Comments on Nowcasting the Czech Trade Balance

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The usual disclaimer applies

Structure of the presentation

- Motivation and objectives
- One technicality
- Comments on the interpretation of the results
- Learning from your paper. Some cool ideas for the future

Objective and Motivation

- Nowcast Czech trade balance

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- Nowcast Czech trade balance
- 8 time series:
- Monthly frequency (4 series):
  - growth rates of export and import (values)
  - growth rates of export and import prices
- Quarterly frequency:
  - Real and nominal export and import (national accounts)
- Foreign PPI?

Objective and Motivation

- Nowcast Czech trade balance

- Why? Up to 45 days publication delay
  - Good motivation for GDP
    - To understand real activity is key for policymakers and for investors

Objective and Motivation

- Nowcast Czech trade balance
- Why? Up to 45 days publication delay
  - Good motivation for GDP
    - To understand real activity is key for policymakers and for investors
- It would be good for the paper to explain why is important to nowcast trade in real time.
  - Is it relevant for GDP growth forecast?
  - Is it relevant for trade policy?

One technicality

- Annual growth rates

$$\Delta^{12} y_t = (1-L)^{12} y_t = (1 + L + L^2 + L^3 + \ldots + L^{10} + L^{11})(1-L) y_t =$$

$$= \Delta\, y_t + \Delta\, y_{t-1} + \Delta\, y_{t-2} + \ldots + \Delta\, y_{t-11}$$

$$\Delta^{12} y_t = \phi(\Delta^{12} y_{t-1}) + \varepsilon_t$$

$$\Delta\, y_t + \Delta\, y_{t-1} + \Delta\, y_{t-2} + \ldots + \Delta\, y_{t-11} = \phi(\Delta\, y_{t-1} + \Delta\, y_{t-2} + \ldots + \Delta\, y_{t-11} + \Delta\, y_{t-12}) + \varepsilon_t$$

One technicality

- Annual growth rates

$$\Delta^{12} y_t = (1-L)^{12} y_t = (1 + L + L^2 + L^3 + \ldots + L^{10} + L^{11})(1-L) y_t =$$

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$$\Delta^{12} y_t = \phi(\Delta^{12} y_{t-1}) + \varepsilon_t$$

$$\Delta y_t + \Delta y_{t-1} + \Delta y_{t-2} + \ldots + \Delta y_{t-11} = \phi(\Delta y_{t-1} + \Delta y_{t-2} + \ldots + \Delta y_{t-11} + \Delta y_{t-12}) + \varepsilon_t$$

- Imagine with multivariate models

$$\Delta^{12} y_t = \phi(\Delta^{12} x_t) + \varepsilon_t$$

$$\Delta y_t + \Delta y_{t-1} + \Delta y_{t-2} + \ldots + \Delta y_{t-11} = \phi(\Delta x_t + \Delta x_{t-1} + \Delta x_{t-2} + \ldots + \Delta x_{t-11}) + \varepsilon_t$$

Interpreting the results

- Might be the case that all the models are statistically equal? Formal tests should be conducted.

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- Learning from the winning models and the winning horizons.
  - Values. Elastic net regressions
  - Prices. Univariate methods

- The sample starts in January 2006. The entry in the EU should not be a problem

Interpreting the results

- Learning from the variables selected and the winning horizons.
  - Which variables are selected for each magnitude to forecast
  - Do comovements in the forecast could be due to common selected variables?
  - Are monthly variables of the same magnitude selected when forecasting quaterly variables of that magnitude?
  - Almost 100 variables in the appendix!!
  - Timing of the variables. Are they available much earlier than trade variables?

A really cool proposed model

- Exports, Imports values and prices move together

$$Y_t = (\Delta X_t, \Delta M_t, \Delta x_t, \Delta m_t, \Delta PX_t, \Delta PM_t, \Delta px_t, \Delta pm_t)$$

$$\Delta X_t = 1/3\Delta x_t + 2/3\Delta x_{t-1} + \Delta x_{t-2} + 2/3\Delta x_{t-3} + 1/3\Delta x_{t-4} + \varepsilon_{x,t}$$

$$\Delta M_t = 1/3\Delta m_t + 2/3\Delta m_{t-1} + \Delta m_{t-2} + 2/3\Delta m_{t-3} + 1/3\Delta m_{t-4} + \varepsilon_{m,t}$$

$$\Delta PX_t = 1/3\Delta px_t + 2/3\Delta px_{t-1} + \Delta px_{t-2} + 2/3\Delta px_{t-3} + 1/3\Delta px_{t-4} + \varepsilon_{xp,t}$$

$$\Delta PM_t = 1/3\Delta pm_t + 2/3\Delta pm_{t-1} + \Delta pm_{t-2} + 2/3\Delta pm_{t-3} + 1/3\Delta pm_{t-4} + \varepsilon_{mp,t}$$

A really cool proposed model

- Exports, Imports values and prices move together

$$YM_t = (\Delta x_t, \Delta m_t, \Delta px_t, \Delta pm_t)$$

$$\Delta x_t = \beta_{1x} f_{1t} + u_{x,t}$$

$$\Delta m_t = \beta_{1m} f_{1t} + u_{m,t}$$

$$\Delta px_t = \beta_{1,px} f_{1t} + \beta_{2,px} f_{2t} + u_{px,t}$$

$$\Delta pm_t = \beta_{1,pm} f_{1t} + \beta_{2,pm} f_{2t} + u_{pm,t}$$

A really cool proposed model

$$
\begin{pmatrix}
\Delta x_t \\
\Delta m_t \\
\Delta px_t \\
\Delta pm_t \\
z_{1t} \\
z_{2t} \\
\dots \\
z_{nt}
\end{pmatrix}
=
\begin{pmatrix}
\beta_{1,x} & 0 \\
\beta_{1,m} & 0 \\
\beta_{1,px} & \beta_{2,px} \\
\beta_{1,pm} & \beta_{2,pm} \\
\alpha_{1,1} & \alpha_{1,2} \\
\alpha_{1,2} & \alpha_{2,2} \\
\dots & \dots \\
\alpha_{1,n} & \alpha_{2,n}
\end{pmatrix}
\begin{pmatrix}
f_{1t} \\
f_{2t}
\end{pmatrix}
+
\begin{pmatrix}
u_{xt} \\
u_{mt} \\
u_{pxt} \\
u_{pmt} \\
u_{1t} \\
u_{2t} \\
\dots \\
u_{nt}
\end{pmatrix}
$$

f_{it} and u_{it} AR process

To conclude

- A first step into the development of a good model for real time analysis of trade balances

- If this is an important issue in the Czech Republic

- I would love if you keep working on this area

To conclude

- A first step into the development of a good model for real time analysis of trade balances
- If this is an important issue in the Czech Republic
- I would love if you keep working on this area
- And I volunteer to help!