Discussion of

Global Drivers and Macroeconomic Volatility in EMs: A Dynamic Factor, General Equilibrium Perspective

by G. Bajraj, A. Fernández, M. Fuentes, B. García, J. Lorca, M. Paillacar, and J. M. Wlasiuk

A. Cesa-Bianchi*
Bank of England, CEPR, and CfM

CBCh Annual Conference

Virtual meeting - November 22-23, 2021

*The views expressed here do not necessarily represent those of the Bank of England or of any of its Committees.

This paper

- What are the global factors that shape EMEs' business cycles, and how do they operate?

This paper

- What are the global factors that shape EMEs' business cycles, and how do they operate?
- Answer is challenging...
  - What global factors?
  - What channels of transmission?

This paper

- What are the global factors that shape EMEs' business cycles, and how do they operate?
- Answer is challenging...
  - What global factors?
  - What channels of transmission?
- ... but crucial for policy makers

This paper

- What are the global factors that shape EMEs' business cycles, and how do they operate?
- Answer is challenging...
  - What global factors?
  - What channels of transmission?
- ... but crucial for policy makers
- **This paper** tackles both challenges
  [1] Builds a structural factor model where global factors have economic interpretation
  [2] Embeds global factors in a large scale DSGE model to investigate transmission mechanisms

This paper: Main takeaways

- **Factor model** Global factors can explain $> 40\%$ of variation in EMEs' macro-financial variables
  - Financial factor has preponderant role, especially for financial variables
  - But price/commodity factor at least as important for GDP fluctuations
  - Growth factor much less important, and negligible for consumer/commodity/asset prices

This paper: Main takeaways

- **Factor model** Global factors can explain $> 40\%$ of variation in EMEs' macro-financial variables
  - Financial factor has preponderant role, especially for financial variables
  - But price/commodity factor at least as important for GDP fluctuations
  - Growth factor much less important, and negligible for consumer/commodity/asset prices
- **DSGE model**
  - Financial factor less important in the model than in the data
  - GE analysis shows that financial factor shocks are transmitted through offsetting channels

My Comments

[1] **Factor Model** Can we sharpen the economic interpretation of the factors?

My Comments

[1] **Factor Model** Can we sharpen the economic interpretation of the factors?

[2] **DSGE Model** What can account for the discrepancy between model and data?

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- Factor models: Two types of identification
  - [1] Separate common from idiosyncratic variation
  - [2] Economic ‘structural’ interpretation

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- Factor models: Two types of identification
  - [1] Separate common from idiosyncratic variation
  - [2] Economic 'structural' interpretation

- Traditional focus on [1]
  - Agnostic statistical approach
  - Orthogonal factors, but hard to interpret

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- Factor models: Two types of identification
  - [1] Separate common from idiosyncratic variation
  - [2] Economic 'structural' interpretation
- Traditional focus on [1]
  - ∗ Agnostic statistical approach
  - ∗ Orthogonal factors, but hard to interpret
- This paper also tackles [2] in a novel way
  - ∗ Zero restrictions on factor loadings
  - ∗ Reminiscent of a Choleski-identified VAR

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- Factor models: Two types of identification
  - [1] Separate common from idiosyncratic variation
  - [2] Economic 'structural' interpretation
- Traditional focus on [1]
  - * Agnostic statistical approach
  - * Orthogonal factors, but hard to interpret
- This paper also tackles [2] in a novel way
  - * Zero restrictions on factor loadings
  - * Reminiscent of a Choleski-identified VAR

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

Do these restrictions
accord well with theory?

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- In related work, Cesa-Bianchi, Pesaran, Rebucci ('20) identify global growth and financial uncertainty shocks with zero restrictions on factor loadings

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- In related work, Cesa-Bianchi, Pesaran, Rebucci ('20) identify global growth and financial uncertainty shocks with zero restrictions on factor loadings
- Multi-country version of Lucas ('78) tree model
  - Equities driven by both growth and financial factors
  - At odds with zero restrictions on global growth factor

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- In related work, Cesa-Bianchi, Pesaran, Rebucci ('20) identify global growth and financial uncertainty shocks with zero restrictions on factor loadings

- Multi-country version of Lucas ('78) tree model
  - Equities driven by both growth and financial factors
  - At odds with zero restrictions on global growth factor

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- In related work, Cesa-Bianchi, Pesaran, Rebucci ('20) identify global growth and financial uncertainty shocks with zero restrictions on factor loadings

- Multi-country version of Lucas ('78) tree model
  - Equities driven by both growth and financial factors
  - At odds with zero restrictions on global growth factor

$\Rightarrow$ Growth factor's relevance may be understated

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- More in general, reasonable to assume that global factors affect **contemporaneously** quantities and prices in both AEs and EMEs

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	●	○	●
CPI EMEs	●	●	○
EMBI	●	○	○
Stock Mkt. Index	●	○	○
Global Variables			
Import Price Index	●	●	○
GDP Trade Partners	●	○	●
CPI Trade Partners	●	●	○
Exchange Rate	●	○	○
Commodities	●	●	○
Shadow FFR	●	○	○

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- More in general, reasonable to assume that global factors affect **contemporaneously** quantities and prices in both AEs and EMEs
- Unfortunately, back to agnostic approach

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	•	◦	•
CPI EMEs	•	•	◦
EMBI	•	◦	◦
Stock Mkt. Index	•	◦	◦
Global Variables			
Import Price Index	•	•	◦
GDP Trade Partners	•	◦	•
CPI Trade Partners	•	•	◦
Exchange Rate	•	◦	◦
Commodities	•	•	◦
Shadow FFR	•	◦	◦

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- More in general, reasonable to assume that global factors affect **contemporaneously** quantities and prices in both AEs and EMEs

- Unfortunately, back to agnostic approach

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	•	•	•
CPI EMEs	•	•	•
EMBI	•	•	•
Stock Mkt. Index	•	•	•
Global Variables			
Import Price Index	•	•	•
GDP Trade Partners	•	•	•
CPI Trade Partners	•	•	•
Exchange Rate	•	•	•
Commodities	•	•	•
Shadow FFR	•	•	•

[1] Factor Model

Can we sharpen the economic interpretation of the factors?

- More in general, reasonable to assume that global factors affect **contemporaneously** quantities and prices in both AEs and EMEs
- Unfortunately, back to agnostic approach
- **Suggestion** Sign restrictions on factor loadings
  - Growth and price factors easy to disentangle with output/prices comovement
  - Exchange rate can maybe be used to separate growth and financial factor?

Table 1: Baseline Model
(Restrictions on loading matrix)

	Factor		
	Financial	Price	Growth
EME Variables			
GDP EMEs	•	•	•
CPI EMEs	•	•	•
EMBI	•	•	•
Stock Mkt. Index	•	•	•
Global Variables			
Import Price Index	•	•	•
GDP Trade Partners	•	•	•
CPI Trade Partners	•	•	•
Exchange Rate	•	•	•
Commodities	•	•	•
Shadow FFR	•	•	•

[2] DSGE Model

What can account for the discrepancy between model and data?

- Quantitative role of factors in DSGE model does not accord well with data
  - Financial factor accounts for 10% of the variance of GDP
  - Major role for price factor

[2] DSGE Model

What can account for the discrepancy between model and data?

- Quantitative role of factors in DSGE model does not accord well with data
  - Financial factor accounts for 10% of the variance of GDP
  - Major role for price factor
- Paper highlights the role of offsetting channels
- Useful to understand the mechanics of the model... but silent about the discrepancy

[2] DSGE Model

What can account for the discrepancy between model and data?

- Quantitative role of factors in DSGE model does not accord well with data
  - Financial factor accounts for 10% of the variance of GDP
  - Major role for price factor
- Paper highlights the role of offsetting channels
- Useful to understand the mechanics of the model... but silent about the discrepancy
- Two possible explanations:
  - Role of financial factor in empirical model is overestimated (back to [1])
  - Absence of financial amplification mechanisms in the model

[2] DSGE Model

What can account for the discrepancy between model and data?

- Only form of financial frictions in the model is the country premium
  - Not directly affected by factors, but indirectly via NFA position a la Schmitt-Grohe and Uribe ('03)

[2] DSGE Model

What can account for the discrepancy between model and data?

- Only form of financial frictions in the model is the country premium
  - Not directly affected by factors, but indirectly via NFA position a la Schmitt-Grohe and Uribe ('03)

- No role for asset prices to interact with financial constraints (via collateral values)
  [1] Price of capital/securities/housing
  [2] Exchange rate

[2] DSGE Model

What can account for the discrepancy between model and data?

- Only form of financial frictions in the model is the country premium
  - Not directly affected by factors, but indirectly via NFA position a la Schmitt-Grohe and Uribe ('03)
- No role for asset prices to interact with financial constraints (via collateral values)
  [1] Price of capital/securities/housing
  [2] Exchange rate

Key for financial cycle to play a role?

[2] DSGE Model

What can account for the discrepancy between model and data?

- Only form of financial frictions in the model is the country premium
  - Not directly affected by factors, but indirectly via NFA position a la Schmitt-Grohe and Uribe ('03)

- No role for asset prices to interact with financial constraints (via collateral values)
  [1] Price of capital/securities/housing
  [2] Exchange rate

Key for financial cycle to play a role?

- To (roughly) fix ideas:

$$Net\ Worth = (Div + Q)A + RER \cdot (Div^* + Q^*)A^* - R_D D - RER \cdot R_D^* D^*$$

[2] DSGE Model

What can account for the discrepancy between model and data?

- Only form of financial frictions in the model is the country premium
  - Not directly affected by factors, but indirectly via NFA position a la Schmitt-Grohe and Uribe ('03)
- No role for asset prices to interact with financial constraints (via collateral values)
  [1] Price of capital/securities/housing
  [2] Exchange rate

Key for financial cycle to play a role?

- To (roughly) fix ideas:

$$Net\ Worth = (Div + Q)A + RER \cdot (Div^* + Q^*)A^* - R_D D - RER \cdot R_D^* D^*$$

[2] DSGE Model

What can account for the discrepancy between model and data?

- Only form of financial frictions in the model is the country premium
  - Not directly affected by factors, but indirectly via NFA position a la Schmitt-Grohe and Uribe ('03)
- No role for asset prices to interact with financial constraints (via collateral values)
  [1] Price of capital/securities/housing
  [2] Exchange rate

Key for financial cycle to play a role?

- To (roughly) fix ideas:

$$Net\ Worth = (Div + Q)A + RER \cdot (Div^* + Q^*)A^* - R_D D - RER \cdot R_D^* D^*$$

- Potentially relevant for firms, banks, households

In sum

- Great paper, lots of interesting results

In sum

- Great paper, lots of interesting results
- Effort to move the discussion from factors to ‘shocks’ very welcome

In sum

- Great paper, lots of interesting results
- Effort to move the discussion from factors to ‘shocks’ very welcome $\longrightarrow$ More to be done?
  - Zero restrictions on loadings may be too restrictive
  - Sign restrictions identification as a way forward

In sum

- Great paper, lots of interesting results
- Effort to move the discussion from factors to ‘shocks’ very welcome $\longrightarrow$ More to be done?
  - Zero restrictions on loadings may be too restrictive
  - Sign restrictions identification as a way forward
- DSGE analysis crucial to understand transmission mechanisms
  - Introduce some key ingredients to give a fairer shot to the financial factor/shock