Import Price Misalignment after the Crisis: A New Keynesian Perspective

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Motivations

• Will exchange rate adjustments be sufficient for rebalancing U.S. external deficits? Maybe not, because of low exchange-rate passthrough to import prices.

• How are U.S. import prices related to the production cost of its trading partners, especially Asian countries? If there are any misalignments, how to explain them?

• An essential source of persistent trade imbalances might be associated with import-price stickiness.

• Then how to identify the role of price stickiness abstracting from that of monetary policy?

• Are region-, country-, or industry-specific factors responsible for misalignments?
Passthrough to Import Prices

Import price misalignment: the deviation of manufactured goods import prices from exchange-rate-adjusted domestic manufacturing producer prices.
Import Price Misalignment

Import Price Index (All Goods But Petroleum)
Exchange Rate Adjusted, Trade Weighted Index of Trading Partner Domestic Manufacturing PPI's

- Following Marquez and Thomas (2006)

US Import Price Misalignment (2000=1)
Figure 2a US Import Price Misalignment by Global Region of Origin (2004=1)
Figure 2b: Import Price Misalignment: Asian Subregions (2004 =1)
State of Play

• U.S. imports have historically been cheap relative to foreign production costs.
  – U.S. dollar has declined but not reflected in more expensive imports.

• The import price misalignment measure declines most extremely among Pacific Rim countries, especially ASEAN.
Import Price Passthrough

• Well documented: slow pass-through and sticky import prices.

• Need optimizing model to:
  – Control for endogenous costs: Exchange rates vs. marginal costs.
  – Immunize from the Lucas critique: Slow price changes may be attributable to monetary policy response.

• Asian monetary policy challenges for “Full Information” model.
Strategy

• Estimate the degree of price stickiness using the New Keynesian model of local currency pricing (theory by Betts & Devereux 2000).

• Implement the estimation method in Choi and Cook (2013).

• GMM estimation using out-of-sample forecasts of future inflation.
Findings

• U.S. import prices are extremely sticky.
• Imports from Asia are significantly stickier than other regions.
• Differences in price stickiness can mostly explained by goods types.
New Keynesian Building Blocks (1)

- Calvo-type local currency pricing: the likelihood of price change = (1-ν)

\[ \pi^{LCP}_t = E_t \left[ \frac{(1-\nu)(1-\beta \nu)}{\nu} \left( mc_t - \mu_t \right) + \beta \cdot \pi^{LCP}_{t+1} \right] \]

where:

- \( S \): Exchange Rate;
- \( MC \): Marginal Cost in Foreign Currency;
- \( IPI \): Index of Import Prices;
- \( mc \): \( \ln(MC/PPI) \);
- \( \mu \): \( \ln(IPI) - \ln(S \cdot PPI) \);
- \( PPI \): Producer Prices in Foreign Currency
New Keynesian Building Blocks (2)

• Domestic New Keynesian Phillips Curve

\[
\pi_{t}^{PPI} = E_{t} \left[ \frac{(1 - \kappa)(1 - \beta \kappa)}{\kappa} m c_{t} + \beta \pi_{t+1}^{PPI} \right]
\]

• Producer Currency Pricing (PCP)

\[
\pi_{t}^{PCP} = \pi_{t-1}^{PPI} - d s_{t-1}
\]

• Combine PCP and LCP (local currency pricing)

\[
\pi_{t}^{IPI} = \lambda \cdot \pi_{t}^{PCP} + (1 - \lambda) \cdot \pi_{t}^{LCP}
\]

where \( \lambda \): fraction of PCP pricers
Estimating the Model

\[ E_t \left( \pi_t^{IPI} - \beta \pi_{t+1}^{IPI} \right) = \lambda \cdot E_t \left( \pi_t^{PCP} - \beta \cdot \pi_{t+1}^{PCP} \right) \]

\[ + (1 - \lambda) E_t \left[ \frac{(1-\nu)(1-\beta\nu)}{\nu(1-\kappa)(1-\beta\kappa)} \left( \pi_t^{PPI} - \beta \cdot \pi_{t+1}^{PPI} \right) - \frac{(1-\nu)(1-\beta\nu)}{\nu} \mu_t \right]. \]

- Approximate the above equation: \( \beta \sim 1 \)

\[ \pi_t^{IPI} - \pi_{t+1}^{IPI} = \alpha_0 + \alpha_1 \cdot \mu_t + \alpha_2 \cdot \left[ \pi_t^{PPI} - \pi_{t+1}^{PPI} \right] + \alpha_3 \cdot \left[ \pi_t^{PCP} - \pi_{t+1}^{PCP} \right] + \epsilon_{t+1} \]

where \( \alpha_1 < 0; \alpha_2, \alpha_3 < 0 \) \( E_t[\epsilon_{t+1}] = 0 \)
Data

• BLS Import Price Indices
• 54 U.S. trading partners
• Spot Exchange Rates, IMF IFS
• PPI – Domestic Manufacturing or as close as possible.
• For country $j$, $M_t^j \equiv \frac{S_t^j \cdot IPI_t}{PPI_t^j \cdot PPP_{BY}^j} \cdot \frac{1}{\prod_{j=1}^{J}(M_t^j)^{w_{t-k}^j}}$, PPP relative price from ICP, $\mu_t = \ln M_t$. 
Instruments

• Expected inflation acceleration not orthogonal.
• IV (Instrumental Variables): $[\pi_t^{PPI} - \hat{\pi}_{t+1}^{PPI}]$, $\mu_{t-1}$
• For each country $j$, construct rolling out-of-sample forecasts, depending on the availability of data, $\hat{\pi}_{t+1}^{PPI,j}$.
• Construct weighted average
# Import Price Stickiness (1)

1. European Union  
2. Canada  
3. Latin America  
4. ASEAN  
5. ANICs  
6. Japan  
7. China

<table>
<thead>
<tr>
<th>Joint Estimation (A)</th>
<th>Asian Regions (B)</th>
<th>Non Asian Regions (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \alpha_1 )</td>
<td>0.005*** (.001)</td>
<td>0.002*** (.001)</td>
</tr>
<tr>
<td>( \alpha_2 )</td>
<td>0.272*** (.019)</td>
<td>0.197*** (.017)</td>
</tr>
<tr>
<td>( \alpha_3, \lambda )</td>
<td>0.083*** (.004)</td>
<td>0.093*** (.006)</td>
</tr>
</tbody>
</table>

| \( N \cdot T \) | 474 | 474 |
| \( J \text{ Stat} \) | 18.547 | 15.993 |
| \( d.f. \)   | 18  | 15  |
| \( 5\% \text{ C.V.} \) | 28.869 | 24.996 |

| \( \nu \)   | 0.932 (.005) | 0.956 (.008) | 0.883 (.008) |
| \( \kappa \) | 0.877 (.009) | 0.905 (.017) | 0.883 (.008) |
## Import Price Stickiness (2)

<table>
<thead>
<tr>
<th></th>
<th>Pacific Rim (A)</th>
<th>NICs (B)</th>
<th>ASEAN (C)</th>
<th>China (D)</th>
<th>Japan (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_1$</td>
<td>-0.003 (.005)</td>
<td>-0.001 (.001)</td>
<td>-0.002 (.004)</td>
<td>-0.007 (.008)</td>
<td>-0.005 (.004)</td>
</tr>
<tr>
<td>$\alpha_2$</td>
<td>0.258*** (.059)</td>
<td>0.096*** (.038)</td>
<td>0.517*** (.076)</td>
<td>0.085 (.097)</td>
<td>-0.049 (.057)</td>
</tr>
<tr>
<td>$\alpha_3$</td>
<td>0.061*** (.022)</td>
<td>0.138*** (.042)</td>
<td>0.120*** (.027)</td>
<td>0.092*** (.03)</td>
<td>0.057*** (.011)</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.601 34 15.479</td>
<td>0.450 86 17.88</td>
<td>0.457 34 11.98</td>
<td>0.173 35 9.576</td>
<td>0.158 87 42.79</td>
</tr>
<tr>
<td>Num. Obs.</td>
<td></td>
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<tr>
<td>Cragg-Donald Critical Value</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>$\nu$</td>
<td>.944 (.036)</td>
<td>.974 (.031)</td>
<td>.952 (.046)</td>
<td>.920 (.042)</td>
<td>.934 (.021)</td>
</tr>
<tr>
<td>$\kappa$</td>
<td>.895 (.065)</td>
<td>.922 (.011)</td>
<td>.934 (.061)</td>
<td>.770 (.132)</td>
<td>---</td>
</tr>
</tbody>
</table>
## Industry-Level Regression

<table>
<thead>
<tr>
<th></th>
<th>Independent Variable $\ln(\frac{M^{j}<em>{2012}}{M^{j}</em>{2002}})$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.231**</td>
</tr>
<tr>
<td></td>
<td>(.042)</td>
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<tr>
<td>Intermediate Dum</td>
<td>0.213*</td>
</tr>
<tr>
<td></td>
<td>(.109)</td>
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<tr>
<td>Asean+3 Share 2000</td>
<td>-0.331</td>
</tr>
<tr>
<td></td>
<td>(.242)</td>
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<tr>
<td>China Share 2000</td>
<td></td>
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<td></td>
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<tr>
<td>$\ln(\nu^{j})$</td>
<td></td>
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<tr>
<td>Average Appreciation 2000-2011</td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>36</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.100</td>
</tr>
</tbody>
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Concluding Remarks

• Consider two possibilities for U.S. import price misalignments:
  – (1) The level of misalignment is simply a function of the slow passthrough of exchange rates into import prices (Campa and Goldberg 2005; and Gust et al. 2010).
  – (2) The industries with low passthrough have not adjusted quickly to the run up in currency values of U.S. trading partners.

• Import price stickiness—rather than monetary policy per se—may explain the degree of such misalignments.

• The low passthrough of import prices from Asia is attributable to the particular composition of goods rather than any special behavior of East Asian firms.
Thank you!