

Global fragmentation, fiscal policy, and economic growth: a cross-country analysis

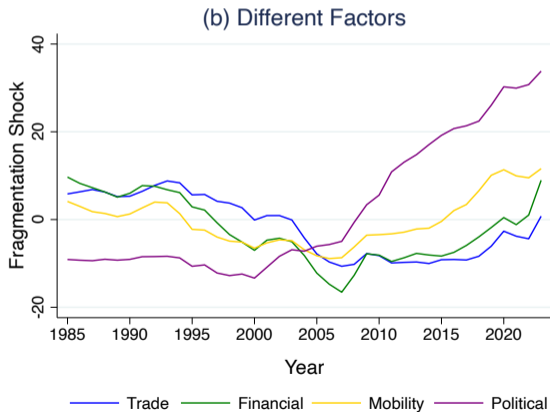
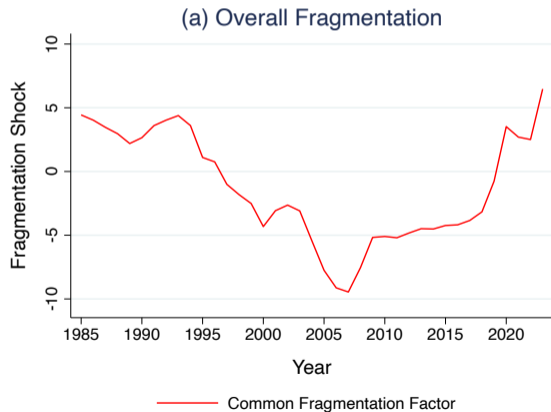
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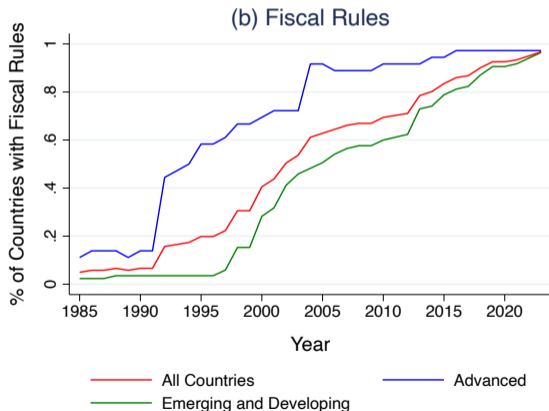
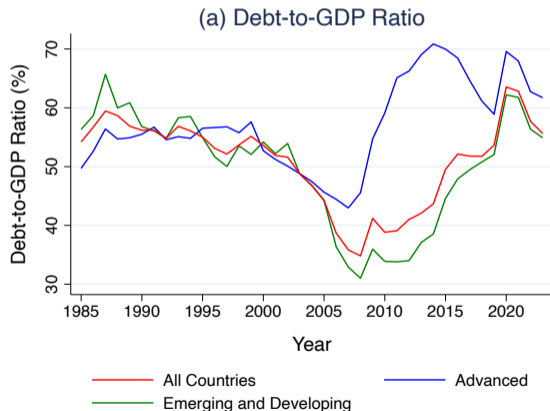
Motivation

- ▶ After decades of globalization, geopolitics is now pulling the world economy apart.
- ▶ The Geopolitical Fragmentation Index (Fernández et al., 2024) has risen steadily since the Global Financial Crisis.



Motivation

- ▶ Disruptions to trade and finance are straining budgets and worsening debt risks—debt-to-GDP is already at record highs.
- ▶ Meanwhile, fiscal rules have become increasingly widespread.



This paper

Question

1. What are the dynamic macro and fiscal effects of fragmentation shocks?
2. Do fiscal rules mitigate output losses and debt dynamics?
3. What is the role of fiscal-monetary interaction in dealing with fragmentation?

This paper

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1. What are the dynamic macro and fiscal effects of fragmentation shocks?
2. Do fiscal rules mitigate output losses and debt dynamics?
3. What is the role of fiscal-monetary interaction in dealing with fragmentation?

- ▶ Using an intensive panel data for 121 countries, 1985-2023:
 - * Employ the State Dependent Local Projection ([Jordà \(2005\)](#)) to shed light of the fragmentation risk
 - * Macro fiscal and productivity effects of the global fragmentation risk
 - * The role of having active fiscal rules
 - * The role of interaction of fiscal rule and monetary policy stances (exchange rate regime and central bank independence = CBI)

Preview of main findings

- ▶ The rise in fragmentation has contractionary effects on the real economy and worsens fiscal sustainability in the medium- to long-run (**Macro-fiscal effects**).
- ▶ It also dampens productivity and reduces the incomes of poor people disproportionately (**Development effects**).
- ▶ The presence of a fiscal rule helps to mitigate both the effects
- ▶ Having fiscal rules with inflation-targeting (float exchange rate) monetary policy and high CBI also helps to mitigate both effects

Literature

Fiscal policy and sustainability: Fernández-Villaverde et al. (2015); Ramey and Zubairy (2018); Ardanaz et al. (2024); Esquivel and Samano (2026); Grosse-Steffen et al. (2025); Potrafke (2025); Antolin-Diaz and Surico (2025); Fatás et al. (2026), ...

⇒ *We focus on the fiscal framework to deal with fragmentation risks*

Fiscal monetary interaction: Leeper (1991); Sims (1994); Woodford (1995); Cochrane (1998); Araujo et al. (forthcoming); Bajaro et al. (2025), ...

⇒ *We measure the interaction empirically in dealing with fragmentation*

Productivity and unequal effect: Auerbach (2025); Antolin-Diaz and Surico (2025); Chie and Ganelli (2015); Zouhar et al. (2021); Clements et al. (2022, 2025); Uddin et al. (2025), ...

⇒ *We focus on the implication of fragmentation risks*

Baseline empirical strategy: panel local projections

This paper addresses the macroeconomic implications of geopolitical fragmentation risks and the role of fiscal rules in mitigating them. We use a fragmentation index, constructed using a dynamic hierarchical factor model by Fernández-Villaverde et al. (2024), as an exogenous shock. Baseline local projection:

$$Y_{i,t+h} - Y_{i,t-1} = \beta_h \text{Frag}_t + \theta_h X_{i,t-l} + z_i + \varepsilon_{i,t+h}, \quad h = 0, 1, 2, \dots$$

- ▶ Frag_t : global fragmentation shock
- ▶ z_i : country fixed effects
- ▶ X : set of control variables including: real GDP, real consumption, real investment, inflation rates, the government debt-to-GDP ratio, the real effective exchange rate, the current account-to-GDP ratio, the financial development index, the financial institution index, capital account openness, VIX, and oil price.

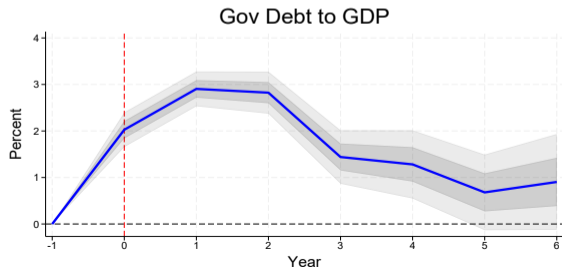
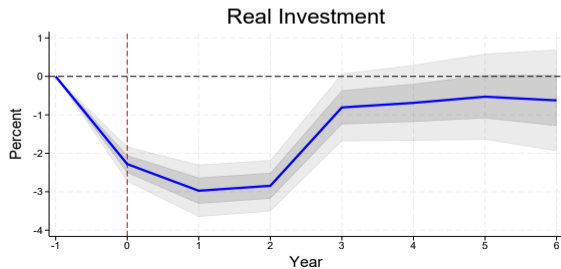
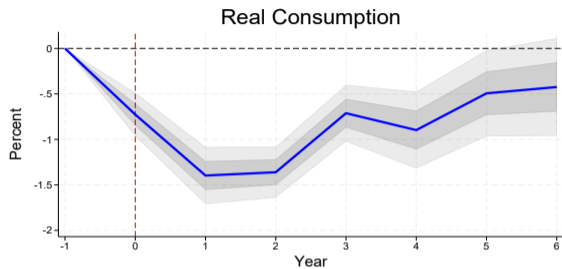
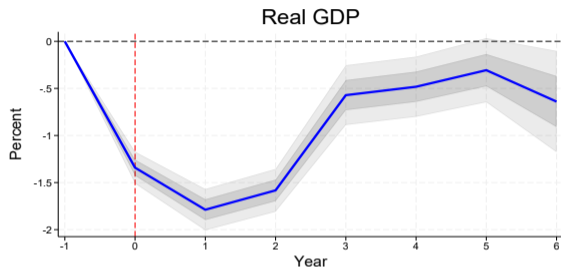
State dependence via interactions (fiscal rule, exchange rate regime, CBI) to obtain conditional IRFs.

Selected variables

Variables	Descriptions & Source
Geopolitical Fragmentation	Fernández-Villaverde et al. (2024)
Fiscal Rule	IMF (Alonso-Albarran et al. (2025))
Real GDP	GMD (Müller et al. (2025))
Real Consumption	GMD (Müller et al. (2025))
Real Investment	GMD (Müller et al. (2025))
Government Debt to GDP	GMD (Müller et al. (2025))
Inflation Rate	GMD (Müller et al. (2025))
Real Effective Exchange Rate	GMD (Müller et al. (2025))
Unemployment Rate	GMD (Müller et al. (2025))
Real Government Spending	Gethin (2024)
Income Distribution	World Inequality Database (WID)
Financial Market Index	IMF, IFS
Financial Development Index	IMF, IFS
TFP (constant price)	PWT (Feenstra et al. (2015))
TFP-Welfare Relevance (constant price)	PWT (Feenstra et al. (2015))
WTI Spot Crude Oil Price	FRED
CBOE Volatility Index	FRED

Macroeconomic effects

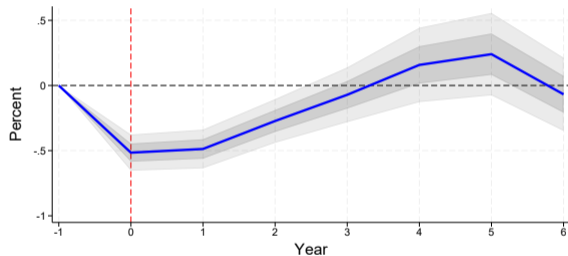
Fragmentation shocks lead to persistent recession and can be a **growth** and **debt** problem simultaneously.



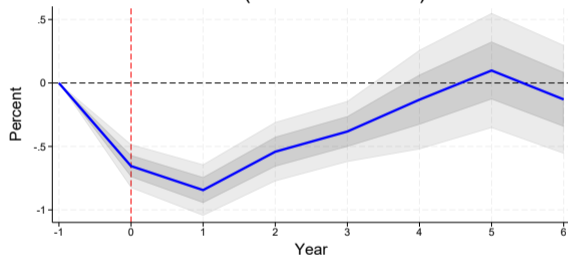
Development effects

Fragmentation shocks dampen the long-run growth through TFP

TFP



TFP (Welfare Relevant)



State dependent analysis: Fiscal rule and monetary fiscal interactions

(1) State dependence with a fiscal rule

$$Y_{i,t+h} - Y_{i,t-1} = \beta_h \text{Frag}_t + \delta_h D_{i,t}^{FR} + \gamma_h \text{Frag}_t \times D_{i,t}^{FR} + \theta_h X_{i,t-l} + z_i + \epsilon_{i,t+h} \quad h = 0, 1, 2, \dots,$$

(2) State dependence with monetary-fiscal interactions (FX regime)

$$\Delta_h Y_{i,t} = \beta_h \text{Frag}_t + \delta_h D_{i,t}^{FR} + \zeta_h D_{i,t}^{EX} + \gamma_h (\text{Frag}_t \times D_{i,t}^{FR}) + \kappa_h (\text{Frag}_t \times D_{i,t}^{EX}) \\ + \xi_h (\text{Frag}_t \times D_{i,t}^{FR \times EX}) + \theta_h X_{i,t-l} + z_i + \epsilon_{i,t+h}.$$

- ▶ $D_{i,t}^{FR} = 1$: fiscal rule, no flexible FX, 0 otherwise
- ▶ $D_{i,t}^{EX} = 1$: flexible FX, no fiscal rule, 0 otherwise
- ▶ $D_{i,t}^{FR \times EX} = 1$: fiscal rule & flexible FX, 0 otherwise

(3) State dependence with monetary-fiscal interactions (CBI): replace $D_{i,t}^{FR}$ with $D_{i,t}^{CBI}$

- ▶ $D_{i,t}^{FR} = 1$: fiscal rule, CBI is lower than the median, 0 otherwise
- ▶ $D_{i,t}^{CBI} = 1$: CBI is higher than the median, no fiscal rule, 0 otherwise
- ▶ $D_{i,t}^{FR \times CBI} = 1$: fiscal rule & CBI is higher than the median, 0 otherwise

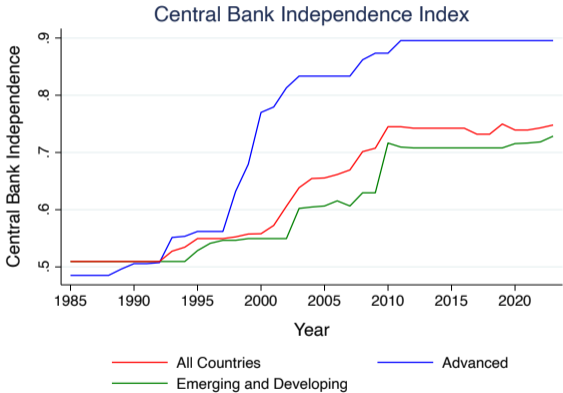
Definition of Fiscal Rules

We define $D_{i,t}^{FR} = 1$ if at least one of the following rules is implemented. (Alonso-Albarran et al., 2025)

- ▶ **Debt rule:** Explicit anchor or ceiling for public debt, expressed in percentage of GDP.
- ▶ **Budget balance rule:** Constraint on the budget aggregate that primarily influences the debt ratio.
- ▶ **Expenditure rule:** Limits on total, primary, or current government expenditures.
- ▶ **Revenue rule:** Ceilings or floors on revenues aimed at boosting revenue collection and/or preventing an excessive tax burden.

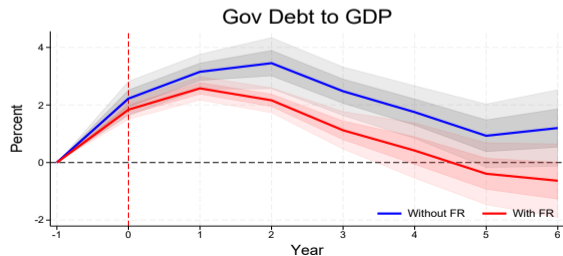
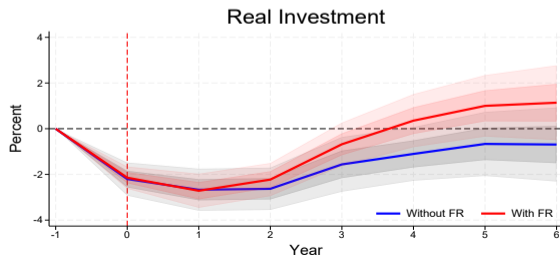
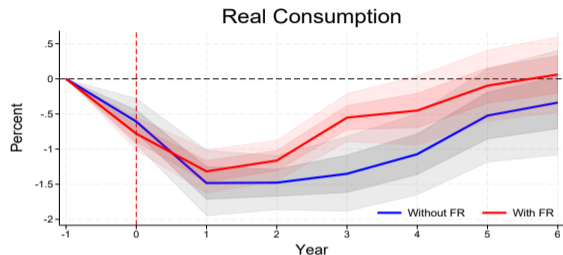
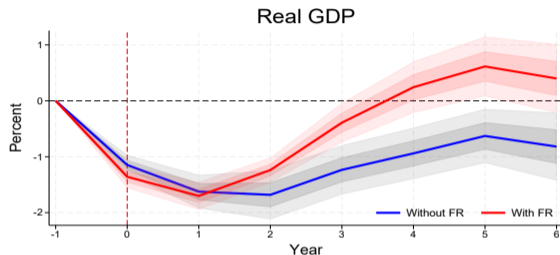
Central Bank Independence

► Central banks are becoming increasingly independent (Romelli, 2024).

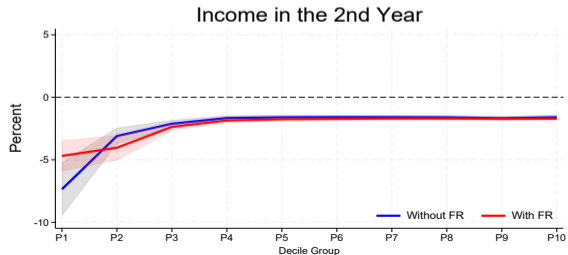
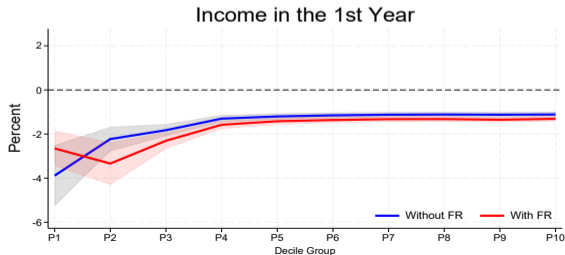
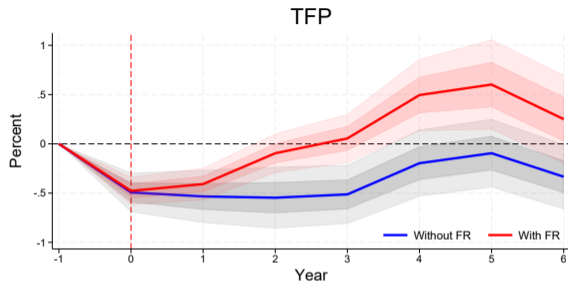
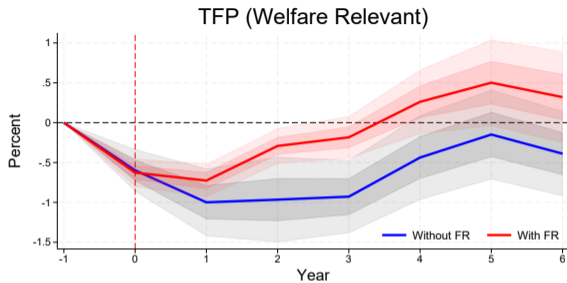


Fiscal rules mitigate output losses and debt accumulation

Fragmentation shocks are mitigated with the presence of fiscal rules in both the macroeconomic environment and fiscal sustainability

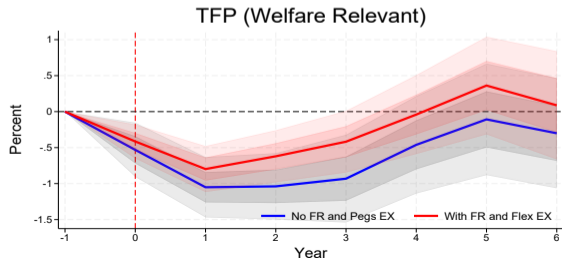
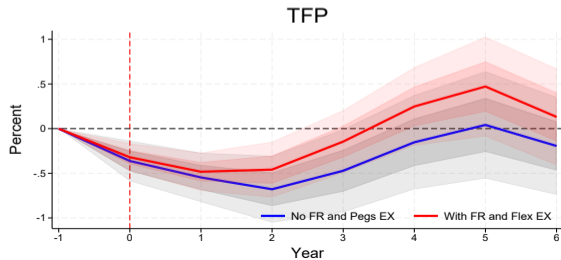
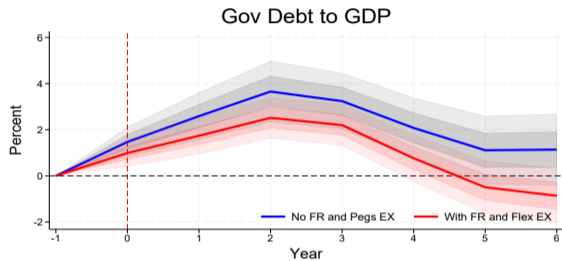
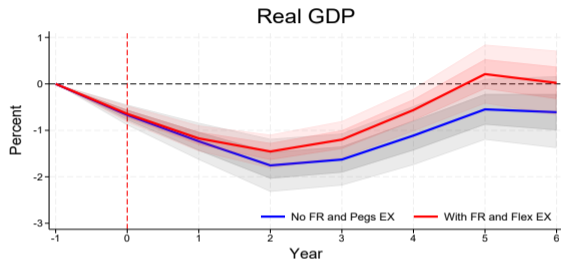


Fiscal rules: Productivity and distributional effects



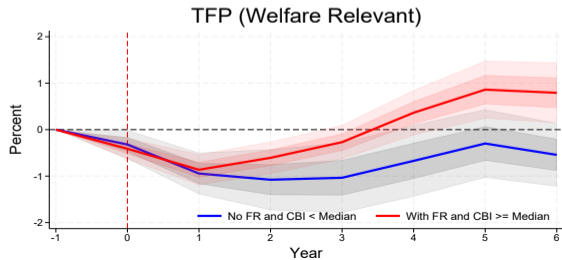
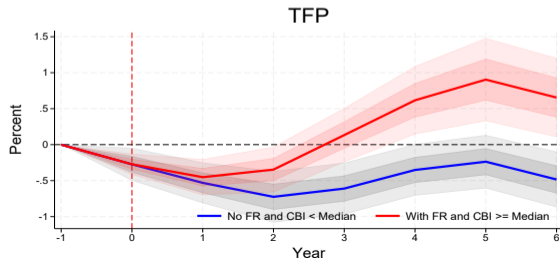
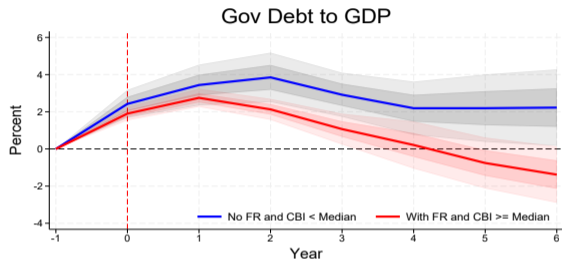
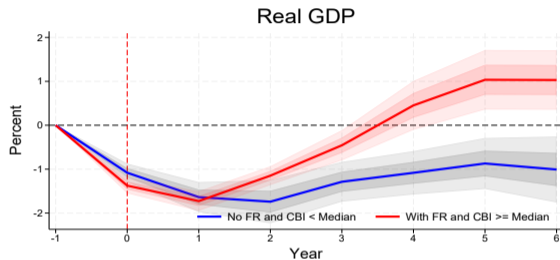
Monetary-fiscal interactions: exchange rate regime

The role of fiscal rules, combined with inflation targeting (a floating exchange rate), helps mitigate the effect, highlighting the role of monetary policy independence.



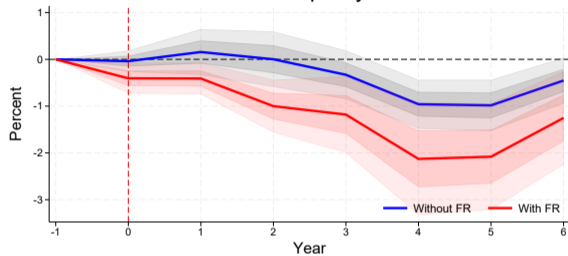
Monetary-fiscal interactions: central bank independence

The role of fiscal rules is more effective when combined with high central bank independence, highlighting the role of monetary policy credibility.

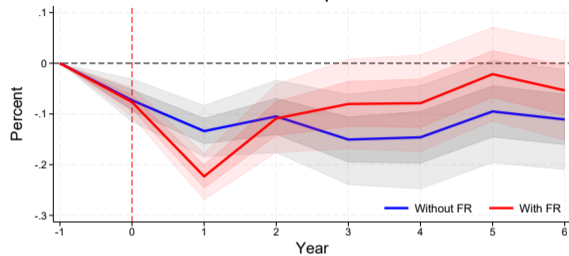


Other results: Sectoral and development effects

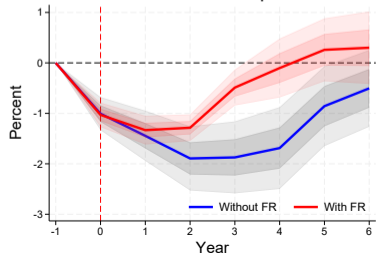
Gender Inequality Index



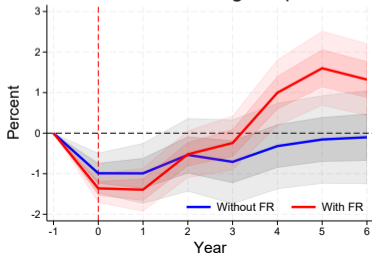
Human Development Index



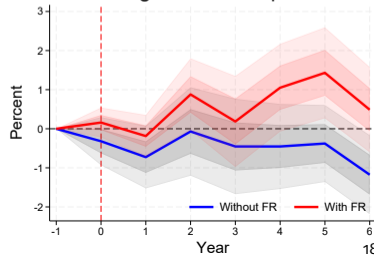
Services Output



Manufacturing Output



Agriculture Output



Conclusion

- ▶ **Fragmentation shocks are contractionary:** They reduce real GDP, consumption, and investment, weaken productivity, and lead to a persistent deterioration in fiscal sustainability (higher debt-to-GDP).
- ▶ **Fiscal rules mitigate adverse effects:** Countries with fiscal rules experience smaller and less persistent declines in activity and productivity, and a more contained rise in debt-to-GDP.
- ▶ **Monetary-fiscal interaction matters:** The buffering role of fiscal rules is strongest under *monetary independence* (proxied by flexible exchange rates) and with higher central bank independence.
- ▶ **Heterogeneity and distributional relevance:** Effects are larger—and fiscal rules are more valuable—in EMDEs, in weaker institutional settings (lower political stability / higher corruption), and in more climate-exposed countries. Fiscal rules also help preserve key spending categories and reduce distributional fallout over the medium term.

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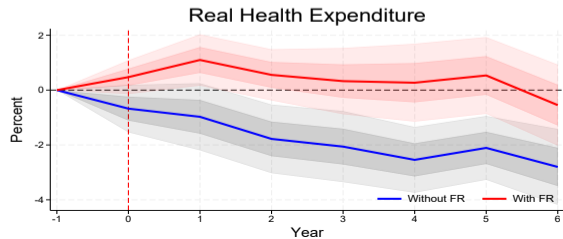
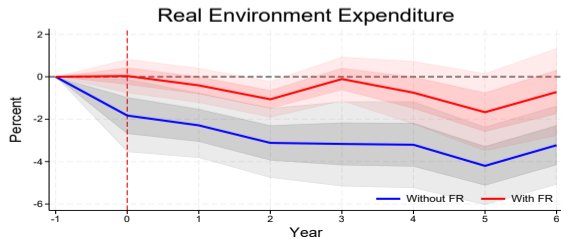
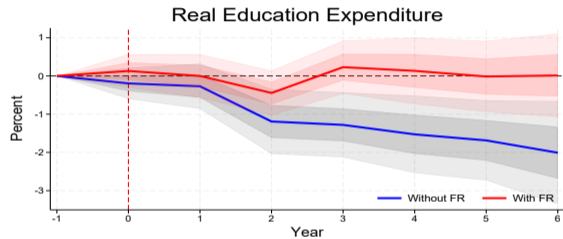
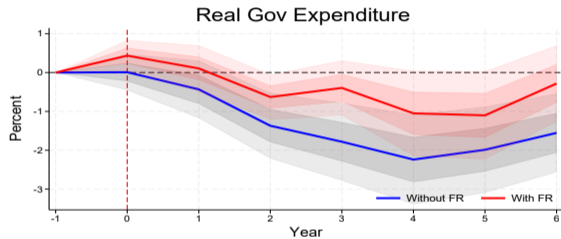
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Appendix

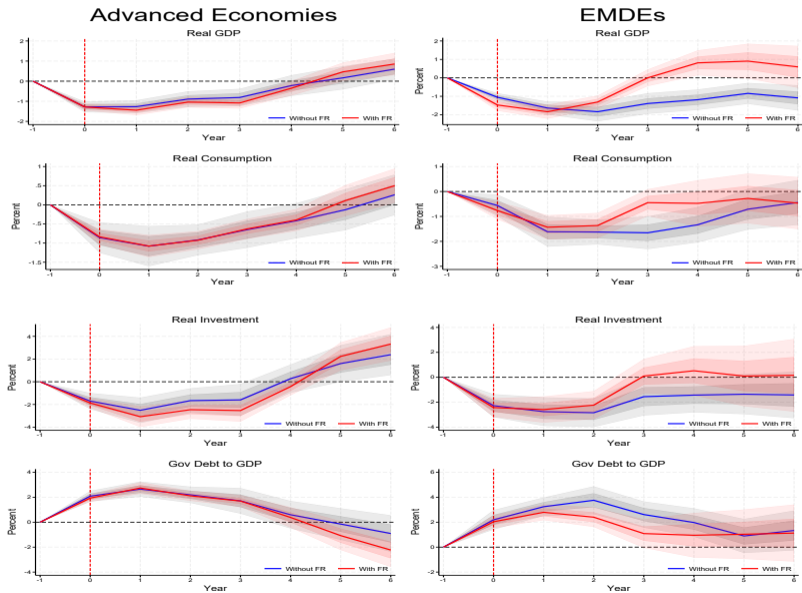
Other results (1)

Figure 4: The response of government expenditures



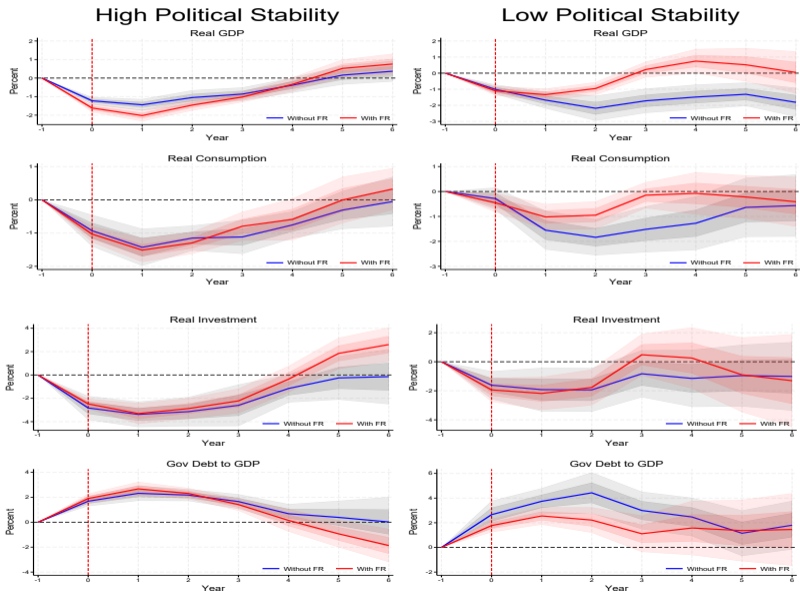
Other results (2)

Figure 5: Fragmentation shock in AEs and EMDEs



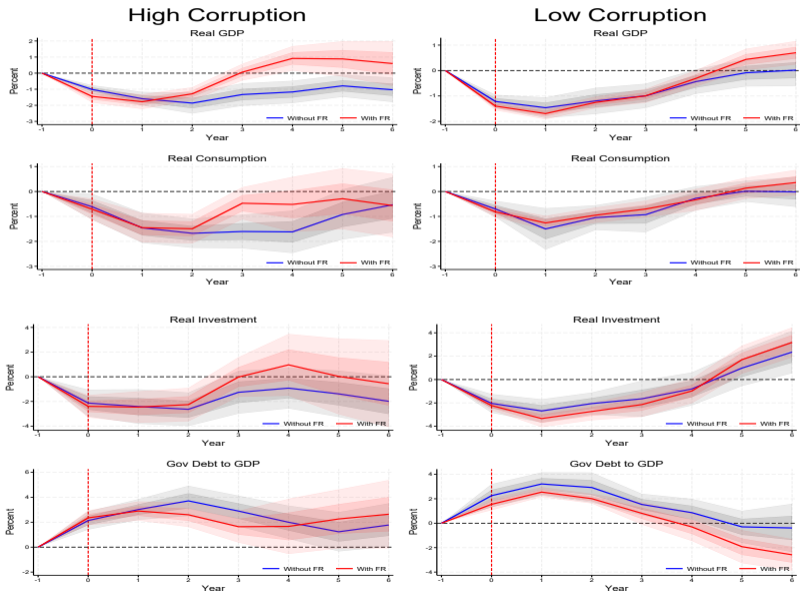
Other results (3)

Figure 6: The role of political stability



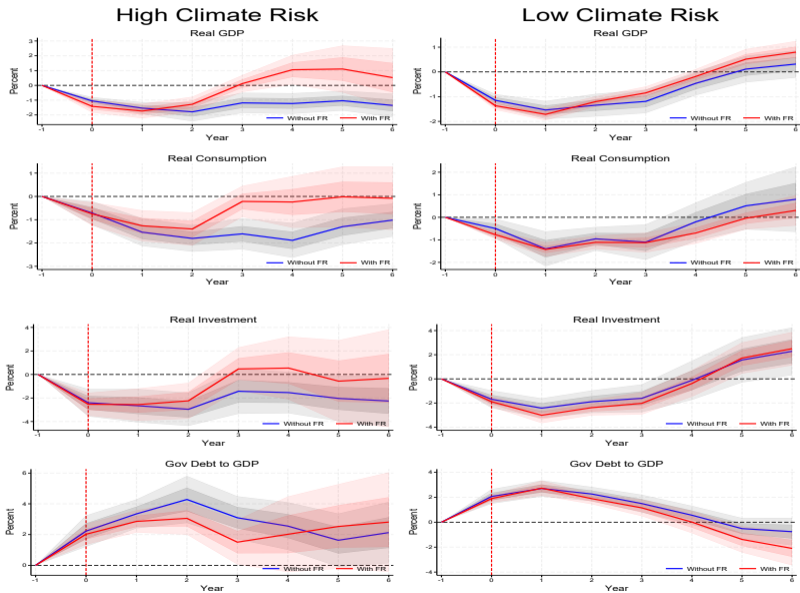
Other results (4)

Figure 7: The role of political corruption



Other results (5)

Figure 8: The role of political corruption



Other results (6)

Figure 9: Distributional effects

