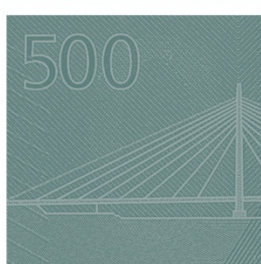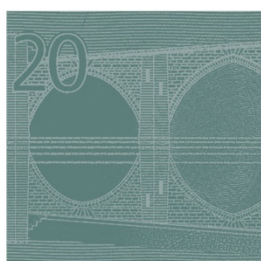EUROPEAN CENTRAL BANK

EUROSYSTEM

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GOING BEYOND LABOUR COSTS: HOW AND WHY "STRUCTURAL" AND MICRO-BASED FACTORS CAN HELP EXPLAINING EXPORT PERFORMANCE?

Carlo Altomonte, Filippo di Mauro and Chiara Osbat

This policy brief presents research conducted within the Competitiveness Research Network (CompNet). The network is composed of economists from the European System of Central Banks (ESCB) - i.e. the 27 national central banks of the European Union (EU) and the European Central Bank – a number of international organisations (World Bank, OECD, EU Commission) universities and think-tanks, as well as a number of non-European Central Banks (Argentina and Peru) and organisations (US International Trade Commission).

The objective of CompNet is to develop a more consistent analytical framework for assessing competitiveness, one which allows for a better correspondence between determinants and outcomes.

The research is carried out in three workstreams: 1) Aggregate Measures of Competitiveness; 2) Firm Level; 3) Global Value Chains. CompNet is chaired by Filippo di Mauro (ECB). The three workstreams are headed respectively by Chiara Osbat (ECB), Antoine Berthou (Banque de France) and João Amador (Banco de Portugal). Julia Fritz (ECB) is responsible for the CompNet Secretariat.

ABSTRACT

As policy-makers refocus on growth, there is an urgent need to enhance our understanding of the factors at the root of competitiveness, in order to improve the appropriateness and precision of policy design. This policy brief argues that traditional aggregate indicators, such as unit labour costs, can be most effectively used for policy-making when complemented by sectoral and firm level -based indicators. Conceptually, such indicators offer a more complete view of the factors that drive productivity at the firm level, and hence competitiveness at the country level; second, empirically, they help explain why variations in e.g. relative prices have different explanatory power across countries on ultimate policy targets, such as export results. This policy brief – drawing from ongoing work within CompNet - presents some concrete example of how a broader assessment of competitiveness can enhance policy analysis, design and evaluation. At the macro level, it shows how adjusting traditional relative export prices for quality allows us to better understand export patterns for a number of EU countries. At the micro level, it shows that for firms undertaking R&D an increase in the ULC is not necessarily affecting their ability of exporting, whereas the latter applies to firms that do not engage in R&D activities. This confirms also at the micro level the idea that quality considerations might severely alter the ability of aggregate cost-related measure to provide a good proxy for external competitiveness.

1   INTRODUCTION

Competitiveness depends strongly on firm-level factors, such as size, organisation, technological capacity, and other supportive conditions in the economic ecosystem in which firms operate. At the same time, the attention of policy-makers has been focused on aggregate macroeconomic factors, such as labour costs and current account positions. Central banks in particular have concentrated on these indicators, which is not surprising given that their traditional policy instruments are inherently macroeconomic in nature. Recently, however, central banks have been called upon to collaborate on the design of policies at the European level that have competitiveness as one of the main objectives. From here, also in light of a renewed focus on growth, a general need emerges for a broader and more precise assessment of competitiveness and its drivers even at the level of central banks.

Still, in the midst of a major fiscal and financial crisis in the euro area, when referring to 'competitiveness' the emphasis tends to fall again on macroeconomic and financial stability considerations. In such circumstances, there is in fact a need for concepts and indicators that i) are easy to communicate and ii) are generally identified as being closely related to the macroeconomic imbalances that have to be quickly corrected. Unit labour costs (ULC) are useful indicators in this respect; however, if these are not complemented by more structural, micro-based indicators, there is a risk that a rigid interpretation of these aggregate indicators ends up into policy prescription which might lose sight of the ultimate goal of sustainable growth.

In this policy brief we thus build a case for such a broader assessment of competitiveness, by providing, among others, two examples of how to complement some commonly used indicators, namely real effective exchange rates and unit labour costs differentials, with more structural, micro-based indicators. In particular, we show initial evidence that adjusting traditional relative export prices for quality allows to better understand export patterns for a number of EU countries, such as France. We also show that for gauging international competitiveness the concept of unit labour costs should be computed at the firm-level in order to filter other factors (such as Research & Development) having a critical impact on the aggregate measure and thus its (potentially biased) implications on competitiveness.

2 DEFINING COMPETITEVENESS

Even though "competitiveness" is at the centre of the public debate, there is no agreement on an unequivocal definition of the concept. In particular, when looking at a narrow, measurable concept of competitiveness, the focus is in general on prices, costs, wages and exchange rates. These are important factors in determining the ability of firms to compete in international markets, especially in the short run, but there is strong evidence that - in a fully globalised world and over longer term horizons – such factors are only part of a much broader set that includes at least three main elements, as identified by the literature: (i) firm-level factors, e.g. technological ability to utilise factor endowments, capacity to specialise and exploit new and dynamic markets; (ii) structural/macroeconomic factors prevailing in the individual countries, such as labour- and product-market functioning, technological diffusion, innovation, taxation, financing constraints as well as demand and overall macroeconomic conditions; (iii) the geographical position of the country and the extent of trade frictions.

The relevance of these "non-price" factors is acknowledged by current analyses on competitiveness (see Dieppe et al., 2011). However, the measurement of these factors at the aggregate level is very challenging and usually relies on indirect estimation, often treated as a "residual", and thus not properly considered in the ensuing policy debate, given the difficulty in measurement and interpretation. But non-price factors such as product quality and technological innovation all play an important role in the export performance of advanced economies, and as such they represent a critical, systematic element of the external competitiveness of a country.

Against this complex background, we subscribe to a very broad definition of competitiveness as proposed already e.g. in the speeches of Presidents Trichet[1] and Draghi[2], respectively "a country's ability to achieve sustainable improvements in the economic living standards and job opportunities of its citizens in an open economy" and "a competitive economy is one that provides the institutional environment necessary to foster the development of highly productive firms." This institutional environment encompasses all factors impacting on the ability of firms to mobilise and efficiently employ (also beyond the country's borders) the productive resources required to offer goods and services and compete in international markets. In the European context this has a very important additional dimension, i.e. the need to enhance

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[1] Speech of 23 February 2011: "Competitiveness and the smooth functioning of EMU," http://www.ecb.europa.eu/press/key/date/2011/html/sp110223.en.html
[2] Speech of 13 March 2012: "Competitiveness of the euro area and within the euro area," http://www.ecb.europa.eu/press/key/date/2012/html/sp120313.en.html

complementarity across EU firms and their respective economies, thus supporting productivity enhancement for the continent as a whole.

3   STANDARD PRICE AND COST COMPETITIVENESS INDICATORS DO NOT FULLY EXPLAIN EXPORT DEVELOPMENTS

Standard indicators of "price competitiveness" comprise a wide range of real effective exchange rates based on various cost and price measures, such as consumer prices, producer prices, unit labour costs, or the GDP deflator. It is common practice to look at a wide range of deflators, because each has pros and cons. For example, relative export prices provide an accurate measure of the prices of the goods that are actually exported, and thus tend to be more closely associated with export performance, but by definition only those firms that have been able to export are considered in the computation of this indicator, unlike other prices, and hence the latter involve a selection effect. As a result, a country may face poor aggregate exporting performance with complete sectors disappearing from the export market, which would not necessarily be reflected by favourable evolutions of export prices of the remaining exporters. To correct for the latter bias, wider-economy deflators are also used, as they may contain information about price and cost pressures building up in the economy that will eventually show up in the increase of export prices or in the shrinkage of the export sector.

For these reasons, it is not surprising that real effective exchange rates, however calculated, suffer from measurement errors, international comparability problems as well as aggregation biases.

A recent study by the Bank of Spain (Rodriguez et al, 2012) in particular estimates that "although there is a long-term relationship between relative-price-based competitiveness indicators and exports, the real exchange rate in most cases explains well below 10% of the variance in (country-specific) exports, that world (trade) export developments are the variable that best explains export developments (about 80%), and that the other 15% is determined by other unknown factors that are reflected in this estimation in the past behaviour of exports themselves". These findings are reported for different countries in Table 1 below.

The variables considered are the world trade volume as measured by exports, the real exchange rate and the logarithm of lagged exports. The estimation is based on an error correction mechanism using a sample of ten countries for the period 1995 Q1-2011 Q3, in which the exports of each country are a function of the volume of world exports (general world trade

developments) and its relative price/cost competitiveness. Three alternative measures of competitiveness are used, all of which are supplied by the European Commission, namely the real exchange rate calculated using ULCs, manufacturing wages and the GDP deflator.

Previous studies by ECB staff (di Mauro and Forster, 2008) also indicate that a standard export volumes equation for the euro area features a statistically significant negative time trend over the last decades, pointing to an increasing role of structural factors affecting euro area market shares over and above foreign demand and relative prices, including quality and changes in taste. A recent application of the ECB's new multi-country model also confirms these findings (Dieppe et al. 2011).

### Table 1: Variance of Export Volume: 1995 Q1 - 2011 Q3

	World trade volume	Real exchange rate	Lagged exports
GERMANY			
ULC-based exchange rate	87	1.1	11.9
Manufacturing wage-based exchange rate	83.8	5.9	10.3
GDP deflator-based exchange rate	89.5	0.2	10.3
FRANCE			
ULC-based exchange rate	87	6.8	6.2
Manufacturing wage-based exchange rate	87.4	4.5	8.1
GDP deflator-based exchange rate	83.6	8.2	8.2
ITALY			
ULC-based exchange rate	86.9	0.3	12.8
Manufacturing wage-based exchange rate	88.3	0.2	11.5
GDP deflator-based exchange rate	91.1	1.3	7.7
SPAIN			
ULC-based exchange rate	87.7	1.6	10.7
Manufacturing wage-based exchange rate	85.5	4.1	10.4
GDP deflator-based exchange rate	92	0.8	7.2
GREECE			
ULC-based exchange rate	76.9	1.6	21.5
Manufacturing wage-based exchange rate	67.3	20.8	11.9
GDP deflator-based exchange rate	72	7.7	20.3
UNITED KINGDOM			
ULC-based exchange rate	58.3	2.1	39.5
Manufacturing wage-based exchange rate	55.4	1.8	42.8
GDP deflator-based exchange rate	59.8	1.2	39
UNITED STATES			
ULC-based exchange rate	84.8	9	6.2
Manufacturing wage-based exchange rate	81.7	10.2	8.1
GDP deflator-based exchange rate	81.2	13.8	5
AVERAGE			
ULC-based exchange rate	78.9	5.1	16
Manufacturing wage-based exchange rate	77	6	16.9
GDP deflator-based exchange rate	80.6	4.1	15.3

Source: Extract from Rodriguez et al., 2012.

The relationship between export performance and developments in price competitiveness appears to be highly differentiated across individual euro area countries, particularly more

recently (see Figure 1 below). Looking at the period from 1999 up to 2008Q3 (i.e. right before the great trade collapse), for some countries the change in price competitiveness was in line with developments in market shares. Most notably, the increase in Germany's market share seems to be closely associated with improvements in price competitiveness; the opposite appears to be true of Italy's market share losses. On the other hand, there are also a number of countries, such as France, recording losses in export market shares despite an improvement in price competitiveness.

Figure1: Price competitiveness and export market shares in volumes (average annual percentage changes, 1999-2008Q3
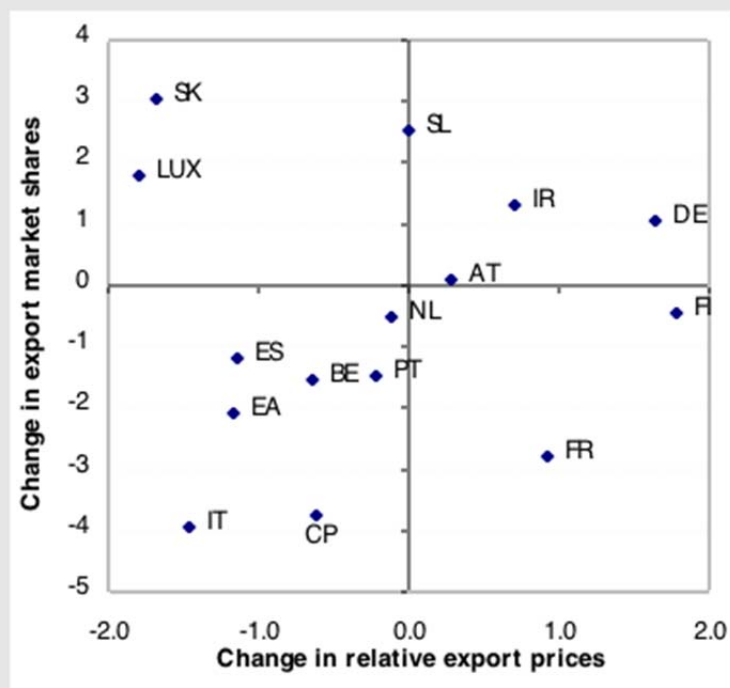
Note: Relative export prices are computed as competitors over domestic prices. A positive value corresponds to a gain in price competitiveness.
Source: ECB calculations

4 WHAT FACTORS DO STANDARD EXPORT PERFORMANCE STUDIES LEAVE OUT?

We can identify at least two classes of problems behind the seemingly large part of export outcomes that is left unexplained after taking into account relative prices and foreign demand: one is the impact of globalisation on international production systems, and the other is an aggregation bias in the construction of cost and price indicators.

4.1   IMPACT OF GLOBALISATION

The ongoing process of internationalisation of production and the emergence of global value chains (GVC) has largely increased - across countries - the heterogeneity of results in terms of export market shares, depending upon the global strategy adopted. For example, for countries that have shifted some production facilities abroad, export markets shares will be lower if a higher share of sales is undertaken out of offshore affiliates, as opposed to domestically-located parent companies. Hence, in the global context the same organisational modes of production can be as relevant in driving the export outcome of a country as its relative prices.

Moreover, with the presence of GVCs, the import content of export is also increased, but in a highly differentiated way across final products and corresponding intermediate components. This implies that export volumes will respond differently to changes in relative export prices depending not only on the organisational modes of GVCs, but also on the stage of the production process at which exports take place. Such developments once again would not necessarily be due to developments in cost competitiveness, but rather to different strategies of internationalisation.

Finally, and more in general, given the sizeable changes in the world market structure brought about by globalisation and the raise of emerging economies, the overall trade performance of a country is more and more likely to depend on factors beyond pure price or cost considerations. In this context, the ability of countries and firms to compete successfully will be determined by their capacity to change and adapt to new market conditions, reviewing their product mix and export portfolios beyond pure cost considerations, and by other means of enhancing productivity.

As a concrete application of the above, a recent working paper by Bank of Latvia (Benkovskis and Wörz, 2012) computes non-price factors-adjusted competitiveness indicators for several EU and non-EU countries.

In the charts reported in Figure 2 below the blue solid line is the conventional or traditional relative export price (unit values) and the red dashed line is the same price adjusted by non-price factors (quality, taste, set of exporters). An increase in the relative price indicates in general losses in both price and non-price competitiveness, while the difference between the blue (solid) and red (dashed) lines shows the contribution of non-price factors to competitiveness. The results for EMU countries indicate that non-price competitiveness issues appear to be present for France, Ireland, to a lesser extent Portugal and Italy. For France, this finding would somewhat explain the puzzle of export market share declining while traditional price competitiveness has improved.

Figure 2: Relative Export Prices (RXP) in selected EU countries

(France)   (Portugal)

Source: Benkovskis and Wörz (2012)
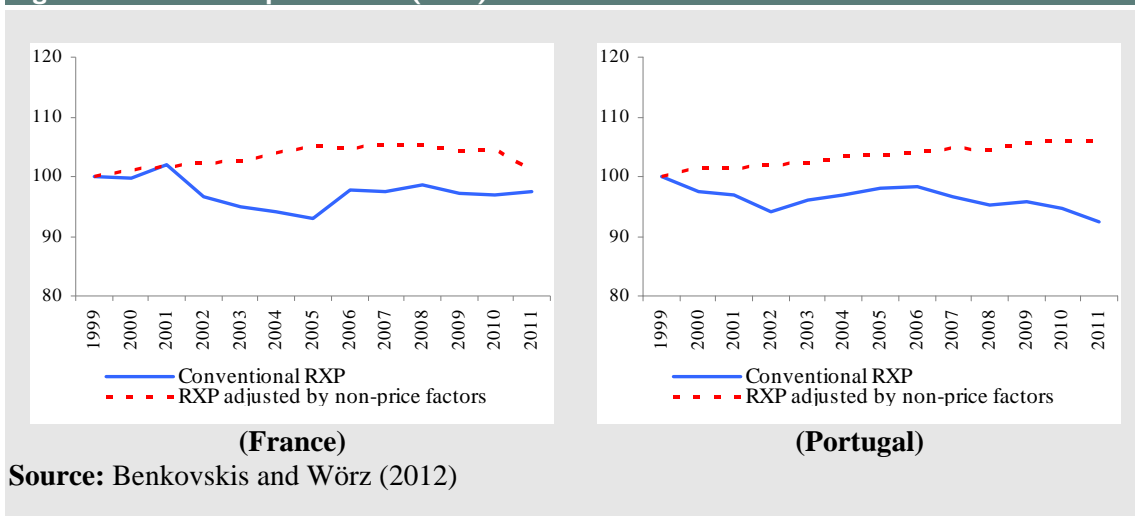
4.2   AGGREGATION BIAS

In addition to the new, structural effects of globalisation and internationalisation of production, traditional price-related measures of competitiveness also suffer from a potential *aggregation bias*.

Let us consider the case of unit labour costs (ULC), frequently used as a proxy of competitiveness. Unit labour costs are defined as the ratio of the nominal wage rate (euro per worker) to labour productivity (units of output per worker), and thus in principle they track excessive increases in costs as well as stagnating productivity. However, as pointed out by Felipe and Kumar (2011), officially calculated ULCs are derived from sector- or economy-wide data, where aggregate labour productivity is calculated as the ratio of nominal value added to a deflator, and then this is divided by the number of workers. As such, labour productivity is imperfectly measured due to an aggregation problem: because of unknown firm-specific weights (as units of output per worker are observed within individual firms), the average productivity so calculated does not represent the productivity of the average firm.

The effect of the aggregation bias on the adequacy of standard aggregate cost measures in capturing export capability can be shown with reference to the so-called "Spanish paradox": from 2000 to 2009, Spain displayed a constant worsening of its price competitiveness (as measured in terms of both ULCs and export prices) in excess of 10-15%. Still, the Spanish share in world exports first increased (by some 10% in the mid-2000s) and then barely moved with respect to its initial levels.

Antrás et al. (2010) have explored this "Spanish paradox", finding that when firm-level instead of aggregate-economy ULC developments are considered, Spain's experience is less paradoxical. Indeed, they find that the ULCs of the largest firms in Spain have behaved best

over the last decade and, in turn, their exports have grown faster than those of other smaller firms. The different relative weights of large, performing vs. smaller, under-performing firms in aggregate ULCs and in total exports may thus help explain the "Spanish paradox".

To develop on this, Figure 3 below plots the probability of exporting of a balanced sample of some 9,000 European firms as derived from the EFIGE dataset[3] against the natural logarithm of their ULC.

The vertical axis in particular refers to the probability of exporting as predicted from a probit estimation in which a dummy variable taking value 1 if a firm exported in 2008 or before is regressed against R&D, a dummy indicating whether the firm allocated at least one employee to Research and Development activities in 2008, and unit labour costs, calculated as labour compensation over value added.

Figure 3: Relationship between ULC and export by R&D activity
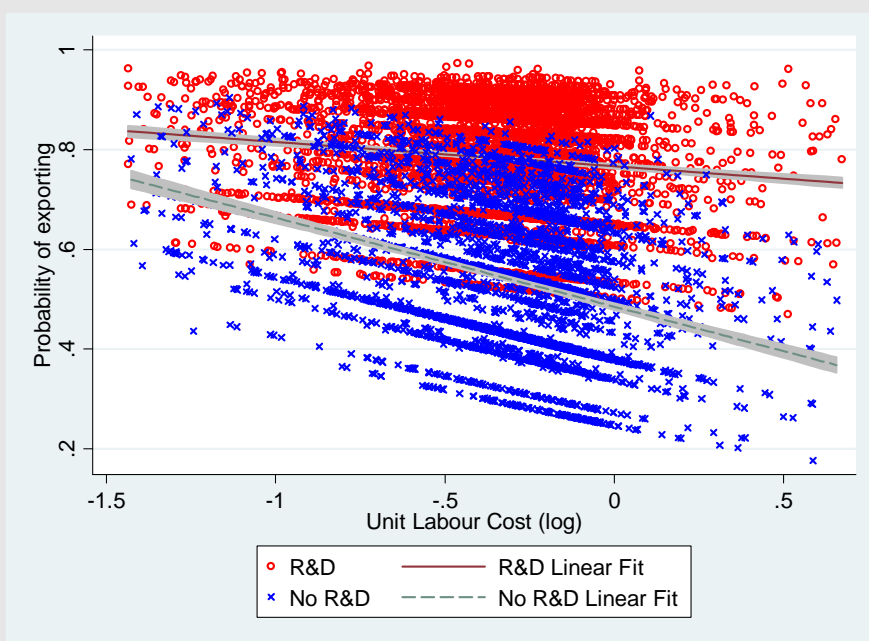
Source: Altomonte et al. (2012).

The two slopes highlighted illustrate the coefficients estimated for the firms which undertake R&D activities and for those that do not. The difference in slopes is statistically significant controlling for country and industry fixed effects. It disappears when Total Factor Productivity

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[3] The EU-EFIGE/Bruegel-UniCredit dataset is a unique firm-level dataset collected within the project EFIGE - European Firms in a Global Economy: internal policies for external competitiveness - supported by the Directorate General Research of the European Commission through its 7th Framework Programme. The dataset surveys, among others, the international activities of a sample of around 15,000 manufacturing firms with more than 10 employees across 7 European countries, and it is constructed in order to obtain representative samples for each country.

is used as a proxy of individual firms' productivity vs. ULC. This evidence suggests that for firms undertaking R&D an increase in the ULC is not necessarily affecting their ability of exporting (their competitiveness does not depend exclusively on the competitive price of the goods sold), whereas for those firms that do not undertake R&D activities an increase in ULC translates more strongly into a reduction of the probability of exporting. We thus retrieve also from the micro perspective the idea that quality consideration might severely alter the ability of aggregate cost-related measure, such as ULC, to provide a good proxy for external competitiveness.

Clearly, an adequate measure of competitiveness should be capable of capturing to some extent the effect of heterogeneity across firms.

CONCLUSIONS

Improving productivity and thus economic growth in Europe is crucial to provide a structural solution to the EU crisis. To this extent, traditional aggregate measures of competitiveness (e.g. real effective exchange rate, unit labour costs and relative export prices) remain central to the policy debate. This policy brief shows however that assessing country competitiveness positions requires exploring a number of additional indicators, including firm level data, in order to overcome the aggregation bias of traditional macro indicators. For instance, there is ample evidence that a number of structural factors – ranging from institutional to export specialisation – affect countries' export outcomes very differently. This suggests that there is no such thing as one "competitiveness strategy" fitting all countries, and that conversely there are risks in trying to pursue this for these reasons. The research activities carried out within the Competitiveness Research Network centre on a broader definition of competitiveness, based on a wide range of indicators at different levels of aggregation. The battery of indicators under development encompasses those constructed using sectoral and firm-level data, as well as measures that take into account the role of global value chains and its implications for competitiveness. This policy brief provides some first concrete examples of such additional indicators, as well as their relevant use for policy.

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