The Economic Impact of Fiscal Policy Uncertainty: Evidence from a New Cross-Country Database

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Motivation: why should we care about fiscal policy uncertainty

- Forging a political consensus on fiscal policy is becoming increasingly difficult.
  - Rising spending needs (aging, climate, AI, public investment)
  - Shrinking fiscal space
  - Deepening political divide and populism (backlash on tax increases, reforms)
- Fiscal policy uncertainty, or *ambiguity in fiscal plans or public debt valuations*, is often perceived to adversely impact economic activity and financial markets.
- Only few studies have explored the economic impact of fiscal policy uncertainty (US: Fernández-Villaverde et al. (2015), Japan: Arbatli et al. (2017), etc).
- Existing "fiscal policy" shocks do not fully capture fiscal stress events such as the US debt ceiling.

Outline

1. Construct a novel database of news-based fiscal policy uncertainty (FPU)
   - Global Fiscal Policy Uncertainty: events that attract global attention
   - Country-level Fiscal Policy Uncertainty for 189 countries
   - Main approach: frequency of "FPU-related" keywords (Baker, Bloom, and Davis (2016)), but also explore other approaches such as LLM, stochastic volatility, narrative checks for some countries
2. Empirical analysis on the effects of fiscal policy uncertainty on economic activity and financial variables
   - Global FPU on IP and spreads for US, AE excluding US, EM
   - Contractionary effects of country-level vs. global FPU
   - Global FPU on global financial cycle variables, à la Miranda-Agrippino and Rey (2020)
3. Some thoughts on the UK: A Source or a Receiver of Global Spillovers?

Literature

1. **News-based approach to construct policy uncertainty indicators**: Baker, Bloom, and Davis (2016), Ahir, Bloom, and Furceri (2022), Caldara and Iacoviello (2022), and many others
2. **Identification of fiscal policy shocks**: Ramey and Shapiro (1998), Romer and Romer (2010), Blanchard (1984), Auerbach and Gorodnichenko (2012)
   Existing studies focus on legislated events or use realized fiscal outcomes.
3. **Economic impact of fiscal volatility policy shocks**: Sims (2011), Fernández-Villaverde et al. (2015), Mumtaz and Surico (2018), Not on cross-country spillovers of FPU
4. **Financial impact of fiscal policy shocks (convenience yields, bond risk premia)**: Von Hagen, Schuknecht, and Wolswijk (2011), Gómez-Cram, Kung, and Lustig (2024), Not on cross-country spillovers of FPU

Construction of a New Database of Fiscal Policy Uncertainty Index

Textual Analysis for News-Based Fiscal Policy Uncertainty Indicators

- Existing methodologies of measuring policy uncertainty: survey-based approach, stochastic volatility (Fernández-Villaverde et al. (2015), Jurado, Ludvigson, and Ng (2015)).
- In this paper, focus on the frequency at which certain topics is mentioned in news articles in a month, with a dictionary of keywords that capture the topic of interest, similar to Baker, Bloom, and Davis (2016)
- $\rho(\widehat{Y}_{p,k}, Y_p)$: $\widehat{Y_{p,k}}$ is the news-extracted frequency of a phenomenon p using keywords k and Y_p is the actual occurrence of a phenomenon p

Data Description

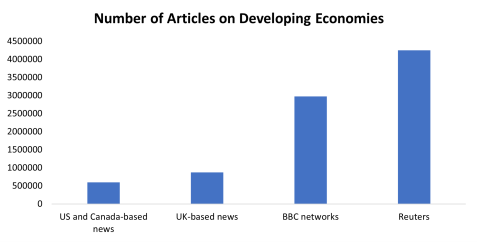
- Source: Major English-language newspapers from the Dow Jones Factiva
  - US, Canada, and UK based newspapers
  - International BBC networks and Reuters News (important for coverage of EMDEs)
  - 40 million plus articles
- Time period: January 1977 to July 2024 for global series; starts from January 1995 for country-level
- Country coverage: (potentially) 189 countries, completed narrative checks for 60 countries (more than 90 percent of GDP)
- Global FPU: unrestricted search in terms of country; Country FPU: country name restrictions in the title, snippet, or the main paragraph

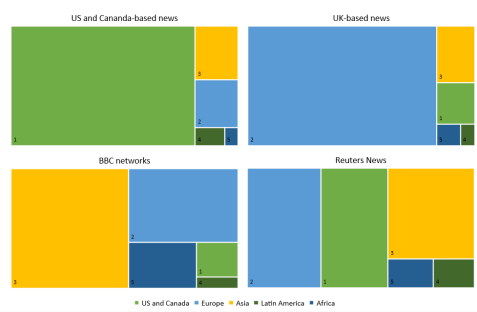
News-based Fiscal Policy Uncertainty: Search Queries

Table 1: Examples of search keywords

Category identifier	Keywords
I. Fiscal Topics	
1. Tax	taxation *or* taxes *or* taxed *or* tax
2. Government expenditure	government spending *or* federal spending *or* *or* defense spending *or* military spending *or* pension reform *or* pension expenditure
3. Public debt	federal debt *or* government debt *or* national debt *or* public debt *or* debt ceiling *or* debt sustainability *or* government borrowing
II. Policy authority	govern* *or* parliament *or* congress* *or* regulat* *or* policy *or* policies *or* legislat* *or* minist* *or* national assembly
III. Uncertainty	uncertain* *or* ambiguous *or* dubious *or* precarious *or* unpredictable *or* undecided *or* undertermined *or* unresolved

Coverage of newspaper articles by outlets

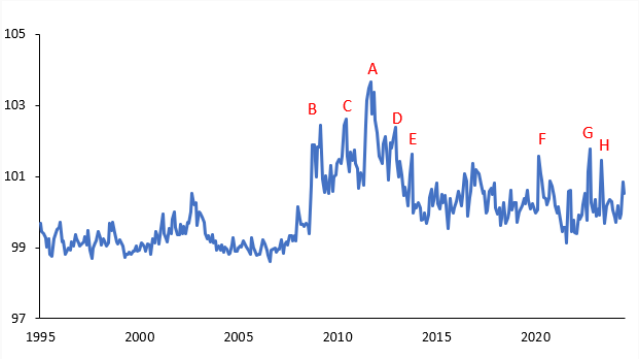




Addressing false positives

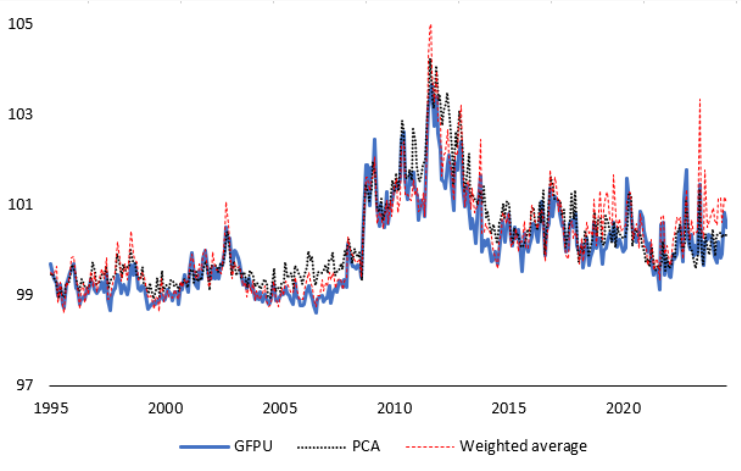
- Keyword searches are not perfect. False positives are inevitable.
- Validation process is critical.
  - Human readings of narratives of newspaper articles
  - Variations of search queries (near, and, or)
  - Correlations with self-constructed fiscal policy uncertainty indicator using stochastic volatility approach and LLM as well as other existing indicators of uncertainty (Ahir, Bloom, and Furceri (2022))

Global Fiscal Policy Uncertainty (GFPU)

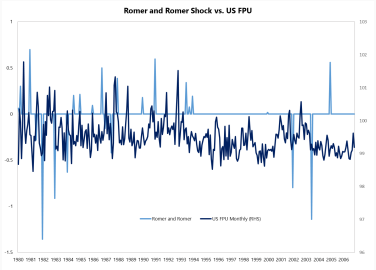


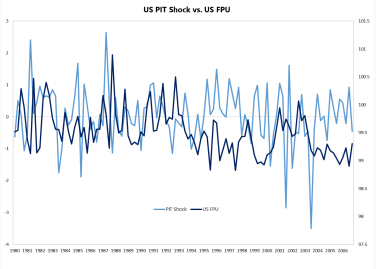
A. July-November 2011. Eurozone debt crisis, US debt ceiling. B. October 2008-March 2009. Global Financial Crisis. C. May-June 2010. First Greece Bailout. D. 2012. Sovereign debt crisis. US fiscal cliff (expiration of tax cuts and spending increases). E. October 2013. US government shutdown. F. March 2020. COVID-19 pandemic. G. October 2022. UK's mini-budget episode. H. May 2023. US debt ceiling episode.

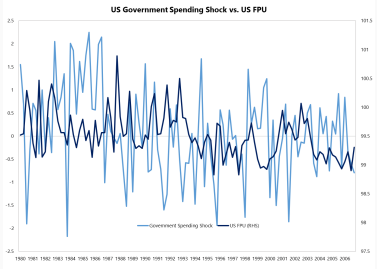
GFPU: Alternative methodologies



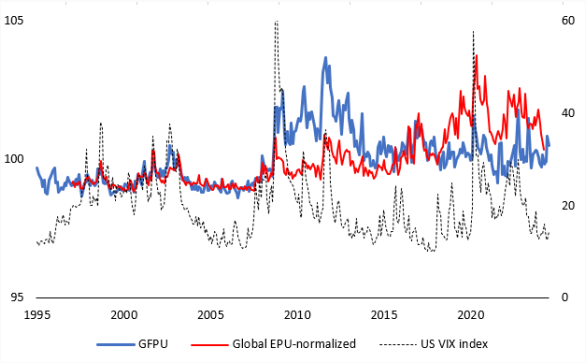
GFPU looks nothing like first-moment fiscal shocks







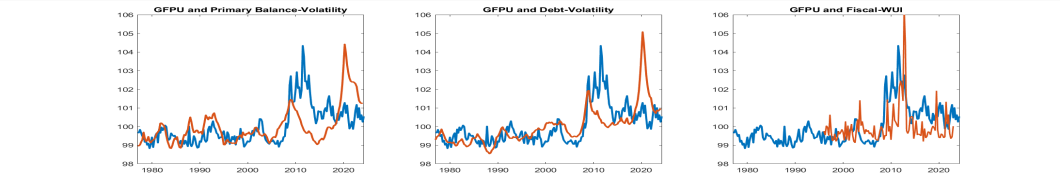
Some similarities with global economic policy uncertainty, but not with VIX



Source: Global economic policy uncertainty indicator (PPP-adjusted) is a normalized series from Davis (2016). The US CBOE volatility index (VIX) is from the Federal Reserve Bank of St. Louis.

Relatively high correlations with 2nd-moment fiscal shocks

Stochastic volatility of Primary Balance and Public Debt, World Uncertainty Index



Note: Stochastic volatility series are constructed using an AR(3) model. World Uncertainty Index is from Ahir, Bloom, and Furceri (2022).

Correlations

	PB-SV	Debt-SV	Fiscal-WUI
Pre-COVID	0.40	0.60	0.45
Full sample	0.38	0.52	0.41

Robustness Check using Large Language Model

Data: all news articles published in Financial Times, from Jan 1985 to July 2023.

Prompt for tax policy uncertainty

Here's the news article: {NEWS ARTICLE}

Questions:

Q1: Is [country name] mentioned in the news article? Answer "Yes" or "No".

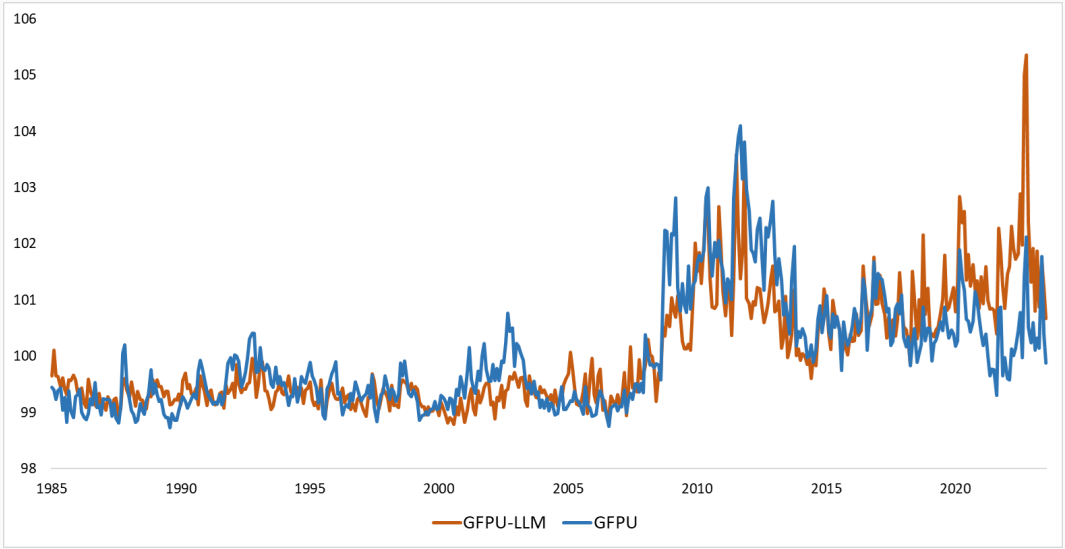
Q2: If [country name] is mentioned in the news article, is [country name]'s tax policy mentioned in the article? Answer "Yes" or "No".

Q3: If [country name]'s tax policy is mentioned in the article, do you think this news reflects that the tax policy in [country name] or its effects in [country name] are more uncertain? Write your answer as "Yes, more uncertain" or "No".

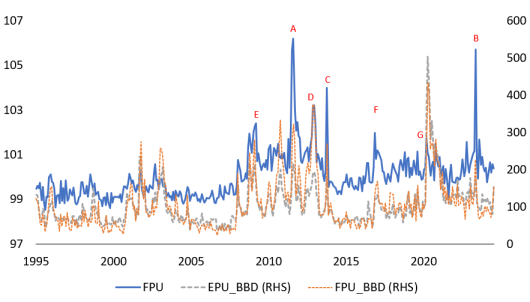
Q4: Provide explanation for your answer in Q3. Write your answer in natural language.

Similar prompt for government spending and debt uncertainty.

LLM-based Global FPU

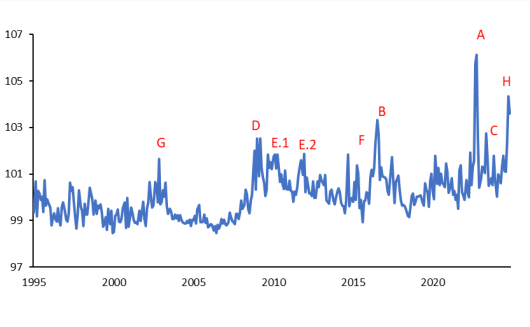


Country-Level Fiscal Policy Uncertainty: US



A. July-August 2011. Debt ceiling crisis. B. May 2023. Debt ceiling crisis. C. October 2013. Government shutdown. D. November-December 2012. Fiscal cliff, with tax creases and spending cuts effective from December 2012. E. March 2009. First large-scale asset purchase by the Fed. F. November 2016. Presidential election, Trump elected. G. March 2020. COVID-19 pandemic.

Country-Level Fiscal Policy Uncertainty: UK



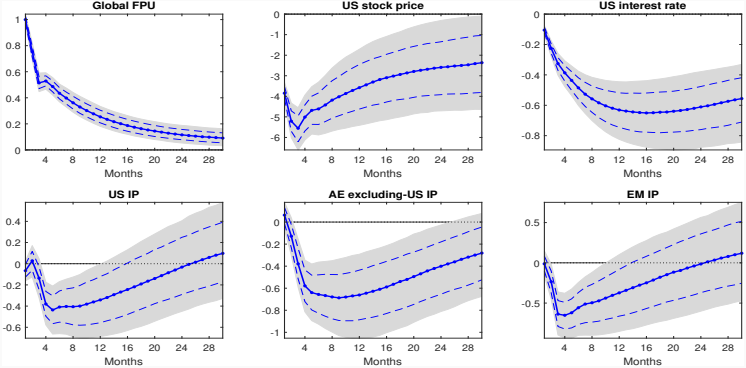
A. September-November 2022. Mini budget, energy crisis. B. June-July 2016. Brexit. C. March-May 2023. Cost-of-living crisis, debt costs rise. D. November 2008-March 2009. GFC. E. Eurozone debt crisis. F. April 2015. Before the General Election, discussing a potential UK Brexit referendum. G. November 2002. Budget concerns. Discussion to join the single currency.

How does FPU affect economic activity and financial conditions?

Question 1. Economic Impact of GFPU

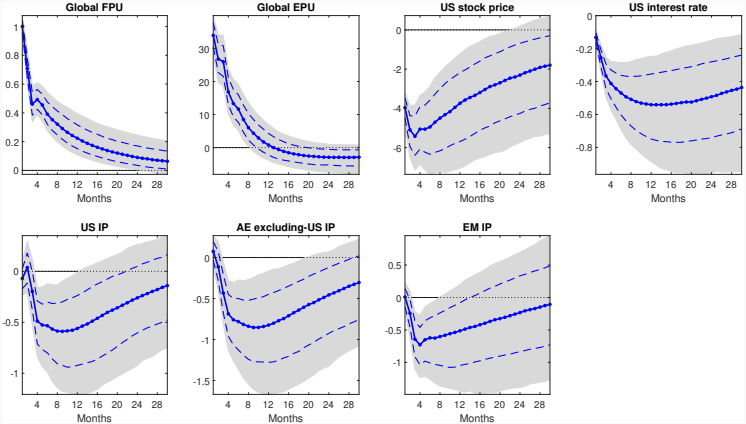
Baseline VAR with Cholesky Decomposition:

$$Y_t = [GFPU_t,\ sp500_t,\ i_t,\ ip_{US,t},\ ip_{AExUS,t},\ ip_{EM,t}] \tag{1}$$



Question 1. Economic Impact of GFPU

Controlling for GEPU



1997M1-2023M4, Cholesky decomposition, COVID-related dummies

Question 1. Economic Impact of GFPU: Sign restrictions with Narrative

Combine (1) sign restrictions with narrative restrictions as in Antolín-Díaz and Rubio-Ramírez (2018), including (2) restrictions on forecast error variance decomposition as in Barsky and Sims (2011):

- *Sign restriction 1*: A positive GFPU shock leads to a contemporaneous increase in GFPU.
- *Sign restriction 2*: The responses of the US stock prices, IP in the US, the US interest rates, IP in AEs (excluding US), and IP in EMs are negative at least once in any month within the first six months following the occurrence of the shocks.
- *Narrative restriction*: The shock is positive in the August 2011 US debt ceiling crisis.
- *Variance decomposition restriction*: The GFPU shock causes the largest forecast error variance decomposition of GFPU in the first forecast horizon.

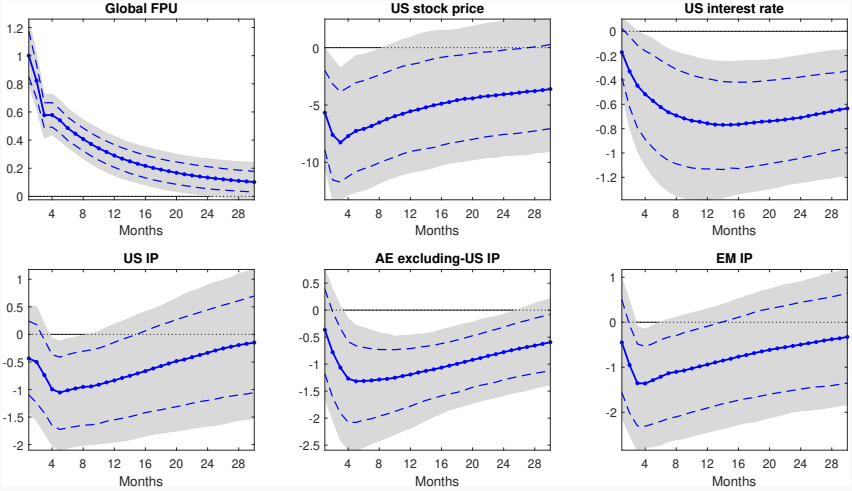
Question 1. Economic Impact of GFPU: Sign Restrictions with Narrative

Table 2: Sign restrictions of GFPU shock

GFPU	US Stock price	US Interest rate	US IP	AE excluding-US IP	EM IP
> 0	< 0	< 0	< 0	< 0	< 0

Note: The table lists signs of responses of endogenous variables (in the first column) to an unexpected increase in the global fiscal policy uncertainty.

Question 1. Economic Impact of GFPU: Sign Restrictions with Narrative



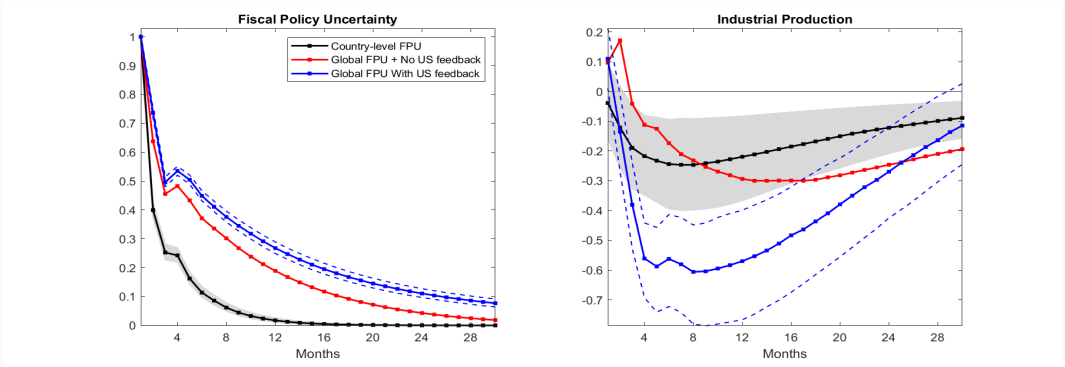
1987M1-2023M4, COVID-related dummies

Question 2. Country-level FPU vs. GFPU, which is more contractionary?

- Model 1 - *Country FPU*: a Panel-VARX model with two endogenous variables for each country: country FPU and log of domestic industrial production. Exogenous: log of the US stock index, the federal funds rate, and the log of US IP.
- Model 2 - *Global FPU + No US Feedback*: a Panel-VARX model similar to Model 1 but replacing GFPU instead of country FPU.
- Model 3 - *Global FPU + US feedback*: a Panel-VAR model including GFPU index first, followed by the US variables (log of US stock, the federal funds rate, the log of US IP), and then the country-specific industrial production.

Question 2. Country-level FPU vs. GFPU, which is more contractionary?

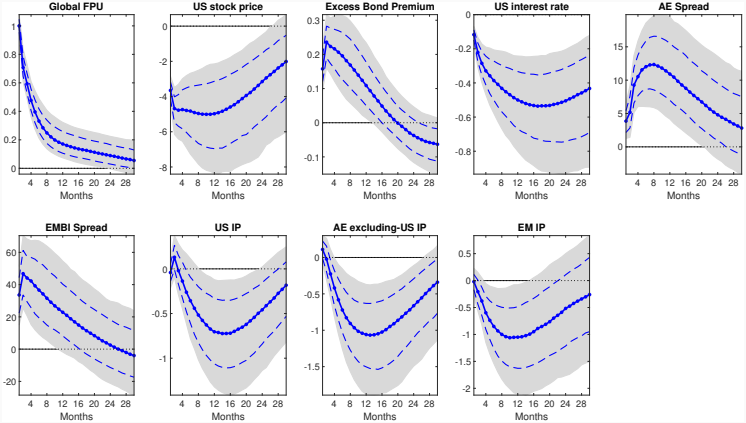
Country-level vs. Global Fiscal Policy Uncertainty



1997M1-2023M4, Cholesky decomposition, COVID-related dummies, 27 countries

Q3: GFPU on Sovereign Borrowing Costs

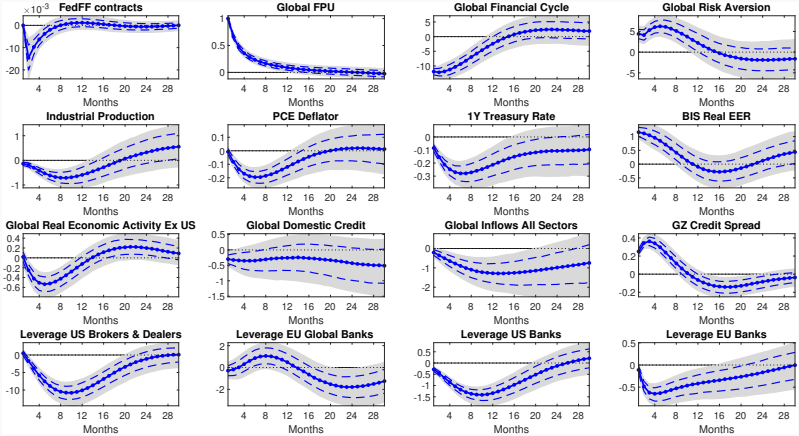
Impacts of GFPU on Spreads



1997M12-2023M4, Cholesky decomposition, COVID-related dummies

Q4: GFPU on Global Financial Cycle Variables

Impact of a Positive Shock to GFPU on Financial Risks



1990M2-2010M12, Cholesky decomposition, Global VAR of Miranda-Agrippino and Rey (2020).

Conclusions

- A novel database of fiscal policy uncertainty indexes
- An increase in fiscal policy uncertainty reduces output and raises borrowing costs.
- Global fiscal policy uncertainty has larger adverse impact than country-level fiscal policy uncertainty through spillover channels.
- Global fiscal policy uncertainty, even after controlling for the US monetary policy shocks, generates co-movements of global financial variables.

Thank you!

Measuring FPU with Large Language Model

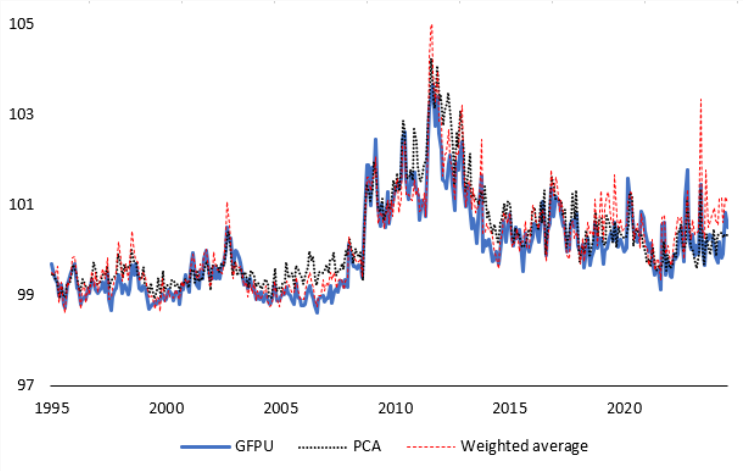
- Keyword searches, though used widely in the literature, are not perfect.
  - False positive/negative due to missing semantics.
  - Too much flexibility in the keywords (how to create a list of keywords for "uncertainty"?)
  - Can't answer more interesting questions: what's causing high FPU? What's the consequence of high FPU?
    - News articles will report specific events/narratives related to FPU, but keyword search can't help us to understand them.

- It would be great if we can "read" all news articles!
  - In the old era: hire a team of research assistants. But too costly and inefficient.
  - In the era of Generative AI: inference using Large Language Models (LLM).

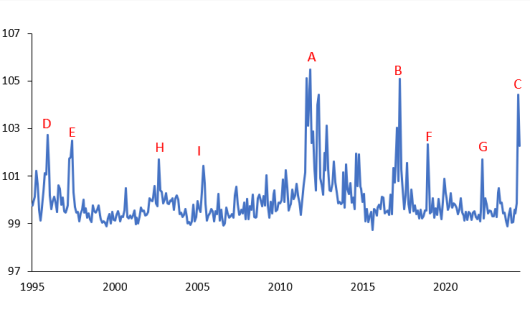
Measuring FPU with Large Language Model

- Data: all news articles published in Financial Times, from Jan 1985 to July 2023.
- LLM implemenation: `Llama-3-8b-instruct`
  - Open-source LLM developed by Meta AI, easier for parallel computing and no cost for running it.
  - Performance on par with other open-sourced models, such as Phi3 (from Microsoft), Gemma-7B (from Google), and Mistral-7B (from Mistral AI).
  - Can try closed-source LLM such as GPT later.

GFPU: Alternative methodologies

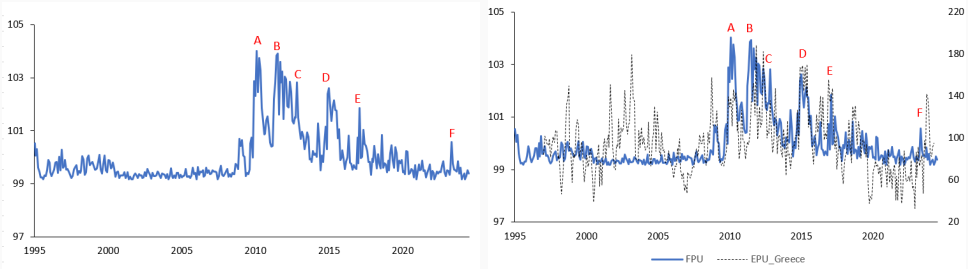


Country-Level Fiscal Policy Uncertainty: France



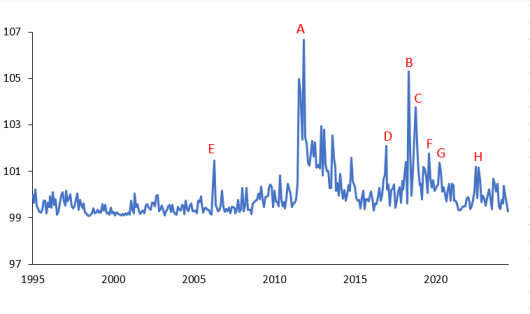
A. 2011-2012. Eurozone debt crisis. B. April-May 2017. Presidential Election. *"The twists and turns of France's strangest ever presidential election (the Guardian, April 23, 2017)"* C. June-July 2024. Snap Election. D. December 1995. Nationwide protests. E. April-June 1997. EMU entry, snap election *"Jospin seeks to squash French EMU doubts (Reuters, June 17, 1997)"* F. December 2018. Yellow vests protests. G. April 2022. Presidential election H. September 2002. Concerns for breaching EU's SGP. *"Stability Pact proves wobbly. (the Times, September 25, 2002)"*

Country-Level Fiscal Policy Uncertainty: Greece



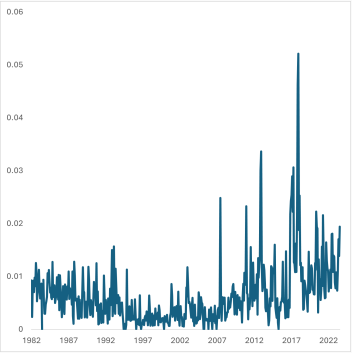
A. January-May 2010. First bailout for Greece. B. June-July 2011. Intensification of Eurozone debt crisis. Spain downgrade. C. January-February 2012. EU agrees to new bailout. D. December 2014-January 2015. Legislative election. Disagreement over debt relief. E. February 2017. IMF warns debt unsustainable, tensions with creditors. F. May 2023. Legislative election.

Country-Level Fiscal Policy Uncertainty: Italy

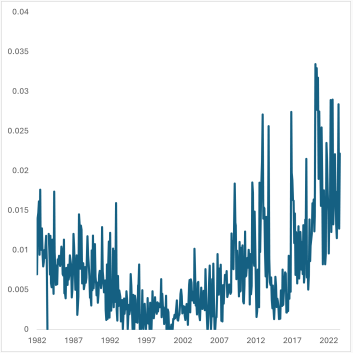


A. 2011-2012. Eurozone debt crisis. B. May 2018. Political crisis. *"Political and financial turmoil of a kind not seen since the euro zone's debt crisis (Reuters, May 31, 2018)"* C. September-November 2018. Budget woes. EC rejection of the draft budget. D. December 2016. Bailout talks of Monte dei Paschi. E. April 2006. Defeat of Berlusconi in a close election. F. August 2019. Coalition between PD and Five-star movement. G. April 2020. COVID-19. H. July-October 2022. Meloni government. *"Italy's right-wing bloc wins: five questions for markets (Reuters, September 26, 2022)"*

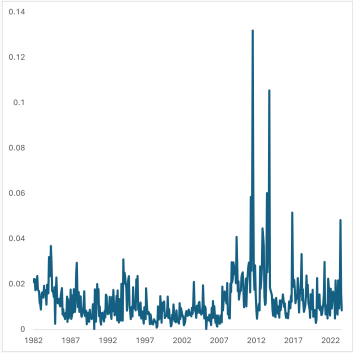
Measuring FPU with Large Language Model: FPU for US



(a) Tax

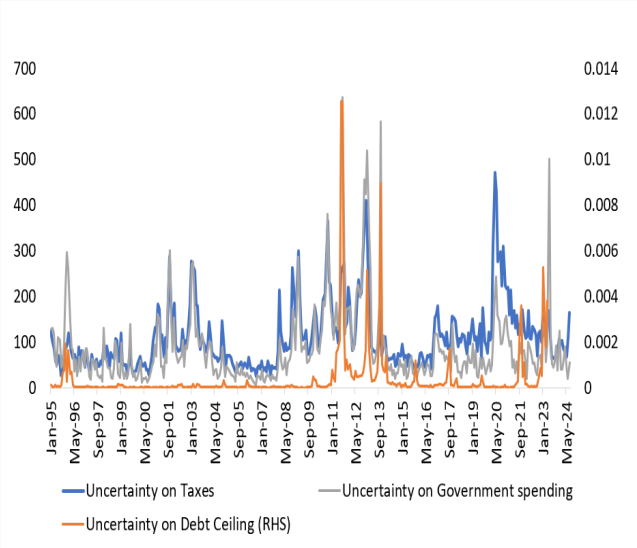


(b) Government Spending

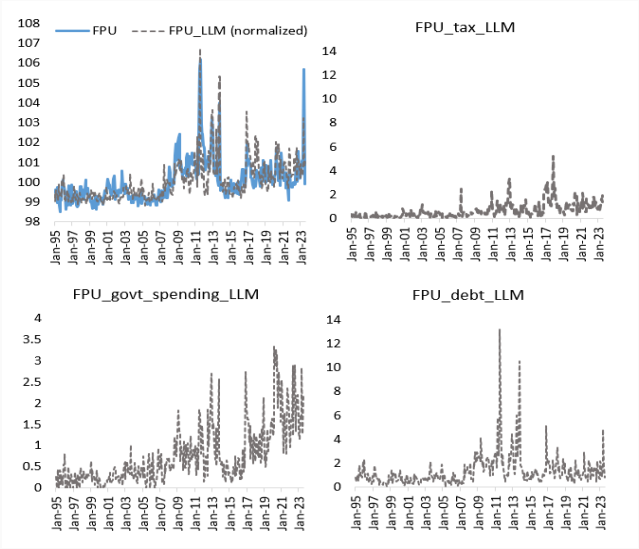


(c) Public Debt

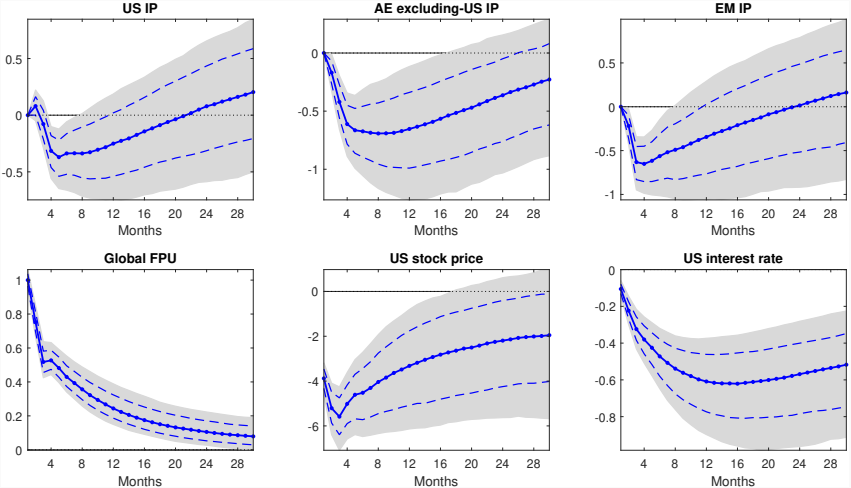
FPU components: Baker, Bloom, and Davis (2016)



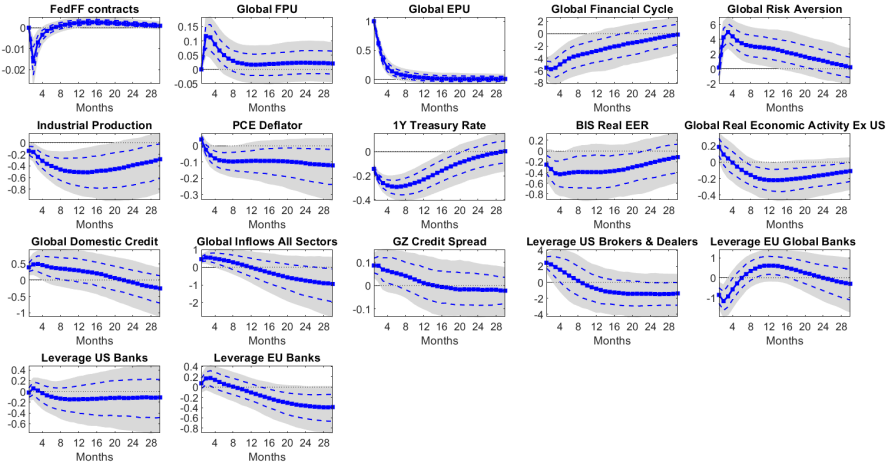
Measuring FPU with Large Language Model: FPU for US



Economic impact of GFPU: Alternative Cholesky decomposition



GEPU with Global financial cycles



UK: domestic FPU vs. global FPU spillovers