

# HEAVEN OR EARTH?

## THE EVOLVING ROLE OF GLOBAL SHOCKS FOR DOMESTIC MONETARY POLICY

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# WHAT IS THE QUESTION AND THE APPROACH?

- 1 *What are the driving forces of international business cycles?*
- 2 12 advanced economies plus the Euro area.
- 3 Demand, supply and monetary policy shocks (global and domestic) plus a global oil price shock.
- 4 Factor-Augmented-Vector-AutoRegression (FAVAR) with zero restrictions domestic to global block and a subset of impact sign restrictions.
- 5 Results presented in a set of interesting variance decompositions by source of shock and across sub-samples.

# SUMMARY OF KEY FINDINGS

- ① Global factor component variation is significant in relation to domestic factor component variation: interest rates (13.4%), inflation (26.1%) and output (23.5%).
- ② Marked increase in global factor contributions to interest rates upon establishment of the ECB (Euro?) from 80:20 to 60:40.
- ③ Global factor of inflation is very unstable.
- ④ Both are starkly contrasting with output where the global factor is consistent across periods 80:20 (except COVID 65:35, unsurprisingly).

## KEY EQUATIONS

$$\begin{bmatrix} \hat{Z}_t^g \\ Z_t^j \end{bmatrix} = \begin{bmatrix} B_{gg} & B_{gj} \\ B_{jg} & B_{jj} \end{bmatrix} \begin{bmatrix} \hat{Z}_{t-1}^g \\ Z_{t-1}^j \end{bmatrix} + \begin{bmatrix} \hat{\epsilon}_t^g \\ \hat{\epsilon}_t^j \end{bmatrix} \quad (1)$$

- The  $\hat{Z}'$ s are  $\hat{z}$ 's because they are estimated world factors, the other  $Z$ 's are macroeconomic variables.
- Dynamic spillovers ( $B$ 's) unrestricted and  $\epsilon^g$  and  $\epsilon^j$  are vectors of 4 global and 3 domestic orthogonal structural innovations.

$$\begin{bmatrix} \hat{u}_t^g \\ \hat{u}_t^j \end{bmatrix} = \begin{bmatrix} \text{signs} & \mathbf{0} \\ \mathbf{free} & \text{signs} \end{bmatrix} \begin{bmatrix} \hat{\epsilon}_t^g \\ \hat{\epsilon}_t^j \end{bmatrix} \quad (2)$$

- Domestic shocks do not affect global shocks but the reverse is not true.

## GLOBAL SHOCKS AND NATIONAL BUSINESS CYCLES

|                  |      |      |      |      |      |      |
|------------------|------|------|------|------|------|------|
| Start date       | 1970 | 1970 | 1985 | 1999 | 2008 | 2020 |
| End date         | 2024 | 1984 | 1998 | 2007 | 2019 | 2024 |
| Global component |      |      |      |      |      |      |
| Output growth    | 20.8 | 17.9 | 19.7 | 21.4 | 20.9 | 35.3 |
| Interest rates   | 16.4 | 16.8 | 17.9 | 36.4 | 38.0 | 48.7 |
| Inflation rates  | 28.2 | 44.4 | 17.3 | 31.7 | 27.8 | 32.7 |

# KEY FACTS

- ❶ Global component of real output variation is stable across time (except for COVID, which is intuitive).
- ❷ Global component of the nominal interest rate takes a pronounced jump with the advent of Euro and ECB policy.
- ❸ Global component of inflation rate does not follow either of these patterns.
- ❹ **PUZZLE.** World general equilibrium asserts that a single intertemporal price adjusts to clear supply and demand across ALL national markets. In other words, we should expect a much larger global component to interest rates than output, but the data indicate the opposite.

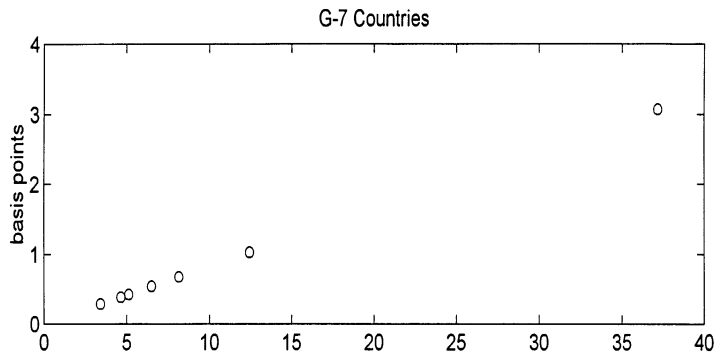
# GENERAL EQUILIBRIUM CONSIDERATIONS

$$p_t \left[ \sum_i \frac{N_{it}}{N_t} (Y_{it} - C_{it} - I_{it} - G_{it}) \right] = 0 \quad (3)$$

$$p_t^b = \frac{E_t p_{t+1}}{p_t} \quad (4)$$

- ① What matters theoretically for the real interest rate is the fraction of world economic geography impacted by a particular shock and/or policy response.
- ② The assumption of a small open economy is when that fraction reaches the limit point, so the global real interest factor is orthogonal to a shock originating in an *atomistic* geography.

# GENERAL EQUILIBRIUM (CRUCINI (1991))



- 1 Couldn't you construct something like this?
- 2 What is the response of the nominal and real interest rate to various global and nation-specific shocks?

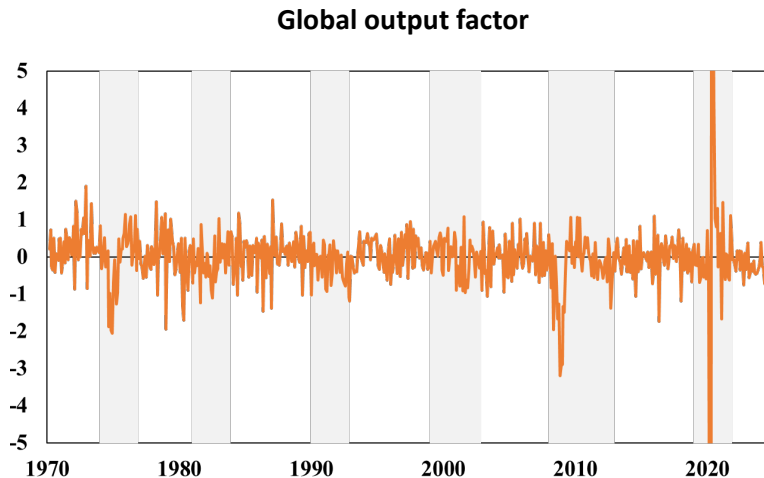
# NOMINAL VERSUS REAL INTEREST RATES

The RBC model focuses on real interest rates and physical marginal product conditions, but here we are dealing with monetary equilibrium and both nominal and real variables.

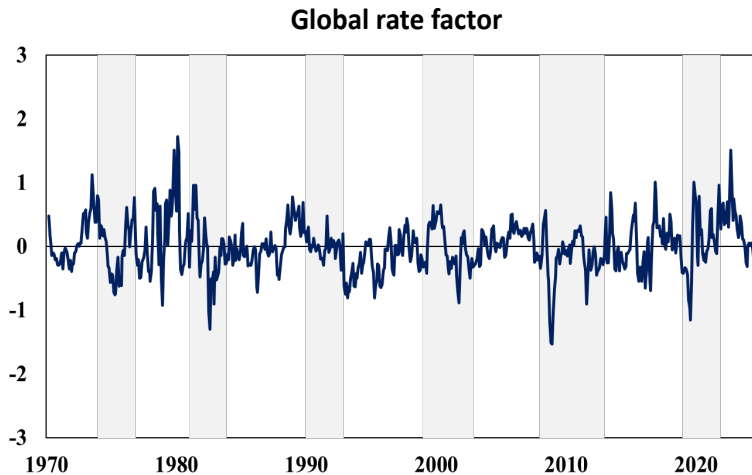
$$(1 + R_{it}) = (1 + \pi_{it}^e)(1 + r_{it}) \quad (5)$$

- ❶ Data are the nominal interest rate and realized inflation rate, not expected inflation.
- ❷ Would be instructive to model world and country factors for all three components of the relationship.
- ❸ Policy rate is the focus and it is responding to inflation developments (right-hand-side).
- ❹ Why are nominal exchange rates not considered? They afford some flexibility in terms of deviations from a common inflation target (which later becomes the world inflation factor?).

# GLOBAL FACTOR IN OUTPUT GROWTH

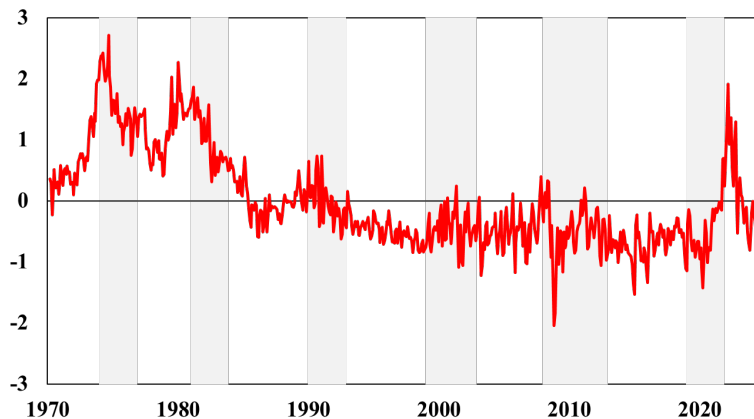


# GLOBAL FACTOR IN INTEREST RATES



# GLOBAL FACTOR IN INFLATION RATES

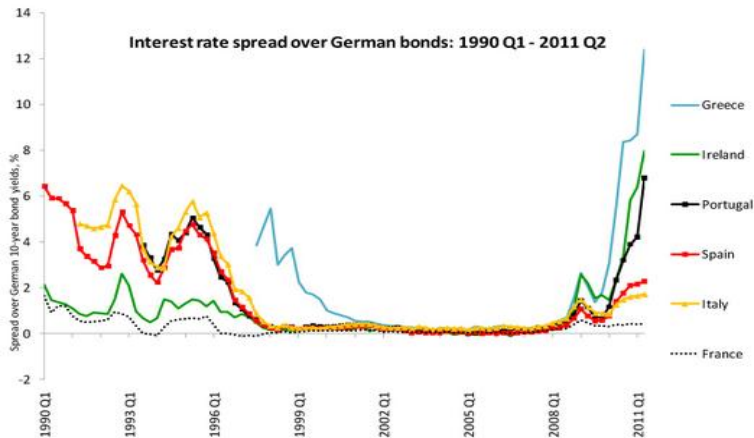
**Global inflation factor**



# WORLD INFLATION REGIMES (STORY-TELLING)

- ① Oil price shocks of the 1970s and 1980s may have generated more synchronous inflation than typical (1970-1984 44.4%)
- ② Average inflation rates were likely more unequal as well during this period and combined with asymmetric national transitions toward common long-run inflation targets in the 1990s, the common factor of inflation reaches a low point.
- ③ Then a stable period of comparable interest rate and inflation rate global components.
- ④ Then the COVID shock where there is reason to expect asymmetric fiscal stimulus played a role as well.

# INTERESTING BREAK-OUT EURO AREA NATIONS



## OTHER COMMENTS

- ① Crucini, Otrok and Kose (2011) found oil prices and world business cycle factor changes from negative to positive as one moves forward in time. Oil supply shocks lower world output in the 1970s and 1980s, but after the 1990s China's growth generates rising oil prices via energy demand but also directly raises world output through positive trade spillovers.
- ② China is an important (missing) global factor and one that is non-stationary (economic size, trade, etc.). Using monthly import data to proxy for China's output and existing interest rate and inflation data could allow inclusion into the empirical model.
- ③ Could sub-samples be chosen more rigorously, perhaps by using the estimated model directly in terms of the relative intensity of global factors? Perhaps some discussion of international policy co-ordination or lack thereof?
- ④ Monetary and fiscal policy functions?