

Comment on: International Inflation Spillovers Through Input Linkages

João Amador

Banco de Portugal
Nova School of Business and Economics

DNB Research Conference
Amsterdam, 30th September 2016

Disclaimer: The views expressed are those of the author and do not necessarily reflect those of Banco de Portugal

What drives synchronization of (producer price) inflation?

Several interesting questions...

Is there a role for input linkages?

- Quantify the role of global input linkages.
- What are the channels in place? (exchange rate; pricing to market; heterogeneity in technology across sectors and countries).

Do global input linkages transmit granular shocks?

- The structure of global input linkages contributes to periods of disinflation and inflation?

Where does the paper integrate in the recent literature strands?

Input-output linkages is changing the macro literature

- Contributions by Gabaix (2011) on granularity and Acemoglu et al. (2012) and Carvalho (2014) on tail risks and production networks
- Network-based propagation is quantitatively larger than the direct effects of the shocks

Input-output linkages have changed trade literature

- Contributions by Hummels et al. (2001) on vertical specialization and Baldwin (2013) on the unbundling of production, hand in hand with the availability of new databases
- Fragmentation of the production chain is the paradigm for production, with deep impacts in the economy

Policy relevance for macro (monetary) policy

We need answers for serious macroeconomic dilemmas

Low inflation and financial stability

- Persistent low inflation and interest rates at the ZLB jeopardize bank's profitability
- What is the role for international coordination in increasing inflation?

Liquidity, leverage and GVC's

- Low inflation adds to pressures on debt sustainability
- GVCs increase country-linkages; engine for growth and with a bearing on resilience

What does the paper conclude?

The role of global input linkages is important

- Synchronization of observed PPI doubles that of underlying cost shocks

Channels at play

- Exchange rates have no role in synchronizing inflation
- Pass-through plays a crucial role in synchronization
- Synchronization is driven by common sectoral shocks and linkages propagate them
- Heterogeneity in IO matrix across sectors and countries contributes to synchronization

Granular shocks

- Underlying cost shocks present fat tails, the structure of IO matrix maintains them, thus PPI is equally fat tailed

Skipping the time, country, source country and sector subscripts. . .

$$\widehat{W} = \gamma^C \widehat{C} + \gamma^I \widehat{P} \quad (1)$$

$$\widehat{P} = \beta^I (\widehat{W} + \widehat{E}) \quad (2)$$

Allows for the recovering of underlying cost shocks as:

$$\widehat{C} = \frac{1}{\gamma^C} \left[(I - \beta\Gamma) \widehat{P} - \beta \widehat{E} \right] \quad (3)$$

W : Cost function; P : Prices of inputs

E : Exchange rate; C : Cost of value added in country-sector

γ^C : Share of value added; (γ^I) and share of expenditure with foreign inputs \rightarrow in total output value

β : Pass-through of cost and exchange rate to prices

Γ : Global input-output matrix

Assuming full pass-through ($\beta = 1$) and ignoring exchange rate movements ($\hat{E} = 0$), the equilibrium \hat{P} , given a vector of shocks \hat{C} , is:

$$\hat{P} = (I - \Gamma)^{-1} \gamma \hat{C} \quad (4)$$

Then proceed to:

- Assess synchronization of recovered cost shocks and actual (producer) inflation $\rightarrow R^2$ metric, static and dynamic factor models
- Feed hypothetical underlying cost shocks in the global IO matrix \rightarrow Country-specific inflationary shock and energy price shock
- Asses the role of pass-though and exchange rates

Issues to consider

- Empirical literature has documented that markups are pro-cyclical, thus assuming constant markups (and assess the impact of different assumptions) may not be sufficient
- The distribution of the correlation between constructed aggregate PPI and official figures seems disperse (max=0.99; min=0.02; median=0.82 and IQR=?) What would be a threshold to assess a "good fit"?
- It would be very good to develop an external validation exercise on recovered cost shocks (e.g., use wage updates, producer tax changes, prices of non-tradables)
- Does pass-through take place along several years? What is the role for inventories?
- Is there a country coverage issue? WIOD is Europe-focused, the RoW block is important for energy/raw materials

Results

- Exchange rates have no net impact on the extent of synchronization (a priori less synchronization was expected)
- As β (pass-through) falls, the contribution of international linkages to synchronization drops
- A 1% inflationary shock in US affects MEX, CAN, TWN and in China affects KOR, TWN, CZE and HUN (typically very low impacts, $< 0.1 p.p. \Delta PPI$)
- Bilateral impacts are also small (larger impacts correspond to GVC linkages)
- A 10% rise in energy prices worldwide impacts mostly LTU, RUS and BGR

Issues to consider

- The exchange rate effect may be conditioned by a sample where the euro area is over-represented
- Is it possible to simulate depreciation shocks?
- Is the energy shock, as inserted, realistic? Should originate in energy producers (in RoW)
- Consider testing scenarios where the coefficients in the IO matrix are altered (e.g., higher energy efficiency)

Overall, this is a **very interesting paper**. More fundamental questions, beyond this methodological set up, can be raised.

Further issues to consider

- PPI is different from (CPI) inflation. . .
- What is the role of expectations? Economic theory has always put a big emphasis on this driver (Lucas' islands). Is there a case for having expectations on inflation acting as a third element and driving the identified correlation?
- The PPI developments and cost shocks are endogenous in the (world) economy and the size of the sectors as well (not to mention technological coefficients). From partial to general equilibrium, a model is warranted.