The Economic Effects of Trade Policy Uncertainty on Emerging Market Economies

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Motivation

- uncertainty regarding the conduct of US trade policy emerged as an important trade policy issue especially during the last five years

- empirical measure of trade policy uncertainty (TPU) based on text search of major global newspapers shows marked increase especially following the announcement of the candidacy of D. Trump (Figure 1)

- focus of studies on effects of TPU mainly for the U.S. and other advanced economies
Figure 1. Trade Policy Uncertainty and Exports of Emerging Markets

Source: Caldara et al. (2020) and authors’ calculations. Left hand axis uses log scale
Research question addressed

- little research on the empirical effects of TPU on emerging markets (EMs)
- research on EMs confined to studies related to the aftermath of China’s accession to the WTO (2001)
- what have been the effects of changes to TPU during the last 20 years on the economies of EMs?
- how have the exports of EMs responded to changes in TPU?
Methodology

- Global Vector Autoregression (GVAR) model is well suited to addressing these issues because it models interactions between the U.S. (the dominant economy), emerging economies, and other advanced economies.

- For each economy, we define three types of variables:
  - Endogenous variables
  - Weakly exogenous foreign variables
  - Global variables

- Economies linked via trade matrix
Methodology

- GVAR estimates for each country $i$ the following model

$$A_{i0}x_{i,t} = c_i + d_i t + \sum_{j=1}^{p} A_{ij}x_{i,t-j} + \sum_{j=0}^{p} B_{ij}x_{i,t-j}^* + \sum_{j=0}^{p} C_{ij}W_{t-j} + e_{i,t}$$

where $x_{i,t}$ is the vector of country-specific endogenous variables, $x_{i,t}^*$ is the vector of country-specific ‘foreign’ variables and $W_t$ is the vector of ‘global’ variables (exogenous variables common to all countries)

- the ‘foreign’ variables are weighted averages

$$x_{i,t}^* = \sum_{j=0}^{N} w_{i,j}x_{j,t}, \quad w_{i,i} = 0 \text{ and } w_{i,j} \geq 0 \text{ for each } i, j$$

where the weights $w_{i,j}$ refer to bilateral trade
Methodology

- GVAR is a large model which allows for a high degree of interdependence and dynamics between countries via two channels
  - the impact of the foreign \( x_{it}^* \) variables
  - the error covariances

- shocks to one country can have marked effects on other countries depending on their size and patterns of trade

- to investigate the impact of a TPU shock on the economies of EMs and estimate global impulse response functions, it is essential to solve simultaneously the individual-country models for all countries included in the GVAR

- the global solution is equivalent to reduced-form VAR estimation but with numerous within and cross-equation restrictions
Data

- GVAR model estimated for
  - U.S.
  - 18 EMs (Brazil, Chile, China, Czech Republic, Hong Kong, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, South Africa, Taiwan, Thailand and Turkey)
  - 4 advanced economies (19 EU economies as a group, Canada, Japan and the UK)
- monthly data during 2000:1 – 2019:12
Model Specification

- U.S. is treated differently from other economies

vector of US domestic variables $x_{it} = \left( \Delta lnIP_t, \pi_t, \Delta lnreer_t, lnImports_{US,t}^{TOT}, TPU_t \right)$

vector of US foreign variables $x_{it}^* = \left( \Delta lnIP_t^*, \pi_t^* \right)$

$\Delta lnIP_t =$ growth rate of industrial production
$\pi_t =$ inflation rate
$\Delta lnreer_t =$ growth rate of the real effective exchange rate (if positive then rate of domestic currency real appreciation)
$lnImports_{US,t}^{TOT} =$ log of aggregate US imports
$TPU_t =$ trade policy uncertainty index

- Note: for U.S TPU is endogenous
Model Specification

- two models for each EM

- the reason is that the limited availability of time series data renders the estimation of one large VAR model with a large number of endogenous variables not feasible

- other studies (e.g. Anaya et al. 2017) also consider two alternative models for each EM that focus on different groups of variables, specifically
  - ‘real model’
  - ‘financial model’
Model Specification

‘real’ model for each EM

EM domestic variables $x_{it} = (\Delta \ln IP_{it}, \pi_{it}, \Delta \ln reer_t, lnExports_{it}^{TOT})$

EM foreign variables $x_{it}^* = (\Delta lnIP_{it}^*, \pi_{it}^*)$

EM global variables $W_t = (lnImports_{US,t}^{TOT}, TPU)$

$$lnExports_{it}^{TOT} = \text{each EM’s total exports}$$

Note: for EMs TPU is a global variable
Model Specification

- ‘financial’ model for each EM

**EM domestic variables**

\[ x_{it} = (\text{intr}_{it}, \Delta \ln \text{reer}_{it}, \Delta \ln \text{Stock}_{it}, \pi_{it}, \ln \text{Exports}_{it}^{TOT}) \]

**EM foreign variables**

\[ x_{it}^* = (\pi^*_{it}, \Delta \ln \text{Stock}_{it}^*, \text{intr}_{it}^*) \]

**EM global variables**

\[ W_t = (\ln \text{Imports}_{US,t}^{TOT}, TPU) \]

\[ \text{intr}_{it} = \text{domestic policy interest rate} \]
\[ \Delta \ln \text{Stock}_{it} = \text{rate of return of stock market index} \]

Note: for the ‘financial’ model the stock market return is included amongst the endogenous variables for the US.
Impulse Response Functions (IRFs): U.S.

TPU

Stock Market Return

Imports

Real Effective Exchange Rate
IRFs: EM Total Exports (Groups EMs)

Brazil   Russia   India   China
Asia     Latin America   East/South Europe   South Africa
IRFs: EM Real Exchange Rate Change

Brazil  Russia  India  China

Asia  Latin America  East/South Europe  South Africa
IRFs: EM Stock Market Return

Brazil    Russia    India    China

Asia    Latin America    East/South Europe    South Africa
IRFs: Geographic Composition of US Imports

US Imports from Emerging and Developing Asian Economies

US Imports from Emerging and Developing Economies other than Asia

US imports from Developed Economies
IRFs: Geographic Composition of EM Exports – EM Exports to the U.S.
What about trade openness?

- does the degree to which a country is open to the world economy influence responsiveness to a TPU shock?
- divide 18 EMs into two groups based on average trade openness
- response of EM total exports to TPU shock for two groups

**Low-Openness Economies**

**High-Openness Economies**
Conclusions

- trade policy uncertainty shocks have important economic implications
  - U.S. total imports decline, US stock market return is lower and the dollar appreciates in real terms
  - exports of most EMs decline significantly
  - real depreciation of yuan
  - most EM stock market returns lower
  - US imports from Emerging and Developing Economies decline but those from Asian EMs decline at faster rate
  - China’s exports to the US decline but those from other Asian economies increase in the short term
    - substitution of Chinese imports into the US by imports from other Asian economies