CompNet (the Competitiveness Research Network):

Key features and main policy-relevant takeaways

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This note provides a brief overview of CompNet and some of its most policy-relevant takeaways, with focus on euro area competitiveness. In line with the Five Presidents Reports (p. 8), CompNet defines a competitive economy as one in which institutional and macroeconomic conditions allow productive firms to thrive.

Key points

- The ESCB set up CompNet in March 2012, with two main objectives: (a) study competitiveness in the EU from a holistic perspective, covering both the macro and micro (including global value chains) dimensions; (b) better understand the structural factors hampering the transmission of monetary policy. CompNet has published more than fifty articles and two databases: (i) a macro dataset including around 100 indicators, 20 of which novel in nature; and (ii) a micro dataset based on firm-level data, unique in its comprehensive set of indicators, which draws from national sources in twenty EU countries. This database covers the following dimensions of competitiveness: productivity and allocative efficiency, mark-ups, labour market, trade and financial.[1] Since July 2015, at the end of its mandate, CompNet has been transformed in a self-governed network managed by a 10-members steering committee, chaired by F. di Mauro.

- The illustrative policy-relevant findings summarised in this note lead to the main conclusion that **the implications of firms' heterogeneity cannot be neglected in the policy-maker's toolkit, thus calling for a micro-founded analysis of e.g. productivity, wages, trade elasticities and current account imbalances**.

- Outside the ESCB, institutions such as the IMF, Commission, Eurostat and the OECD have also expressed interest in the CompNet analyses and databases. Looking forward, CompNet could also support the activities of the competitiveness boards if these were to be established.

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[1] See for details, see ECB (2015a) and (2015b) and CompNet's website: https://www.ecb.europa.eu/pub/economic-research/research-networks/html/researcher_compnet.en.html

CompNet: Some examples of policy-relevant takeaways[2]

1.   Firms are very heterogeneous in performance (Figure 1)**, hence economic policy thinking in terms of "average firm" can lead to misleading conclusions.** On average, the top 10% firms are about twice as productive as the bottom 10% firms. The subsequent takeaways move from this point.

2.   <u>TFP</u> growth is driven not only by within-firm efficiency gains (which accounts for around 50% of aggregate TFP growth in an average mature economy), but to a significant extent also by an efficient allocation of resources *within* sectors (which explains around 40%) and *across* sectors (which explains about 10%) (Figure 2). In the euro area, firm-level data show that the TFP differential between exporting and non-exporting firms in the manufacturing sector is significant (12% in Italy and 5% in France)[3]. Shifting resources from the least to the most productive sectors, however, is not the main driver of TFP growth, unless an economy has just experienced a boom in unproductive sectors (e.g. Spain). Evidence on selected euro area economies shows that shifting resources towards the most productive firms *within* each sector of the economy is even more important (Figure 3). This points to the importance of creating the conditions for productive firms to enter the market and expand, and for persistently unproductive firms to exit the market.

Fig. 1: Productivity distribution is very disperse and asymmetric, even across firms operating in the same sector

Contribution of price and non-price factors to change in export market share (1996-2011)
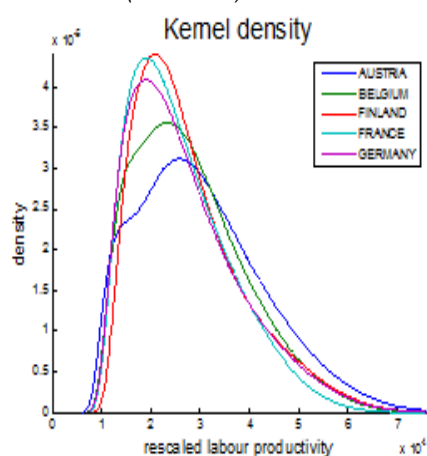
Source: Lopez-Garcia et al. (2015) based on CompNet data.

Fig. 2: Resource reallocation can explain up to 50% of TFP growth. Most of the efficiency gains come from reallocation within sectors, not across sectors

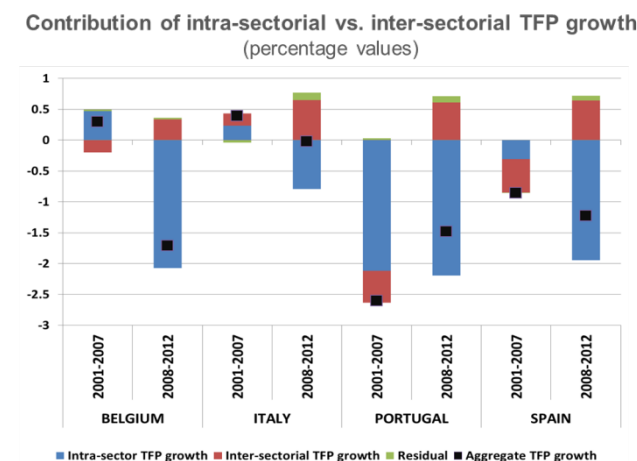*Contribution of within-firm TFP growth vs. reallocation of resources to aggregate TFP growth*
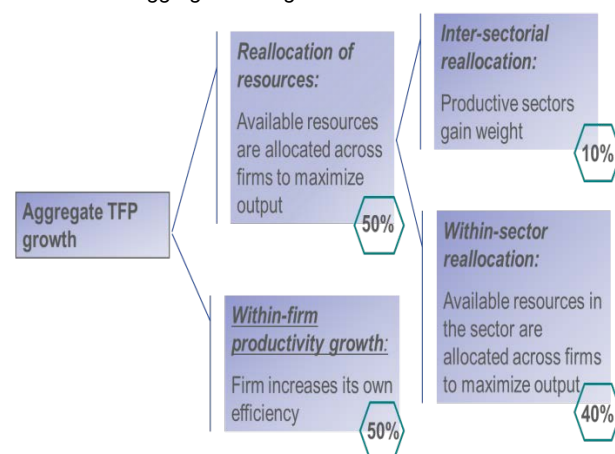
Source: Gamberoni, Giordano and Lopez-Garcia (2016a), forthcoming, based on selected studies.

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[2]   This memo summarises only few of the many CompNet findings. Most notably, it does not address CompNet contribution to the macro assessment of competitiveness. For detail on that, please refer to the website of the network: https://www.ecb.europa.eu/pub/economic-research/research-networks/html/researcher_compnet.en.html

[3]   Berthou, A. et al. (2015).

**Fig. 3: In the euro area, TFP growth is usually mainly driven by the intra-sectorial component**

Contribution of intra-sectorial vs. inter-sectorial TFP growth
(percentage values)

■ Intra-sector TFP growth ■ Inter-sectorial TFP growth ■ Residual ■ Aggregate TFP growth

Source: CompNet data (firms with one employee at least)

Fig. 4: Capital misallocation has been trending up, except for Germany
Misallocation measured as dispersion in marginal revenue productivity of capital within sectors. Weighted average, 2002-2012
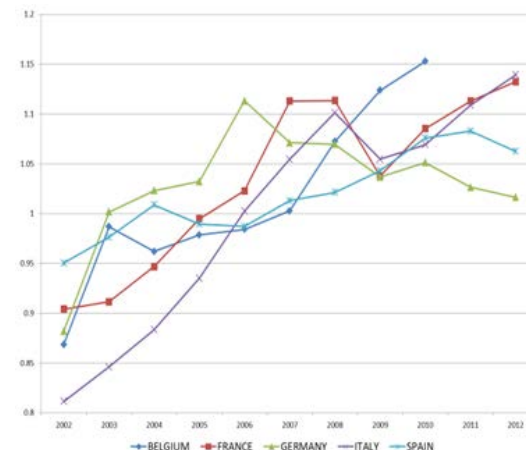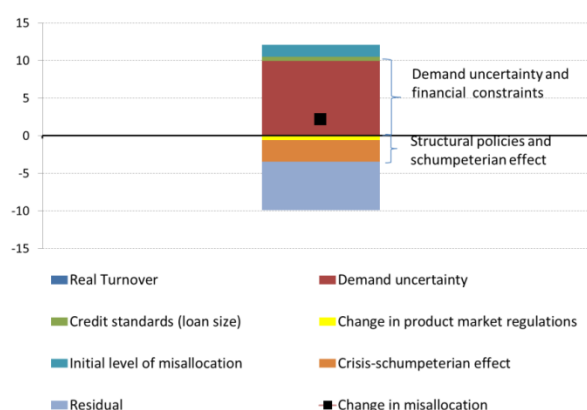

Source: Gamberoni, Giordano and Lopez-Garcia (2016a), forthcoming.
Notes: Weighted averages, where the weights are the country-specific time-varying sectorial value added shares.

3. **In the period 2002-12[4], within-sector <u>resource misallocation</u>, especially regarding capital, was trending up in several euro area economies.** Looking at five euro are countries, capital misallocation was on an upward trend during this period, with the exception of Germany where the trend reversed in 2006 (Figure 4). Using standard panel regression, Gamberoni, Giordano and Lopez-Garcia (2016a) find that capital misallocation was particularly fuelled by heightened demand uncertainty in the sub-period 2008-12. Controlling for both cyclical and structural variables, the Great Recession had instead a cleansing "schumpeterian" effect. On the whole, the increased capital misallocation in 2002-12 was due to the cyclical drivers (demand uncertainty and financial constraints) prevailing over the structural drivers (crisis effect and changes in product market regulation) (Figure 5).

Fig. 5: Cyclical vs. structural factors drove the observed changes in capital misallocation in 2002-12
Average contributions of covariates to changes in MRPK dispersion (average annual percentage changes)

■ Real Turnover ■ Demand uncertainty
■ Credit standards (loan size) ■ Change in product market regulations
■ Initial level of misallocation ■ Crisis-schumpeterian effect
■ Residual ■ Change in misallocation

Source: Gamberoni, Giordano and Lopez-Garcia (2016a), forthcoming.

Notes: A positive sign means an increase in capital misallocation. Calculations based on estimated coefficients and average contributions of the explanatory variables to the average change in capital misallocation in 2002-12, controlling for country and sector fixed effects (not reported in the chart). Breakdowns for the sub-periods 2002-07 and 2008-12 also available.

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[4] 2012 is the last year available in the CompNet firm-level dataset, which is about to be updated to 2013.

4.   **Firm-level analysis can also help explain <u>macroeconomic puzzles</u>.** For example, in the period 2001-14, France experienced an average export market share decline of about 3.5%, whereas Italy lost about 2% (Figure 6). During the same period, real GDP in Italy declined by almost 1% per year, driven by a negative contribution of TFP growth. Conversely, in France real GDP grew by 1.1% and the contribution of TFP was similar to other euro area economies. This apparent paradox[5] between TFP growth and poor export market performance in France can be partly explained by granular evidence on the performance of French top exporters. First, exports in France are concentrated among fewer firms than in Italy, implying a higher vulnerability of trade performance.[6] Second, during 2001-12 the performance of French top-ten exporters has been far more disappointing than the one of top-10 Italian exporting firms in terms of TFP growth (Figure 7).

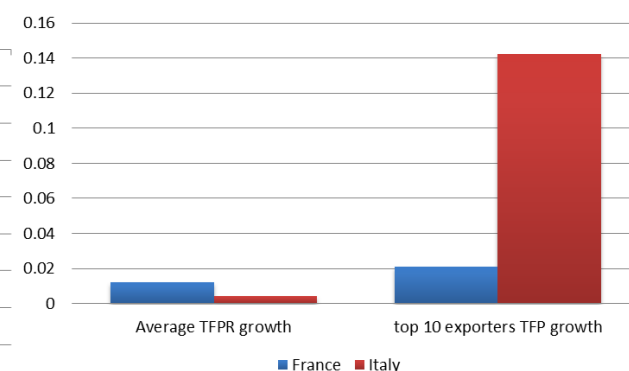**Fig. 6: Export performance in France has been disappointing…**
Average yearly change in the share of exports (%)
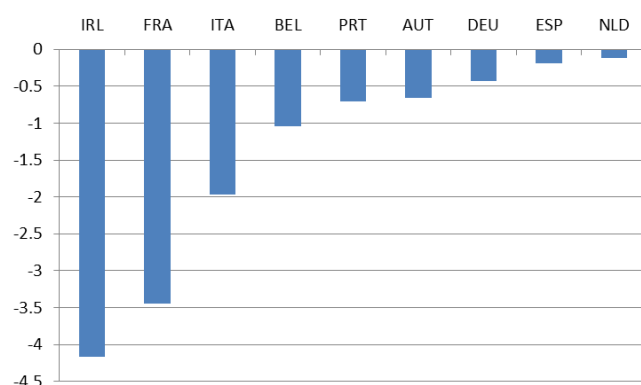
Source: World Trade Organization.

Fig. 7: …due to the poor performance of its top exporters
Average TFP growth in manufacturing of all firms vs. TFP growth of top 10 exporters in France and Italy, 2001-2012.

Source: CompNet based on Gamberoni and Serafini (2015).

4.   **Firm heterogeneity also implies that <u>wage growth</u> should be aligned with productivity growth at the firm rather than the sector or country level. The design of some labour market institutions may prevent this.** Given firms' large heterogeneity, it is reasonable to expect different productivity developments and, therefore, different wage dynamics across firms – and this even within narrowly defined sectors. However, rigidities in the labour market resulting from the design of labour market institutions (e.g. wage indexation to inflation, large coverage of collective bargaining agreements) might prevent wage-productivity alignment at firm level. For example, productivity developments in French low and highly productive firms were different over the period 2003-12. Nominal wage developments, however, were quite similar and followed the changes in the CPI index. The reason is that negotiated wages in France follow closely the minimum wage developments, which depend on past inflation (Figure 8). Another factor is given by centralised collective bargaining. Indeed, in countries or

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[5]   See Gamberoni and Serafini (2015) who illustrate this paradox and the analysis of the potential determinants for Italy and France.

[6]   The top-10 exporting firms account for more than 10 percent of exports, compared to 6 percent in Italy.

sectors where wages are set far from the firm, the misalignment of wage and productivity developments is larger, and so will be the loss of cost competitiveness[7] (Figure 9).

Fig. 8: Firm-level wage and productivity growth in France are misaligned also as a result of wage indexation

France – wage growth of the top and bottom 10% firms in terms of productivity in manufacturing and HCPI index; 2003-2012
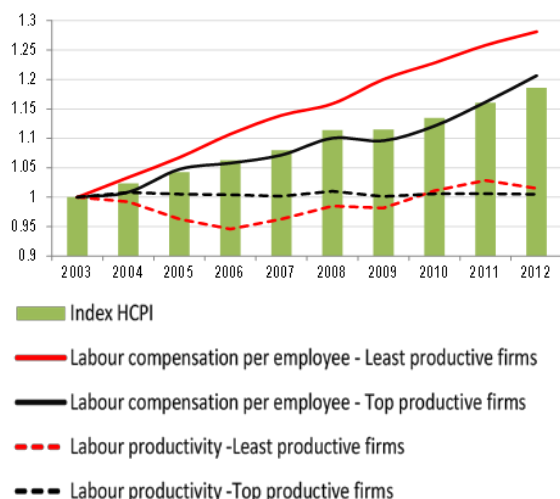

Source: Author's calculations on CompNet data.

Note: Evolution of wages and productivity of the top 10% and bottom 10% productive firms with at least 20 employees in the manufacturing sector; 2003=1.

Fig. 9: Countries with centralised collective bargaining feature higher wage-productivity misalignment at the firm level

Wage and productivity misalignment within 2-digit industries and centralised collective bargaining in broad sectors; 2007
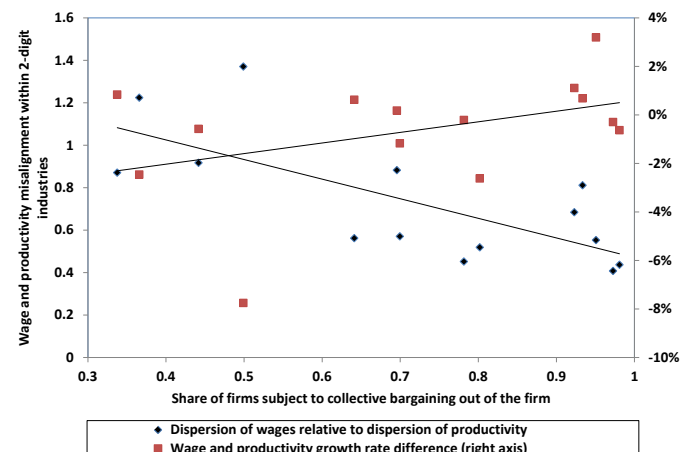
Source: Lopez-Garcia (2015) based on CompNet data, and 2007 firm survey of the Wage Dynamic Network

Note: Dispersion is measured as the difference between the 8th and 2nd decile of the distribution of the variable in a given industry. Data from CompNet, covering firms with at least one employee of the following EA countries for which the matching with WDN data was possible: Austria, Spain, Italy and Portugal. Both misalignment measures refer to the period 2005-2007. The x-axis shows the share of firms subject to collective agreement out of the firm, from the 2007 firm survey of WDN.
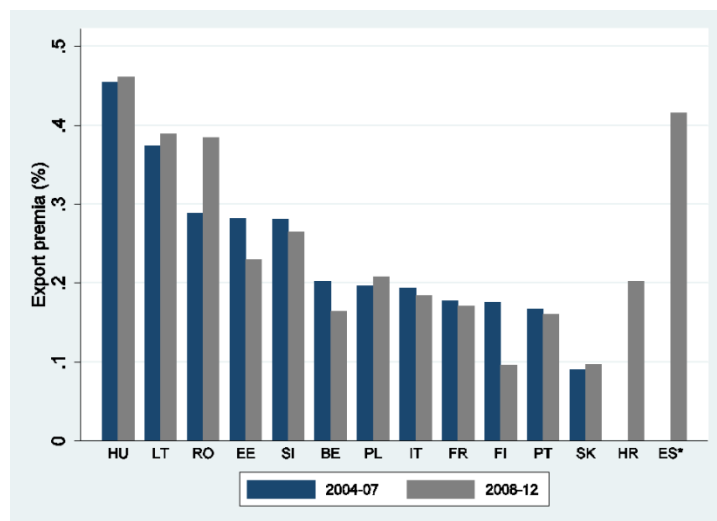
5.   Aggregate exports are largely driven by the most productive firms. The concentration of foreign sales among these firms determines the <u>elasticity of aggregate exports to movements in the real effective exchange rate (REER)</u>. There is a tight link between firm-level productivity and export performance. Only the most productive firms in a given industry are able to bear trade costs and sell abroad. The productivity premia of exporters, vis-à-vis other non-exporting firms in the same industry, is about 20%, although there is large country variation (Figure 10). Large and productive firms feature very low trade elasticities to REER movements (Figure 11). Hence, aggregate trade elasticities will depend on the prevalence of these firms in each sector. Specifically, the elasticity of exports to exchange rate fluctuations is lower in sectors with a higher dispersion of productivity (Demian and di Mauro, 2015) or, in other words, the larger the concentration of exports in fewer firms. Moreover, the larger the pool of very productive firms (i.e. the fatter the right tail in the productivity distribution) that could start exporting following lower trading costs, the higher the reaction of exports to REER movements. As a result, countries such as Germany, characterized by a higher average and a fatter right tail in the productivity

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[7] Lopez-Garcia (2015).

distribution compared to e.g. Italy and Spain, will require lower movements in the exchange rate in order to rebalance (di Mauro and Pappada, 2014).

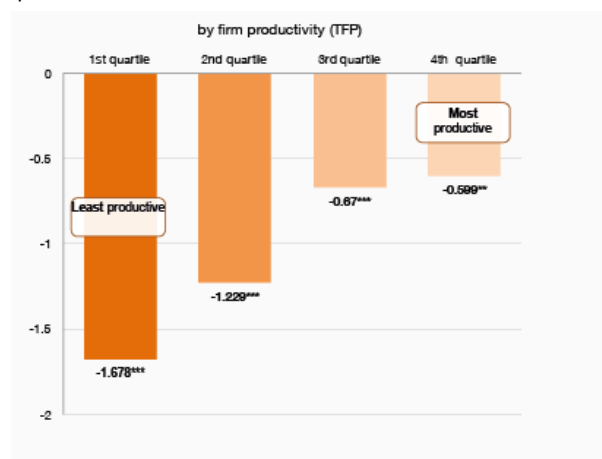**Fig.10: On average, the productivity premium of exporters is 20%**
Export premia in labour productivity, 2004-2012

Fig. 11: Export elasticity to REER movements is much lower in more productive firms
*Export elasticity with respect to ULC-REER by productivity quartile*

Source: Berthou et al. (2015) based on CompNet.

Source: Berthou et al. (2016) based on CompNet.

6.   Because of the emergence of global value chains (GVC), into which euro area economies are tightly integrated, trade imbalances within the euro area are to a significant extent also an endogenous result of the international organisation of production at the firm-level. As a consequence, a non-negligible part of intra-area imbalances (estimated at around one fifth in 2011) cannot be controlled by demand and relative price adjustments of euro area economies alone, i.e. it depends on developments outside the euro area. Official trade statistics are reported in 'gross' terms, which measure the value of the physical flow of goods and services across borders. The prevalence of trade in intermediates, however, implies that countries do not necessarily consume the goods they import, but rather that they often use them as inputs in the production of other final and intermediate goods that may again be exported to other destinations. In order to correct for this, several CompNet studies have proposed alternative measures which extract the value added embedded in gross trade flows. Di Mauro, Nagengast and Stehrer (2016) show that between 1995 and 2008 intra-area trade imbalances increased substantially as measured by the standard deviation of the bilateral gross trade balances between all euro area countries. Rather remarkably, however, over the same period there has been a growing divergence between the measure in gross terms with respect to the one in value added (Figure 12). Figure 13 provides details on the source of the difference between gross and value added trade balances. While the bulk is due to value added generated abroad (foreign value added) and directly absorbed by one of the two direct trading partners, the most dynamic factor over the period has been the *demand in third countries outside the euro area*, which increased from about zero in the mid-90s to 20% in 2011, as a result of the expansion of intra-area production networks. The importance of this third

country effect implies that a sizeable portion of gross bilateral trade balances can no longer be influenced directly by demand and relative price conditions in the two respective trading partners.

Fig.12: Standard deviation of bilateral trade imbalances within the euro area
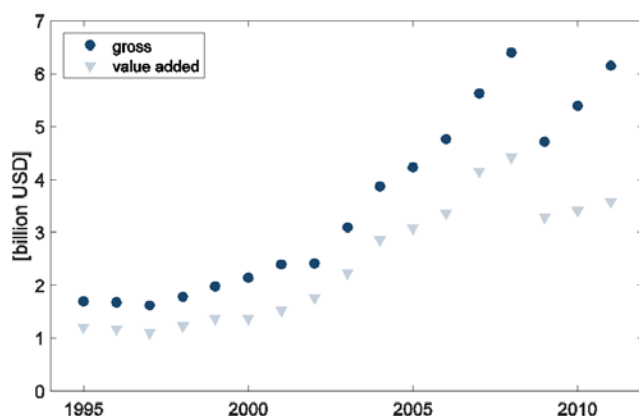
Source: Di Mauro, Nagengast and Stehrer (2016).

Fig. 13: Variance decomposition of bilateral gross trade imbalances within the euro area
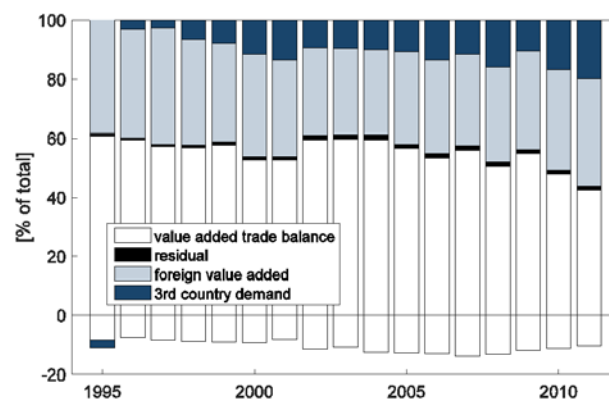
Source: Di Mauro, Nagengast and Stehrer (2016).

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