Euro Area External Imbalances and the Burden of Adjustment

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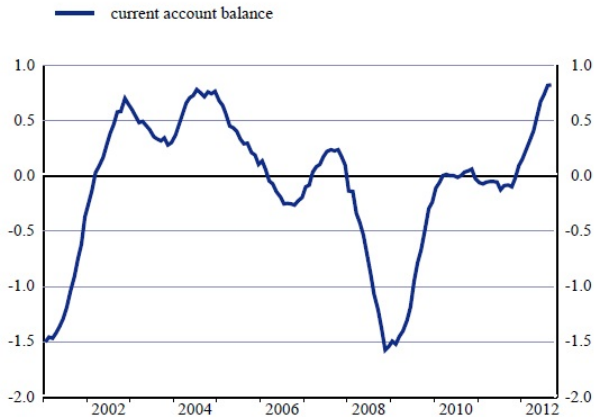
ECB CompNet Workshop, Central Bank of Ireland, Dublin
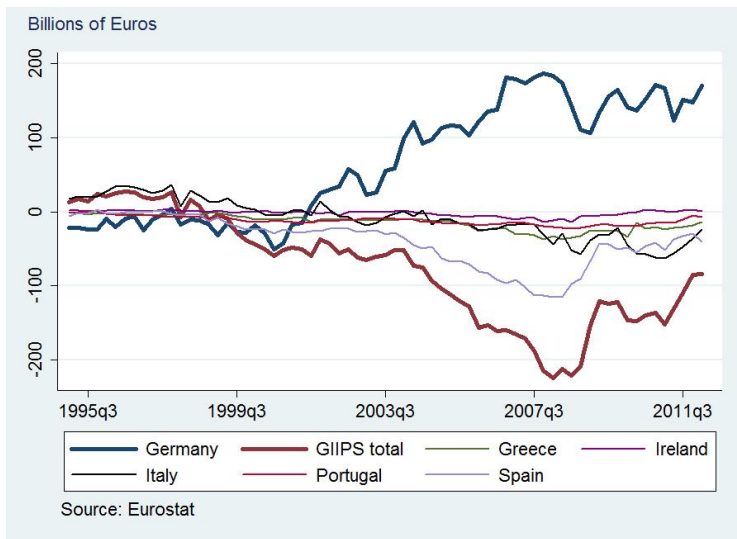
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Euro Area Current Account

C32 Euro area b.o.p.: current account
(seasonally adjusted; 12-month cumulated transactions as a percentage of GDP)

— current account balance

Source : ECB.

Current account balances in the Euro Area

Billions of Euros

Legend: Germany, GIIPS total, Greece, Ireland, Italy, Portugal, Spain

Source: Eurostat

Source: Hale (2013). Note: Individual GIIPS lines don't add up to the total GIIPS because of inter-GIIPS balances.

Intra Extra CA

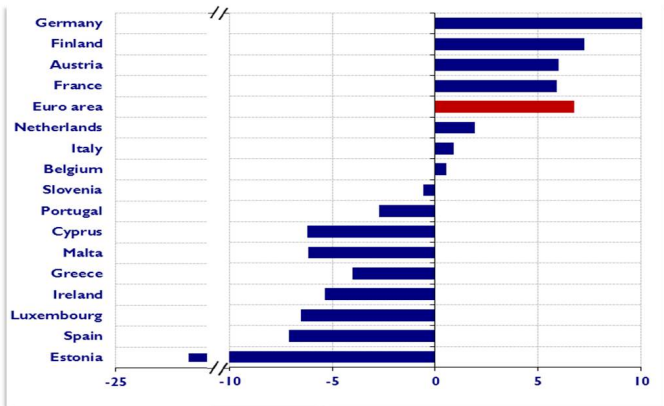
Total and Extra Current Account Balances (2011)
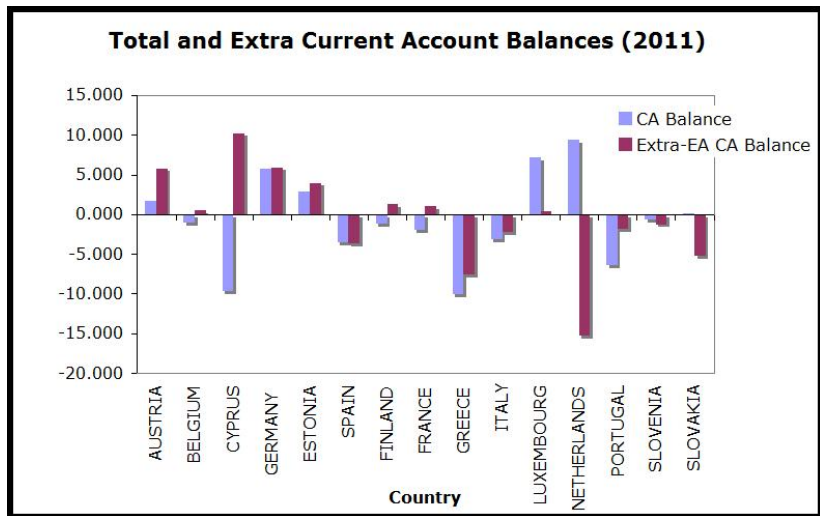
Source : ECB.

Harmonised Competitiveness Indicators

Developments in HCIs
(CPI-based, including intra- and extra-trade; cumulated changes over 1999Q1-2012Q2; percent)

Source: Eurostat.
Note: A positive number implies a gain in price competitiveness.
For the euro area, the chart shows the EER-40 (CPI-deflated), based on extra-trade only.

Stylized facts

1. The importance of the extra-EA dimension :
   - ▶ a large fraction of CA surpluses in Euro Area is due to surplus w.r. to extra-EA countries
   - ▶ a large fraction of CA deficits in Euro Area is due to deficits w.r. to extra-EA countries

2. Chen, Milesi-Ferretti and Tressel (2012) show :
   - ▶ the asymmetric impact of currency appreciation across EA countries
   - ▶ the differences in export demand elasticities and displacement effects

3. The importance of the intra-EA dimension for capital flows :
   - ▶ Euro Area surplus countries more than extra-EA countries are financing EA debtor countries
   - ▶ Since 2009, public flows replace private flows in financing GIIPS

The CA adjustment is ongoing, but how much change in relative prices is required for the adjustment ?

Fundamental mechanism of CA rebalancing and the transfer problem

- ▶ Ohlin's income effect :
  - ▶ the CA rebalancing implies a transfer of resources from the Debtor country towards the Surplus country. This transfer lowers the income of Debtor country, lowering their demand for foreign goods, thus imports.

- ▶ Keynes's terms-of-trade effect :
  - ▶ the "secondary burden" of the CA rebalancing is the change in relative prices and the deterioration of the terms-of-trade of the Debtor country.

International Trade and Open Macroeconomics

- ▶ Evidence from theoretical and empirical trade literature on the role of the extensive margin:
    - ▶ exporters are big and highly productive firms
    - ▶ a large fraction of the growth in trade flows is due to the extensive margin

- ▶ Question: what are the consequences of an active extensive margin of trade on macroeconomic adjustment ?
    - ▶ Dekle, Eaton and Kortum (2008)
    - ▶ Pappadà (2011)
    - ▶ Corsetti, Martin and Pesenti (2012)

Model

A three-country general equilibrium model with a tradable and a non-tradable sectors. In both sectors, firms are heterogeneous in terms of productivity.

Denote Euro Area deficit countries (GIIPS) by D, surplus countries (Germany) by S, and Rest of the Worls by R

In each country $i = D, S, R$, domestic labor units are assumed to be the domestic numéraire. All prices in country i are measured in terms of country i units of labor. This means that unit wages are $w_i = 1 \; \forall i$.

There are three bilateral exchange rates :

$$\varepsilon_{D,S} = \frac{w_S}{w_D} \qquad \varepsilon_{D,R} = \frac{w_R}{w_D} \qquad \varepsilon_{S,R} = \frac{\varepsilon_{D,R}}{\varepsilon_{D,S}}$$

The exchange rate ε_D is defined as units of Deficit labor per unit of Surplus labor. An upward (downward) change in ϵ_D therefore refers to a depreciation (appreciation) of Deficit labor vs. Surplus labor.

Households

The household maximizes utility from consumption

$$C_i = \left[k^{\frac{1}{\theta}} C_{i,T}^{\frac{\theta-1}{\theta}} + (1-k)^{\frac{1}{\theta}} C_{i,N}^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}}$$

The consumer price index for country i is :

$$P_i = \left[k P_{i,T}^{1-\theta} + (1-k) P_{i,N}^{1-\theta} \right]^{\frac{1}{1-\theta}}$$

The basket of goods $C_{i,T}$ is defined over a continuum of tradable goods $\omega \in \Omega_i$:

$$C_{i,T} = \left[\int_{\omega \in \Omega_i} c(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right]^{\frac{\sigma}{\sigma-1}}$$

The Home price index for tradable goods is :

$$P_{i,T} = \left[\int_{\omega \in \Omega_i} p(\omega)^{1-\sigma} d\omega \right]^{\frac{1}{1-\sigma}}$$

Firms

A firm with a productivity level x is able to produce x units of good using one unit of labor.

In each country i, firms selling their goods in the domestic market pay a fixed cost of production $F_{i,d}$ expressed in units of labor of country i.

The fixed cost is assumed to be the same in the tradable and non-tradable sectors. When firms in the tradable sector export goods, they incur the iceberg transport cost $\tau > 1$

In each country i, exporting firms have to pay a fixed cost of production $F_{i,EXP} \geq F_{i,d}$, expressed in units of labor of country i.

Prices and profits

Prices are set by profit maximizing firms as a constant mark-up $\phi = \frac{\sigma}{\sigma-1}$ over marginal costs. All prices are denominated in units of labor of the country where they are produced.

Prices of tradable goods are:

$$p_{i,d}(x) = \frac{\phi}{x} \qquad p_{i,EXP}(x) = \frac{\tau\phi}{x}$$

Firm productivity is Pareto distributed with a scale parameter $\bar{x}$ and a shape parameter $\gamma > \sigma - 1$:

$$G(x) = 1 - \left(\frac{\bar{x}}{x}\right)^{\gamma}$$

Because of the Pareto assumption, the distribution of firm size is also Pareto with shape $\psi = \frac{\gamma}{\sigma-1}$

Zero-profit conditions

In each country i, the zero-profit conditions determine the productivity thresholds $\bar{x}_{i,d}$, $\bar{x}_{i,EXP}$ and $\bar{x}_{i,N}$. For country D :

$$\pi_{D,d}(x) = \frac{1}{\sigma} \left[\frac{p_{D,d}(\bar{x}_{D,d})}{P_{D,T}} \right]^{1-\sigma} P_{D,T} C_{D,T} - F_{D,d} = 0$$

$$\pi_{D,EXP}^S(x) = \frac{1}{\sigma} \left[\frac{\frac{1}{\varepsilon_{D,S}} p_{D,EXP}(\bar{x}_{D,EXP})}{P_{S,T}} \right]^{1-\sigma} P_{S,T} C_{S,T} - \frac{F_{D,EXP}}{\varepsilon_{D,S}} = 0$$

$$\pi_{D,N}(x) = \frac{1}{\sigma} \left[\frac{p_{D,N}(\bar{x}_{D,N})}{P_{D,N}} \right]^{1-\sigma} P_{D,N} C_{D,N} - F_{D,d} = 0$$

Equilibrium

The zero-profit conditions and the aggregate budget constraint in each country i jointly determine :

- the equilibrium productivity thresholds $\overline{x}_{i,d}$, $\overline{x}_{i,N}$, $\overline{x}_{i,EXP}$
- the bilateral exchange rates $\varepsilon_{D,S}$ and $\varepsilon_{D,R}$.

Extensive and Intensive Margins of CA adjustment

Consider the intra-EA adjustment between Deficit and Surplus country. Symmetrical equilibrium, only tradable sector. Denote the transfer of resources that balances CA_D as $T_{D,S}$.

The impact of the transfer on $EXP_{D,S}$ is :

$$dEXP_{D,S} = \underbrace{B\left(\frac{1}{\psi_D}\right)dT_{D,S}}_{\text{intensive}} + \underbrace{BY_D\left[\frac{1}{A}\left(\frac{1}{\psi_D}-\sigma\right)+\sigma-1\right]d\varepsilon_{D,S}}_{\text{intensive}} +$$

$$+ \underbrace{B\left(\frac{\psi_D-1}{\psi_D}\right)dT_{D,S}}_{\text{extensive}} + \underbrace{BY_D\left\{(\psi_D-1)\left[\frac{1}{A}\left(\frac{1}{\psi_D}-\sigma\right)+\sigma\right]\right\}d\varepsilon_{D,S}}_{\text{extensive}}$$

▶ Ohlin and Keynes effects at the intensive and extensive margin

▶ the role of firm size dispersion ψ_D

The consequences of the intra-EA CA adjustment on exchange rates

Preliminary evidence from CompNet data shows that deficit countries are those where there is a higher dispersion of firm sizes and a larger fraction of small firms : $\psi_D < \psi_S$

This means that the intra-EA current account adjustment would require a large adjustment of relative wages (REER) as the extensive margin would play a small role in the current account rebalancing

Asymmetrical adjustment for imports and exports ?