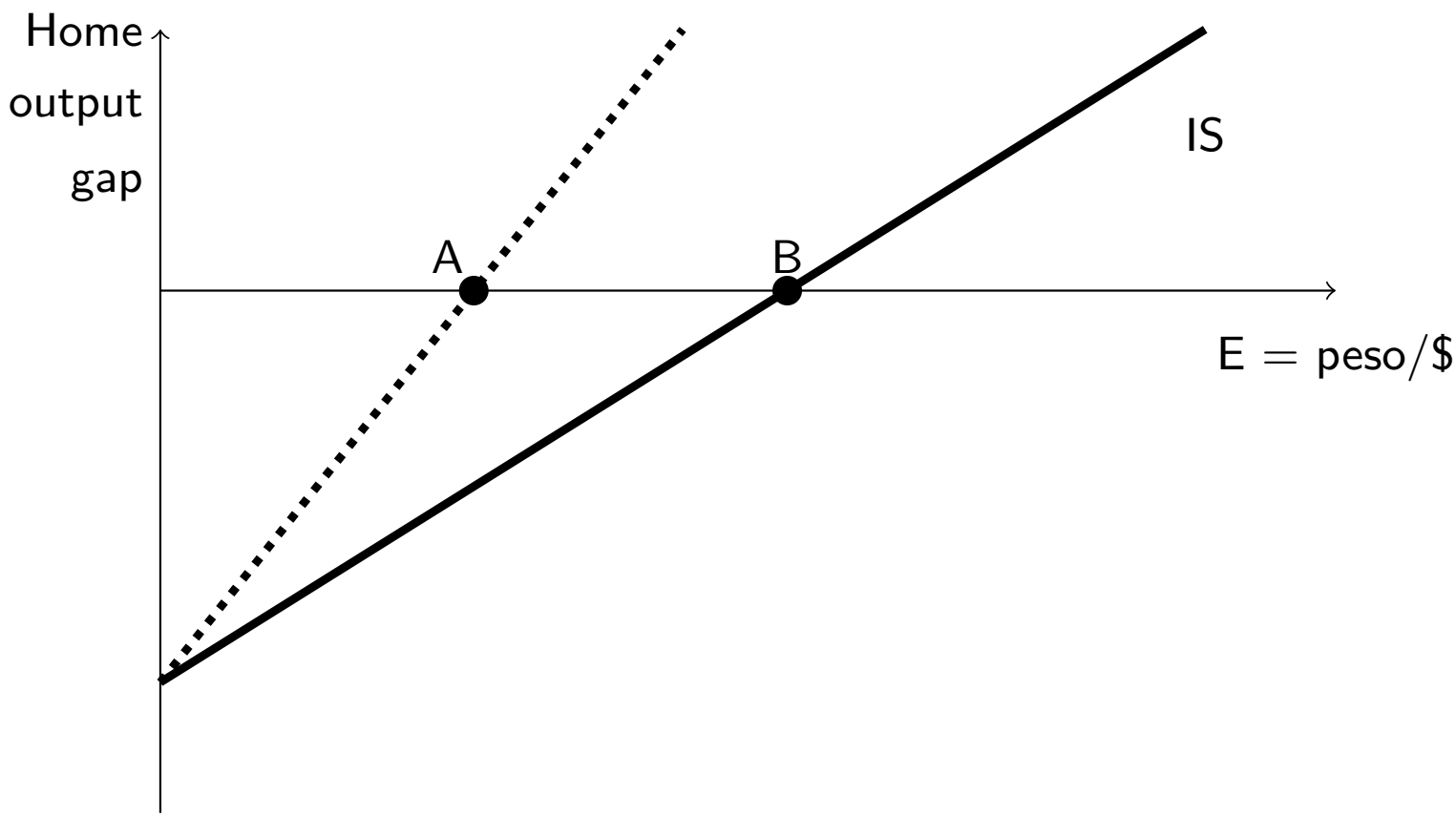
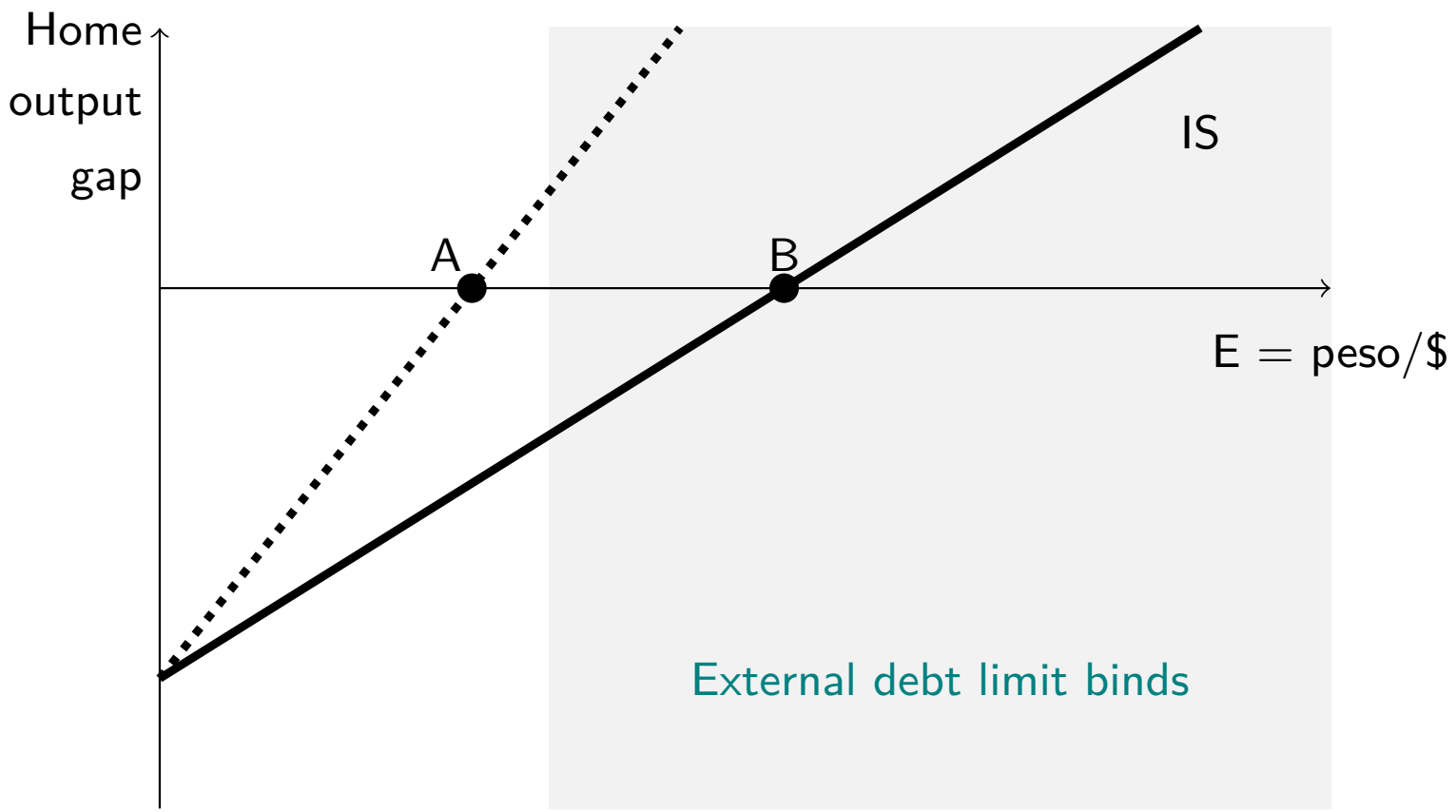


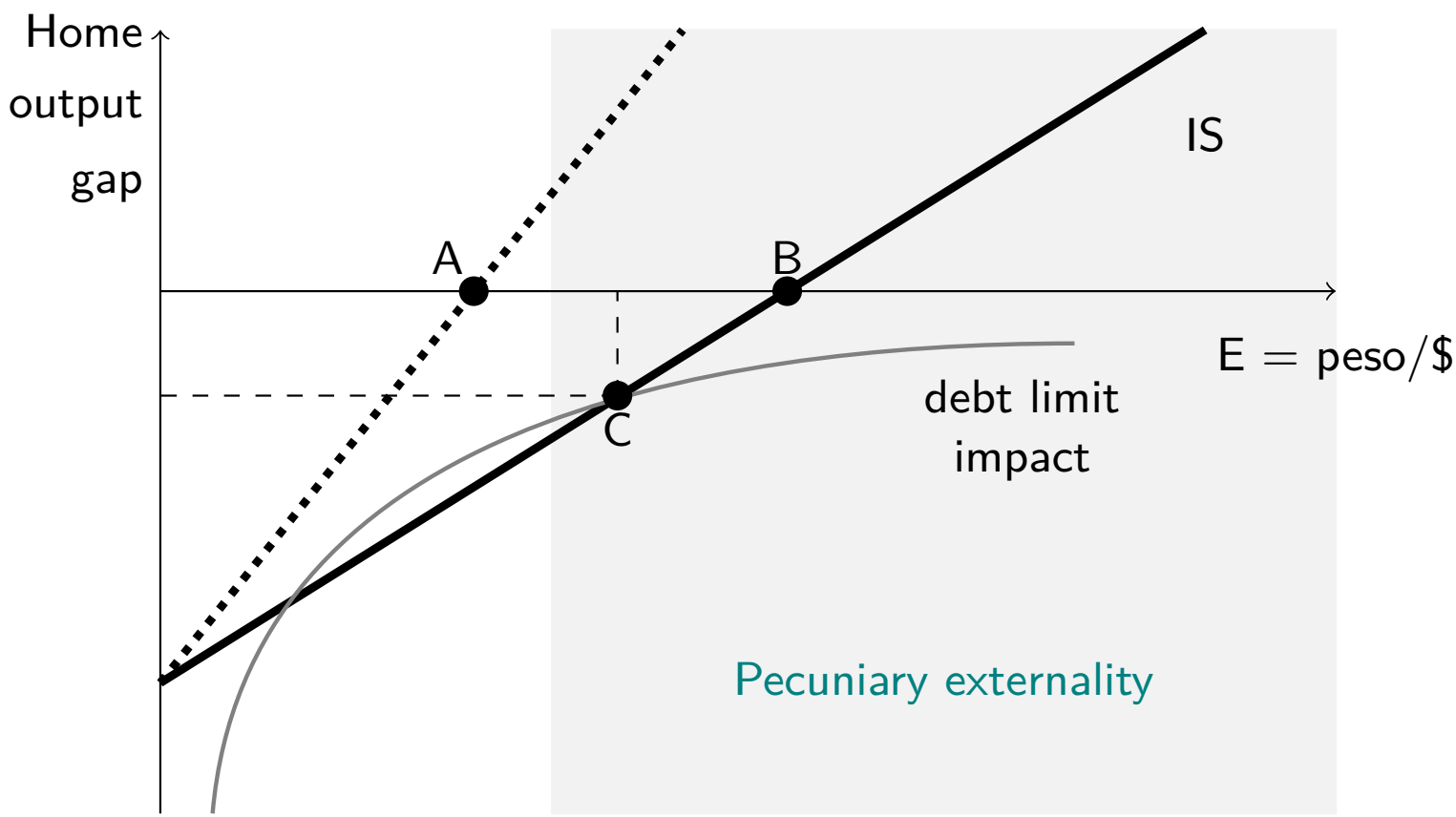
Adverse Commodity Price Shock

- Decline in wealth $\Rightarrow$ Reduce imports $\Rightarrow$ Shift IS curve
  - External FX debt limit may bind



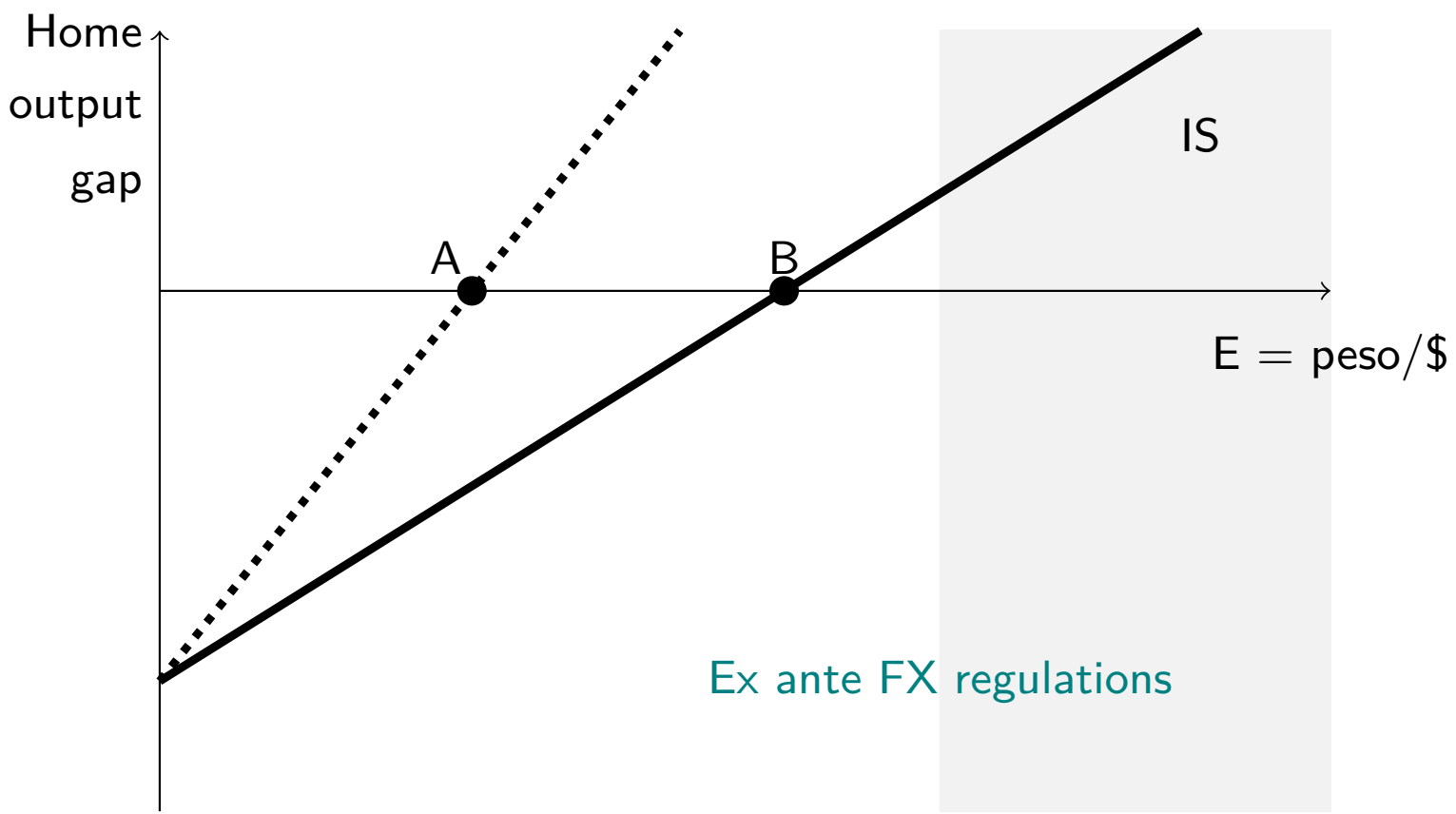
Adverse Commodity Price Shock

- Decline in wealth $\Rightarrow$ Reduce imports $\Rightarrow$ Shift IS curve
  - External FX debt limit may bind
  - If so, home output gap is not closed due to pecuniary externality



Adverse Commodity Price Shock

- Ex ante FX regulations + market development $\Rightarrow$ Greater benefits of ex post exchange rate flexibility



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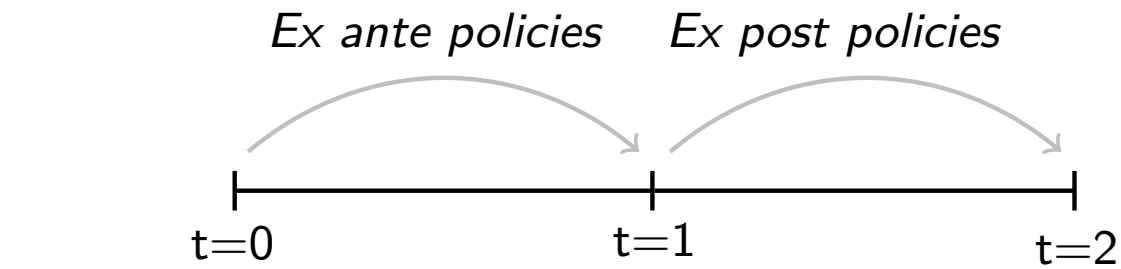
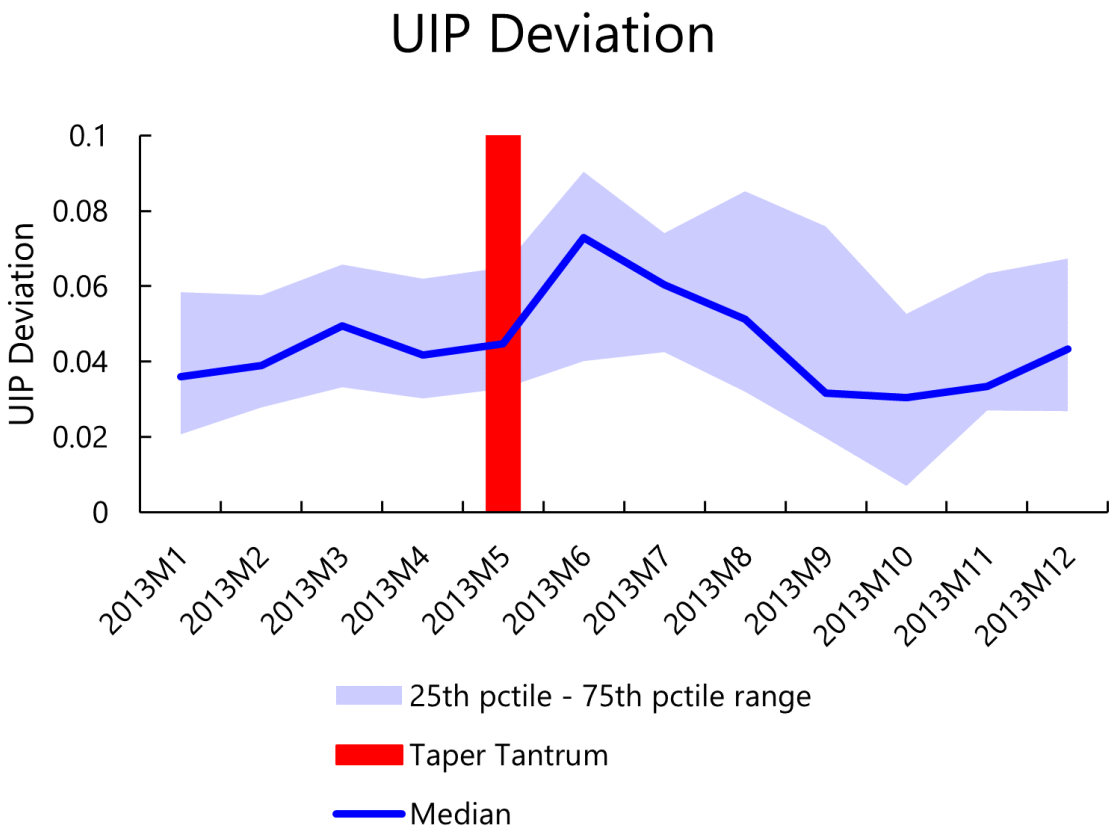


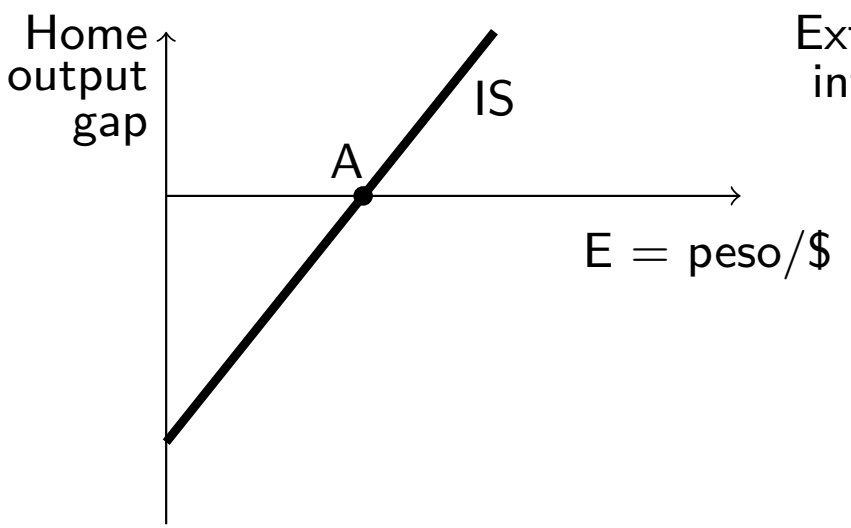
Taper Tantrum

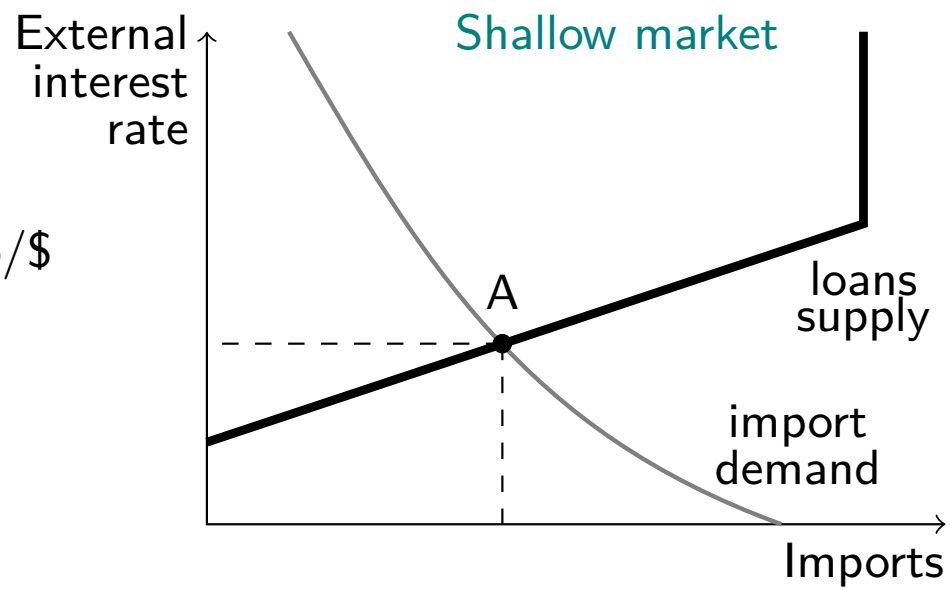


Source: Das, Gopinath, and Kalemli-Ozcan (2022). The following countries are included: Mexico, Brazil, Colombia, Peru, Russia, Turkey, Hungary, Malaysia, Indonesia, Philippines, Argentina, China, India, Paraguay, Poland, Romania, South Africa, Thailand and Vietnam.

Taper Tantrum

- Taper tantrum + shallow FX market $\Rightarrow$ Imports $\downarrow$, premia $\uparrow$
  - Depreciation alone does not insulate
  - Ex post FX intervention and capital controls can insulate
  - With those tools, depreciation is not needed





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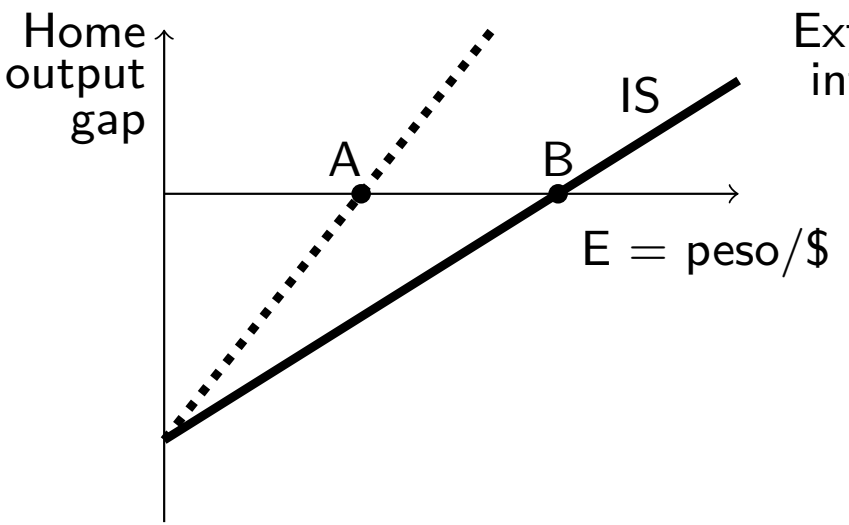

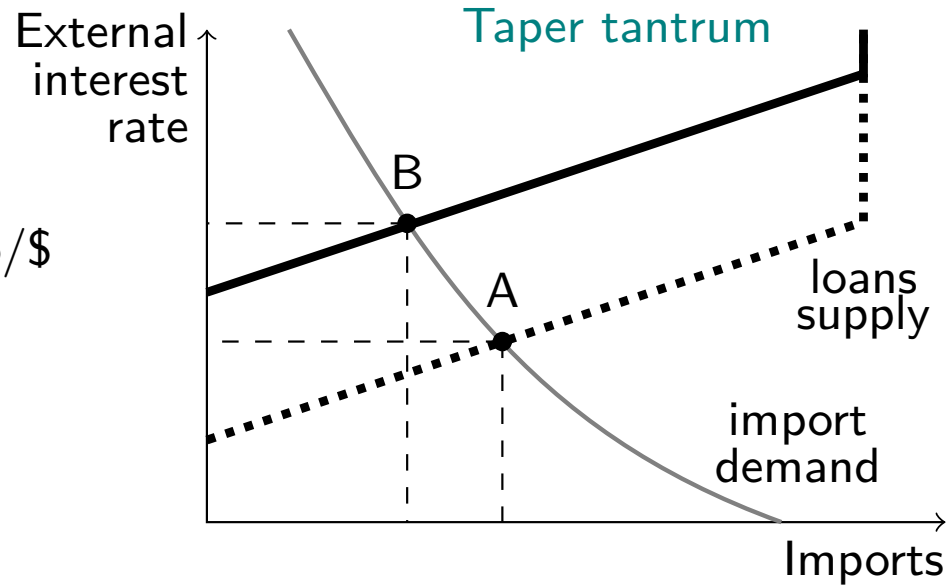

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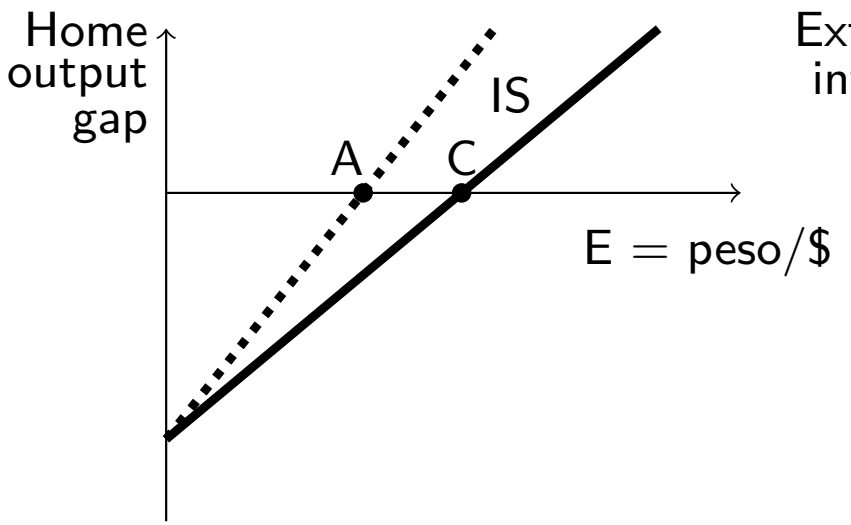

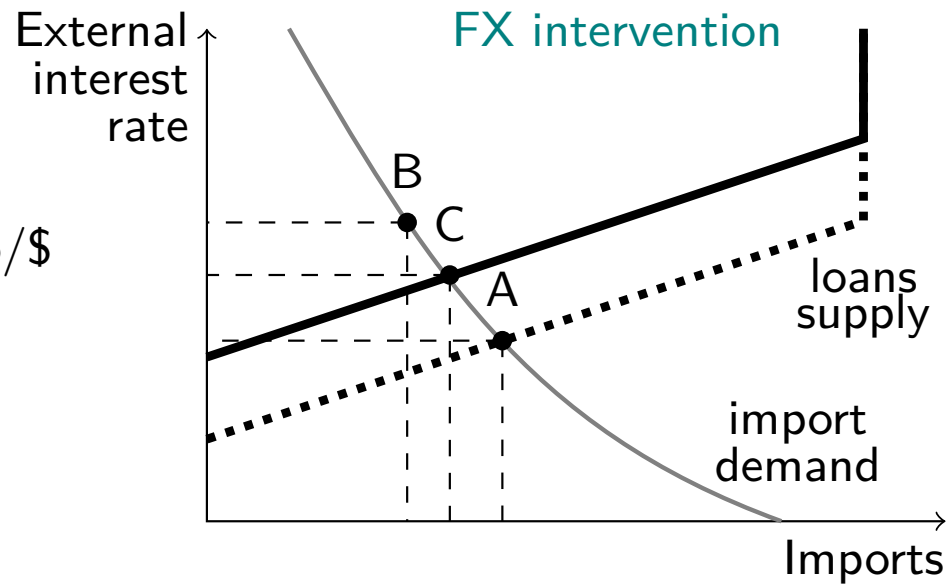

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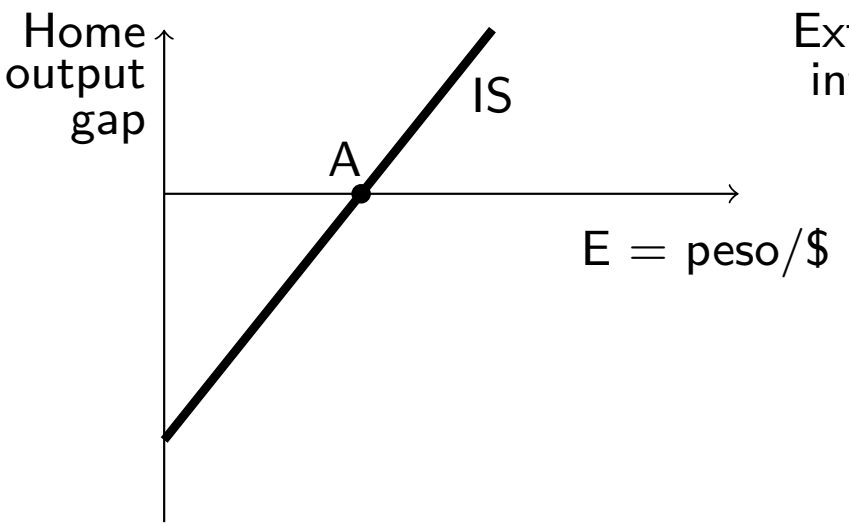

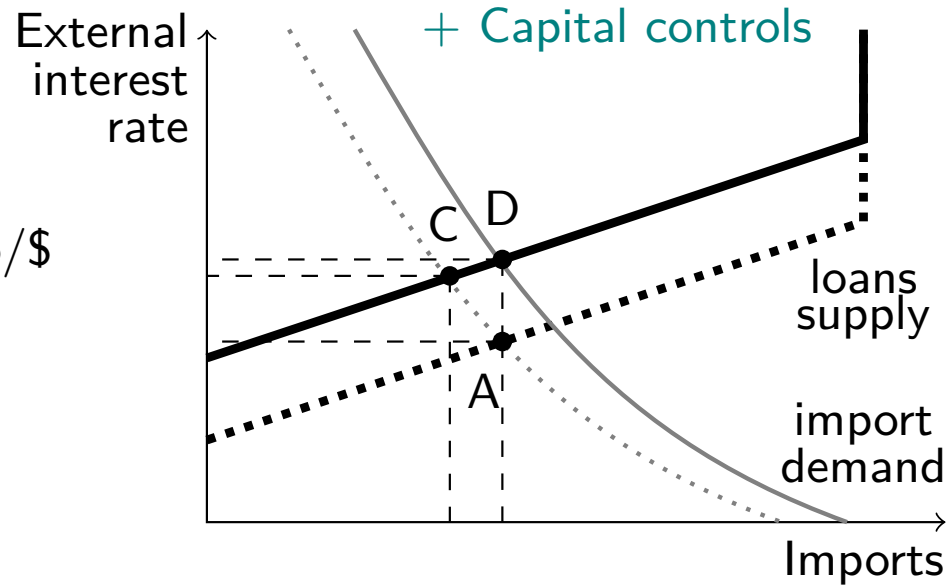

Frictions in Borrowing: Takeaways

1. Do monetary policy and flexible exchange rates achieve domestic goals after shocks?
   - Yes $\rightarrow$ Not always
   - Credit conditions co-move owing to global financial cycle
   - If financial constraints bind, goals are not achieved

2. Are FXI & capital controls needed to achieve those goals?
   - No $\rightarrow$ Yes, sometimes
   - Ex ante FX regulations and market development support ex post exchange rate flexibility after fundamental shocks
   - Ex post FX intervention and capital controls dominate policy rate and exchange rate flexibility after non-fundamental shocks

Conclusion: The Key Insights

1. Do monetary policy and flexible exchange rates achieve domestic goals after shocks?
   - Yes $\rightarrow$ No under DCP and/or financial frictions

2. Are FXI & capital controls needed to achieve those goals?
   - No $\rightarrow$ No under DCP
   - No $\rightarrow$ Yes, sometimes with financial frictions

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Drivers of IMS: Endogenous currency choice

- Gopinath and Stein (2020): DCP may incentivize borrowing and lending in USD, and vice versa
- Chahrour and Valchev (2021), Mukhin (2022)

Evolution of IMF Thinking

- Role for capital controls in specific circumstances
  - Institutional View on Capital Flows (2012): To manage surges
  - Review of Institutional View (2022): To manage FX mismatches pre-emptively
- Whether and how to use multiple instruments
  - Integrated Policy Framework (2020 onwards)
  - FX intervention, capital controls, and macroprudential measures alongside policy rate and exchange rate flexibility

Open Questions

- Inflation targeting with financial frictions
- Gains from monetary policy coordination
- New issues from shadow banking and crypto assets
- Implications of geo-economic fragmentation