Export Dynamics Since the Great Trade Collapse: A cross-country panel analysis

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Was this a structural break?

• Some authors argued this was a short-run shock so as these factors eased off, trade should recovered to pre-crisis levels
  – Impaired trade finance (Chor and Manova, 2012; JaeBin, Amiti and Weinstein, 2011)
  – Heightened uncertainty (Novy and Taylor, 2014)

• Others argued this was a structural break in the GDP:trade nexus, and that trade would be permanently lower
  – Offshoring process had reached its end (Krugman, 2013)
  – Rise in hidden protectionism (Davies, 2013)
This paper

- Estimate a panel error correction model of goods exports for 16 advanced economies.

- Use common correlated effects (CCE) estimator of Pesaran (2006), to control for possible existence of unobserved common factors.

- Was the actual behaviour of exports after the GTC up to 2012 in line with the pre-crisis relationships? Yes.
  - This supports temporary shock explanation
  - Suggests any structural weakness in trade after 2012 is a separate phenomenon to the GTC.
Empirical approach

- Standard theoretical model = imperfect substitutes model of international trade (Goldstein and Khan, 1985)
  
  \[ X_{i,t} = f(Y_{i,t}^*, E_{i,t}) \]

  with \( X \) = real exports
  \( Y^* \) = trade-weighted external demand
  \( E \) = real effective exchange rate

- Our extensions:
  - Sectoral composition of global trade (Mayer 2010; Levchenko, Lewis and Tesar 2010)
  - Decomposing real exchange rate

  \[ X_{i,t} = f(Y_{i,t}^*, S_{i,t}, U_{i,t}, C_{i,t}^*) \]

  where \( S \) refers to nominal exchange rates, \( U \) to relative domestic unit labour costs and \( C^* \) to a measure of sectoral shocks
Data

\[ X_{i,t} = f(Y_{i,t}^*, S_{i,t}, U_{i,t}, C_{i,t}^*) \]

- Panel of 16 OECD economies, 1984Q1-2012Q4, unbalanced (G7+Austria, Denmark, Finland, Netherlands, New Zealand, Portugal, Sweden & Switzerland)

- ULC-based real effective exchange rate, nominal effective exchange rate (IMF)

\[ REER_{it} = S_{it} \times U_{it} \]

- External demand given by trade-weighted RoW GDP growth, over 76 trading partners

\[ \Delta Y_{i,t}^* = \sum_{p=1}^{P} \omega_{ipt} \Delta Y_{p,t} \]

- Bilateral weights taken from COMTRADE, lagged by a year to avoid correlations with exchange rate changes

- Sectoral composition measure which captures effect of shift in composition of trade.
Econometric Model

- Single equation error correction model (ECM) in line with e.g. Ca’Zorzi and Schnatz (2007); di Mauro, Rüffer and Bunda (2008); Breuer and Klose (2013)

- Motivated by time series properties of data, and backed up by formal ECM test
  - ECM property may be important for capturing “bounceback” after GTC

- Use Common Correlated Effects (CCE) estimators (Pesaran, 2006)
  - Augments model with cross-section average of all variables to take account of unobserved common factors
  - Residual term: $v_{i,t} = \lambda_i f_t + \varepsilon_{i,t}$

- Mean group estimator: run separate regression for each country, average parameters to produce estimate of population parameter
### Empirical results

<table>
<thead>
<tr>
<th>Estimation sample:</th>
<th>I 1984Q1-2008Q2</th>
<th>II 1984Q1-2008Q2</th>
<th>III 1984Q1-2012Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>World output ( y^* )</td>
<td>0.519 (0.407)</td>
<td>0.886* (0.495)</td>
<td>0.852 (0.520)</td>
</tr>
<tr>
<td>Real exchange rate ( c )</td>
<td>-0.098** (0.045)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nominal exchange rate ( s )</td>
<td>-0.051 (0.056)</td>
<td>-0.089* (0.046)</td>
<td>-</td>
</tr>
<tr>
<td>Unit labor costs ( u )</td>
<td>-0.300** (0.117)</td>
<td>-0.288** (0.121)</td>
<td>-</td>
</tr>
<tr>
<td>Sectoral composition ( c^* )</td>
<td>0.669 (0.416)</td>
<td>0.419 (0.563)</td>
<td>0.779* (0.409)</td>
</tr>
<tr>
<td>( c^{*+1} )</td>
<td>0.498 (0.459)</td>
<td>0.457 (0.362)</td>
<td>0.621 (0.362)</td>
</tr>
<tr>
<td>( c^{*+2} )</td>
<td>0.791*** (0.197)</td>
<td>0.665** (0.270)</td>
<td>0.512** (0.229)</td>
</tr>
<tr>
<td>Error correction</td>
<td>-0.571 (0.050)</td>
<td>-0.643 (0.056)</td>
<td>-0.584 (0.067)</td>
</tr>
</tbody>
</table>

### Long-run coefficients

| World output \( y^* \)     | 1.695*** (0.404) | 1.947*** (0.489) | 1.892*** (0.521) |
| Real exchange rate \( c \) | -0.366*** (0.088)| -                | -               |
| Nominal exchange rate \( s \) | -0.209 (0.088)  | -0.331** (0.065)| -               |
| Unit labor costs \( u \)   | -0.415*** (0.081)| -0.546** (0.082)| -               |
| Sectoral composition \( c^* \) | 0.180 (0.318)  | 0.144 (0.346)  | 0.317 (0.380)  |
| Average correlation         | -0.047 (0.071)  | -0.046 (0.077) | -0.042 (0.078) |

Number of observations for respectively columns I and II and column III: Total=1276, N=16, min T=53, max T=97, average T=80 and Total=1516, N=16, min T=68, max T=112, average T=95. Note: *, **, *** denote significance at 10, 5, and 1% levels respectively. Standard errors are in brackets, p-values in italics. Note that the p-values for the error correction term are not listed, given that the t-statistic is not standard normally distributed due to the approximation of unobserved common factor by the CSAs (see appendix).
Conditional Forecast Exercise

- Use coefficient estimates to conduct dynamic forecasts for each country's exports, jumping off at 2008Q2.

- Include CSA terms- to see how large impact is of common correlated effects.

- We let the model “see” the CSA data- this exercise is a way of testing for a structural break, rather than developing a new way to forecast exports (also do forecast with CSAs “switched off”).

- Consider both country level forecasts, and the aggregate path of advanced economy exports.

- Decompose forecast into marginal contribution of each variable (hold all exogenous variables flat, add one at a time back in, and difference between profiles gives marginal contribution of that variable).
Forecast exercise: Aggregate data

Figure 2 Forecast decomposition (weighted average)
Conclusions

- Estimate panel data ECM for 16 advanced economies
  - Sectoral coefficient only important in short run
  - Differential response of exports to ULCs vs nominal exchange rate

- Model can capture fall since GTC, but large contribution for CCEs
  - Consistent with literature that GTC was larger than GDP fall can explain

- Bounceback in trade was to levels consistent with pre-GTC model: => Implies GTC was a temporary shock rather than a permanent structural break