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Price competitiveness and export performance indicators

Methodology

The indicators presented in this document are intended to measure real-time developments of major world exporters' market shares and the movements of one of their key determinants which is price competitiveness.

World demand addressed to a country i

Changes in global demand to a country i can differ from world trade. Indeed, this country can be initially specialized in more or less dynamic markets. Global demand addressed to a given country is thus defined as the evolution that would have enjoyed this country export volume if its market shares in each of the countries considered (for all goods) would have remained constant.

For a given country i global demand is therefore calculated as the weighted indices of import volumes of its partners. The weight of each trading partner corresponds to the share of this market in total exports (in value terms) of the reference country for the base year (here 2005 = 100) :

$$IDMi = \sum_{ij} \alpha_{ij} IM_j$$

With IM_j the index of imports of the trading partners j of the country i and α_{ij} the weight of the market j in total exports of the country i.

Elementary indexes of import volumes are derived from the world imports index constructed by Coe-Rexecode.

Export performance and competitiveness

Export performance

Export performance of a country measures the evolution of its market shares. They are assessed in volume terms. The base year is conventionally fixed in 2005. The main interest of measuring performance export volume is to offset optical effects related to short-term fluctuations in exchange rates (for example, when there is an appreciation of the euro, all things equal together European market shares increase artificially in value terms). Additionally, export market shares in volume terms can be directly related to the developments of the contribution of foreign trade to economic growth.

In practice, it reports reference country i exports to global demand addressed by its partners, both variables being previously converted to a database:

$$PERFi = IXi/IDMi * 100$$

Where IXi is the export volume index of the country i based 100 the reference year basis and $IDMi$ the world demand addressed to this country.

Export performances are currently calculated for eight major world exporters: USA, Japan, Germany, France, Italy, UK, China and South Korea. According to the availability of national information, volume indexes are obtained in different ways: either directly from trade data expressed in volume terms released by the statistical office, or by deflating exports in value terms by an indicator of export prices (either a unit value index, or an import price index, or the deflator of goods imports in the national accounts). In all cases these indices are corrected from seasonal variations and partially of the number of working days. A euro area export performance index is also calculated, considering only the extra-zone trade flows.

Export price competitiveness

The export price competitiveness indicator relates export price of the reference country to export prices of its competitors, converted to a common currency common and converted to 100 as the reference year:

$$ICOMP_i = IPX_i/IPCONC_i * 100$$

Where PX_i is the export price of the country i , rebased to 100 the reference year, and $IPCONC_i$ the export prices of its competitors, also rebased to 100 the reference year.

Actually, this indicator is a real effective exchange. Thus, an increase of the indicator must be interpreted as an appreciation of the real effective exchange rate and a deterioration of the price competitiveness.

The main difficulty in this exercise is to give the appropriate weight to each competitor in the construction of the synthetic competitors price index. This assessment is based here on a double weighting system where the weight of a competitor is based: t

- on the structure of competition on each export market export of the reference country ;
- on the weight of each elementary market in the total exports of the reference country.

Export performance and competitiveness

Formally, the synthetic competitors price index is written: as follows :

$$PCONC_i = \prod_{j=1}^N \left(\frac{e_j}{e_i} \cdot \frac{PX_i}{PX_j} \right)^{w_j}$$

With I_i , the export price index of the reference country.

I_j , the export price index of the country j.

e_j , the exchange rate of the country j against the US dollar.

e_i , the exchange rate of the reference country against the US dollar.

w_j , the intensity of competition of the country j (against the reference country) j.

The calculation of the w_j coefficients is derived from the following process.

For each country of reference, we build a matrix in which are positioned in lines H export markets and in columns N competing countries. For a given market j, the following vector gives the market shares of the N competing countries of the reference country:

$$z_j = \left(\frac{X_{i,j}}{\sum_{i=1}^N X_{i,j}} \right)$$

With, $X_{i,j}$: exports of the country i to the market j.

The matrix z gives the structure of the on each market of the reference country:

$$z_{(N,H)} = [(z_1) \dots (z_H)]$$

The weight of each market for the reference country is given by:

$$y_{(1,H)} = \left(\frac{X_j}{X} \right)$$

With X_j : the exports of the reference country to the market j

X : total exports of the reference country

The weighting system is finally obtained by multiplying z et y :

Export performance and competitiveness

$$w_{(N,1)} = z_{(N,H)} \times y_{(H,1)} = \begin{pmatrix} w_1 \\ \vdots \\ w_{N'} \end{pmatrix}$$

To refine the previous estimates, we can take also into account the sectoral specialization of the different exporters. Indeed, assume that China exports textile products and that the US export aircrafts. These two countries are not then directly in competition, since there is no substitutability between exported products. Thus in the following calculations of coefficients of competition, we consider as individual markets the imports of a country for a given product type (70 products are identified here using the CEPII-Chelem database). The weight of a competitor on the external markets is :

$$w_{(N,1)} = z_{(N,H \times n)} \times y_{(H \times n,1)}$$

With,

$$z_{j,k} = \left(\frac{X_{i,j,k}}{\sum_{i=1}^N X_{i,j,k}} \right) \text{ and } y_{j,k} = \left(\frac{X_{j,k}}{X} \right)$$

Where, $X_{j,k}$: exports of the reference country for the product k to the market j

$X_{i,j,k}$: exports of the competitor j for the product k to the market j

Currently, export price competitiveness indicators are calculated for eight major world exporters: USA, Japan, Germany, France, Italy, UK, China and South Korea. The evolution of export prices of one of these countries is thus compared to average developments of the seven other competitors listed above. A price competitiveness index is also calculated for the euro area as a whole, vis à vis its main competitors: UK, USA, Japan, China, South Korea. The export price index used in this case is the extra-zone index provided by the ECB.

The tables below describe the structure of the competition for each reference country, using the Cepii-Chelem databank:

Export performance and competitiveness

Structure of the competition for each reference country (2005, %)

United States						
France	Germany	Italy	U.K.	Japan	South Korea	China
12.83	20.96	7.87	11.34	16.45	7.67	22.74

U.K.						
United States	France	Germany	Italy	Japan	South Korea	China
16.45	15.60	26.39	12.53	9.78	4.19	15.06

Japan						
United States	France	Germany	Italy	U.K.	South Korea	China
18.61	6.43	21.62	5.56	8.14	18.30	21.34

France						
United States	Germany	Italy	U.K.	Japan	South Korea	China
17.56	33.15	12.55	13.09	8.62	3.96	11.07

Germany						
United States	France	Italy	U.K.	Japan	South Korea	China
14.39	20.57	18.54	15.62	13.43	5.01	12.40

Italy						
United States	France	Germany	U.K.	Japan	South Korea	China
10.82	16.84	32.16	11.65	7.42	3.74	17.37

South Korea						
United States	France	Germany	Italy	U.K.	Japan	China
15.50	5.74	13.69	4.90	5.69	32.49	21.99

China						
United States	France	Germany	Italy	U.K.	Japan	South Korea
17.42	8.94	15.66	14.00	9.79	20.60	13.45

Euro area					
United States	U.K.	Japan	South Korea	China	
23.03	27.13	18.08	8.36	23.40	

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