# Discussion of How Important is the Global Financial Cycle (capital flows)

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- Like the Business Cycle, we study ups and downs, fluctuations and comovements of some variables (risk taking, credit, asset prices, capital flows, spreads, leverage) but on a global scale.
- There is a growing literature analysing drivers of financial cycles, amplification mechanisms, endogeneity of booms and busts on a global scale.

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  - Transposed in Business Cycle literature would be: All investment flows in financial and physical assets should be highly correlated across sectors! High R2 when regressing investment flows on monetary policy rate!!!
- In theory, capital flows can but do not have to be the transmission channel of US monetary policy to the rest of the world (it can go through prices).

# What does this paper do?

- It focuses on capital flows exclusively
- It runs a lot of regressions.
- It estimates common factors on capital inflows and outflows data (across advanced, emerging economies, type of assets, static, dynamic).
- It presents correlation matrices and simple panel regressions of flows on Fed Funds, factors, VIX etc... etc... etc...
- This is not big data, rather many different ways to cut the sample and estimate correlations.

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- Conclusions: "Succintly, most variation in capital flows does not seem to be the result of common shocks nor stem from observables in a central country like the United States".
- In other words: Exit the Global Flow Cycle and the effect of the US on it.

# Methodology

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- Is the methodology of the paper the right one for this question?

# Existence of a Global Factor for Risky Assets: Miranda-Agrippino and Rey (2015)

- We estimate a Dynamic Factor Model from a collection of world risky asset returns:

$$\textit{return (i,t)} = \textit{common component (t)} + \textit{idiosyncratic (i,t)}$$

- Using a set of restrictions on the coefficient matrices of the DFM we further decompose the common component in two:

$$\textit{common (t)} = \textit{global factor (t)} + \textit{regional factors (t)}$$

- Each return series is then the sum of three components:
  1. a global factor that is a common to *all* series in the set
  2. a region (or market) specific component common to many but not all series
  3. an idiosyncratic asset-specific component
- Formally:

$$y_{i,t} = \mu_i + \lambda_{i,g} f_t^g + \lambda_{i,m} f_t^m + \xi_{i,t}. \qquad (1)$$

# DFM for Risky Assets: Block Structure

- Let the variables in $y_t$ being univocally assigned to one of the $nB$ postulated blocks.
- Order them accordingly such that $y_t = [y_t^1, y_t^2, \ldots, y_t^{nB}]'$; then:

$$y_t = \underbrace{\begin{pmatrix} \Lambda_{1,g} & \Lambda_{1,1} & 0 & \cdots & 0 \\ \Lambda_{2,g} & 0 & \Lambda_{2,2} & & \vdots \\ \vdots & \vdots & & \ddots & 0 \\ \Lambda_{nB,g} & 0 & \cdots & 0 & \Lambda_{nB,nB} \end{pmatrix}}_{\Lambda} \underbrace{\begin{pmatrix} f_t^g \\ f_t^1 \\ f_t^2 \\ \vdots \\ f_t^{nB} \end{pmatrix}}_{f_t} + \xi_t.$$

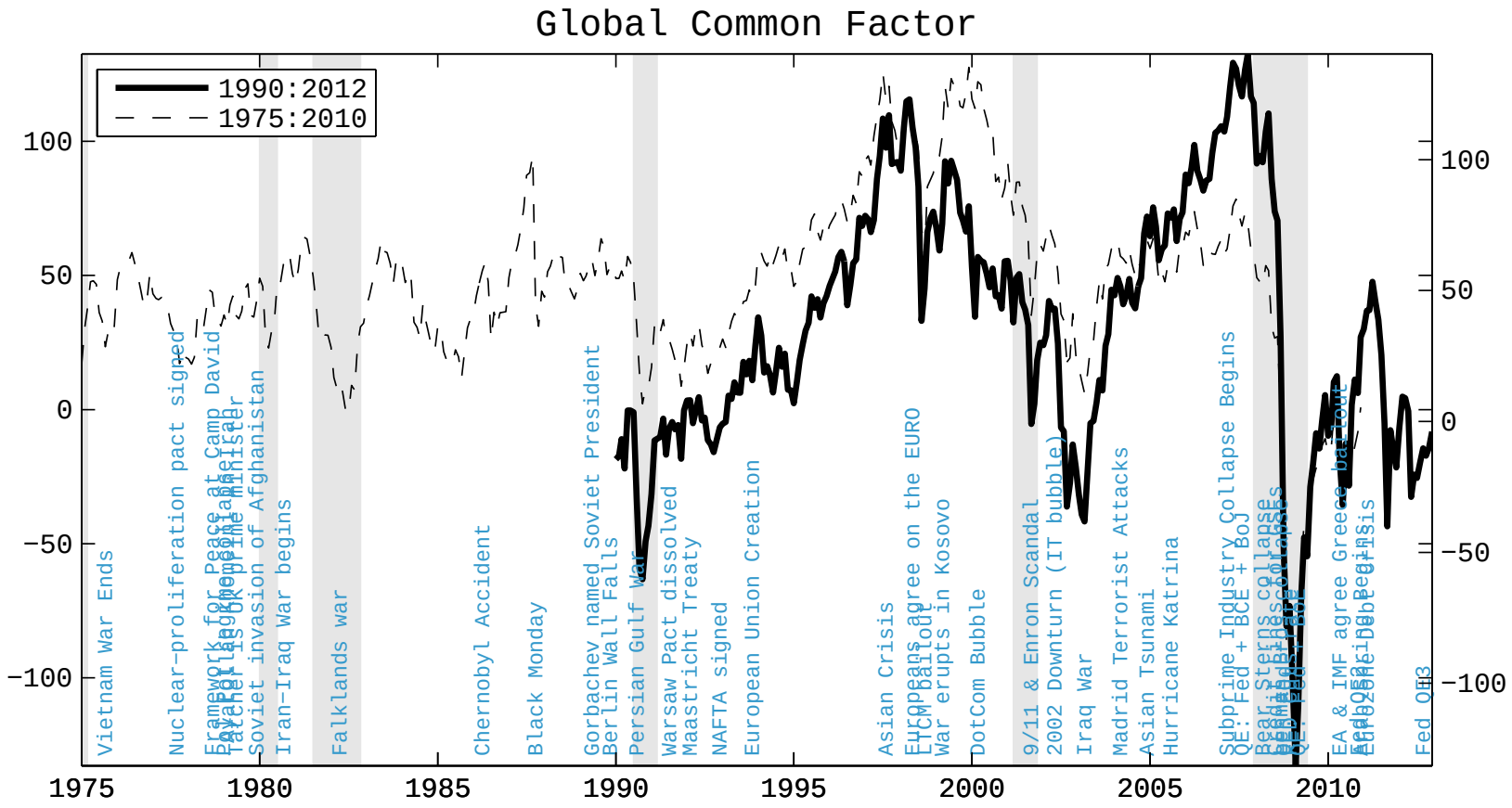
# DFM for Risky Assets: Specification and Estimation

Table: **Number of Factors**

| $r$ | % Cov Mat | % Spec Den | Bai Ng (2002) | | | Onatski |
|---|---|---|---|---|---|---|
| | | | $IC_p1$ | $IC_p2$ | $IC_p3$ | |
| | | | (a) 1975:2010 | | | |
| 1 | 0.662 | 0.579 | -0.207 | -0.204 | -0.217 | 0.015 |
| 2 | 0.117 | 0.112 | -0.179 | -0.173 | -0.198 | 0.349 |
| 3 | 0.085 | 0.075 | -0.150 | -0.142 | -0.179 | 0.360 |
| 4 | 0.028 | 0.033 | -0.121 | -0.110 | -0.160 | 0.658 |
| 5 | 0.020 | 0.024 | -0.093 | -0.079 | -0.142 | 0.195 |
| | | | (b) 1990:2012 | | | |
| 1 | 0.215 | 0.241 | -0.184 | -0.183 | -0.189 | 0.049 |
| 2 | 0.044 | 0.084 | -0.158 | -0.156 | -0.169 | 0.064 |
| 3 | 0.036 | 0.071 | -0.133 | -0.129 | -0.148 | 0.790 |
| 4 | 0.033 | 0.056 | -0.107 | -0.102 | -0.128 | 0.394 |
| 5 | 0.025 | 0.049 | -0.082 | -0.075 | -0.108 | 0.531 |

*Notes:* For both sets and each value of $r$ the table shows the % of variance explained by the $r$-th eigenvalue (in decreasing order) of the covariance matrix of the data, the % of variance explained by the $r$-th eigenvalue (in decreasing order) of the spectral density matrix of the data, the value of the $IC_p$ criteria in [Bai, Ng (2002)] and the p-value for the [Onatski (2009)] test where the null of $r - 1$ common factors is tested against the alternative of $r$ common factors.

# Global Factor for World ASSET PRICES




▸ RegionalFactors ▸ LocalCurrency

# Global Factor in ASSET PRICES and Risk

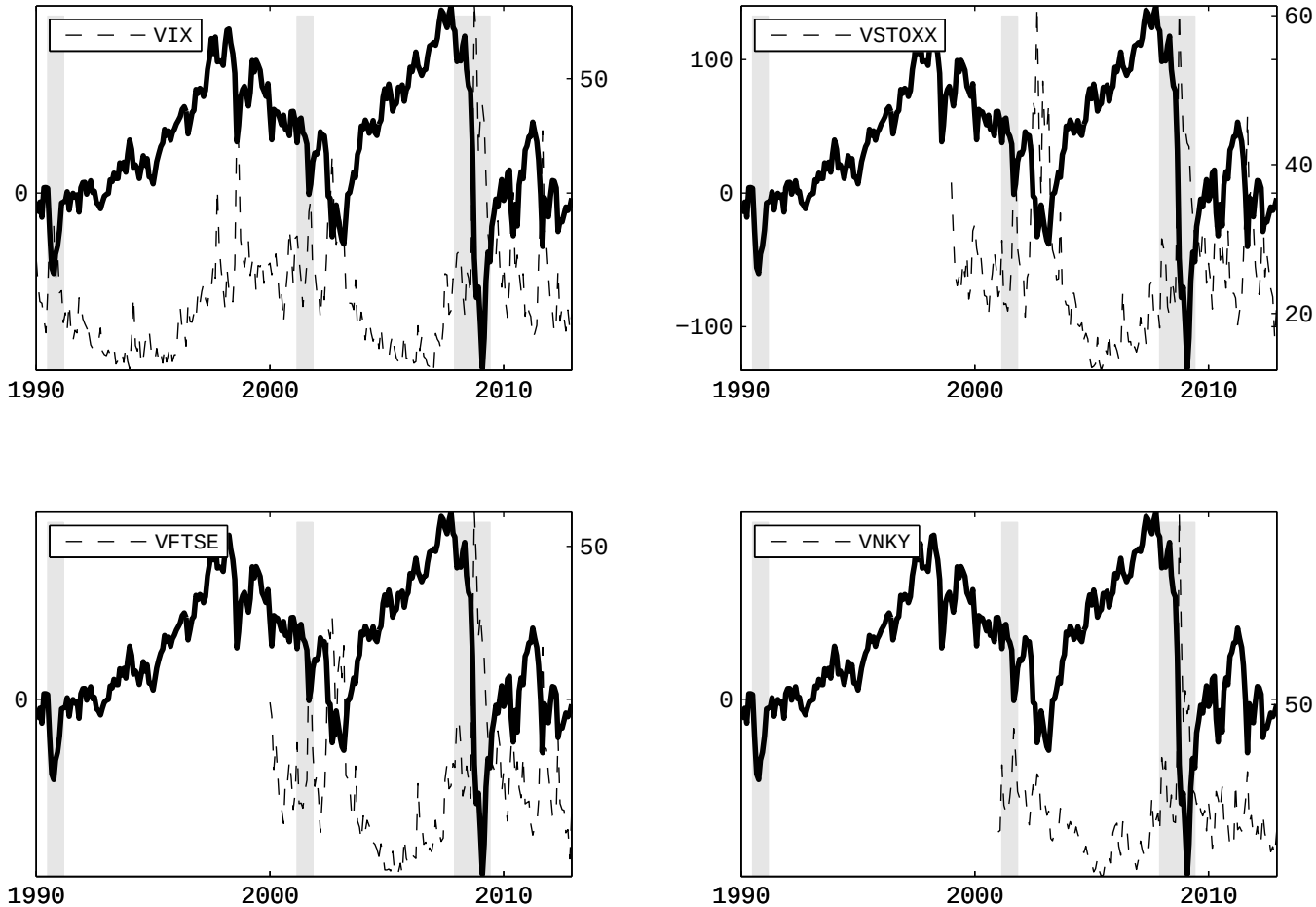



Figure: Global Factor (bold line) and major volatility indices (dotted lines); clockwise from top left panel: US; EU; JP and UK. *Source:* Datastream, authors calculations.

# Methodology: Global Factors

- First step: Specify model and test for the number of global factors.
- Second step: How much variance explained by each factor.
- For asset prices, Miranda Agrippino and Rey find that 1 global factor is a good representation of the data. This factor accounts for between 20% and 25% of the variance (852 variables). This is a lot.
- Cerruti et al. do not use this methodology:
  - Do not present an econometric model
  - Do not test for the number of global factors in capital flow data.
  - Do not present evidence on how much variance is explained by any of their factors.
  - No reason why there should be a high R2 when regressing capital flows on the global asset price factor.
  - A bit like regressing stock market index on some investment volume.

# Methodology of the paper: bottom line

- Cerutti et al do not answer the following questions: Is there one (or 2 or 3) global factor in flows ? How much of the variance does it (do they) explain?

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- So, is the Cerutti et al methodology of the paper the right one to estimate global factors in flows?
- Probably not.
- Second question Cerutti et al. ask: Are flows affected by "global variables"?

# Effect of global variables on flows

- Paper regresses many measures of flows on Fed Funds rates and VIX and many other global variables.
- Finds low R2.
- Paper looks at correlation matrices between flows, factor estimated from flows and Fed Funds rates and VIX and many other variables.
- Finds correlations are low.
- Paper concludes: Neither US variables nor global variables are relevant to explain the Global Financial (Flow) Cycle.
- Let us apply their methodology to the Business Cycle....

# Business Cycle

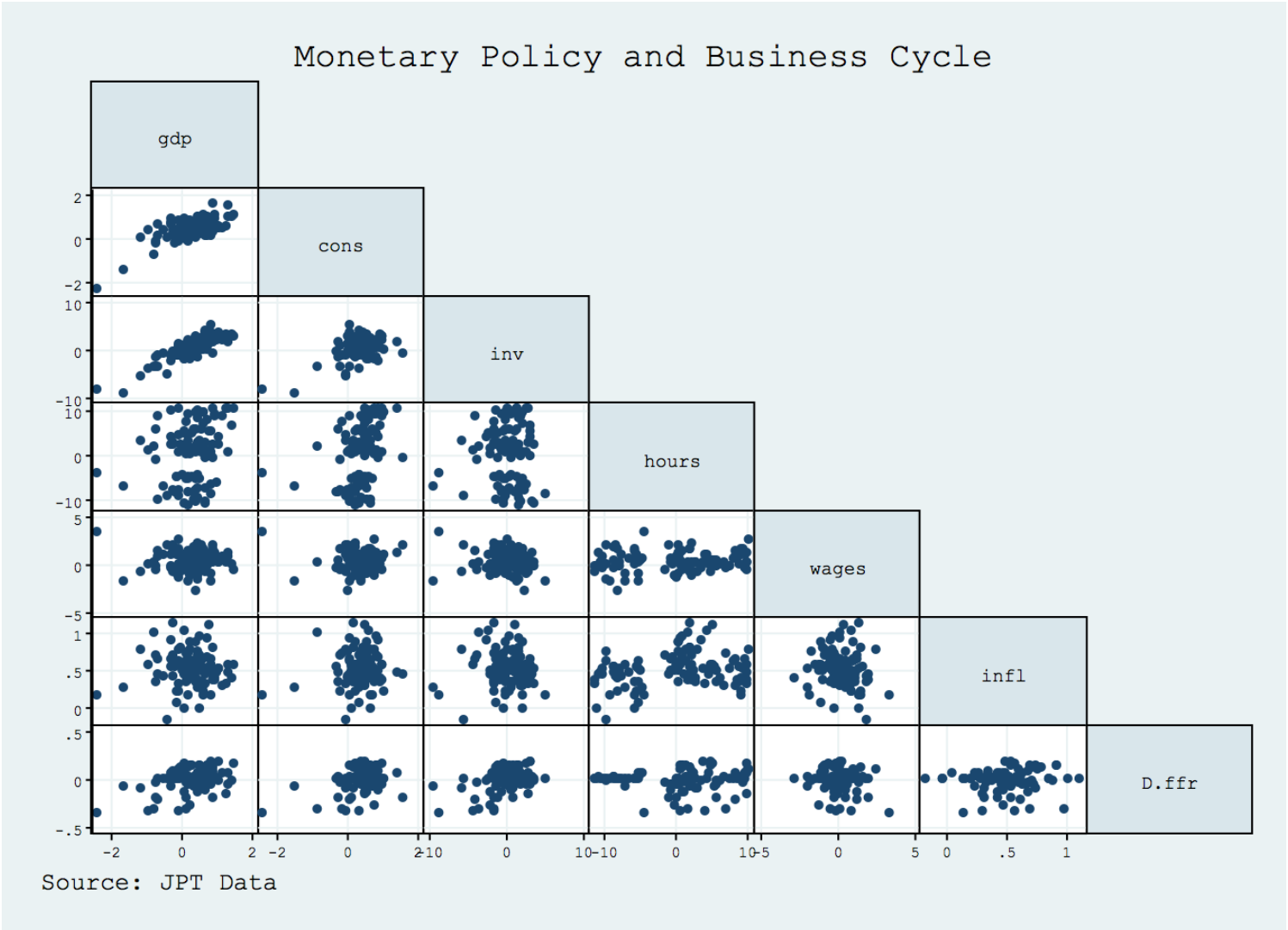


Figure: Correlations of changes in the Fed Funds rate and growth rate of GDP, consumption, investment, hours, wages and inflation.

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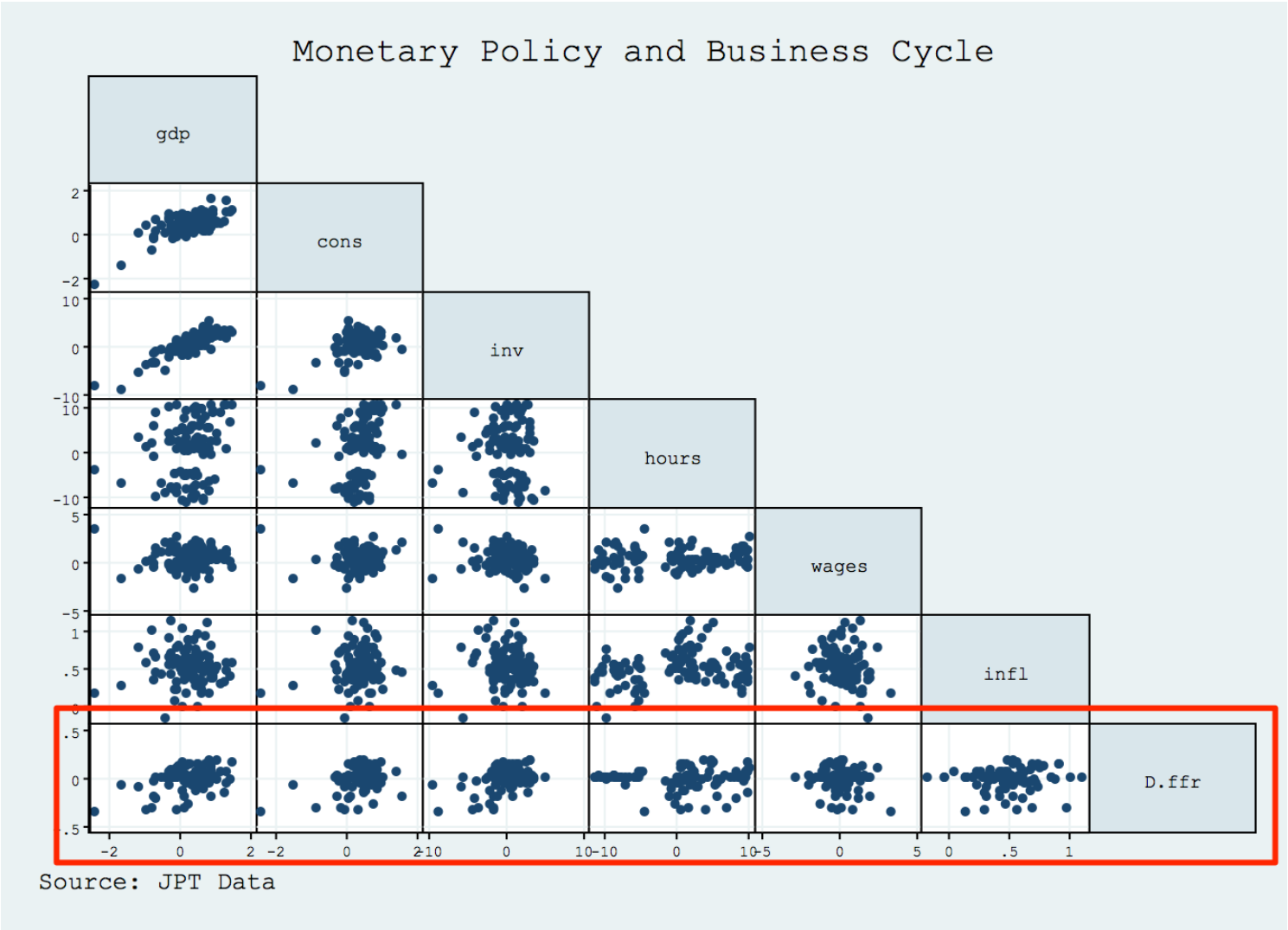


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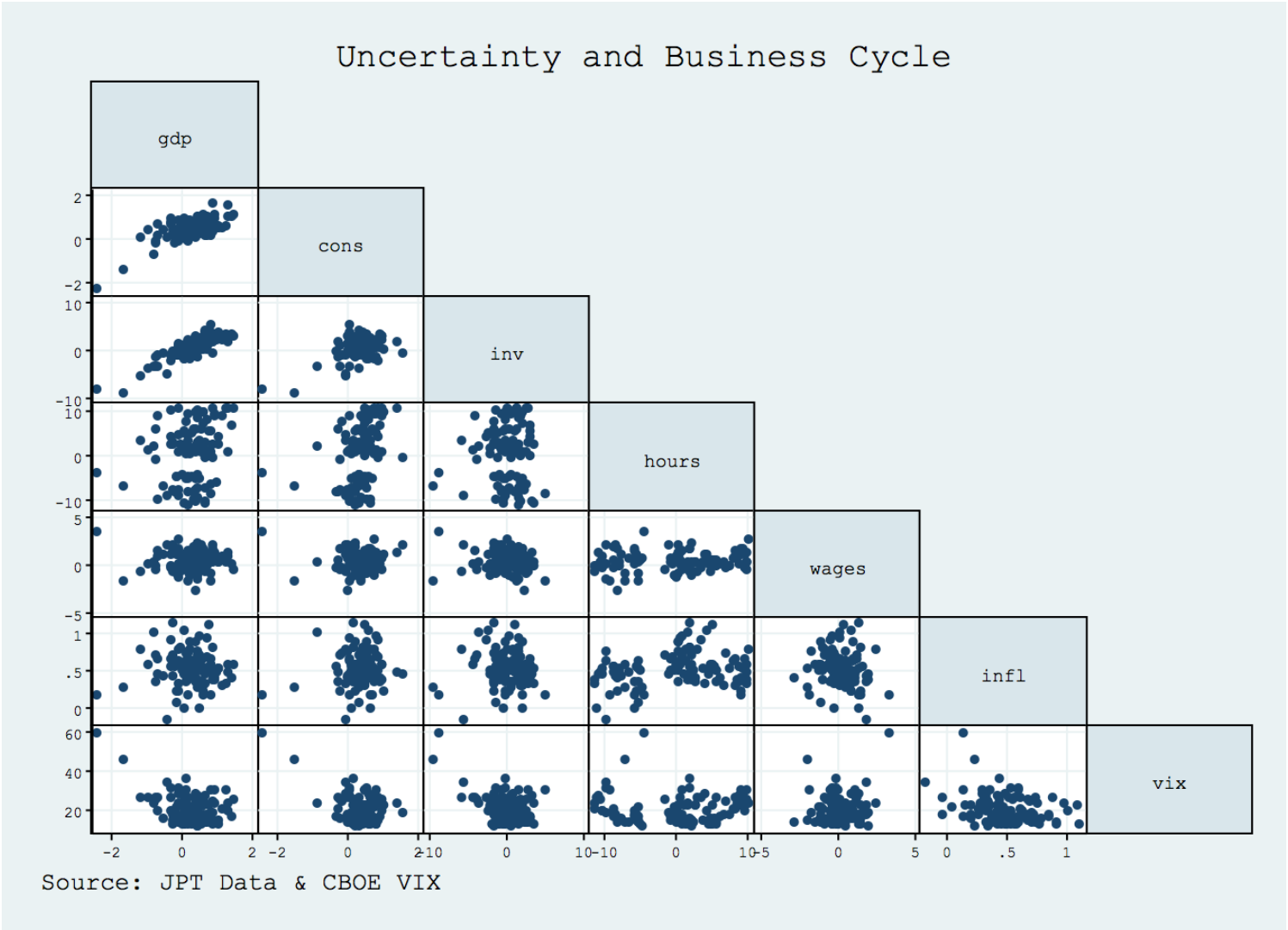


Figure: Correlations of change in VIX and growth rate of GDP, consumption, investment, hours, wages and inflation.

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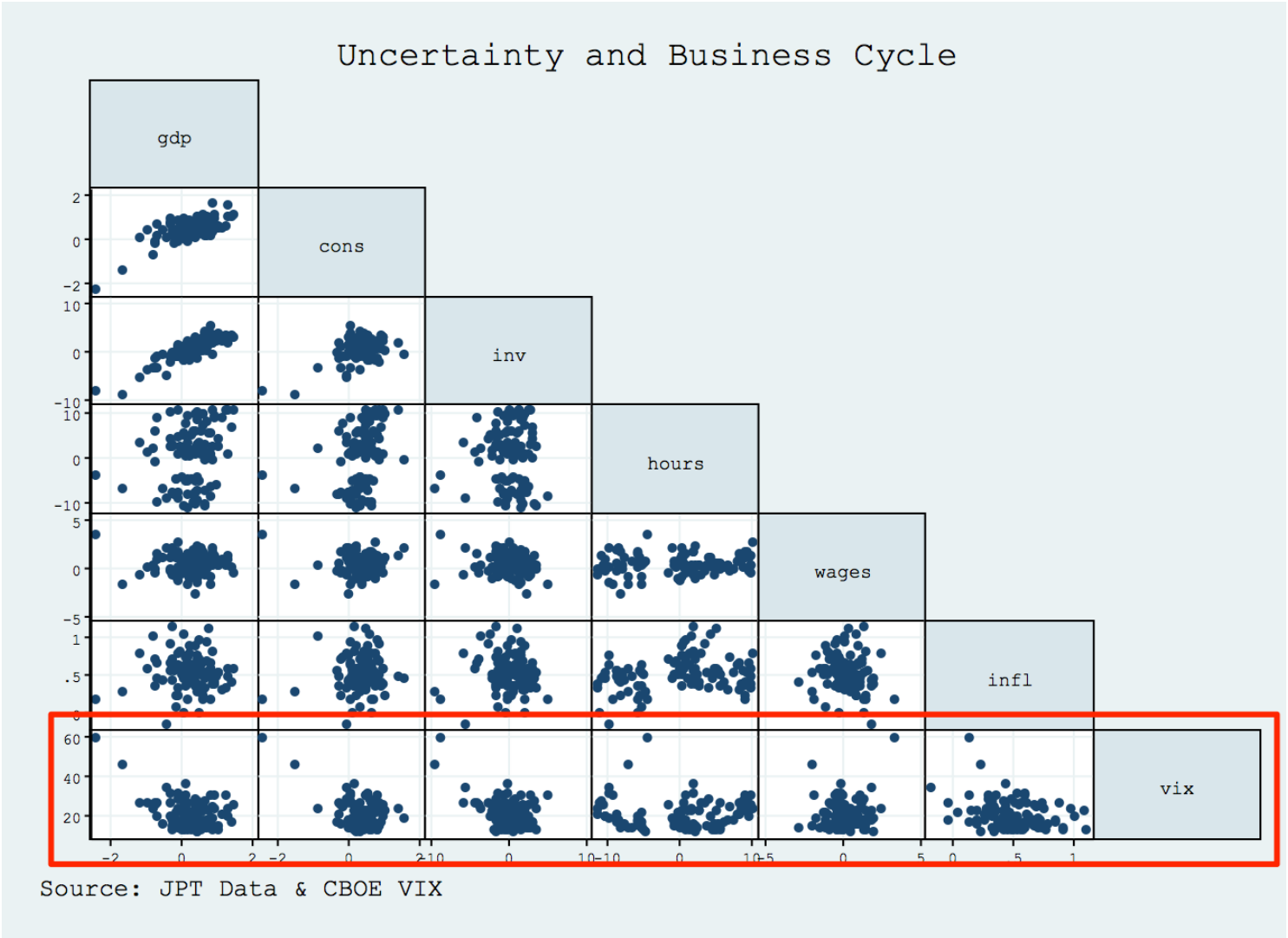


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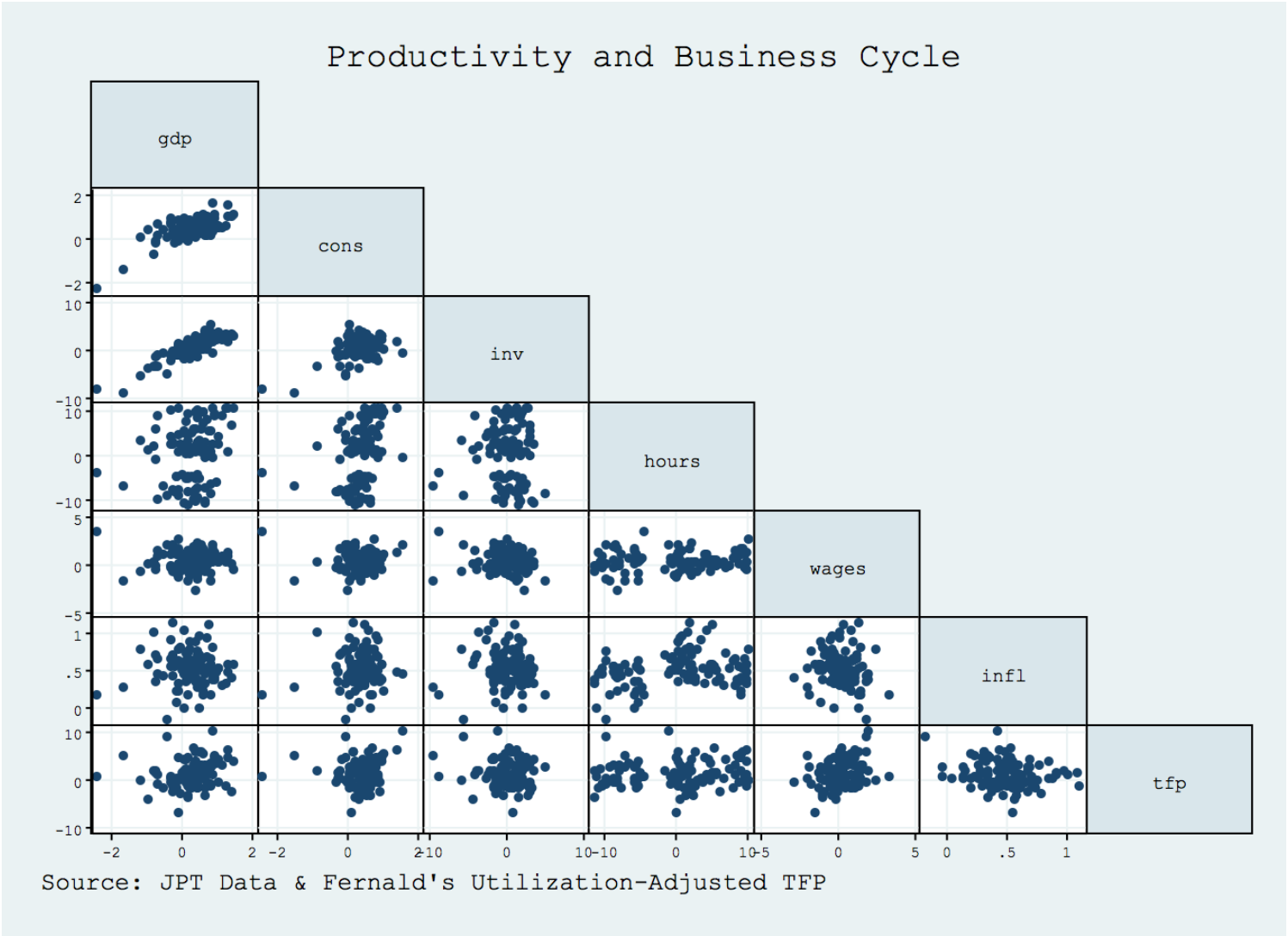


Figure: Correlations of TFP and growth rate of GDP, consumption, investment, hours, wages and inflation.

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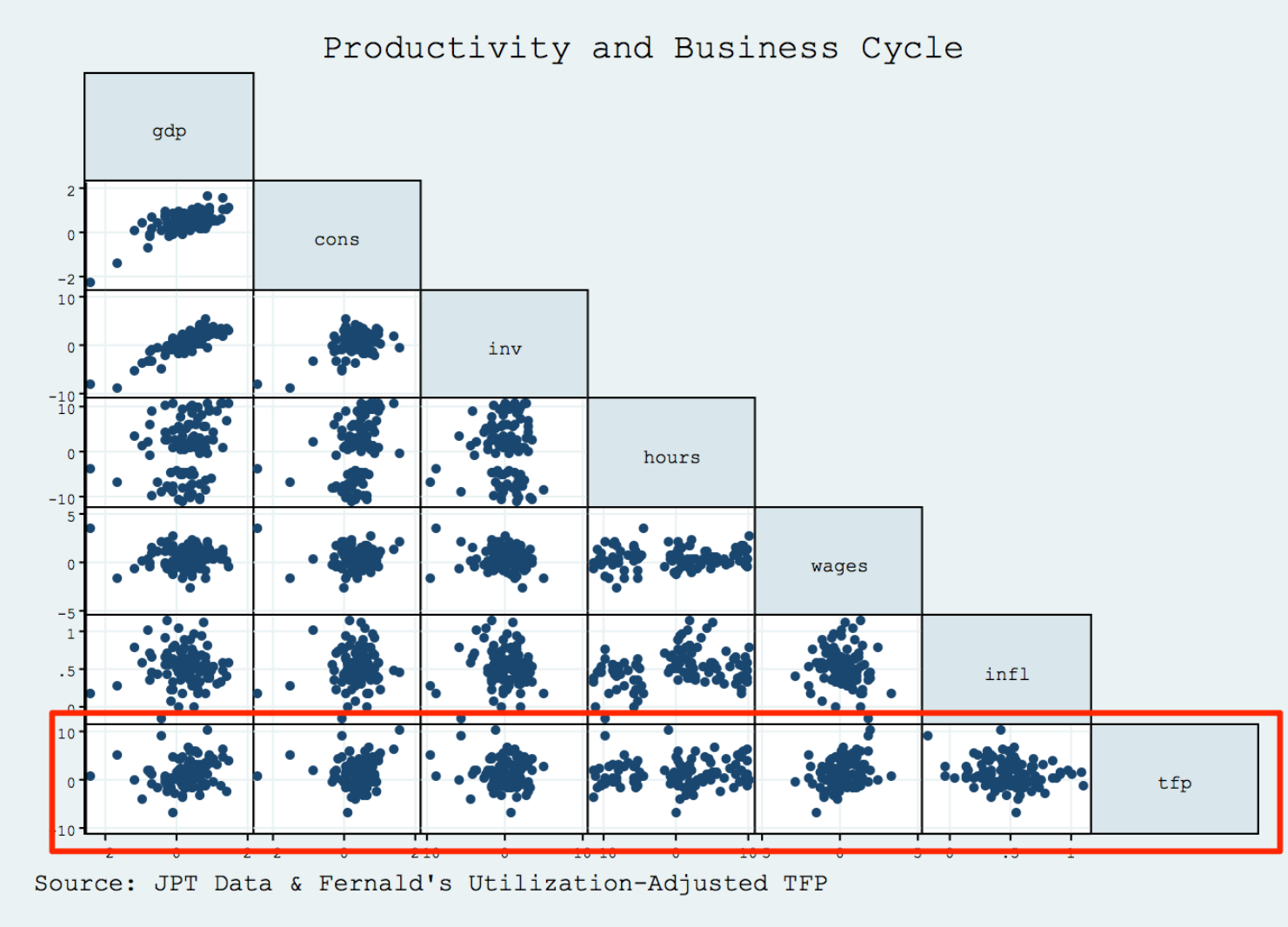


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# Business Cycle

| | (1) infl | (2) inv | (3) gdp |
|---|---|---|---|
| D.ffr | 0.182 | | |
| | (0.218) | | |
| D.vix | | -0.0483 | |
| | | (0.102) | |
| tfp | | | 0.0469* |
| | | | (0.0211) |
| _cons | 0.499*** | 0.238 | 0.272*** |
| | (0.0214) | (0.220) | (0.0573) |
| N | 109 | 109 | 110 |
| adj. R-sq | -0.002 | 0.003 | 0.037 |

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Figure: Effect of monetary policy, uncertainty and TFP on the business cycle.

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  - TFP
- Oh! wait...

# Identification Strategy

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- Miranda-Agrippino and Rey: Bayesian BVAR with instruments: effects on standard macroeconomics and international financial variables (25 variables).

# Monetary Policy and the Global Financial Cycle

- We estimate a Bayesian VAR (in levels) with 4 lags. Typical set of macroeconomic variables, including output, inflation, investment and labor data PLUS global credit, cross border credit flows, financial leverage, global factor in asset prices, term spread (25 variables)

- The monetary policy shock is identified using the effective federal funds rate as the instrument for monetary policy and (i) block-ordering the variables into slow-moving and fast-moving ones; (ii) using the Romer and Romer narrative approach as instrument (also experimented with high frequency instruments).

# Response of domestic Business Cycle

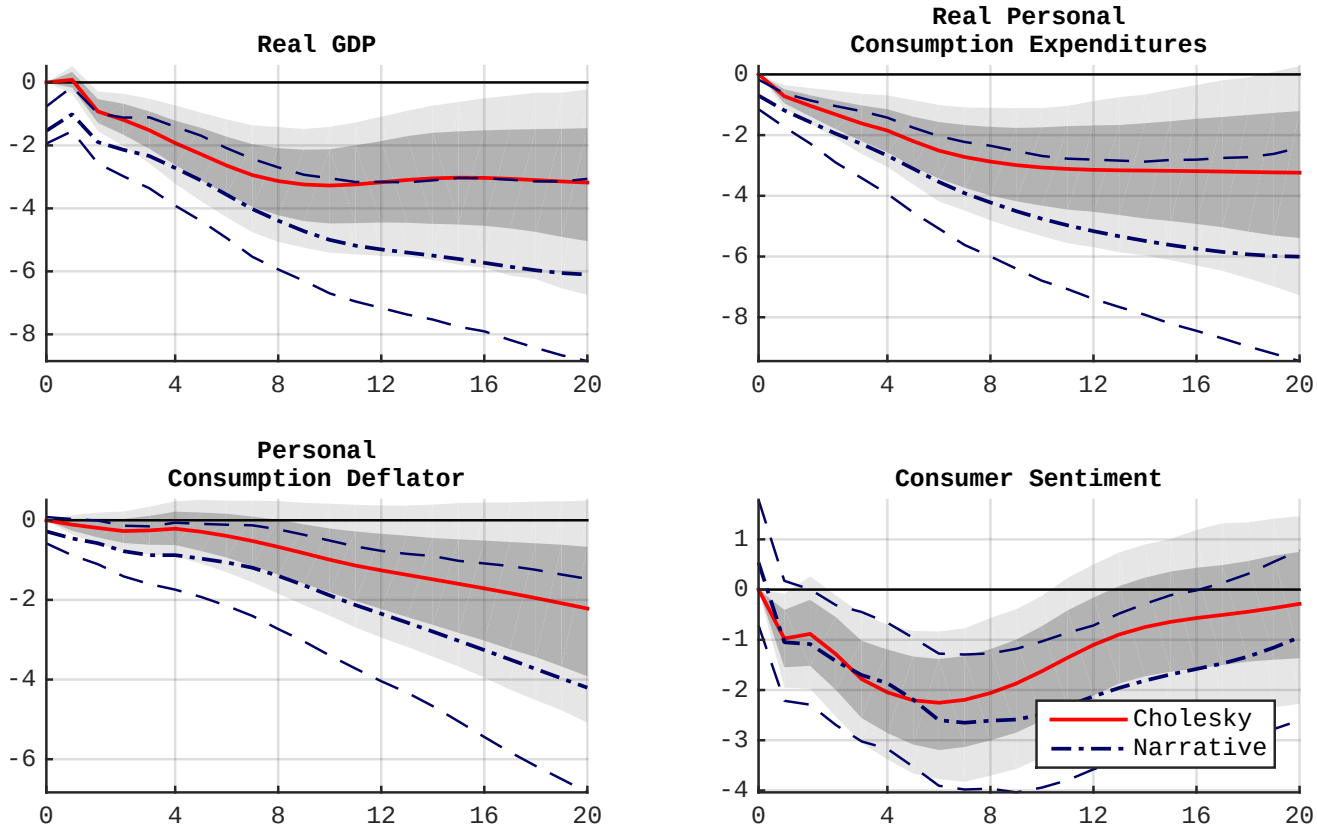


Figure: Response of Business Cycle (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.

# Response of Global Credit, with and without US

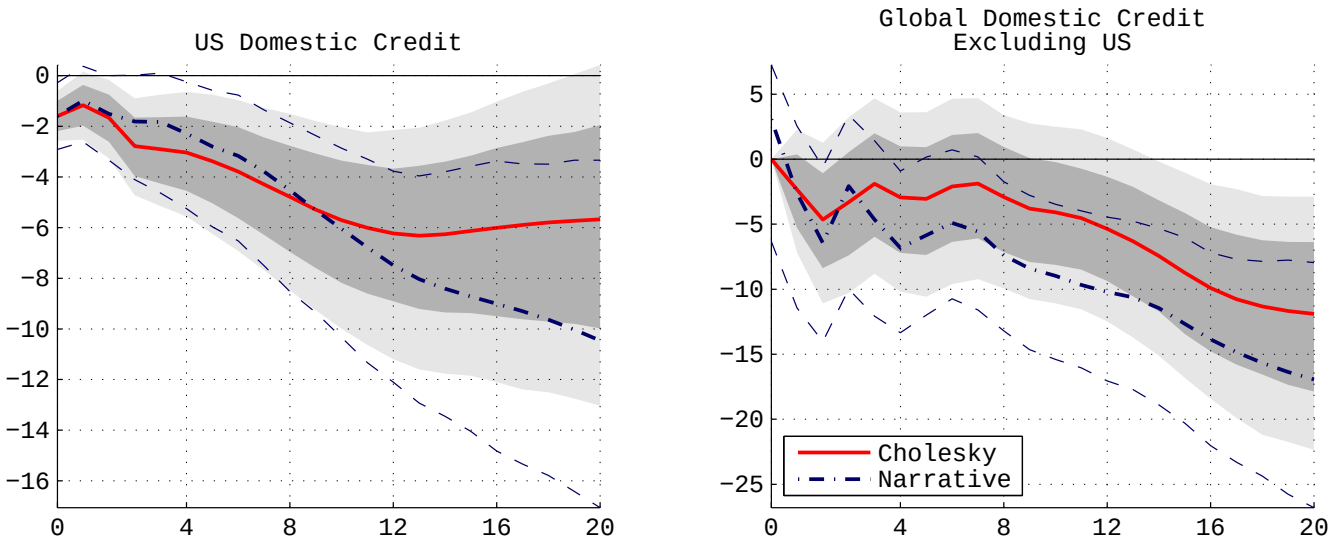


Figure: Response of Global Credit (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.

# Response of Global Credit and of Cross Border Credit

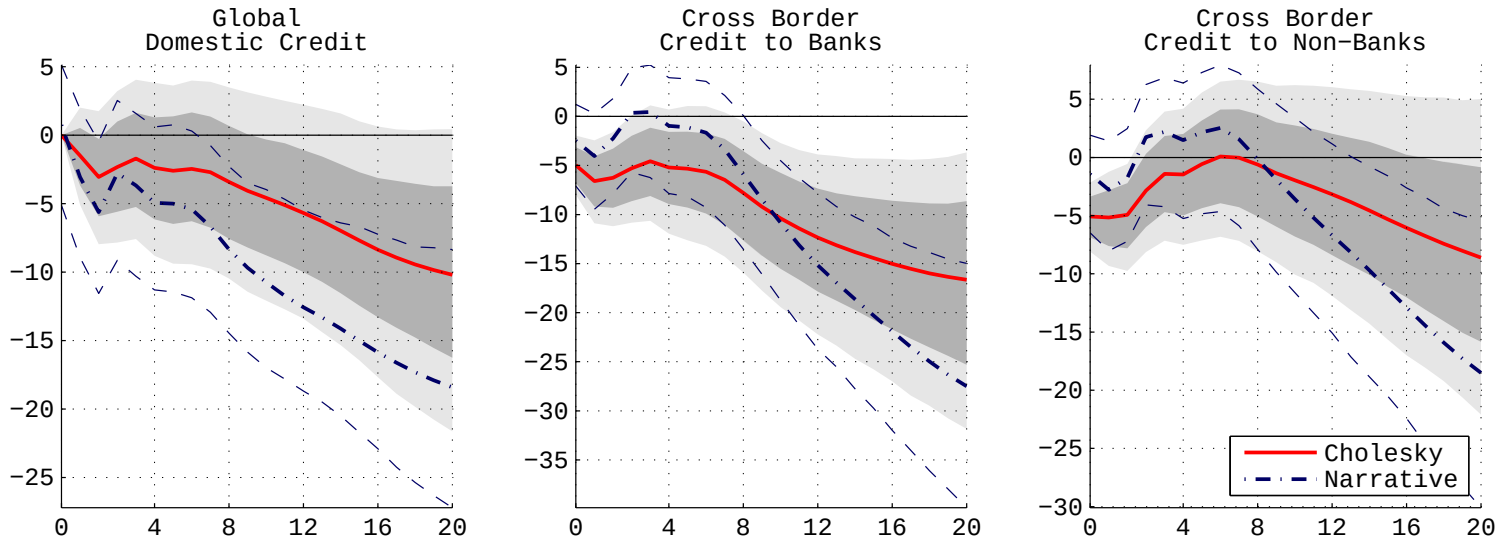


Figure: Response of Global Credit (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.

# Response of Banks Leverage in the US, Euro area, UK (GSIBs)

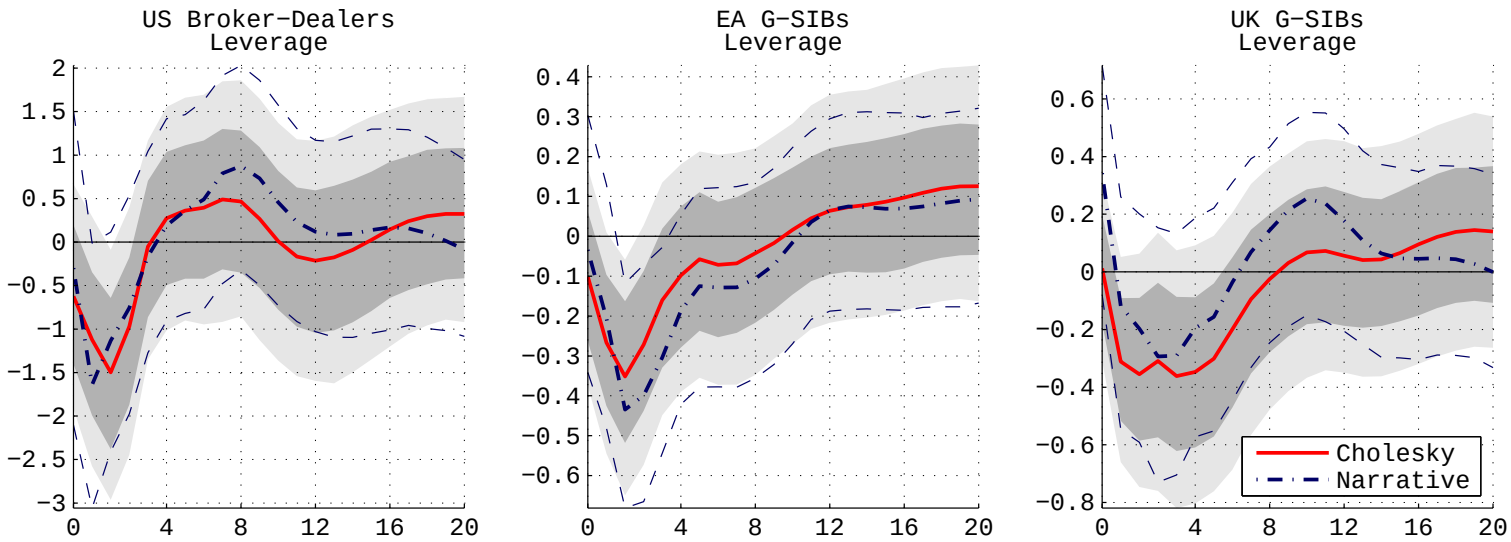


Figure: Response of Banking Sector Leverage (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.

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- But I enjoyed reading the paper. More work on Global Financial Cycle definitely welcome.

# Research Agenda

- Empirical work: Risk taking channel of monetary policy (Peydro et al.); Emerging markets and global financial cycle (Kalemli-Ozcan et al.); booms and busts: Jorda, Schularick and Taylor, Bruno and Shin, Borio; Krishnamurthy and Muir; global banks: Cetorelli and Goldberg (2009, 2010); capital flows (Fratzscher (2012), Forbes and Warnock (2014))
- Theoretical work: Bruno and Shin (risk taking and global banks); Laeven and Dell'Arricia; Mojon and Ragot, Farhi and Werning, Caballero Simsek (2017) (explaining gross flows); Coimbra and Rey (2017) (explaining endogenous risk build ups)
- Understanding better international channels of transmissions: time varying risk taking; frictions. We probably need models with heterogenous intermediaries.

# BVAR results: Full Baseline