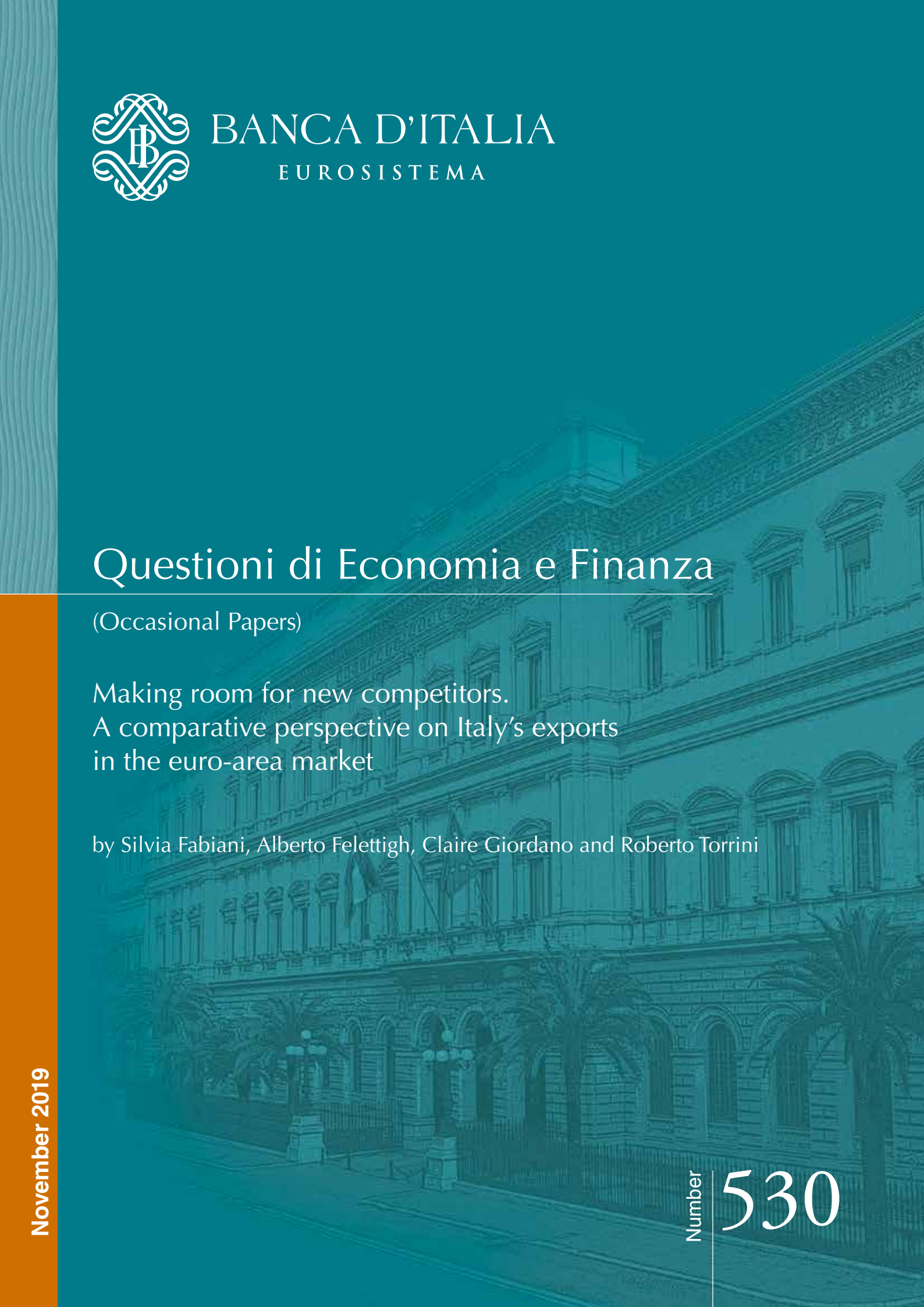
BANCA D'ITALIA
EUROSISTEMA

Questioni di Economia e Finanza

(Occasional Papers)

Making room for new competitors. A comparative perspective on Italy's exports in the euro-area market

by Silvia Fabiani, Alberto Felettigh, Claire Giordano and Roberto Torrini



November 2019

Number 530

BANCA D'ITALIA
EUROSISTEMA

Questioni di Economia e Finanza

(Occasional Papers)

Making room for new competitors. A comparative perspective on Italy's exports in the euro-area market

by Silvia Fabiani, Alberto Felettigh, Claire Giordano and Roberto Torrini

Number 530 – November 2019

The series Occasional Papers *presents studies and documents on issues pertaining to the institutional tasks of the Bank of Italy and the Eurosystem. The* Occasional Papers *appear alongside the* Working Papers *series which are specifically aimed at providing original contributions to economic research.*

The Occasional Papers *include studies conducted within the Bank of Italy, sometimes in cooperation with the Eurosystem or other institutions. The views expressed in the studies are those of the authors and do not involve the responsibility of the institutions to which they belong.*

The series is available online at www.bancaditalia.it .

ISSN 1972-6627 (print)
ISSN 1972-6643 (online)

Printed by the Printing and Publishing Division of the Bank of Italy

MAKING ROOM FOR NEW COMPETITORS. A COMPARATIVE PERSPECTIVE ON ITALY'S EXPORTS IN THE EURO-AREA MARKET

by Silvia Fabiani, Alberto Felettigh, Claire Giordano and Roberto Torrini *

Abstract

Over the last two decades Italy's intra-euro area export performance has been weak when compared with that of Germany and Spain, but not in relation to France. This paper first tracks the heterogeneous developments in the four countries' goods exports in the euro-area market across different sub-periods and product categories. It then discusses some potential determinants of these dynamics: price competitiveness and the entry of new competitors, namely China and the Central and Eastern European countries (the "CEE6"), in the euro-area market. By exploiting several datasets and by using different techniques, the paper quantitatively explores the impact of developments in intra-euro area price competitiveness; it analyzes the role played by China and by the CEE6 in displacing the four economies' exports in the euro-area market and in activating their total exports via the heightened import demand stemming from the new competitors. These effects are found to be heterogeneous across the four countries, and generally more unfavourable for Italy, thereby helping to explain the country's relative underperformance, at least vis-à-vis Germany.

JEL Classifications: F00, F10, F40, F62.
Keywords: goods exports, global value chains, competition from low-wage economies, euro area.
DOI: 10.32057/0.QEF.2019.530

Contents

* Banca d'Italia, DG Economics Statistics and Research.
The authors are grateful to Andrea Brandolini, Matteo Bugamelli, Giovanni D'Alessio, Stefano Federico, Daniela Marconi and Paolo Sestito for comments on previous versions of the paper and for data-sharing. Any error is responsibility of the authors. The views herein are those of the authors, and not of the institution represented.

1. Introduction

Over the past two decades patterns in international trade of euro-area countries, both in world but also specifically in the euro-area market, have been affected by two major events. Focusing on goods, China's entry into the World Trade Organization (WTO) in 2001 boosted the country's exports share in world markets, which has more than tripled since the end of the nineties, as did its intra-euro area export share. At the same time, the accession to the European Single Market have led Central and Eastern European countries to gradually increase their exports: the aggregate world share of Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia (hereafter labeled as "the CEE6") has more than doubled, as well as their share in the euro-area market.[2] As new EU members, these countries have benefited from development-oriented structural funds and have been progressively integrated in European value chains, also attracting direct investment from the rest of the EU.

As a result of these developments, world market shares of the main euro-area countries have declined: the drop has been sharper for Italy and, especially, France, and less intense for Germany and Spain. The fall in Italy's and France's export shares has been particularly strong in the euro-area market, where Germany and Spain instead showed a broad resilience.

The effects of the entry of China into the WTO and its fast growing role in international trade have been studied extensively in the literature.[3] Several studies have also attempted to estimate the potential economic impact of the EU enlargement to Central and Eastern European countries *ex ante* (among others, Baldwin, 1995 and Baldwin et al., 1997). However, much less research has been conducted to investigate the actual impact of this integration *ex post*; in particular, while there is a burgeoning literature on the effects on the CEE6 countries themselves (see, for example, Mirdala, 2018 and Hagemejer and Mućk, 2019), much less is known about the main euro-area countries,[4] and specifically on Italy.

Motivated by this sketchy evidence, this paper analyses Italy's intra-euro area goods exports in the 1999-2018 period relative to France, Germany and Spain, focusing on two broad aspects: price-competitiveness developments, for the first time measured specifically in the euro-area market, and the growing presence of new international low-wage competitors.[5] The latter aspect is, in turn, explored

[2] Slovakia has a somewhat ambiguous nature since it became a euro-area member in 2009. As mentioned later, we exclude this country from the euro-area market in our regression analysis.

[3] Some recent examples are Bloom, Draca and Van Reenen (2016) on the impact on firm productivity, Bernard, Jensen and Schott (2016) on that on firm's product specialization, Jaravel and Sager (2018) on that on prices and Autor, Dorn and Hansen (2013), Wang et al. (2018) and Cabral et al. (2018) on that on labour markets. Focusing specifically on Italy, there is evidence of an effect of trade with China on sector-level productivity (Bugamelli and Rosolia, 2006; Bugamelli, Schivardi and Zizza, 2009), on firms' pricing strategies (Bugamelli, Fabiani and Sette, 2015), on export unit values (Giovannetti and Sanfilippo, 2016), on output and employment in the manufacturing sector, including inter-sectoral effects via input-output linkages (Federico, 2014), as well as on export performance (Giovannetti, Sanfilippo and Velucchi, 2011; Bugamelli et al., 2018).

[4] Few exceptions are Chen, Lee and Milesi-Ferretti (2016), Stöllinger et al. (2018) and Lopez-Villavicencio and Mignon, (2019) and, solely on Germany, IMF (2013) and Dauth, Findesein and Suedekum (2014).

[5] We loosely refer both to China and to the CEE6 countries as "emerging" or "low-wage economies". Although this notation is not strictly correct for the CEE6, on average over the 1999-2017 period the CEE6 block's real GDP per capita was under half that of the four euro-area countries jointly considered.

along two different dimensions. The first is the potential "displacement effect" that the increasing penetration of China and the CEE6 had on the four countries' intra-euro area exports.[6] The second is the "activation affect". Indeed, the gain in euro-area area market shares by China and the CEE6 came hand in hand with the expansion of their economic activity and of their imports, both for satisfying internal demand and for procuring the intermediate inputs necessary for exports. In turn these developments plausibly activated exports of the four main euro-area countries to China and the CEE6, for intermediate and for final uses, either directly or indirectly through international production chains, thereby partially compensating the above-mentioned displacement in the euro-area market.

Our claim is that the aforementioned factors affected the export performance of Germany, France, Italy and Spain asymmetrically, due to their different sectoral specialization and to their heterogeneous capacity to engage in production relationships with these new competitors. To our knowledge, no existing study has addressed these topics specifically for Italy relative to its three main euro-area peers, and this paper aims at filling this gap.

In order to achieve this purpose, we adopt various approaches, namely descriptive assessments, counterfactual exercises, statistical decompositions and regression analyses. We use a variety of data sources, spanning from international merchandise trade statistics (IMTS), either from official sources (Eurostat) or from harmonized datasets (CEPII-BACI), to national account data, the world input-output database (WIOD) and foreign-affiliates trade statistics, as well as novel, disaggregated price-competitiveness indicators produced by Banca d'Italia. We restrict our analysis to merchandise trade, hence not considering services (except in the analysis of WIOD for reasons that will be later spelled out), partly due to data availability, but mainly because the competitive pressures exerted by low-wage economies stemmed essentially from goods exports, at least in their initial stage. Moreover, we exclude energy products from our analysis, since they are characterized by high price volatility and have a physiologically limited weight in exports of euro-area countries, due to the scarce endowment of natural resources of these economies; this choice also allows assessing market shares at current prices and exchange rates.

Our main findings are the following. Italy's unfavourable price-competiveness developments in the euro-area market until the 2008-2009 global financial crisis contributed to explain its weaker intra-euro area export performance relative to Germany. Due to its initial product specialization, Italy was also unambiguously harder hit by Chinese export displacement than its main euro-area competitors, whereas the crowding-out effect exerted by the CEE6 was statistically significant and large for all four euro-area countries, albeit possibly to a higher extent for Italy (and Spain). Since 2010 the pressures stemming from these new competitors have lessened, due to a slowdown of their penetration in the euro-area market, as well as to an adjustment of the four euro-area economies export mix towards less "vulnerable" goods. Turning to the activation of exports, Germany was the only country which

[6] *A priori*, rising import penetration from new competitors does not necessarily crowd out exports of advanced economies. The latter countries' firms may indeed respond by innovating more, boosting their productivity growth and, in turn, potentially exporting more to all destination markets (on this, see Bloom, Draca and Van Reenen, 2016, and Bugamelli, Schivardi and Zizza, 2009, specifically on Italian manufacturers). The export displacement (i.e. negative) effect needs, therefore, to be tested empirically.

benefited from the fast growth in China's import demand, whereas in the case of the CEE6 region Italy too gained, yet to a lower extent. Germany's overall advantage was amplified by the fact that the country was more strongly integrated with these economies already in 1999, thereby earning a significant head-start relative to its peers.

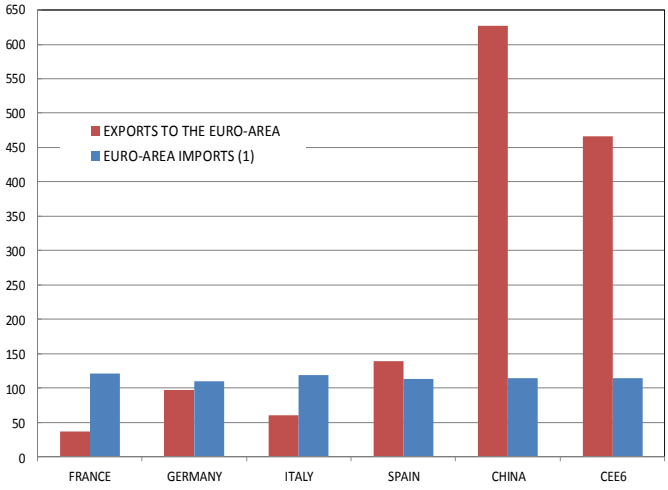
The paper is structured as follows. Section 2 provides some stylized facts concerning Italy's intra-euro area export performance in comparative terms relative to the other three main euro-area countries. Section 3 analyses price-competitiveness developments in the euro-area market. Section 4 provides quantitative evidence of the displacement effect of China and the CEE6 on the four main euro-area countries' exports, again in the euro-area market. Section 5 focuses on the extent to which the growing demand for imports by China and the CEE6 activated the four countries' exports, also taking into account the indirect flows related to their participation in international production networks. Section 6 concludes.

2. Export performance in the euro-area market

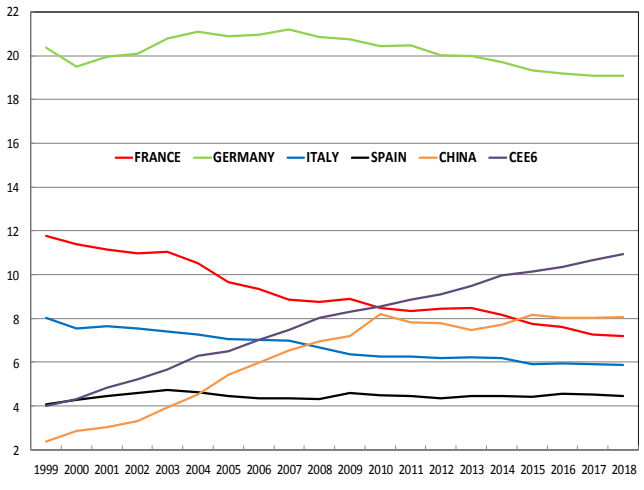
In the last twenty years, Italy and, more so, France were clear under-performers relative to Germany and Spain in terms of their sales to the euro area (Fig. 1, panel a). Italy's goods exports, at current prices and net of the volatile energy component, increased by 66 percent in the overall period, against an almost double increase in foreign demand, as measured by the imports of the other countries of the area; the growth gap between exports and import demand was even larger for France, whereas it was negligible and even of the opposite sign in Germany and Spain, respectively.

Figure 1 – Export performance in the euro-area market
(goods excluding energy; current prices and exchange rates)

a) Exports to the euro area and euro-area imports
(percentage growth rates between 1999 and 2018)



b) Export shares in the euro-area market (2)
(percentages)



Source: authors' calculations on Eurostat IMTS data.
Notes: 1) excluding the imports of the euro-area reporting country; 2) When computing the market share of a euro-area country, its imports are excluded from the euro-area imports used as the denominator.

As a result of these developments, between 1999 and 2018 Italy and France experienced a sharp decline in their merchandise export share in the euro-area market (Fig. 1, panel b). Throughout the paper, euro-area export market shares are computed using as denominator euro-area imports net of the reporting country when the latter belongs to the euro area. Starting from around 8 per cent, the Italian share dropped by 2 points in absolute terms (-27 per cent from its initial level), accounting for over two-thirds of the overall loss of the country's world market share. The drop in France stood at almost 5 percentage points in absolute value (from nearly 12 to just above 7 per cent), corresponding to a 39 percentage drop from the initial level. Conversely, Germany's intra-euro area export share diminished only marginally and Spain posted a slight increase, albeit starting from a very low level compared to the other three countries.

In the same period China and the CEE6 recorded impressive gains in the euro-area market. Thanks to a seven-fold increase in exports, the Chinese share increased from about 2 to 8 per cent, with a peak in 2010; that of the CEE6 reached 11 per cent in 2018, from roughly 4 at the end of the Nineties, following a gradual upward trend with no major discontinuity over time.

Zooming into different sub-periods and product categories shows how the market-share loss in the euro area experienced by Italy and, especially, France was particularly large between 1999 and 2007 (Fig. 2). In Italy the decline was concentrated in goods for final use, defined according to the Eurostat classification by Broad Economic Category (BEC), whereas it involved both final and intermediate use goods with similar intensity in France. In contrast, intermediate goods were the main driver of the rising German and Spanish market shares until 2007.

Similarly, the impressive surge of China's and the CEE6 countries' shares in the euro-area market took place mainly in the pre-global financial crisis period: the CEE6 increased their share by about 3.5 percentage points (almost 90 per cent from their initial level), while China's performance was even more striking, by more than 4 points (a 180 per cent rise). The drivers of these pre-2007 booms were, however, different: intermediate inputs propelled the CEE6's exports, whereas final use goods contributed most to China's upsurge, thereby suggesting that the two "shocks" were heterogeneous in nature, as well as plausibly affecting the four euro-area economies to a different extent.

In the aftermath of the 2008-2009 crisis the euro-area export share declined in all the main euro-area countries except Spain.[7] However, the loss incurred by Italy was smaller than that observed in Germany and France, and much lower than that recorded by Italy itself in the previous decade. A common trend across the four countries was the negative contribution, even in Spain, of intermediate goods; this evidence is consistent with the supposed recent retrenchment of global value chains (GVCs; see, for example, Timmer et al, 2016).[8] In the same period, China's share decreased slightly, dragged

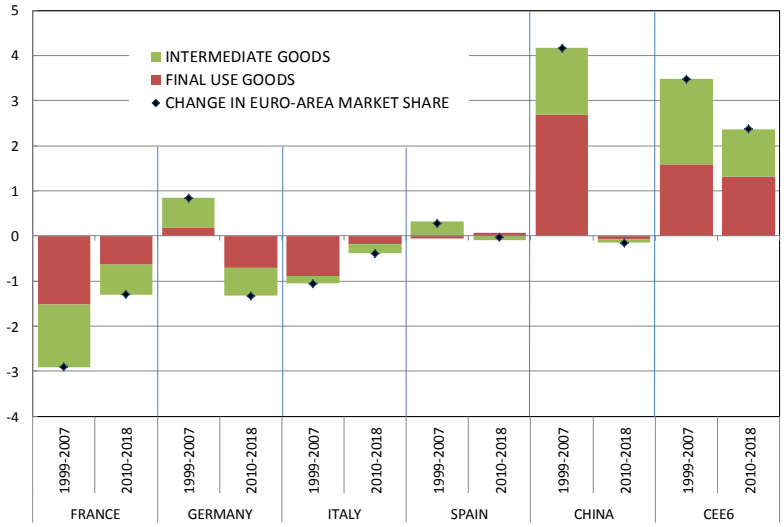
[7] Given that 2008 and 2009 were affected by exceptional world-wide trade developments, which were partially compensated by the rebound in 2010, this sub-period is often discarded from our overall assessment.

[8] Our evidence, as well as that in the mentioned Timmer et al. (2016), is based on current-price series. Recent research that has estimated the volume of intermediate trade shares has, however, found that price effects explain a large chunk of the corresponding current-price developments (Gaulier, Sztulman and Ünal, 2019): in particular, the intermediate goods share in world trade, calculated with deflated flows, is found not to be increasing in the 2000s but fairly stable, and shows no sign of a reversing trend in the recent years.

down by intermediate goods, suggesting a waning of the "China shock" in recent years, whereas the CEE6's share continued to rise, boosted by both product categories.

Figure 2 - Export shares in the euro-area market by sub-period and BEC

(absolute changes in percentage points; goods excluding energy; current prices and exchange rates)



Source: authors' calculations on Eurostat trade data by BEC.
Notes: Export market shares are computed excluding from the denominator the imports of the euro-area reporting country.

As a note of caution to this paper, it has to be borne in mind that a non-negligible part of the trade flows classified as CEE6 exports to the euro area, according to the residence criterion adopted by Eurostat IMTS data, are possibly shipped by foreign-owned firms based in the CEE6. Many of these enterprises are German-owned, as suggested by data on foreign affiliates briefly discussed in Box A, so that the corresponding export flows would be classified as German exports on the basis of an ownership criterion, suggesting more (less) favourable developments in Germany's (CEE6's) intra-euro area market share than those depicted in Figure 1 and Figure 2. This is presumably less of an issue for Chinese exports, due to the larger geographical distance from all four main euro-area countries.

Box A. CEE6 manufacturing expansion and the role of German foreign direct investment

Manufacturing in the CEE6 has increasingly expanded its weight within the EU over the last two decades: according to Eurostat data, in 1999 the CEE6 accounted for about 4 per cent of EU manufacturing value added (Table, panel a); in 2018 this share had reached almost 10 per cent, close to that of France in the same year, and only slightly lower than Italy's. The most significant drivers of this expansion were the motor-vehicle and the basic metal industries.

Whereas the growing relevance of the CEE6 was mirrored by a declining weight of both Italy and France, Germany's share in EU manufacturing expanded, especially in the years following the global financial crisis, reaching over 30 per cent in 2018. The weight of Spain instead remained almost unchanged over time and in 2018 was lower than that of the CEE6 region.

This eastward shift in the geographical location of EU manufacturing activity, with Germany playing a pivotal role, was driven by the increasing weight of manufacturing on total value added in the CEE6 and in Germany (Table, panel b), which stood at odds with the expansion of the private tertiary sector observed in the other main European countries: in 2018 manufacturing still accounted for over 23 per cent of Germany's total value added, the highest share among advanced economies (see, for example, De Nardis, 2018 for possible explanations of Germany's exceptional manufacturing strength).

Table - Manufacturing value added

(percentage shares and changes; current prices)

a) Shares in EU28 manufacturing value added

	1999	2007	2010	2018	var% 1999-2018
France	13.4	11.7	11.6	10.1	-25.3
Germany	27.6	27.6	29.0	30.5	10.5
Italy	13.8	13.3	12.9	11.4	-17.5
Spain	6.4	7.6	7.4	6.6	2.8
CEE6	4.1	7.6	8.6	9.6	136.5

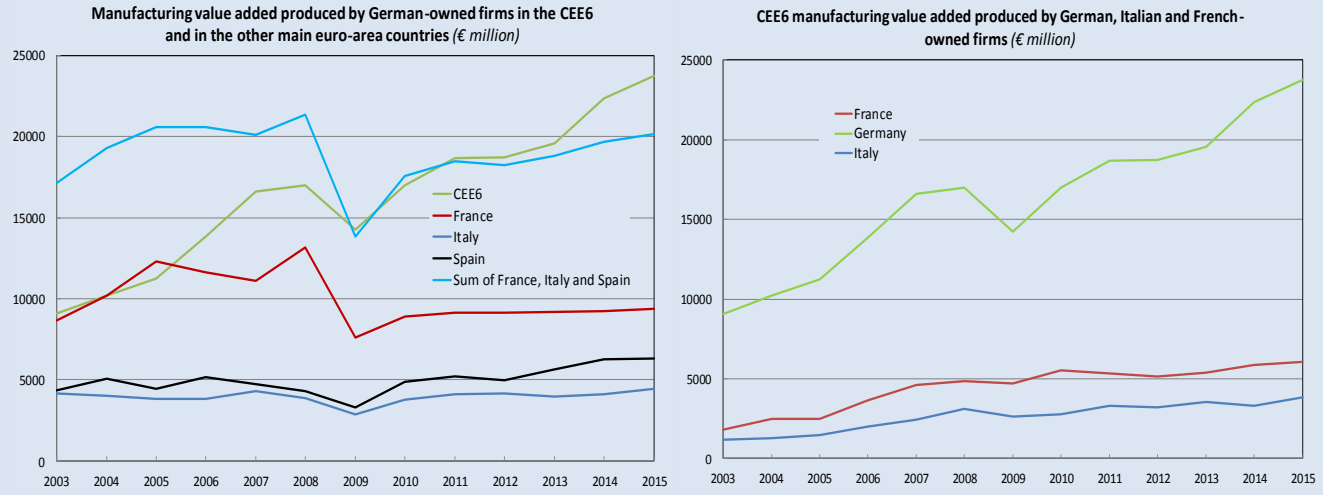
b) Weight of manufacturing on total value added

	1999	2007	2010	2018	var% 1999-2018
France	16.2	11.5	11.5	11.1	-31.3
Germany	22.3	23.4	22.2	23.1	3.4
Italy	19.8	17.8	15.8	16.7	-15.7
Spain	18.0	15.0	13.3	14.0	-22.2
CEE6	20.9	21.6	20.5	21.3	2.2

Source: authors' calculations on Eurostat data.

Foreign direct investment in the CEE6, in particular from Germany, played a significant role in this process. According to Eurostat Foreign affiliate trade statistics (FATS), the manufacturing value added produced by German-owned firms located in the CEE6 almost tripled in fifteen years (Figure, left hand-side panel); in 2015 (last year for which FATS data are available) it amounted to about EUR 24 billion (more than 12 per cent of the CEE6 manufacturing value added), as compared to about 10 billion pertaining to French and Italian-owned companies considered jointly. The value added produced by German-owned firms located in the CEE6 is now larger than the overall value added produced by German-owned firms in France, Italy and Spain considered jointly. It was half as much in 2003. The role played by Italian and French-owned firms in the expansion of CEE6 manufacturing was instead minor (Figure, right hand-side panel; data for Spain are not available).

Figure - Manufacturing value added produced by foreign-owned firms in various countries



Source: authors' calculations on Eurostat Foreign affiliate trade statistics.

3. Price-competitiveness developments in the euro-area market

The price competitiveness of a given country is commonly measured by its real effective exchange rate (REER), which, for euro-area economies, is conventionally referred to as the price-competitiveness indicator (PCI) by the Eurosystem. REERs and PCIs are commonly computed as the weighted geometric average of the country's nominal exchange rates *vis-à-vis* its main trading partners (NEER or nominal PCI), deflated by relative prices or costs. The price and cost indices underlying REERs/PCIs are manifold and include consumer price indices, producer price indices (PPIs), GDP deflators and unit labour costs. There is consensus both in the literature and in the policy debate that no deflator is optimal (Chinn, 2006; Osbat et al., 2017; Kangur, 2018), yet developments of alternately deflated PCIs have differed for many euro-area countries (e.g. ECB, 2003; Deutsche Bundesbank, 2004; Giordano and Zollino, 2016).

Banca d'Italia produces REERs/PCIs deflated by PPIs of manufactures sold in the domestic market. The latter may be considered as a proxy for cost developments that encompasses all production cost pressures, including labour, capital and intermediate inputs, in the sector of tradable goods, which is a broader concept than traded goods, since some tradables may turn out not to be actively traded specifically because of price-competitiveness issues. The standard weights that are employed are an average of both import and (double-weighted) export weights, based on bilateral trade flows (Schmitz et al. 2013; Felettigh et al. 2016), so as to gauge overall competitive pressures, on both the import and the export side.

In order to appraise price-competitiveness developments, existing studies on euro-area exports, such as Bayoumi, Harmsen and Turunen (2011) and Bobeica, Christodoulopoulou and Tkačevs (2016), employ PCIs restricted to euro-area trading partners, but based on all world markets. In our view, these trading partner-based PCIs are not appropriate to assess the dynamics of exports to euro-area destinations. Indeed the appropriate metric should focus exclusively on export-weighted price competitiveness (which we hereon refer to as export price competitiveness) and solely in the euro-area market (while still considering the entire set of the reporting country's trading partners), in order to gauge the competitive pressures that domestic producers specifically face in the euro-area export market. Banca d'Italia currently publishes these intra-euro-area-market PCIs for a wide number of countries, according to the methodology suggested by Felettigh and Giordano (2018) and outlined in Annex A. By employing these market-based PCIs, this paper is therefore the first in our view to properly address the issue of the link between price-competitiveness developments and exports in the euro-area market. Moreover, it is useful to bear in mind that since these marked-based PCIs single out the competitive pressures of all trading partners - so not only of euro-area members - in the euro-area market, both the nominal PCI and relative price dynamics matter in explaining intra-euro area price-competitiveness developments, as shown algebraically in Annex A and as discussed later on herein.[9]

[9] In this paper we use the 13th May 2019 data vintage of Banca d'Italia's PCIs. Using the variance decomposition approach put forward by Ahn, Manu and Zhou (2017), relative price dynamics are found to account for around 7-8 per cent of variation in annual growth since 1999 in the intra-euro-area-based PCIs of France and Spain, 17 per cent in the case of Italy and over 41 per cent in Germany. Nominal PCIs therefore explain the bulk of the PCI variance, even when

According to these novel market-based indicators, in 2018 Italy's intra-euro area export price competitiveness was only slightly more favourable than in 1999,[10] against a nearly 10 percentage-point improvement in Germany and France and a 9 point deterioration in Spain (Tab. 1).

Dynamics, however, differed in the two key sub-periods. Indeed, in the years prior to the eruption of the global financial crisis, both Italy and, to a larger extent, Spain marked a loss, against gains recorded by France and, especially, Germany. These heterogeneous trends occurred despite a common 3-4 percentage point appreciation of the nominal PCI of the four countries within the euro-area market. They thus imply that intra-euro area relative price dynamics in France and, in particular, in Germany were very favourable in this period, to the extent that they more than offset the nominal appreciation. In Italy relative price developments contributed to only partly counterbalance the latter, whereas in Spain unfavourable price dynamics compounded it.

After 2010 all countries except Spain marked a general improvement: France registered the largest gain by far, with Italy turning out as the second best achiever. Since nominal PCIs appreciated by approximately 1 percentage point in these years, the gains were entirely due to relative price dynamics.

Table 1 - Export price-competitiveness developments of the main euro-area countries in the euro-area market

(percentage changes on annual averages of monthly data)

	France	Germany	Italy	Spain
1999-2007	-1.4	-5.6	2.4	7.2
2007-2010	-5.0	-3.8	-2.5	-0.6
2010-2018	-3.2	-0.5	-0.9	2.2
1999-2018	-9.4	-9.6	-1.1	8.9

Source: Banca d'Italia.

Notes: PPI-based indicators. A positive (negative) change indicates a loss (gain) in price competitiveness. For details on the indicators see Annex A and Felettigh and Giordano (2018).

How did the developments in these mature economies compare to those of the emerging countries considered herein? Focusing solely on the euro-area market (*vis-à-vis* all trading partners), the four euro-area economies' dynamics appear quite flat in comparison. Indeed, over the entire period the export price competitiveness of the CEE6 deteriorated substantially (by over 80 percentage points in the extreme case of Romania), with the exception of Poland whose loss was relatively contained (Tab. 2); China too recorded a significant worsening in its intra-euro area price-competitiveness (by over 15 points). It is, however, useful to recall that PCIs are based on price indices and therefore track only

restricting the attention solely to the euro-area market. However, as to be expected, the contribution of the nominal component is much larger for each of the four countries when extending the indicator to all world markets (figures available upon request).

[10] We adopt 1999 as the initial benchmark year in our whole analysis; however, this does not imply that in 1999 the four euro-area countries' PCIs were at their equilibrium value. A return to 1999 levels does not necessarily therefore entail a complete absorption of price-competitiveness imbalances, although Giordano (2018) shows that in 1999 PPI-based PCI misalignments *vis-à-vis* all trading partners and in all world markets of the four economies under study (only overall estimates are available) were reasonably contained relative to later years.

changes in prices: these large price-competitiveness losses were plausibly associated with lower price levels at the beginning of the period, which PCIs do not account for.[11]

Table 2 - Export price-competitiveness developments of China and CEE6 countries in the euro-area market

(percentage changes on annual averages of monthly data)

	China	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovakia
1999-2007	-12.3	34.3	32.0	36.1	14.7	94.8	27.7
2007-2010	20.1	5.5	2.9	-0.7	-7.2	-8.2	2.2
2010-2018	9.7	4.7	-3.7	-1.3	-0.7	1.5	-6.1
1999-2018	15.4	48.3	30.7	33.4	5.7	81.4	22.5

Source: Banca d'Italia.

Notes: PPI-based indicators. A positive (negative) change indicates a loss (gain) in price competitiveness. For details on the indicators see Annex A and Felettigh and Giordano (2018).

The CEE6 countries' price-competitiveness deterioration was concentrated in the years prior to the global financial crisis, generally linked to the appreciation of their NEERs;[12] in contrast, China marked a significant gain (about 12 percentage points) in that period, aided by a comparable depreciation of its NEER.After 2010, when the NEERs were either broadly stable or depreciating, all CEE6 countries bar Bulgaria and Romania recorded significant price-competitiveness improvements; conversely China recorded a loss of nearly 10 points, in conjunction with an even stronger nominal appreciation.

Overall, price-competitiveness patterns, although heterogeneous across the four main euro-area countries, are not sufficient to fully explain the observed performance of their export market shares (e.g. Fontagné, Martin and Orefice, 2018). In particular, France's share dropped in spite of significant price-competitiveness gains over the two decades (on this "French puzzle" see Malgouyres and Mayer, 2018 and Emlinger, Jean and Vicard, 2019), whereas the opposite happened in the case of Spain leading to the well-known "Spanish paradox" (discussed, for example, in Correa-López and Doménech, 2012). Focusing on Italy, the increasing export growth gap, at least until 2007, with respect to Germany might partly be ascribed to differential price-competiveness developments, but the latter certainly do not help explain its comparative export performance relative to Spain.

The observed disconnect between export and price-competitiveness developments may have several explanations. The first is a measurement issue. Global price-competitiveness patterns (computed *vis-à-vis* all trading partners and in all world markets) have differed significantly according to the deflator employed (see for example the large difference between the dynamics of Spain's PPI- and UCLT-based PCIs, discussed in Bugamelli et al., 2017, where the latter lead to a significantly more favourable

[11] Referring to all world markets, estimates based on the model in Giordano (2018) point to the PPI-deflated REERs of the CEE6 countries except Poland being strongly undervalued in the pre-crisis period, but moderately overvalued after 2010; conversely, China's REER was always slightly undervalued, more so in recent years. These "level" estimates are consistent with the dynamics observed in the euro-area market described in Table 2.

[12] Until 2007 only Romania recorded a NEER depreciation (by about 50 percentage points). Despite this trend, Romania's price competitiveness deteriorated substantially, as shown in Table 2, due to extremely unfavourable relative price developments.

assessment of Spain's price-competitiveness dynamics). This evidence presumably is true also for PCIs disaggregated by destination market, although it cannot be tested since currently only PPI-based indicators are available.

A second, economic, explanation refers to the endogeneity of (export) prices and profit margins, which firms set according to their costs and to international competition. In particular, exporting firms are known to absorb part of exchange-rate changes in their domestic-currency export price (Burnstein and Gopinath, 2014); macroeconomic indicators, such as our PCIs, cannot however capture firm-level pricing decisions. Using national account data, Amici, Bobbio and Torrini (2018) anyhow find that developments in euro-area countries' export shares between 2000 and 2015 were positively correlated with those of profit margins in the tradable sector: price-competitiveness gains associated with shrinking margins were accompanied by a negative export performance, whereas price-competitiveness losses associated with stable or rising profitability did not entail a loss in export shares. Spain and Germany, both characterised by rising margins, shared positive export trends in spite of opposite price-competiveness developments; on the other hand, France and Italy, which both showed declining profitability, recorded a relatively negative export performance, notwithstanding different price-competitiveness dynamics.

Another possible economic explanation lies in non-price competitiveness factors, which can offset (or weaken) the expected price competitiveness-export link. For example, Correa-López and Doménech (2012) shed light on the "Spanish paradox" by showing that non-price competitiveness factors, such as company size, R&D spending, product diversification, product and process innovation, were behind Spain's high export growth since 1999. Emlinger, Jean and Vicard (2019) argue that France's recent modest export performance relative to its main euro-area peers despite its favourable price-competitiveness developments was largely due to the shift abroad of many of its enterprises. Germany's rising profit margins are found to have increased R&D investment and improved non-price competitiveness (Bechetoille et al., 2017), in turn plausibly boosting exports. These non-price factors are not captured by standard macroeconomic PCIs, and in turn are very hard to measure.[13]

In the econometric assessment below we follow a standard export equation approach, continuing to use only a PPI-based indicator of price competitiveness. We hence disregard the just mentioned limitations of this choice, which is mostly motivated by the lack of suitable data, since the availability of information on costs and margins for the whole period and for all the countries considered in our analysis is rather scanty, in particular for China and the CEE6.

4. An assessment of export displacement by China and the CEE6 in the euro-area market

All other determinants equal, the different developments in euro-area export market shares across France, Germany, Italy and Spain could suggest that China's and the CEE6's foreign sales displaced

[13] See Giordano and Zollino (2016) and Bugamelli et al. (2018) for different "macroeconomic" attempts to account for non-price competitiveness factors amongst the export determinants of the four main euro-area countries.

those of the euro-area countries to a different extent (see, for example, previous research on world markets in Giovannetti, Sanfilippo and Velucchi, 2011 and in Benkovskis et al., 2013). A synthetic way to assess the severity of both the Chinese and CEE6 "shocks" for Italy's exports in comparison with the other euro-area countries has been put forward by Bugamelli et al. (2018). The method compares the evolution of export shares according to the four economies' different exposure to competitive pressures stemming from low-wage countries, and is here applied solely to trade within the euro area.

4.1 The intensity of competitive pressures from China and the CEE6

We first focus on China's potential export displacement effect. Using the highly disaggregated CEPII-BACI dataset for the period 1999-2017 (last year of data availability),[14] we classify approximately 4,900 goods on the basis of the intensity of competition exerted by China in the euro-area market, measured by China's export share in this market for each product in 2007, a year prior to the exceptional years of the Great Trade Collapse and close to the midpoint of the period under study. In particular, we distinguish three groups of goods based on the terciles of the product-wise distribution of China's share: "high competition" (when the share is above 8.0 per cent), "medium" (when it falls between 1.2 and 8.0 per cent) and "low" (when it is below 1.2 per cent).

Figure 3 reports the weight of high, medium and low-competition products, thus defined, in the exports of each manufacturing branch in 1999 and in 2017, averaged across the four main euro-area countries.[15] In 1999 a predominant share of exports from the low-technology leather and wearing apparel branches, as well as from the residual "other manufacturing" sector (which includes furniture and toys), was subject to high competition from China;[16] this share was even higher in 2017 in the former two branches. Conversely, Chinese competition was generally low in the high-technology pharmaceutical and transport equipment sectors, but also in agricultural products, food, beverages and tobacco in both years.

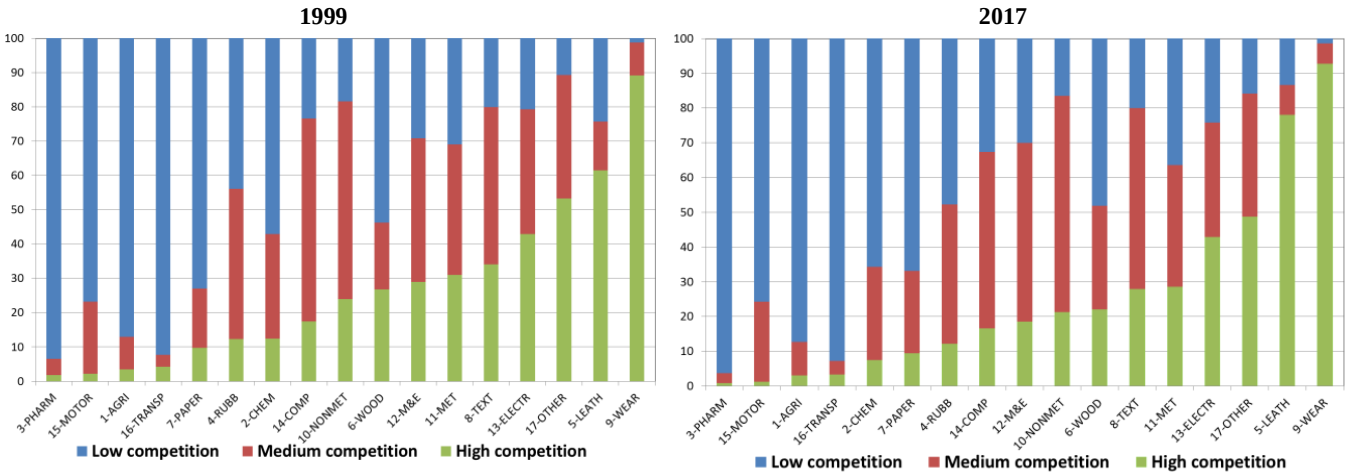
[14] The CEPII-BACI dataset includes bilateral exports at current prices at the HS6 product-level detail. It applies a harmonization procedure to the United Nations COMTRADE data, which reconciles the declarations of the exporter and the importer in each transaction (see Gaulier and Zignago, 2010 for details). Energy and mineral products are excluded from this analysis for the reasons discussed in Section 1. As shown in Table B1 in Annex B, the intra-euro area export shares of the four main euro-area countries computed on CEPII data are very similar to those based on Eurostat data, discussed in Section 2.

[15] The sectoral classification is obtained by re-arranging data at the 2-digit level of the HS classification so as to mimic the NACE Rev. 2.1 classification, as in Bugamelli et al. (2017; 2018).

[16] The classification by technological intensity is that put forward by Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries). In particular, the classification is the following: i) high-technology (pharmaceutical, chemical and computer, electronic and optical products); ii) medium-high technology (machinery and equipment and transport equipment); iii) medium-low technology (rubber and plastic products, other non-metallic mineral products, basic metals and fabricated metal products); iv) low-technology (food products, beverages, tobacco, textiles, wearing apparel, leather, wood, paper, printing, furniture and other manufacturing).

Figure 3 - Exposure to Chinese competition in the euro-area market by sector

(percentage shares averaged across the four main euro-area countries)



Source: authors' calculations on CEPII-BACI data.

Notes: For each sector the charts plot the percentage distribution of its exports to euro-area destinations, averaged across the four main euro-area countries, according to three different degrees of exposure to competition from China, computed as discussed in the main text. Sectors are ordered according to their (increasing) share of high-competition goods in a given year. The full sector identification is the following: 1=Agricultural products, food, beverages and tobacco; 2=Chemicals; 3=Pharmaceuticals; 4= Rubber and plastic; 5=Leather and related products (including shoes); 6=Wood and wood products (excluding furniture); 7= Paper and paper products and printing; 8=Textiles; 9=Wearing apparel; 10=Non-metallic minerals; 11=Metals and metal products; 12=Machinery and equipment; 13=Electrical equipment; 14= Computer, electronic and optical products; 15= Motor vehicles, trailers and semi-trailers; 16=Other transport equipment; 17= Furniture, other manufacturing and unallocated goods.

The overall decrease in the intra-euro area export shares of Italy, Germany and France between 1999 and 2017 was common to all three product categories but much larger for goods characterized by high competition from China (Fig. 4a). In the case of Italy in particular, the decline was over three times greater for high-competition relative to low-competition products. Spain is an exception in that it recorded an increase in one product category, namely in its low-competition goods' market share, contributing to its overall share's stationarity; this rise is entirely due to its agricultural exports.

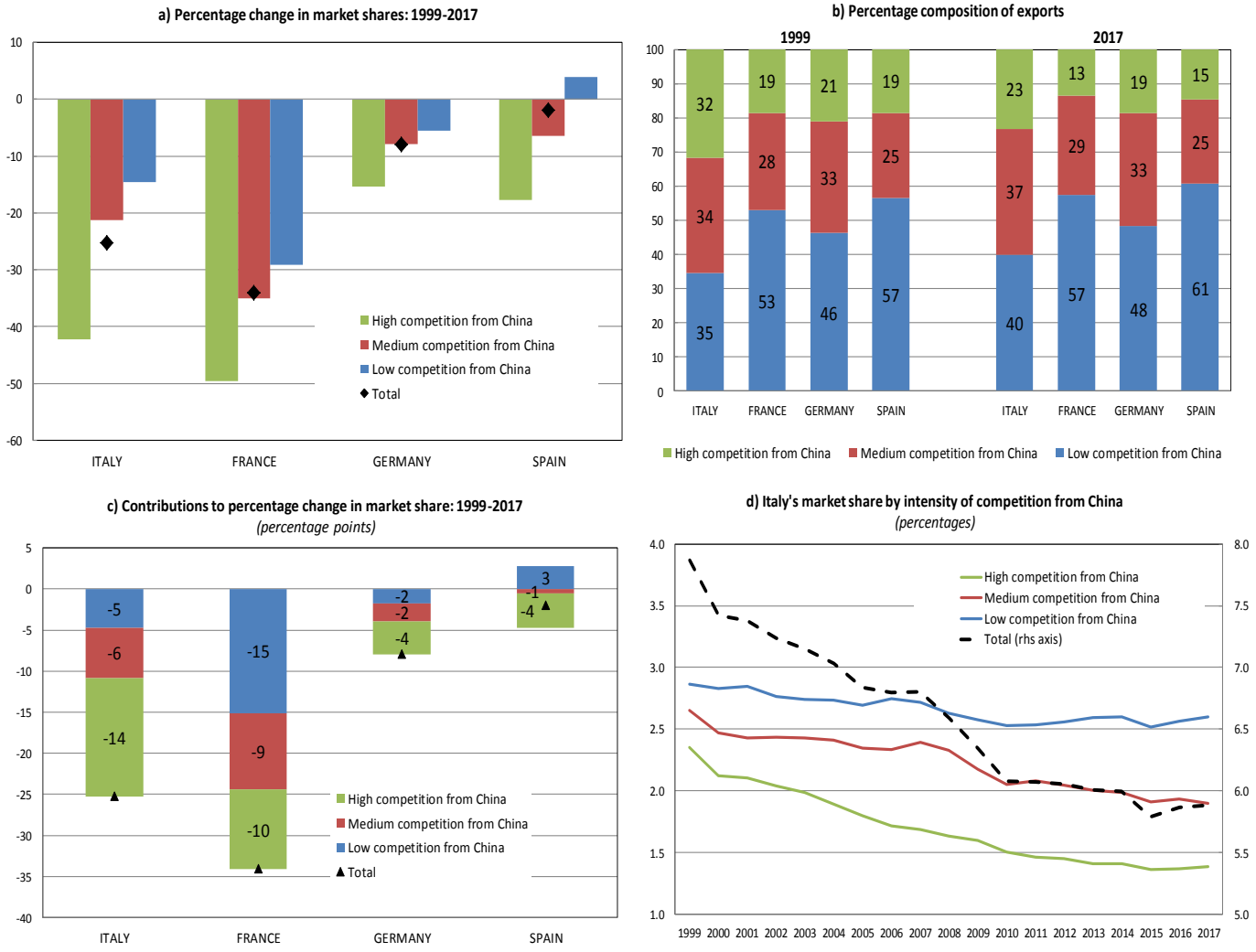
In addition to its deep decline in the high-competition goods' share, Italy also stands out for its particularly unfavourable *ex ante* product specialization: at the beginning of the period 30 per cent of its total intra-euro area exports were characterized by high competition from China, against an average of 18 for the other three economies (Fig. 4b). This was still the case in 2017, yet to a lesser extent, both in absolute and relative terms (24 per cent against an average of 15 in Germany, France and Spain).[17]

Following Finger and Kreinin (1979), Schott (2008) and Bugamelli et al. (2017), an "export similarity" index, described and reported in Figure B1 in Annex B (left-hand side chart), provides qualitatively similar indications of Italy displaying a large overlap of its export bundle with that of China. The export similarity index also points to Germany resembling China in terms of its export mix; although less stark, this result can also be seen in Figure 4b, with Germany's high-competition share of products in both 1999 and 2017 being the second largest after Italy's.

[17] All results depicted in Figure 4 are confirmed when the competition intensity thresholds are computed for 2017 instead of the baseline 2007 (in spite of the fact that, due to higher average Chinese export shares by product, the two thresholds are shifted up to 1.7 and 10.8 per cent, respectively).

As a result of both the strong decline in its high-competition goods' export share and its unfavourable export mix, the drag on Italy's euro-area export market share stemming from high-competition goods was particularly large compared to the other three countries, accounting for nearly half of the overall decline between 1999 and 2017 (Fig. 4c).[18] Despite a still relatively unfavourable export mix, a possible unwinding in the most recent years of the negative effects of the "China shock" on Italy's export performance is signalled by the evidence that since 2010 the steep decline of the export share in the high- and medium-competition product groups has almost bottomed out, whereas the share in low-competition goods has remained roughly stable (Fig. 4d).

Figure 4 - Euro-area export shares and intensity of competition from China



Source: authors' calculations on CEPII-BACI data.
Notes: See the main text for the definition of the intensity of competition.

[18] Contributions are computed using the export composition in 1999. Similar results are obtained if one considers the percentage change of exports to euro-area destinations, instead of euro-area export market shares. Indeed, as shown in panel a of Figure B2 in Annex B, the higher the competition from China, the lower export growth between 1999 and 2017 in Italy, France and Germany; this monotonic relationship breaks up only for Spain, where high- and medium-competition growth rates are comparable. In all four countries high-competition goods exports contributed by far the least to total goods exports (Fig. b2, panel b).

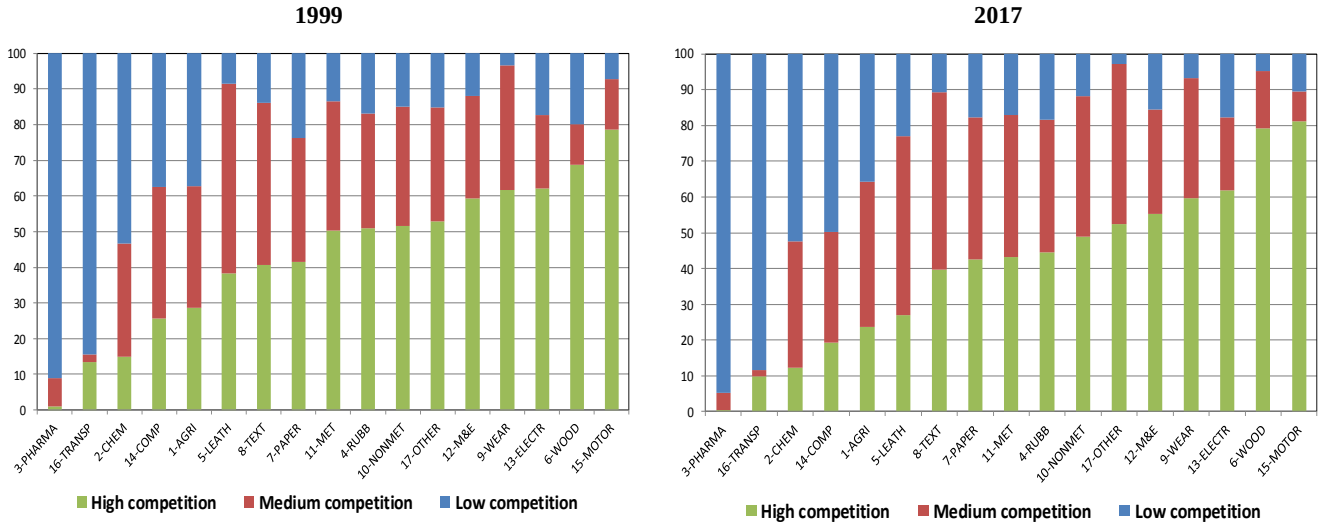
Results available upon request that analyse the 1999-2007 and 2010-2017 periods separately point to the "China shock" being concentrated in the first period. The subsequent recomposition of Italy's export mix away from products subject to intense Chinese competition – the so-called "product cycling" found also for other advanced economies such as the US (Bernard, Jensen and Schott, 2016) – was already evident by 2007, but continued, albeit to a lesser extent, also in the post-2010 period.

We conduct a similar analysis in order to account for the potential crowding-out effect of the CEE6's exports. In this case the terciles of the product-wise export distribution determine the following thresholds for a given good: "high competition" (when the euro-area market share of the CEE6 is above 6.2 per cent), "medium" (when it falls between 1.7 and 6.2 per cent) and "low" (when it is below 1.7 per cent).

Relative to the case of Chinese competition, in both 1999 and 2017 the weight (averaged across Italy, Germany, France and Spain) of products affected by high competition from the CEE6 was generally much higher but more varied (Fig. 5), being large both in low-technology – such as wearing apparel and wood – and in high-technology sectors, such as machinery, electrical equipment and, especially, the motor vehicles industry. It was instead low in the high-technology chemical, pharmaceutical, computer, electronic and optical products and "other" transport equipment sectors.

Figure 5 - Exposure to CEE6 competition in the euro-area market by sector

(percentage shares averaged across the four main euro-area countries)



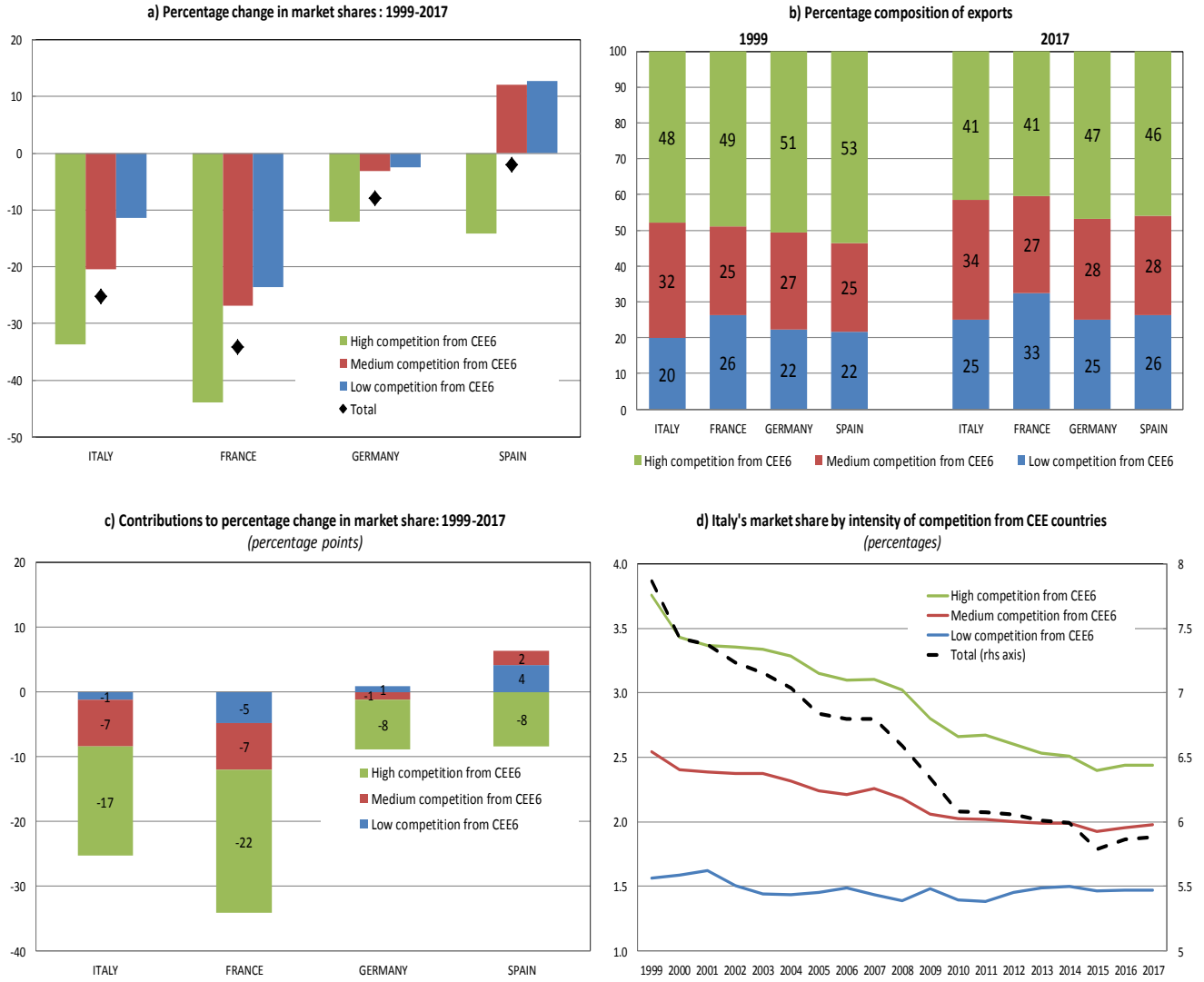
Source: authors' calculations on CEPII-BACI data.

Notes: For each sector, the charts plot the percentage distribution of its exports to euro-area destinations, averaged across the four main euro-area countries, according to three different degrees of exposure to competition from CEE economies, computed as discussed in the main text. Sectors are ordered according to their (increasing) share of high-competition goods in a given year. The full sector identification is the following: 1=Agricultural products, food, beverages and tobacco; 2=Chemicals; 3=Pharmaceuticals; 4= Rubber and plastic; 5=Leather and related products (including shoes); 6=Wood and wood products (excluding furniture); 7= Paper and paper products and printing; 8=Textiles; 9=Wearing apparel; 10=Non-metallic minerals; 11=Metals and metal products; 12=Machinery and equipment; 13=Electrical equipment; 14= Computer, electronic and optical products; 15= Motor vehicles, trailers and semi-trailers; 16=Other transport equipment; 17= Furniture, other manufacturing and unallocated goods.

The decomposition of the decline in euro-area export shares between 1999 and 2017 by intensity of competition from the CEE6 shows a monotonic relationship for all four countries: the higher the

competition, the worse the export performance (Fig. 6a). High-competition goods accounted for over three fifths of the loss in the case of Italy and even more so for France (Fig. 6c).[19] Since 2010 Italy's euro-area export market share attributable to products subject to high-competition from the CEE6 has continued to decline, albeit less pronouncedly than before, whereas its medium-competition share has stabilised and its low-competition share has slightly risen (Fig. 6d).

Figure 6 - Export shares in the euro-area market and intensity of competition from the CEE6



Source: authors' calculations on CEPII-BACI data.
Notes: See the main text for the definition of the intensity of competition.

[19] In Figure B4 in Annex B the same exercise is conducted on export growth in the euro-area market. In this case, the exports of goods most exposed to CEE6 countries' competition grew the least in all four euro-area countries, as well as contributing little to export dynamics in Italy and, especially, France. Moreover, if 2017 is employed as the benchmark year for the computation of the terciles, the two thresholds for the definition of the intensity of competition from the CEE6, as expected, rise (to 2.8 and 8.7 per cent). Although the clear monotonic relationship seen in Fig. 6a breaks down in some cases, the strongest negative contribution stemming from high-competition goods seen in Figure 6c is confirmed.

As regards composition, in 1999 Italy's exports to the euro area were relatively more skewed towards products facing high or medium-competition from the CEE6, although the differences across the four countries were much less striking than those seen in the case of Chinese competition: 80 per cent of Italy's goods exports involved high or medium-competition products, against 78 in Germany and in Spain, and 74 in France (Fig. 6b). By 2017 all four countries were less exposed to competitive pressures in terms of export mix than in 1999, and Italy's export composition was even more similar to that of Germany and Spain; Italy's product cycling due to competition from the CEE6 was, however, less intense than that due to pressures from China.

The "CEE6 shock", differently to the "China shock", was broadly balanced amongst the 1999-2017 and the 2010-2017 periods (results available upon request). Italy's (mild) export product cycling due to the competition stemming from the CEE6 occurred in both periods, yet to a slightly higher extent in the second.

The degree to which each of the four euro-area economies withstood competition from China and the CEE6 considered jointly is evaluated in Figure B6 in Annex B. The terciles for this exercise are computed on the sum of China's and the CEE6's export shares in the euro-area market.[20] As expected, the findings are mid-way between those illustrated for the two shocks considered separately. In particular, in all four euro-area countries the size of the decline in the euro-area export share was positively and monotonically associated with the intensity of competitive pressures. Italy was especially penalised in terms of its export mix in 1999, yet less so in 2017, both in absolute and relative terms. Its export share in goods subject to low competition jointly from China and the CEE6 has been pretty stable since 1999, and so has that in medium-competition goods since 2010; on the contrary, its share in high-competition products bottomed out only in the last four years under study.

4.2 How penalizing was Italy's sectoral export specialization?

In order to assess Italy's exposure to pressures from the new competitors by sector, the first metric we use is the fraction, within each sector's exports to the euro area, of products facing high competition from either China or the CEE6, as measured on the basis of the product-wise distributions described in the previous section.

Focusing on the sectors in which Italy is specialised compared to the other three economies (Tab. 3), it is evident that in 1999 wearing apparel and furniture were the two industries which were most exposed to competition from both competitors; to a lower extent this also holds for machinery and equipment, and metals. In addition, leather goods were particularly vulnerable to the China shock, whereas rubber and plastic were to the CEE6 shock. Amongst the sectors of Italy's relative under-specialisation, motor vehicles stand out as showing a very high weight of products facing high competition from the CEE6.

[20] In this case the terciles of the product-wise distribution lead to the following thresholds: "high competition" (when the euro-area market share of China and the CEE6 is jointly above 17.3 per cent), "medium" (when it falls between 6.1 and 17.3 per cent) and "low" (when it is below 6.1 per cent).

Qualitatively similar results by sector also hold for 2017, with the main exception of machinery and equipment only being highly exposed to the CEE6 shock, and not to China anymore. What is however worth stressing is that, quantitatively, between 1999 and 2017 the share of exports subject to high competition from both China and the CEE6 in the sectors of relative specialization for Italy decreased by nearly 6 percentage points (from nearly 24 and 31 per cent, respectively), thereby also moderately reducing their weight on total intra-euro area exports (from 61 to 58 per cent). In 2017 the weight of products facing high competition from the CEE6 was still significantly higher than that from China (over 25 against around 18 per cent).

Table 3 - Italy's exposure to high competition from China and the CEE6 in the euro-area market by sector

(percentage shares)

		1999			2017		
		weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA	weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA
		...from China	...from the CEE6		...from China	...from the CEE6	
Relative specialization	Leather & related products (incl. shoes)	58.6	42.2	4.4	71.5	29.8	4.3
	Wearing apparel	87.4	60.5	5.8	89.6	57.7	4.1
	Furniture, other manuf. & unalloc. goods	71.5	69.4	5.1	52.5	49.8	4.1
	Textiles	30.4	42.2	4.6	25.1	41.5	1.9
	Non-metallic minerals	27.5	32.3	3.7	19.2	41.8	2.2
	Machinery & equipment	27.3	55.9	19.3	18.5	55.9	15.9
	Metals & metal products	37.1	54.8	9.4	35.3	49.4	12.3
	Pharmaceuticals	1.0	0.5	2.2	0.3	0.1	6.3
	Rubber & plastic	17.1	46.6	6.3	14.6	44.6	7.0
	Total	*23.6*	*31.0*	*61.0*	*18.1*	*25.4*	*58.0*
Relative under-specialization	Paper & paper products & printing	12.4	43.7	2.7	12.9	48.4	2.5
	Computer, electronic & optical products	25.2	18.7	1.7	36.3	15.1	2.3
	Electrical equipment	48.2	62.1	7.1	44.0	64.5	6.2
	Chemicals	13.0	18.7	5.7	7.8	14.3	6.9
	Wood & wood products (excl. furniture)	44.7	77.9	0.6	37.7	83.8	0.5
	Agric. products, food, beverages & tobacco	4.3	13.8	8.5	3.4	14.8	11.5
	Motor vehicles, trailers & semi-trailers	5.4	69.1	11.6	2.7	65.9	10.9
	Other transport equipment	5.9	13.7	1.1	10.2	19.3	1.2
	Total	6.3	*16.8*	*39.0*	5.4	*16.0*	*42.0*
Total		*29.9*	*47.8*	*100.0*	*23.6*	*41.5*	*100.0*

Source: authors' calculations on CEPII-BACI data.

Notes: A given sector is included in the "relative specialization (under-specialization)" if its weight in the reporting country's exports to euro-area (EA) destinations in 1999 was larger (smaller) than the corresponding average weight across the other three main euro-area countries in the same year. Sectors are then ranked in descending order of relative specialization. Cells highlighted in red flag sectors with an exposure to high competition from China and from the CEE6 (as defined in the previous section) that is above the median in a given year.

Focusing on competitive pressures from China, the decrease between 1999 and 2017 was rather widespread and significant across sectors, with the exception of wearing apparel and especially leather, in which Italy was still relatively specialised at the end of the period, and of computer, electronic and optical equipment, together with "other transport equipment", whose weight in total exports was however small (Tab. 3 and Fig. B3 in Annex B, left-hand side chart).[21] Machinery and equipment,

[21] At the other extreme, by 2017 the share of low-competition products had increased in most sectors with respect to 1999, in particular in the chemical industry (Fig. B3 in Annex B, right-hand side chart).

historically the largest sector in Italy export-wise, was amongst those that recorded the most pronounced contraction in the share of high-competition goods.

In the case of the CEE6, the decline in the degree of competitive pressures faced by Italy was also quite widespread across the sectors of relative specialisation but large only in some key industries (leather and furniture), and included wearing apparel, differently to the Chinese case (Fig. B5 in Annex B). It is noteworthy that the share of high competition products substantially increased in the non-metallic mineral industry, a sector of relative specialisation, as well as in "other transport equipment".

In the international comparison, in 1999 Germany, France and Spain were significantly less penalised by pressures stemming from China than Italy, as their shares of high-competition products in the sectors of their relative specialisation were much lower (15, 7 and 3 per cent, respectively; Table B2 in Annex B). By 2017 these shares had mildly shrunk, yet they remained significantly lower than for Italy.

In contrast, competition from the CEE6 not only hit the sectors in which Italy was relatively specialised, but also those in which the other three countries were specialised (Table B2 in Annex B). Indeed, the shares of German and Spanish exports exposed to high competition from the CEE6 in 1999 stood at 43 and 29 per cent, respectively; France stands out as an outlier, with a share of only 18 per cent. By 2017 the shares had fallen by 3 to 4 percentage points, therefore less than for Italy.

For all four countries these CEE6 figures are significantly higher than those related to China. The "export similarity index" displayed in Figure B1 in Annex B (right-hand side chart) confirms the greater overlap of the euro-area countries' products with those of the CEE6 relative to China, as well as the larger assonance, amongst the four countries, between Germany's exports and those of the CEE6.[22]

Following this heterogeneous evidence across the four countries, as an attempt to quantify the extent to which Italy, due to its initial unfavourable export specialization, was relatively penalised by the two shocks discussed so far, counterfactual exercises can provide some useful insights.

We first assume that Italy's export composition by intensity of competition from China in 1999 was equal to the average of the other three countries' in the same year, whereas the decline until 2017 in Italy's share in each product segment was the same as that actually observed. Under this scenario, the percentage loss of Italy's overall share in the euro-area market would have been 4 percentage points smaller than the actual decrease (i.e. 21 cent rather than 25 per cent). The growth gap between Italy's and Germany's euro-area export shares, which stood at around 17 percentage points, would have thus narrowed by nearly one quarter, to 13 points; the gap with respect to Spain would have also been reduced by about 17 per cent (i.e. from the actual 23 to 19). Broadly comparable figures are obtained if the analysis is restrained to the 1999-2007 period, suggesting that these were the years in which the shock mattered most in terms of curbing Italy's performance relative to Germany and to Spain.

[22] Although the export similarity index is based on very disaggregated data, it is possible that the result for Germany, instead of suggesting a crowding-out effect of the CEE6 exports, may be due to a growing specialization of these economies in the same productions, due to their participation in common, regional value chains. This aspect will be examined in Section 5.

In the same vein, we next assume that the export composition of Italy by intensity of competition from the CEE6 was equal in 1999 to that of the average of France, Germany and Spain, and that the 1999-2017 decline in Italy's share by product group was that actually observed. Under these assumptions, the CEE6 shock would have explained only 1 per cent of Italy's export share growth differential in the euro-area market relative to Germany and even slightly less relative to Spain.[23]

To sum up, Italy's sectoral specialization in 1999 appears to have hampered its subsequent export performance in the euro-area market, yet mostly due to its overlap with Chinese productions; this fact, however, would account for around one-fourth of Italy's more pronounced euro-area market-share decline relative to Germany's (and slightly less relative to Spain's). Conversely, Italy's initial export mix does not appear to explain the country's sharper drop relative to Germany and Spain in conjunction with the emergence of CEE6 exports.

4.3 An econometric analysis

These back-of-the-envelope results need to be empirically tested within a more comprehensive framework that takes into account a variety of other factors, including the price-competitiveness developments described in Section 3. We therefore carry out an econometric exercise aimed at quantifying the effect that the increasing relevance of China and the CEE6 countries in international trade, together with price-competitiveness dynamics, exerted in shaping goods exports growth of Germany, France, Italy and Spain to euro-area destinations. Through this exercise we investigate any differences across the four countries, across sectors and over time.

Adopting a macroeconomic bilateral trade framework in the spirit of Chen, Milesi-Ferretti and Tressel (2013), we estimate a standard first-differenced export equation *à la* Goldstein and Kahn (1985), in which changes in the volume of exports depend on changes in price competitiveness and in foreign demand. We augment it with a measure of competitive pressures stemming from China and the CEE6, as our earlier descriptive evidence suggest that these should help explain the heterogeneous export performance of the four euro-area countries.

The augmented baseline regression has the following specification, where all variables are expressed in log-differences and in real terms (details on the construction of the variables and underlying data sources are provided in Annex C): [24]

$$\Delta exp_{ijst} = \beta_0 + \beta_1 \Delta pricecomp_{ijt-1} + \beta_2 \Delta impdemand_{jt} + \beta_3 CHINA\_CEE6 expsh_{st-1} + FE + \varepsilon_{ijst} \quad (1)$$

[23] As a robustness exercise, Table B3 in Annex B shows the results of counterfactual scenarios based on a series of different assumptions. The effects of the two shocks (significant in the case of China, negligible in the case of CEE countries) on Italy's comparative export performance are broadly confirmed.

[24] Chen, Milesi and Ferretti (2013) consider gravity-style level regressions, whereas we analyse dynamics. In our view, the main issues with considering regressions in levels in this context is that: a) PCIs are based on price indices, which do not contain cross-sectional information on price levels although country fixed effects generally correct for this), and, more importantly, b) some of the explanatory variables are non-stationary, and therefore panel cointegration tools, not standard OLS, should be employed in the analysis. The log-differences of our variables are instead stationary, and the corresponding coefficients can be conveniently considered as elasticities.

The dependent variable is the log-change in the volume of bilateral exports of manufactured goods of each of the four reporting countries *i* (France, Germany, Italy and Spain) to their euro-area trading partners (*j*), broken down by 13 NACE Rev.1 manufacturing branches (*s*) in year *t*. We exclude Slovakia amongst the euro-area trading partners, due to its ambiguous nature of also being included in the CEE6 block. Consistently with the descriptive analysis in the previous sections, we also exclude energy products. Moving to trade volumes – which entails deflating export value data employed thus far with sectoral export price data – necessarily shortens our sample period to the years 2000-2017, but we regard it as a methodological improvement relative to previous studies that employ exports at current prices (for instance, Bugamelli et al., 2018), especially when it comes to evaluating the link between foreign sales and price competitiveness.[25]

Amongst the explanatory variables, in the vein of Flam and Nordström (2006), we include a measure that captures price-competitiveness pressures for reporter *i* in destination market *j* stemming from all competitors in that market, including local producers, once all prices are expressed in the currency of country *j*, at time *t* ($pricecomp_{ijt}$). This price-competitiveness measure is included in equation (1) with a one-year lag, as is standard in export regressions (see, for example, Bugamelli et al., 2018). A decrease in this variable, which implies a reduction in the relative price of reporter *i* against its competitors in market *j*, is expected to be positively correlated with its exports, i.e. the expected sign of the coefficient attached to this variable is negative. This measure is defined at the country level, with no sectoral breakdown, due to data availability.[26] Bugamelli et al. (2018) anyhow show that at least for the four main euro-area countries under study herein the explanatory power of total-economy REERs is not significantly different to that of sectoral rates, provided appropriate fixed effects are taken into account.

The variable $impdemand_{jt}$ is the log of real import demand of trading partner *j* at time *t*, given by the sum of domestic demand and exports. Relative to the analyses in Chen, Milesi-Ferretti and Tressel (2013), which only includes domestic demand, and to Auer and Sauré (2011), which employs GDP, in our view ours is a more appropriate measure of import demand and therefore of an "activator" of countries' exports, since foreign sales typically are, together with investment, the most import-intensive component of expenditure (and the more so, the higher the international fragmentation, as GVCs expand; see also, Bussière at al., 2013 and Giordano and Zollino, 2016). The expected sign of the coefficient attached to this variable is positive.

To assess the effect of Chinese and CEE6 exports on the four main euro-area countries' foreign sales, among the explanatory variables we also include China's and the CEE6's export share in the euro-area market by sector. We first consider the joint share of both economies ($CHINA\_CEE6expsh_{st}$),

[25] A deterioration in price competitiveness, due for instance to a rise in domestic prices *ceteris paribus*, supposedly lowers the export volume (quantity effect), but increases the export value via higher export prices (price effect). Since the quantity and price effects pull in different directions, the relationship between nominal exports and price competitiveness is not clear-cut, and depends on the degree of price elasticity of export demand. This plausibly helps explain the weak relationship between nominal exports and price-competitiveness indicators found in Bugamelli et al. (2018) and other studies using current prices.

[26] To our knowledge, sectoral real exchange rates are readily available only in Sato et al. (2015), yet only for a limited number of economies (25), amongst various other shortcomings for this analysis.

and, as a second step, the two shares separately (*CHINAexpsh*$_{st}$ and *CEE6expsh*$_{st}$). Export displacement occurs when the corresponding coefficient is statistically significant and negative; conversely, if the latter is significant and positive, complementarities are at play. The measures are included with a one-period lag to reduce a potential endogeneity bias, to which we will return later.

Regressions include a full set of reporting country, sector-time and partner-sector fixed effects, with sectors defined as macro-sectors in terms of their technological intensity so as not to fully overlap with the sectoral dimension of the emerging economies' export shares.[27] These dummies account, respectively, for single reporting country export trends, for time-varying common sectoral episodes, such as technological shocks, and for sectoral trends that are particular to the single (euro-area) trading partner. Including the latter is important since the variable measuring partner import demand is not defined at the sector level.[28] Estimates are run using standard Ordinary Least Squares (OLS) with robust standard errors clustered at the reporter-partner-sector level and are shown in Table 4.

Column (1) reports estimates of a standard export equation, which only includes partners' import demand and price competitiveness. Indeed, on average for the four countries intra-euro area export dynamics reacted significantly, negatively and with a lag to price-competitiveness developments and significantly and positively to changes in intra-euro area import demand. Column (2) breaks down the price-competitiveness measure into its two components (the nominal PCI, $NEER_{it}$, and relative producer prices, $relp_{ijt}$), showing that both nominal movements and changes in relative prices significantly affected, on average, the four countries' foreign sales.

Price competitiveness is then interacted with country dummies in column (3) to assess any heterogeneity in the corresponding elasticities. The results indicate that it is actually only Italian intra-euro area exports that appear to have been affected by price-competitiveness developments, consistently with the Spanish and French "puzzles" discussed in Section 3. A Wald test of the hypothesis that the four reporting country interaction terms are all equal cannot be rejected, owing to the fact that three out of four are not statistically different from zero.

Throughout the regressions the four countries' intra-area exports are found to have grown less than one-to-one with import demand, confirming the observed decline in export shares in the euro-area market; indeed, Wald tests reject the hypothesis $\beta_2 = 1$ at standard confidence levels (results available upon request). Moreover, the estimated reporter fixed effects show that France and Italy systematically displayed lower export growth relative to Germany on average.

Results shown in columns (4) to (8) refer to the augmented specification (1). They confirm that the higher the joint share of exports of China and of the CEE6 in a given sector, the lower the growth rate of intra-area export volumes of the four economies on average, pointing thereby to a statistically significant general displacement effect (col. 4). Exploring country heterogeneity, we find that the intensity of this effect is (significantly) the highest for Italy (col. 5). Moreover, although the strength of displacement appears to have subsided since 2010 for all four economies, it is still notable for Italy

[27] The classification used is that of Eurostat, discussed in footnote 16.

[28] Time-invariant gravity-style (dyadic) variables, such as geographical distance, border contiguity and language similarity drop out when first differences are taken.

(col. 6), thereby representing an ongoing challenge for this (and apparently only this) country. Interestingly, when the joint China and CEE6 share is allowed to have heterogeneous effects across reporters, Italy's country dummy becomes slightly positive (cols. 5 and 6); the augmented regression thereby suggests an explanation of Italy's less favourable intra euro-area export developments relative to its peers, a trend which is otherwise absorbed by the reporting country's fixed effect.

In columns (7) and (8) the competitive pressures exerted by China and the CEE6 are considered separately. Despite both being negative, the displacement effect of CEE6 penetration was, on average for the four countries, significantly more intense than that of China's (col. 7 and corresponding Wald test). When reporting-country differences in the coefficients are allowed, the results indicate that, whereas pressures stemming from the CEE6 affected all four countries (col. 8), albeit with a statistically significant larger coefficient for Italy and Spain, those arising from China had a significantly negative impact only on Italy's export growth.[29]

An alternative way to assess the displacement effect would be to use, in the place of market shares, the volume of Chinese and CEE6 exports to the euro area, as in Chen, Milesi-Ferretti and Tressel (2013). However, this indicator would have given rise to a severe endogeneity bias due to the fact that both the reporting countries' exports and the emerging economies' exports could have been driven by unobservable factors, such as an increase in world trade openness (see, for example, Eichengreen, Yeongseop and Tong, 2004 and Giovannetti, Sanfilippo and Velucchi, 2011 for a discussion of this issue).

Our measures are less subject to this endogeneity bias, even more so as they are taken with a one-year lag. However, in order to control for reverse causality, related to the potential correlation between the euro-area share of China's and CEE6 exports and the export patterns of the four main euro-area countries, we replicate the regression corresponding to column 5 of Table 5 by considering an alternative measure of competitive pressures, that is, the sectoral euro-area market share of the two economies in the initial year of the sample period (2000), which is quite a standard strategy (see, for example, Bloom, Draca and Van Reenen, 2016).

In addition, in the spirit of Autor, Dorn and Hansen (2013), we run a two-stage least square (2SLS) estimation instrumenting the euro-area market shares of China and CEE6 with the corresponding shares in non-euro area markets. These robustness exercises, presented in Table 5, confirm the results depicted thus far.

[29] The results hold also when including reporter-partner fixed effects (results available upon request), although these do not improve the fit of the model.

Table 4 - China's and CEE6 export displacement in the euro-area market (2000-2017)

(dependent variable: log-change of real goods exports of the four main euro-area economies to euro-area destinations)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lag Δpricecomp	-0.204*							
	(0.108)							
lag ΔNEER		-0.202*						
		(0.109)						
lag Δrelp		-0.197*						
		(0.109)						
*lag Δpricecomp*GER*			-0.083	-0.084	-0.078	-0.04	-0.085	-0.075
			(0.126)	(0.126)	(0.126)	(0.124)	(0.126)	(0.126)
*lag Δpricecomp*SPA*			-0.205	-0.194	-0.192	-0.066	-0.189	-0.192
			(0.200)	(0.200)	(0.198)	(0.206)	(0.199)	(0.199)
*lag Δpricecomp*FRA*			-0.144	-0.156	-0.146	-0.135	-0.165	-0.161
			(0.177)	(0.177)	(0.176)	(0.177)	(0.178)	(0.176)
*lag Δpricecomp*ITA*			-0.499*	-0.495*	-0.545**	-0.497*	-0.494*	-0.547**
			(0.268)	(0.267)	(0.266)	(0.265)	(0.267)	(0.266)
Δimpdemand	0.870***	0.866***	0.870***	0.871***	0.872***	0.873***	0.872***	0.873***
	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)
lag CHINA_CEEexpsh				-0.079***				
				(0.015)				
*lag CHINA_CEEexpsh*GER*					-0.044**	-0.102***		
					(0.019)	(0.038)		
*lag CHINA_CEEexpsh*SPA*					-0.075***	-0.210***		
					(0.025)	(0.036)		
*lag CHINA_CEEexpsh*FRA*					-0.029	-0.151***		
					(0.035)	(0.045)		
*lag CHINA_CEEexpsh*ITA*					-0.160***	-0.266***		
					(0.018)	(0.028)		
*lag CHINA_CEEexpsh*GER*post2009*						0.110***		
						(0.040)		
*lag CHINA_CEEexpsh*SPA*post2009*						0.212***		
						(0.038)		
*lag CHINA_CEEexpsh*FRA*post2009*						0.181***		
						(0.048)		
*lag CHINA_CEEexpsh*ITA*post2009*						0.176***		
						(0.037)		
lag CHINAexpsh							-0.035*	
							(0.021)	
lag CEEexpsh							-0.257***	
							(0.041)	
*lag CHINAexpsh*GER*								0.01
								(0.028)
*lag CHINAexpsh*SPA*								-0.014
								(0.031)
*lag CHINAexpsh*FRA*								-0.004
								(0.050)
*lag CHINAexpsh*ITA*								-0.125***
								(0.026)
*lag CEEexpsh*GER*								-0.253***
								(0.058)
*lag CEEexpsh*SPA*								-0.318***
								(0.078)
*lag CEEexpsh*FRA*								-0.134*
								(0.075)
*lag CEEexpsh*ITA*								-0.301***
								(0.063)
Dummy Spain	0.001	0.001	0.000	0.000	0.005	0.008	0.000	0.007
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.003)	(0.008)
Dummy France	-0.011***	-0.011***	-0.010***	-0.011***	-0.014*	-0.012	-0.012***	-0.021***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.007)	(0.004)	(0.008)
Dummy Italy	-0.010***	-0.010***	-0.010***	-0.010***	0.010**	0.011**	-0.010***	0.006
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)	(0.007)
constant	-0.160***	-0.159***	-0.158***	-0.147***	-0.152***	-0.138***	-0.134***	-0.137***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)	(0.029)	(0.030)
Reporter fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Time-sector fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Partner-sector fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Adj. R squared	0.209	0.21	0.21	0.212	0.213	0.216	0.213	0.214
N	11,254	11,254	11,254	11,254	11,254	11,254	11,254	11,254
Wald test on equality of 4 country coefficients (1)			0.492		0.000	0.001		0.219/0.001
Wald test on equality of IT and DE coefficients (1)			0.129		0.000	0.000		0.550/0.000
Wald test on equality of China and CEE6 shock (1)							0.000	

Source: authors' estimations.

Notes: Fixed-effects OLS estimates. Robust clustered standard errors in brackets.* p<0.10, ** p<0.05,*** p<0.01. (1) Wald test p-values; in column 8 the first p-value refers to the country-specific China effect, the second to the country-specific CEE6 effect.

Table 5 - Robustness: China's and CEE6 export displacement in the euro-area market (2000-2017)
(dependent variable: log-change of real goods exports of the four main euro-area economies to euro-area destinations)

	OLS CHINA_CEE share in 2000	2SLS instrument=extra-euro area CHINA_CEE share
	(1)	(3)
*lag Δpricecomp*GER*	-0.084	-0.078
	(0.126)	(0.125)
*lag Δpricecomp*SPA*	-0.193	-0.192
	(0.200)	(0.197)
*lag Δpricecomp*FRA*	-0.151	-0.141
	(0.176)	(0.174)
*lag Δpricecomp*ITA*	-0.498*	-0.547**
	(0.267)	(0.263)
Δ_impdemand	0.872***	0.872***
	(0.059)	(0.058)
*lag CHINA_CEEexpsh*GER*		-0.041*
		(0.025)
*lag CHINA_CEEexpsh*SPA*		-0.067***
		(0.025)
*lag CHINA_CEEexpsh*FRA*		-0.01
		(0.041)
*lag CHINA_CEEexpsh*ITA*		-0.158***
		(0.020)
*CHINA_CEEexpsh_2000*GER*	-0.039	
	(0.036)	
*CHINA_CEEexpsh_2000*SPA*	-0.134***	
	(0.033)	
*CHINA_CEEexpsh_2000*FRA*	-0.051	
	(0.061)	
*CHINA_CEEexpsh_2000*ITA*	-0.248***	
	(0.023)	
Dummy Spain	0.010*	0.005
	(0.005)	(0.006)
Dummy France	-0.01	-0.017**
	(0.007)	(0.009)
Dummy Italy	0.012**	0.010*
	(0.005)	(0.006)
constant	-0.158***	0.057***
	(0.030)	(0.014)
Reporter fixed effects	YES	
Time-sector fixed effects	YES	
Partner-sector fixed effects	YES	
Adj. R squared	0.219	0.213
A-R Wald test F (first stage)		17.06
N	10,636	11,254

Source: authors' estimations.
Notes: Fixed-effects OLS estimates and 2SLS. Robust clustered standard errors in brackets.* p<0.10, ** p<0.05,*** p<0.01.

To sum up, all other things equal, Italy's euro-area export dynamics were more strongly affected by price-competitiveness dynamics than the other three countries. Although this result implies that Italy suffered from its deteriorating price competitiveness in the years prior to the eruption of the global financial crisis, it also meant that the country gained from its post-2010 improvement. Both China's and CEE6 countries' exports have displaced the four main euro-area economies' foreign sales over the 2000-2017 period. Of the two shocks, export displacement by the CEE6 was on average larger than that by China. But whereas the former hit all four countries under study, the drag arising from China's increasing presence in the euro-area market affected only Italy's performance significantly, hence corroborating the descriptive evidence presented in the previous sub-sections. In other terms, whereas

product competition from the CEE6 contributes to significantly explain Italy's unfavourable intra-euro area export performance in absolute terms, it is Chinese import penetration in the euro-area market that helps explain Italy's underperformance relative to Germany and Spain. Finally, although the joint crowding-out effect of China's and the CEE6's exports has waned since 2010 for all four countries, this attenuation has been less intense for Italy, implying an ongoing challenge, especially in relative terms.

5. China and the CEE6: from export displacers to export activators

The assessment of the export displacement exerted by China and the CEE6 in the euro-area market conducted in the previous section does not fully answer the question of which of the four main euro-area countries' export performance has been impacted the most by the rapid expansion of these low-wage economies. The reason is rooted in the latter countries' increasing demand for imports – also related to their participation in international value chains – which may have (at least partly) "compensated" the intra-euro area export loss of France, Germany, Italy and Spain. Indeed, the gain in euro-area area market shares by China and the CEE6 came hand in hand with a rapid expansion of their economic activity, of their internal demand and of their exports worldwide (so, also to destinations *outside* the euro area). These developments jointly boosted direct or indirect exports of the four main euro-area countries to China and the CEE6 (here labelled "activation effect"), for intermediate and final uses.[30]

5.1 Export performance in the Chinese and CEE6 markets

We start with an analysis of the four main euro-area countries' exports to China and to the CEE6 based on trade statistics. These data are not suited for fully gauging the activation effect, as they only capture direct trade flows, hence disregarding all the indirect transactions connected with the international fragmentation of production, but are however informative as an initial descriptive step.

At the beginning of the second millennium Germany was by far the main goods exporter to China and to the CEE6 amongst the four main euro-area economies: its market share stood, respectively, at about 6 and 33 per cent, in the latter case more than twice as large as that of Italy, France and Spain considered jointly (Fig. 9).

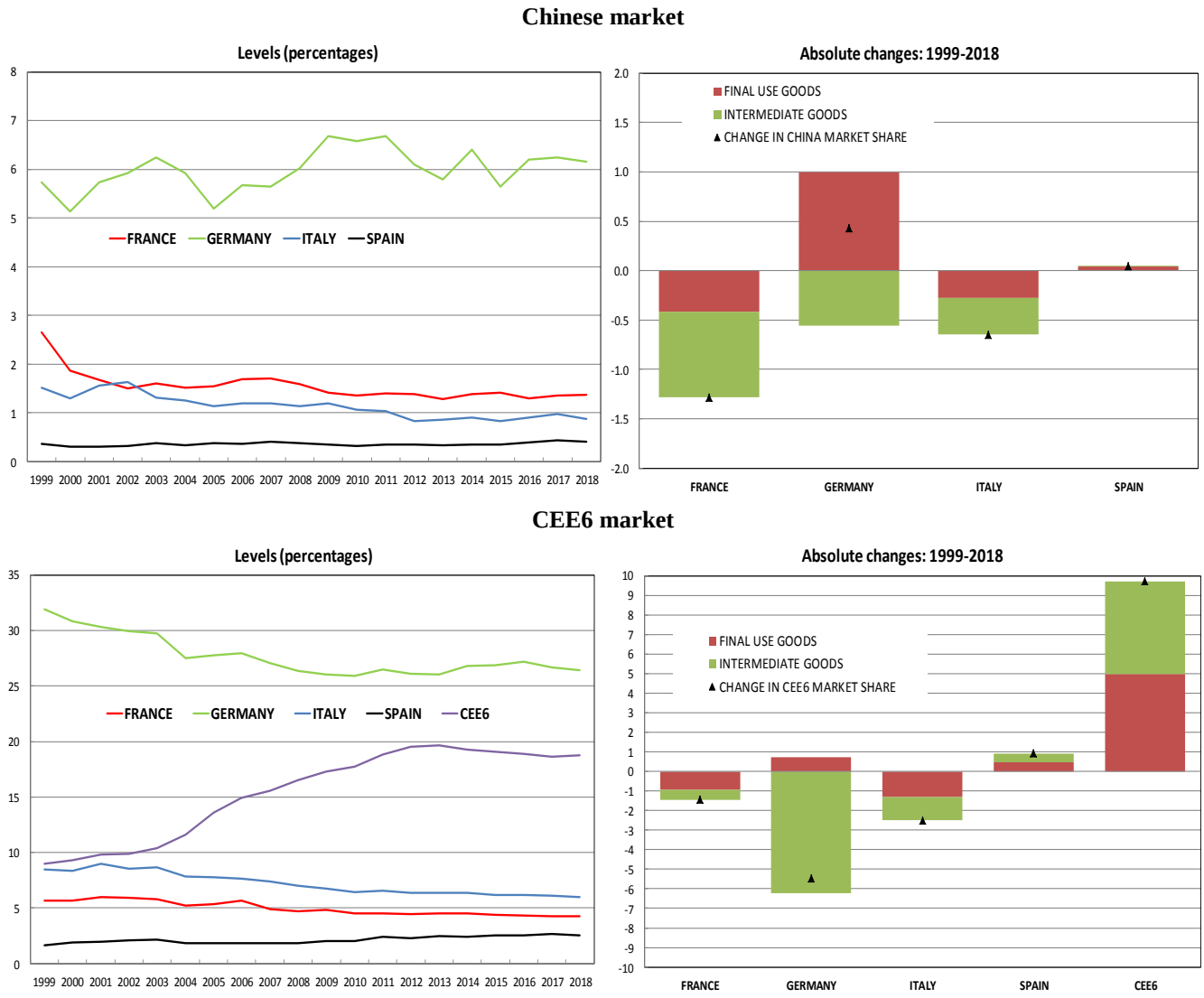
The expansion of the CEE6 manufacturing capacity that followed their integration into the EU, documented in Box A, developed hand in hand with the growth of trade flows among themselves, and was mirrored by a decline in the shares of France, Italy and Germany on their total imports. Spain is an exception, in that its share in the CEE6 market increased, although starting from (and remaining at) very low levels. In the case of France and Italy the reduction was driven mainly by the final-use component, while in Germany it was concentrated in the intermediate input category. Despite its

[30] These flows can thus be interpreted as a form of "compensation" that the four main euro-area countries received from the economic development of China and the CEE6. Clearly, we are somehow overestimating this "compensation", since this broad perspective overlaps in part with our previous analysis. For instance, direct exports from Germany to China that require intermediate inputs from Italy entail Italian exports to Germany that we have already considered, conceptually, as intra-euro area flows.

decline, Germany's export share remained very high in comparative terms throughout the two decades: in 2018 it was about 27 per cent, against around 6 per cent for Italy, approximately 4 for France and under 3 for Spain. Net of intra-CEE6 trade, Germany still accounts for more than one-third of CEE6 imports.

Figure 9 - Export shares in the Chinese and in the CEE6 markets

(goods excluding energy; current prices and exchange rates)

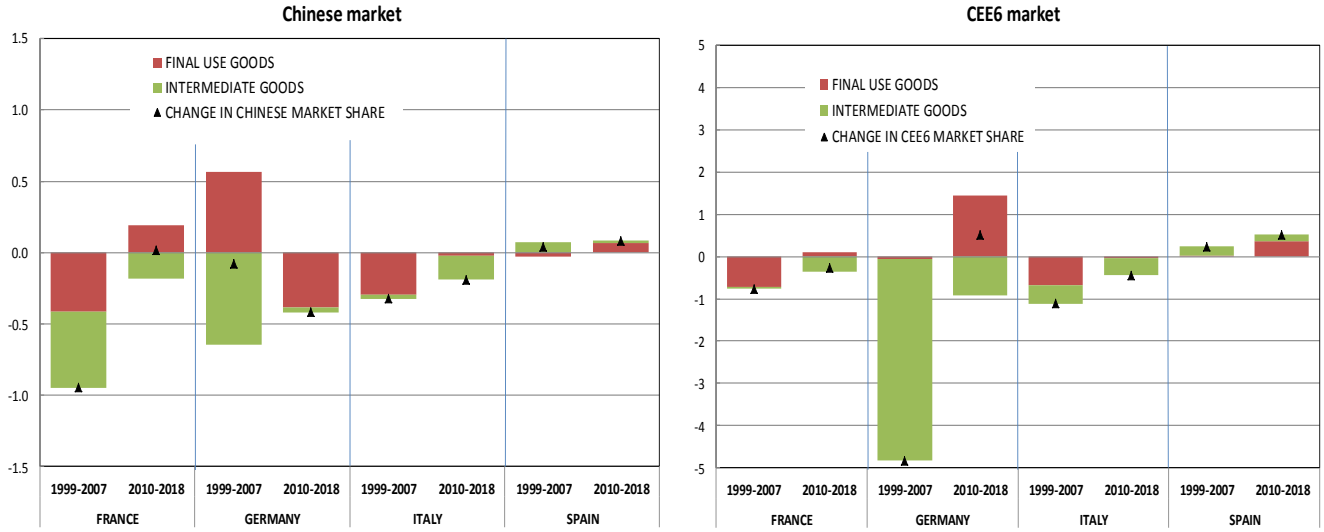


Source: authors' calculations on Eurostat IMTS data and IMF-WEO data.

The predominance of Germany persisted also in the Chinese market, where the country's export share even posted an overall mild increase (due to final-use goods), against the significant drop recorded by France and Italy, which was concentrated especially in the pre-crisis period (Fig. 10). At the end of 2018 the share of China's imports originating from Germany was twice as large as that of the other three countries taken together.

Figure 10 - Export shares in the Chinese and in the CEE6 markets by sub-period

(absolute changes; goods excluding energy; current prices and exchange rates)



Source: authors' calculations on Eurostat IMTS data and IMF-WEO data.

5.2 Quantifying the export activation effect via a GVC analysis

A complementary insight into these trade relationships can be attained through the use of the World Input-Output Database (WIOD), despite its shorter time horizon (from 2000 to 2014). The WIOD is indeed suited for a more accurate description of demand and GVC linkages among countries, and hence for capturing the above-mentioned direct and indirect export flows activated by the expansion of economic activity (both internal demand and exports) in China and in the CEE6. This objective can be achieved by implementing the Hypothetical Extraction approach of Los, Timmer and De Vries (2016),[31] which however requires that we here broaden our focus to exports of both goods and services.

According to our calculations, in 2014 internal demand and exports of China and of the CEE6 countries activated, respectively, as much as 9.6 and 10.9 per cent of overall German exports, up from 2.3 and 7.0 per cent in 2000 (Tab. 6, first and fourth rows). The corresponding shares for France, Italy and Spain are way lower, reaching in 2014 an average of 5.6 per cent in the case of China and of 5.9 per cent in the case of the CEE6.

A part of the whole activation effect consists of exports of intermediates used by China and the CEE6 to produce the goods exported back to the euro area itself. These flows can be either direct or indirect, in turn either through non-euro area countries or through euro-area third parties; they can somehow be interpreted as exports of France, Germany, Italy and Spain that, having been displaced in the euro-area market, were re-directed as a supply of intermediate inputs to China and the CEE6.[32] As to be expected due to their closer geographical proximity, this component is much more relevant in the

[31] See Annex D for details on the methodology.

[32] Our analysis in Section 4, centred on the euro-area market, considers only a small part of these intermediate exports, since it disregards direct exports to China and to the CEE6 by definition, as well as indirect exports through non-euro area third countries.

case of the CEE6. The productive systems of the latter region are strongly intertwined especially with Germany: in 2014 every euro of Germany's total exports to the euro-area market that was displaced by CEE6 exports in the same market can be estimated to have been "compensated" by almost 12 cents of German (direct and indirect) exports to the CEE6 (Tab. 6, last row).[33] The corresponding values for the other three countries are much smaller: around 2.5 cents for Italy, 2.3 for France and 1 for Spain. In terms of export levels, this effect was worth 2.5 per cent of Germany's overall exports in 2014 (up from 1.2 per cent in 2000; Tab. 6, fifth row). The corresponding figure for the other three countries was less than half in both years.

Table 6 - The activation of exports by internal demand and exports of China and of the CEE6 (1)
(percentages)

	France		Germany		Italy		Spain		weighted average of France, Italy and Spain	
	2000	2014	2000	2014	2000	2014	2000	2014	2000	2014
direct and indirect exports to China activated by internal demand and exports of China										
as a % of each euro-area country total exports	2.2	6.5	2.3	9.6	1.6	5.5	1.0	4.1	1.8	5.6
***of which*: direct and indirect exports to China activated by exports of China to the euro area**										
as a % of each euro-area country total exports	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
as a % of China's exports to the euro area	0.5	0.3	0.8	0.9	0.3	0.2	0.1	0.1	0.3	0.2
direct and indirect exports to the CEE6 activated by internal demand and exports of the CEE6										
as a % of each euro-area country total exports	3.1	5.2	7.0	10.9	4.4	7.6	2.5	4.9	3.4	5.9
***of which*: direct and indirect exports to the CEE6 activated by exports of the CEE6 to the euro area**										
as a % of each euro-area country total exports	0.4	1.1	1.2	2.5	0.6	1.5	0.3	0.9	0.5	1.2
as a % of CEE6 exports to the euro area	2.2	2.3	10.7	11.8	2.5	2.5	0.7	1.0	1.8	2.0

Source: authors' elaborations on WIOD at current prices and exchange rates.
Notes: (1) All goods and services are considered. See Annex D for the definition of a country's exports being activated by another country. Weighted averages in the last column are based on countries' exports.

5.3 An econometric assessment of the export activation effect

We now address the magnitude of the activation effect, and its cross-country differences, econometrically via panel regressions on bilateral real exports of the four euro-area countries. We estimate the following equation, based on the same CEPII data exploited in Section 4.4 and therefore returning to the analysis of only merchandise exports:

[33] These flows include direct exports to the CEE6 and indirect exports to the CEE6 via third-countries outside the euro area (indirect exports via third-countries within the euro area are already accounted for as German exports to the euro-area market). More precisely, in 2014 the foreign-input requirements of the CEE6 economies where such that for them to ship exports worth one euro to the euro-area market it was "necessary" for Germany to export 10.9 cents of intermediate inputs.

$$\Delta exp_{ijst} = \beta_0 + \beta_1 \Delta pricecomp_{ijt} + \beta_2 \Delta impdemand_{jt} + \beta_3 \Delta CHINAimpdemand_t + \beta_4 \Delta CEEimpdemand_t + FE + \varepsilon_{ijst} \quad (2)$$

where the overlapping variables are defined as in equation (1) and $\Delta CHINAimpdemand_t$ and $\Delta CEEimpdemand_t$ are the interaction between the (log) change in real import demand (the sum of domestic demand and exports) and, respectively, China and CEE6 country dummies. The latter are indeed aimed a gauging whether the activation of the four euro-area countries' exports on behalf of these emerging economies was any stronger than the average of all trading partners. Equation (2) is thus estimated for all 60 partners *j*, differently from the exercise conducted in Section 4.4 which was only focused on euro-area counterparts. Regressions also include a full set of reporting country and sector-time fixed effects. Standard errors are clustered at the reporter-partner-sector level.

The estimation results presented in column 2 of Table 7 – as well as again confirming the role of standard export determinants reported as a benchmark in column 1 – suggest that only demand growth in the CEE6 has on average boosted the exports of France, Germany, Italy and Spain significantly and more intensely than that of other trading partners. The corresponding Wald test, however, is not as clear-cut, possibly reflecting heterogeneity amongst reporting countries.

Indeed, interacting the variables of interest ($\Delta CHINAimpdemand_t$ and $\Delta CEEimpdemand_t$) with the four country dummies (col. 3), it becomes clear that it is Germany which has benefitted the most from the expansion of economic activity in China and the CEE6, followed by Italy, with a lower (yet statistically significant) coefficient. Elasticities referred to China are however lower compared to the CEE6 case.[34]

To briefly sum up the descriptive and econometric evidence discussed in this section, Germany's exports appear to have gained the most from the demand boost stemming from the increase of China's and the CEE6's economic activity. Its overall advantage was amplified by the fact that the country was more strongly integrated with both China and the CEE6 already in 1999, and therefore profited from a solid head-start in level terms relative to its three euro-area peers, also thanks, in the case of the CEE6, to its more favourable geographical position.

[34] These results hold also when allowing the effect of price competitiveness to differ across the four reporting countries.

Table 7 - Bilateral export regressions: export activation by China and the CEE6 (2000-2016)

(dependent variable: log-change of real goods exports of the four main euro-area economies)

	(1)	(2)	(3)
lag Δpricecomp	-0.201***	-0.195***	-0.194***
	(0.027)	(0.027)	(0.027)
Δ_impdemand	0.966***	0.934***	0.934***
	(0.032)	(0.035)	(0.035)
Δ_CHINAimpdemand		0.095	
		(0.061)	
Δ_CEEimpdemand		0.197***	
		(0.046)	
*Δ_CHINAimpdemand*GER*			0.189**
			(0.074)
*Δ_CHINAimpdemand*SPA*			-0.07
			(0.091)
*Δ_CHINAimpdemand*FRA*			0.207
			(0.185)
*Δ_CHINAimpdemand*ITA*			0.085**
			(0.039)
*Δ_CEEimpdemand*GER*			0.417***
			(0.061)
*Δ_CEEimpdemand*SPA*			-0.014
			(0.092)
*Δ_CEEimpdemand*FRA*			0.11
			(0.084)
*Δ_CEEimpdemand*ITA*			0.238***
			(0.083)
Dummy Spain	0.000	0.000	0.003
	(0.002)	(0.002)	(0.002)
Dummy France	-0.011***	-0.011***	-0.010***
	(0.002)	(0.002)	(0.002)
Dummy Italy	-0.004*	-0.004*	-0.003
	(0.002)	(0.002)	(0.002)
constant	-0.023*	-0.023*	-0.024**
	(0.012)	(0.012)	(0.012)
Reporter fixed effects	YES	YES	YES
Time-sector fixed effects	YES	YES	YES
Adj. R squared	0.162	0.163	0.163
N	41,210	41,210	41,210
Wald test on equality of China and CEE6 activation (1)		0.143	
Wald test on equality of 4 country coefficients (1)			0.123/0.000
Wald test on equality of IT and DE coefficients (1)			0.171/0.071

Source: authors' estimations.

Notes: Fixed-effects OLS estimates. Robust clustered standard errors in brackets.* p<0.10, ** p<0.05, *** p<0.01. (1) Wald test p-values. In column 3 the first p-value refers to the country-specific China activation effect, whereas the second refers to the country-specific CEE6 effect.

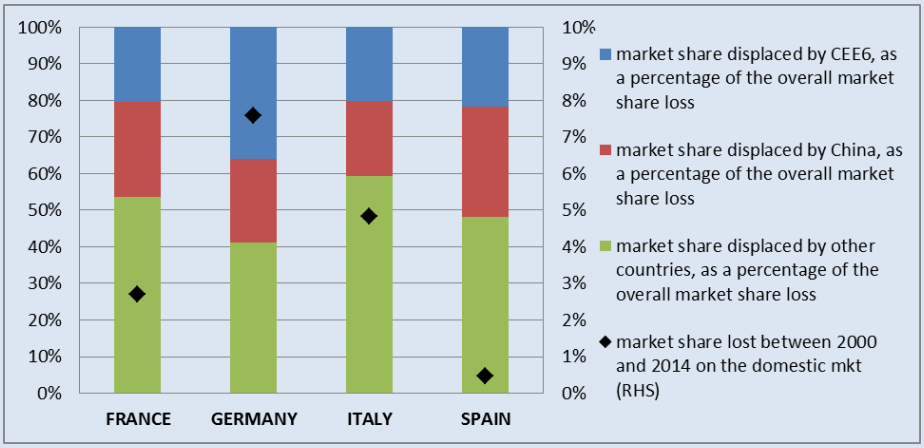
A final caveat that needs to be mentioned, although going beyond the focus of this paper, is that assessing the extent to which euro-area countries have been affected by the export growth of China and the CEE6 requires widening the perspective from the exporting sector to the entire productive system, which in turn calls also for an evaluation of the displacement effect on local producers in domestic markets. In this respect, Germany appears to be the country that was displaced the most in its domestic market, as Box B shows.

Box B. Emerging economies' export displacement in the domestic market of euro-area countries

As China and the CEE6 increased their weight in euro-area imports, they simultaneously displaced domestic production in euro-area countries' own markets. In the case of Germany, for example, in 2000 domestic production satisfied 72.3 per cent of the country's overall demand for final and intermediate goods;[1] this share was down to 64.7 per cent in 2014.

Separating the 44 countries included in WIOD between those which increased and those which decreased their export share in each euro-area domestic market between 2000 and 2014 and assuming that the first group proportionately displaced the second, it turns out that more than a third of the reduction in the German share on its own market is attributable to the CEE6 (Figure); the contribution of China, the second country in the ranking, was 23 per cent. The displacement exerted by the CEE6 in the domestic markets of France, Italy and Spain was much smaller (around one-fifth) and for France and Italy at least was similar to that exerted by China.

Figure - Displacement in domestic markets (1)
(percentages and percentage points)



Source: authors' calculations on WIOD at current prices and exchange rates.

(1) The bars in the graph show the percentage contributions of the CEE6, China and the residual "other countries" (including euro-area countries) to the market share loss of each of the four euro-area countries in its domestic market, indicated by a black diamond and reported on the right-hand-side scale.

[1] Our definition of "goods" here includes all productions of the industrial sector as well as the trading sector (both wholesale and retail), with the only exception of the sectors "mining and quarrying" and "refined petroleum products", so as to shield the analysis from the fluctuations in energy prices, similarly to the rest of this paper.

6. Conclusions

The decline in Italy's and France's goods export share in the euro-area market since the late Nineties has been particularly pronounced, differently to Germany and Spain. Over the same period, the export shares of both China and of Central and Eastern European countries (the "CEE6" block) in the euro-area market increased dramatically and European manufacturing production witnessed a significant eastward shift, with the CEE6 steadily increasing their weight.

In this paper we shed light on why Italy's intra euro-area export performance was so weak relative to its euro-area peers Germany and Spain. The focus is set on two potential broad determinants, namely price-competitiveness developments, on the one hand, and the appearance of the afore-mentioned low-wage economies in international trade, on the other hand. The contribution of this paper to the existing literature is at least two-fold, and concerns both aspects.

First, the literature on the drivers of euro-area trade flows has thus far exploited standard price-competitiveness indicators, constructed for a given euro-area country vis-à-vis only its euro-area trading partners. The problem with these analyses is that they erroneously relate exports to euro-area destinations with price-competitiveness developments in all world markets (vis-à-vis only euro-area trading partners), and not solely in the euro-area market (vis-à-vis all trading partners in the world). By exploiting a novel database published by Banca d'Italia (Felettigh and Giordano, 2018), in this paper we overcome this limitation, to our knowledge for the first time in the literature, and correctly assess developments in price competitiveness of the four main euro-area countries solely in the euro-area market, vis-à-vis all trading partners, emerging economies included.

Second, we contribute in filling up a significant gap in the recent literature. Whereas the growing competitive pressures from China, and their impact on various macroeconomic variables, have received significant attention, the consequences of the integration of the CEE6 into the EU have not been object of as many encompassing and quantitatively robust ex post analyses, especially with respect to Italy.

In particular, we consider the role of the new low-cost international competitors along two dimensions. The first is the export displacement effect, namely the increasing penetration of China's and CEE6 exports into the euro-area market. The second dimension is the extent to which these two economies activated the four euro-area countries' exports through their growing economic activity and integration into international production networks.

The main conclusion of the analysis is that the developments and/or the impact of these factors were, overall, heterogeneous across the four main euro-area countries, and largely damaging for Italy in particular.

Indeed, we find that Italy's exports were particularly penalised by the deterioration in its price-competitiveness dynamics in the euro-area market prior to the eruption of the global financial crisis, whereas Spain and France – which also recorded price-competitiveness losses – were broadly unaffected. Conversely, after 2010 the pick-up in Italy's price competitiveness sustained its export growth, leading to a moderate narrowing of the gap relative to Germany. Whereas China's price-competitiveness in the euro-area market has deteriorated in recent years, potentially giving Italian firms some respite, several CEE6 countries' significant gains pose an ongoing challenge to Italy's intra-euro-area export outlook.

Next, we find that there are both similarities and differences between the "China shock" and the "CEE6 shock" seen from an export crowding-out perspective. These economies' export penetration into the euro area was not too dissimilar in magnitude between 1999 and 2018; however, the increase was concentrated in the pre-crisis period and in the final consumption goods category in the case of

China, whereas it followed a continuous upward trend throughout the two decades and it involved intermediate and final goods to the same extent in the case of the CEE6.

Considering the similarity in the respective export specializations, at the end of the nineties Italy was relatively more exposed than the other three euro-area countries to competitive pressures from China, due to the high incidence of traditional final consumer goods in its export basket. Conversely, competition from the CEE6, which was on the whole significantly stronger than competition from China, not only hit the sectors in which Italy was relatively specialised, but also those in which the other three countries were specialised.

Estimates of bilateral country-sector real export equations confirm that, after controlling for price competitiveness, the penetration of China and the CEE6 in the euro-area market affected export growth in all the four economies significantly and negatively, thereby pointing to a significant export displacement effect. However, whereas pressures arising from China had a negative impact only on Italy's export growth, those stemming from the CEE6 affected all four countries, albeit with a slightly larger effect for Italy and Spain. Competition from these low-wage emerging economies was overall more tenuous in the post-2010 period, presumably showing that euro-area economies have learned to adjust to the new competitive environment; however, this attenuation was slighter for Italy, implying another ongoing challenge, especially relative to its euro-area peers.

Finally, we show that it is Germany's exports – despite having been displaced by the CEE6 to a significant extent – that have benefited the most from the increasing demand stemming from China and the CEE6, also thanks to the strong integration with them (especially the CEE6) in international production chains. Indeed, through the analysis of WIOD, we estimate that exports stimulated by China and the CEE6 account, jointly, for about one fifth of Germany's total exports (almost double than the corresponding figure for the average of Italy, France and Spain). Our econometric analysis then confirms that Germany's merchandise exports dynamics enjoyed the largest boost from the expansion of both the internal demand and exports of China and of the CEE6. This beneficial effect is amplified by the fact that Germany was more strongly integrated with these economies already in 1999 and therefore took advantage of a solid head-start in level terms relative to its three euro-area peers.

Annex A – Measuring price-competitiveness developments in the euro-area market

In addition to world-wide price-competitiveness indicators (PCIs), the set of measures, published by the Bank of Italy and described in Felettigh et al. (2016) and Felettigh and Giordano (2018), includes: a) indicators centred on subgroups of 60 main competitors, in particular to euro-area or non-euro area trading partners; and b) export-based measures in specific markets and, in particular, in the euro-area and non-euro area markets. By also considering competition in the domestic market between local producers and foreign exporters, world-wide PCIs of any given country can be conveniently broken down according to a three-market perspective (domestic; euro-area; non-euro area). In this paper we focus on the euro-area market dimension.

In the remainder of this section we provide the algebra, taken from Felettigh and Giordano (2018), which allows disentangling the latter dimension. The starting point is the nominal effective exchange rate (NEER), or nominal PCI for euro-area countries, which is calculated as the weighted geometric average of bilateral nominal exchange rates. The NEER of reporting country *i* is defined as:

$$NEER_i = \prod_{j=1}^{N} e_{ij}^{w_j^i} \qquad [A1]$$

where *N* denotes the number of trading partners (*N* = 61 in Bank of Italy's case, including the reporting country), e_{ij} stands for the index of the nominal bilateral exchange rate between country *i* and country *j* (expressed in terms of *j*'s currency per unit of *i*'s currency, so that an increase indicates a loss of price competitiveness for *i*), and w_j^i indicates the overall weight of competitor *j* for the reference country *i*.

In computing the NEER for country *i*, the overall weight w_j^i of each competitor *j* in the group of *N* trading partners is equal to the weighted average of export (w_j^i) and import weights (w_j^i):

$$w_j^i = \alpha_i w_j^i + (1 - \alpha_i)\, w_j^i \qquad [A2]$$

where $\alpha_i = \frac{X_i}{X_i + M_i}$ is the share of exports of reporting country *i* on its total trade flows. Countries that are structurally net exporters (importers) are thus assigned a higher export (import) weight.

The import weight of competitor *j* is defined as its share in the reporting country *i*'s total imports:

$$w_j^i = m_j^i \Big/ \sum_{a=1}^{N} m_a^i \qquad [A3]$$

where m_j^i are imports of reporting country *i* from country *j* and the denominator indicates total imports of reporting country *i*, with $m_i^i = 0$ and $\sum_{j=1}^{N} w_j^i = 1$. The higher the share of competitor *j* in the reporting country's total imports, the larger the weight of its exchange rate in the basket of currencies included in the NEER.

The export weight of competitor *j* in the computation of the NEER for country *i* is more articulate, as it is double-weighted in order to account for third-market effects:

$$w_j^i = \sum_{k=1,\ k\neq i}^{N+1} S_k^j x_k^i, \qquad j = 1, \ldots, N \qquad \text{[A4]}$$

where S_k^j denotes the share of competitor j in market k, $S_k^i = 0$ by normalization, x_k^i denotes the share of market k in i's exports and $N+1$ denotes the overall number of outlet markets considered, which is equal to N plus the residual aggregate "rest of the world". Each foreign market k is defined, from the viewpoint of reporting country i, as the sum of "locally-sold local production", i.e. manufacturing gross output of country k sold in its domestic market, and of manufacturing exports to country k from all competitors j ($j \neq i$). Note that, due to data limitations, the residual aggregate "rest of the world" is treated as an additional outlet market while it is not included in the set of competitors for reporting country i.[35]

The double-weighted export weight measures both the direct competition faced by reporting country i in market j from its local manufacturers ($k=j$) and the indirect competition faced by reporting country i from j's exports in third markets k ($k \neq j$).

As mentioned earlier, the PCI of a country i is defined as the weighted geometric average of its relative prices or costs, where all prices/costs are measured in a common currency. Alternatively but equivalently, the indicator can be computed as the product of the NEER and a weighted geometric average of relative prices or costs:

$$PCI_i = \prod_{j=1}^{N} \left(P_{ij} e_{ij}\right)^{w_j^i} = NEER_i \prod_{j=1}^{N} \left(P_{ij}\right)^{w_j^i} \qquad \text{[A5]}$$

where the last equal sign follows from equation [A1] and $P_{ij} \equiv P_i/P_j$, where P_i and P_j are the price indices for countries i and j, respectively. Given the way it is constructed, an increase in the indicator implies a loss in price competitiveness for the reporting country i. Equations [A2] and [A5] can be combined to obtain an alternative interpretation of the world-wide PCI, expressed as a geometric weighted average of an export-based competitiveness indicator (PCI_i^X) and an import-based indicator (PCI_i^M), the weights being α_i and $(1-\alpha_i)$:

$$PCI_i = \left[\prod_{j=1}^{N} \left(P_{ij} e_{ij}\right)^{w_j^i}\right]^{\alpha_i} \cdot \left[\prod_{j=1}^{N} \left(P_{ij} e_{ij}\right)^{w_j^i}\right]^{1-\alpha_i} = \left(PCI_i^X\right)^{\alpha_i} \cdot \left(PCI_i^M\right)^{1-\alpha_i} \qquad \text{[A6]}$$

In order to construct market-restricted indicators, the starting point is the export-based PCI for country i (PCI_i^X), referred to in equation [A6]. By taking logs of this equation and by replacing the export weights with equation [A4], one obtains:

[35] That is, exports from the "rest of the world" to the other markets are disregarded. Moreover, local production is not considered in the definition of the "rest of the world" market. This is of course a simplification of reality, as in this way "rest of the world" is supposed to be only consuming and not producing anything. This procedure is standard in the construction of price-competitiveness measures (see, for example, Schmitz et al., 2013).

$$\ln\left(PCI_i^X\right) = \sum_{j=1}^{N}\left[\left(\sum_{k=1,\ k\neq i}^{N+1} S_k^j x_k^i\right)\ln(e_{ij}P_{ij})\right], \qquad [A7]$$

where again S_k^j denotes the share of competitor *j* in market *k*,[36] $S_k^i = 0$ by normalization, x_k^i denotes the share of market *k* in *i*'s exports and *N+1* denotes the overall number of outlet markets considered, which is equal to *N* plus the residual aggregate "rest of the world". P_{ij} is, as before, the relative PPI (of domestically sold manufactures) between reporter *i* and competitor *j*.

By inverting the two summations and using the definition $P_{ij} \equiv P_i/P_j$, equation [A7] becomes:

$$\ln\left(PCI_i^X\right) = \sum_{k=1,\ k\neq i}^{N+1} x_k^i\left[\sum_{j=1}^{N} S_k^j \ln\left(e_{ij}\frac{P_i}{P_j}\right)\right], \qquad [A8]$$

where $\sum_{j=1}^{N} S_k^j = 1$ for any $k \neq i$ and $S_k^i = 0$ by normalization. By applying the non-arbitrage condition such that $e_{ij}=e_{ik}/e_{jk}$, where e_{ik} is the bilateral nominal exchange rate between country *i* and outlet market *k* (*k*'s currency for one unit of *i*'s currency) and e_{jk} is the bilateral nominal exchange rate between competitor *j* and outlet market *k* (*k*'s currency for one unit of *j*'s currency), equation [A8] can be recognized as the market-based version of the export-based PCI. Indeed, the second summation is, for a given outlet market *k*, a weighted average of the (log) relative prices, all measured in market *k*'s currency, which reporting country *i* faces in market *k*; the weights are given by the share of each competitor *j* in market *k*.[37] For a given market *k*, this term thus captures the competitiveness pressures which reporting country *i* faces in a given market *k* (including local producers). The first summation then sums up the competitiveness pressures stemming from all markets $k \neq i$, weighting them with the share of each outlet market *k* in country *i*'s exports.

As a result, the export-based PCI of country *i* in the euro-area market can be computed, by appropriately restricting the *k* sum, as:

$$\ln\left(PCI_i^{X_{EA}}\right) = \sum_{\substack{k\ \epsilon\ EA\\ k\neq i}} x_k^i\left[\sum_{j=1}^{N} S_k^j \ln\left(\frac{e_{ij}P_i}{P_j}\right)\right] \qquad [A9]$$

The nominal component (*NEER*) of the export-based PCI in the euro-area market is obtained by disregarding relative prices in equation [A9]:

$$\ln\left(NEER_i^{X_{EA}}\right) = \sum_{\substack{k\ \epsilon\ EA\\ k\neq i}} x_k^i\left[\sum_{j=1}^{N} S_k^j \ln\left(e_{ij}\right)\right] \qquad [A10]$$

[36] The competitive pressures of local producers by competitor *k* in the competitor's own market *k* (namely the case *j=k*) is also considered.

[37] It is noteworthy that, as in Schmitz et al. (2013), country *i*'s weight in market *k* is not considered, in that the weights S_k^j are defined as the share of competitor *j* in market *k* net of country *i*. In other terms, when *j=i* in the second summation, the addendum is zero. If this was not the case, then the resulting PCIs would plausibly be smoother in that they would assign a positive weight to one "competitor" (the reporting country itself) with relative prices fixed at unity.

Annex B - Additional tables and figures

Table B1

Export shares in the euro-area market according to different sources
(percentages; goods excluding energy; current prices and exchange rates)

	Eurostat				CEPII			
	France	Germany	Italy	Spain	France	Germany	Italy	Spain
1999	11.8	20.4	8.0	4.1	11.4	20.4	7.9	4.5
2000	11.4	19.5	7.5	4.3	10.8	19.2	7.4	4.4
2001	11.1	19.9	7.6	4.5	10.5	19.8	7.4	4.4
2002	11.0	20.1	7.6	4.6	10.6	20.1	7.2	4.6
2003	11.0	20.8	7.4	4.7	10.5	20.2	7.2	4.8
2004	10.5	21.1	7.3	4.6	10.2	20.2	7.0	4.7
2005	9.7	20.9	7.1	4.5	9.7	20.4	6.8	4.5
2006	9.4	21.0	7.0	4.4	9.3	20.1	6.8	4.4
2007	8.9	21.2	7.0	4.3	8.9	20.1	6.8	4.4
2008	8.8	20.8	6.7	4.3	8.9	20.0	6.6	4.4
2009	8.9	20.8	6.4	4.6	9.0	19.8	6.3	4.5
2010	8.5	20.4	6.2	4.5	8.6	19.5	6.1	4.4
2011	8.3	20.5	6.3	4.4	8.4	19.8	6.1	4.3
2012	8.5	20.0	6.2	4.3	8.4	19.5	6.1	4.1
2013	8.5	20.0	6.2	4.5	8.5	19.1	6.0	4.3
2014	8.2	19.7	6.2	4.4	8.3	19.1	6.0	4.2
2015	7.7	19.3	5.9	4.4	7.9	18.4	5.8	4.2
2016	7.6	19.2	6.0	4.6	7.8	18.6	5.9	4.4
2017	7.3	19.1	5.9	4.5	7.5	18.8	5.9	4.4

Source: Eurostat IMTS and CEPII-BACI data.
Notes: When computing the market share of a given country, its imports are excluded from the euro-area imports used as the denominator.

Table B2

Exposure to high competition from China and the CEE6 in the euro-area market by sector: France, Germany and Spain
(percentage shares)

France

		1999			2017		
		weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA	weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA
		...from China	...from the CEE6		...from China	...from the CEE6	
Relative specialization	Other transport equipment	0.5	3.2	5.2	0.3	1.7	7.8
	Pharmaceuticals	2.1	1.0	2.8	0.8	0.6	5.0
	Chemicals	11.2	11.4	8.9	6.2	9.8	10.2
	Agric. products, food, beverages & tobacco	2.2	43.2	14.7	2.1	34.8	14.9
	Wood & wood products (excl. furniture)	22.3	75.0	0.9	12.4	84.1	0.8
	Electrical equipment	41.5	55.3	9.5	42.0	55.2	6.6
	Paper & paper products & printing	7.8	41.3	3.1	8.4	40.3	2.2
	Rubber & plastic	10.9	52.3	6.3	11.7	46.0	6.4
	Total	*6.5*	*18.1*	*51.5*	*4.8*	*14.5*	*54.0*
Relative under-specialization	Computer, electronic & optical products	11.0	24.8	1.8	9.1	17.2	3.0
	Metals & metal products	26.9	42.3	8.4	28.1	43.4	9.4
	Motor vehicles, trailers & semi-trailers	1.6	84.9	18.0	0.8	81.0	15.9
	Machinery & equipment	32.3	58.9	12.5	12.4	54.8	9.7
	Textiles	39.2	40.1	1.9	27.7	38.5	0.6
	Non-metallic minerals	32.1	66.8	1.6	28.0	74.7	1.1
	Wearing apparel	91.0	57.9	1.9	93.8	47.7	2.1
	Furniture, other manuf. & unalloc. goods	52.5	55.0	1.8	42.3	33.7	2.4
	Leather & related products (incl. shoes)	62.2	29.2	0.8	81.3	17.0	1.6
	Total	11.1	*30.7*	*48.5*	9.1	*26.0*	*46.0*
Total		*17.6*	*48.8*	*100.0*	*13.9*	*40.5*	*100.0*

Germany

		1999			2017		
		weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA	weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA
		...from China	...from the CEE6		...from China	...from the CEE6	
Relative specialization	Computer, electronic & optical products	9.9	24.1	3.1	8.1	15.5	3.9
	Electrical equipment	47.0	61.9	10.7	47.7	59.7	8.8
	Other transport equipment	3.7	8.9	3.2	2.2	8.3	3.7
	Machinery & equipment	26.2	55.2	17.2	23.4	54.1	14.8
	Chemicals	11.3	12.4	8.6	7.5	13.5	8.5
	Paper & paper products & printing	9.9	37.9	3.4	8.4	42.7	2.6
	Rubber & plastic	11.4	41.9	6.8	12.2	41.1	7.1
	Metals & metal products	30.4	47.2	8.9	27.6	49.8	9.4
	Wood & wood products (excl. furniture)	15.1	87.5	0.9	14.7	94.5	0.8
	Motor vehicles, trailers & semi-trailers	0.4	78.6	20.0	0.9	83.4	18.1
	Total	*15.0*	*43.1*	*82.9*	*12.3*	*39.3*	*77.6*
Relative under-specialization	Pharmaceuticals	1.9	1.4	1.9	0.9	0.7	5.4
	Furniture, other manuf. & unalloc. goods	50.7	57.6	2.3	47.5	44.9	3.0
	Textiles	31.7	44.9	2.0	26.9	41.6	0.7
	Wearing apparel	86.4	65.2	1.8	92.6	53.0	2.1
	Non-metallic minerals	26.9	63.6	1.4	22.4	72.8	1.2
	Agric. products, food, beverages & tobacco	2.9	42.5	7.0	2.6	31.7	9.0
	Leather & related products (incl. shoes)	61.0	37.9	0.6	84.1	31.9	0.9
	Total	4.4	*7.6*	*17.1*	4.9	*6.8*	*22.4*
Total		*19.4*	*50.7*	*100.0*	*17.2*	*46.1*	*100.0*

Table B2 (continued)

Spain

		1999			2017		
		weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA	weight of HIGH competition...products on sectoral exports to EA		sectoral share on total exports to EA
		...from China	...from the CEE6		...from China	...from the CEE6	
Relative specialization	Motor vehicles, trailers & semi-trailers	1.3	81.4	29.8	0.6	86.8	24.2
	Agric. products, food, beverages & tobacco	4.5	15.2	16.6	4.6	13.3	21.7
	Leather & related products (incl. shoes)	64.2	44.2	2.2	75.5	29.4	1.9
	Non-metallic minerals	20.0	38.9	2.5	15.5	49.5	1.8
	Wood & wood products (excl. furniture)	24.8	47.8	0.9	23.6	62.6	0.8
	Total	*3.3*	*29.1*	*52.0*	*3.0*	*25.9*	*50.5*
Relative under-specialization	Rubber & plastic	10.0	58.4	5.6	10.2	46.6	6.2
	Metals & metal products	29.7	52.7	7.3	23.4	52.8	9.2
	Paper & paper products & printing	8.9	40.8	2.5	8.4	41.8	2.1
	Furniture, other manuf. & unalloc. goods	54.8	57.1	2.5	52.9	42.0	2.7
	Textiles	34.4	35.6	2.1	32.1	37.6	0.9
	Chemicals	14.5	18.2	5.9	8.8	11.1	7.5
	Electrical equipment	34.2	69.2	6.8	38.2	68.1	4.9
	Wearing apparel	91.8	63.9	1.9	94.9	51.5	2.9
	Pharmaceuticals	2.0	0.6	1.4	1.8	0.5	2.7
	Machinery & equipment	30.2	66.7	9.5	20.2	56.5	6.5
	Computer, electronic & optical products	9.5	39.7	0.9	12.9	29.7	1.3
	Other transport equipment	6.9	14.3	1.4	0.7	10.1	2.5
	Total	13.1	*24.3*	*48.0*	11.5	*20.1*	*49.5*
Total		*16.4*	*53.5*	*100.0*	*14.6*	*46.0*	*100.0*

Sources: authors' calculations on CEPII-BACI data.

Notes: A given sector is included in the "relative specialization (under-specialization)" if its weight in the reporting country's exports to euro-area (EA) destinations in 1999 was larger (smaller) than the corresponding average weight across the other three main euro-area countries in the same year. Sectors are then ranked in descending order of relative specialization. Cells highlighted in red flag sectors with an exposure to high competition from either China or the CEE6 that is above the median in a given year.

Table B3

Counterfactual exercises on Italy's 1999 export specialization and on its impact on Italy's absolute and relative 1999-2017 export share change

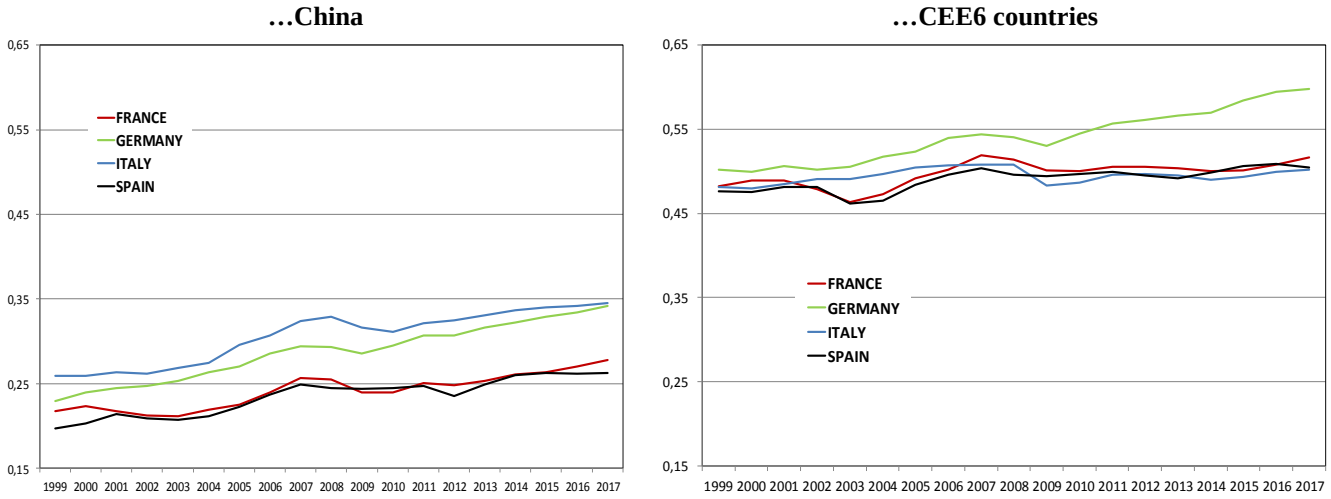
	Low competition	*Medium competition*	*High competition*	*Total*
Actual 1999 weights	36	34	30	100
Actual contribution to change in export market share	-3	-10	-12	-25
Actual gap *vis-à-vis* Germany				17
Actual gap *vis-à-vis* Spain				23
Counterfactual 1: average high-competition shares of France, Germany and Spain in 1999				
Counterfactual 1999 weights	43	40	18	100
Counterfactual contribution to change in export market share	-5	-12	-7	-23
Counterfactual gap *vis-à-vis* Germany				15
Percentage of gap vis-à-vis Germany due to China shock				11
Counterfactual gap *vis-à-vis* Spain				21
Percentage of gap vis-à-vis Spain due to China shock				8
Counterfactual 2: Germany's high, medium and low-competition shares in 1999				
Counterfactual 1999 weights	53	28	19	100
Counterfactual contribution to change in export market share	-6	-8	-7	-22
Counterfactual gap *vis-à-vis* Germany				14
Percentage of gap vis-à-vis Germany due to China shock				21
Counterfactual 3: Spain's high, medium and low-competition shares in 1999				
Counterfactual 1999 weights	53	31	16	100
Counterfactual contribution to change in export market share	-6	-9	-6	-21
Counterfactual gap *vis-à-vis* Spain				19
Percentage of gap vis-à-vis Spain due to China shock				16

	Low competition	*Medium competition*	*High competition*	*Total*
Actual 1999 weights	20	32	48	100
Actual contribution to change in export market share	-1	-7	-17	-25
Actual gap *vis-à-vis* Germany				17
Actual gap *vis-à-vis* Spain				23
Counterfactual 1: average high and medium-competition shares of France, Germany and Spain in 1999				
Counterfactual 1999 weights	23	26	51	100
Counterfactual contribution to change in export market share	-3	-5	-17	-25
Counterfactual gap *vis-à-vis* Germany				17
Percentage of gap vis-à-vis Germany due to CEE shock				1
Counterfactual gap *vis-à-vis* Spain				23
Percentage of gap vis-à-vis Spain due to CEE shock				1
Counterfactual 2: France's high, medium and low-competition shares in 1999				
Counterfactual 1999 weights	26	25	49	100
Counterfactual contribution to change in export market share	-3	-5	-16	-25
Counterfactual gap *vis-à-vis* Germany				17
Percentage of gap vis-à-vis Germany due to CEE shock				4
Counterfactual gap *vis-à-vis* Spain				23
Percentage of gap vis-à-vis Spain due to CEE shock				3

Sources: authors' calculations on CEPII-BACI data.

Figure B1

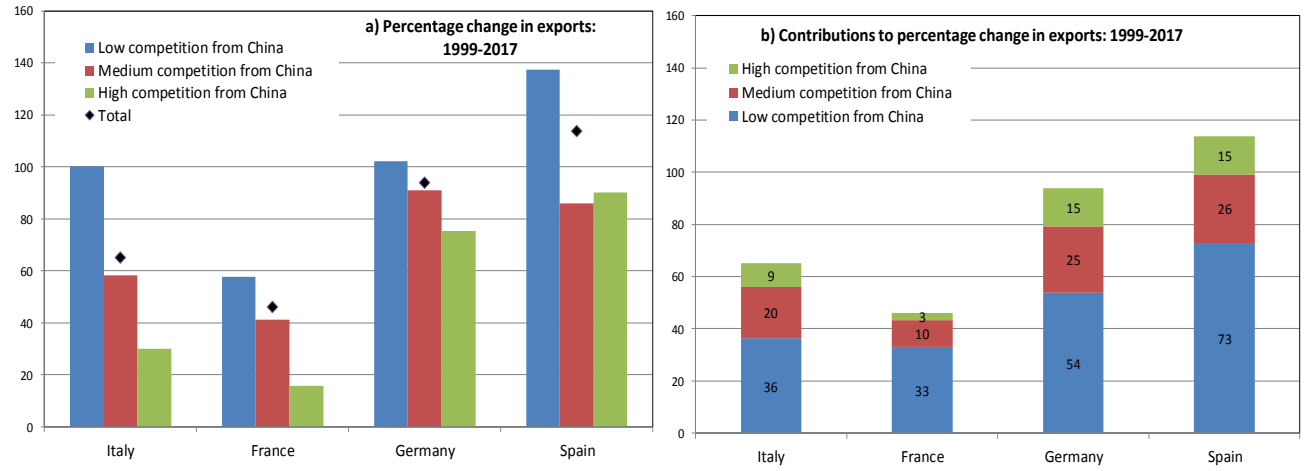
Export similarity in euro-area markets of the four main euro-area countries relative to…
(similarity index)



Source: authors' calculations on CEPII-BACI data at the HS 6-digit level.
Notes: For two countries *i* and *j*, the index is computed as $ESI^{ij}_{t,EA} = \sum_p \min(s^i_{tp,EA}, s^j_{tp,EA})$ where s^i_{tp} is the share of country *i*'s exports of product *p* on its total exports to the euro-area (*EA*) in year *t* and s^j_{tp} is the corresponding share for country *j*. The index is zero if the two countries do not share any product in common in their export bundle and one if the product distribution of their exports is identical.

Figure B2

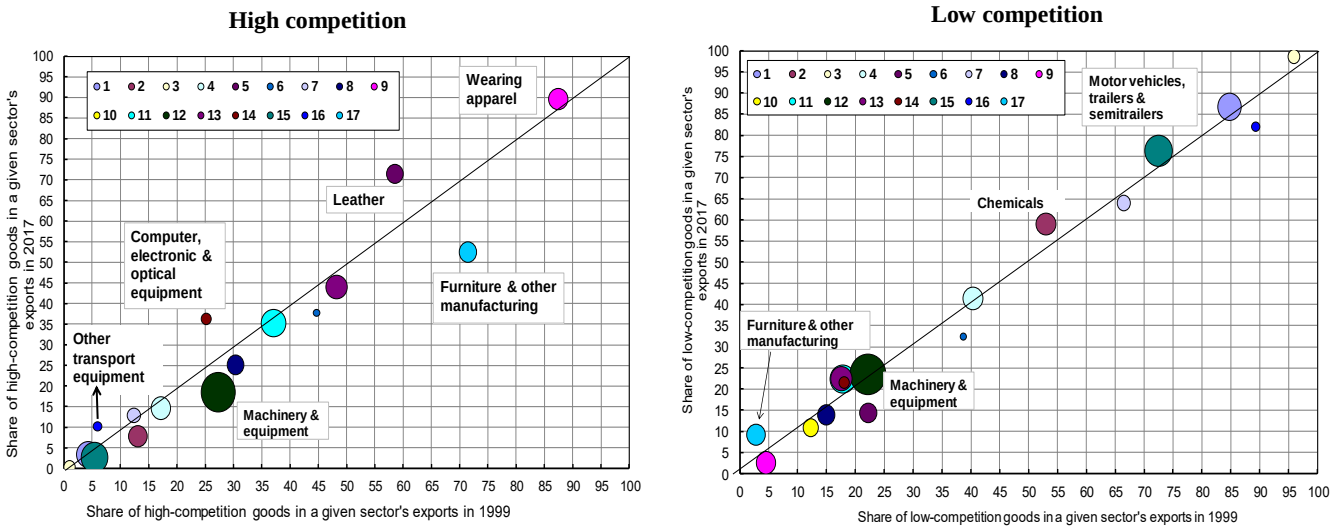
Export growth and intensity of competition from China in the euro-area market



Source: authors' calculations on CEPII-BACI data.
Notes: See the main text for the definition of the intensity of competition.

Figure B3

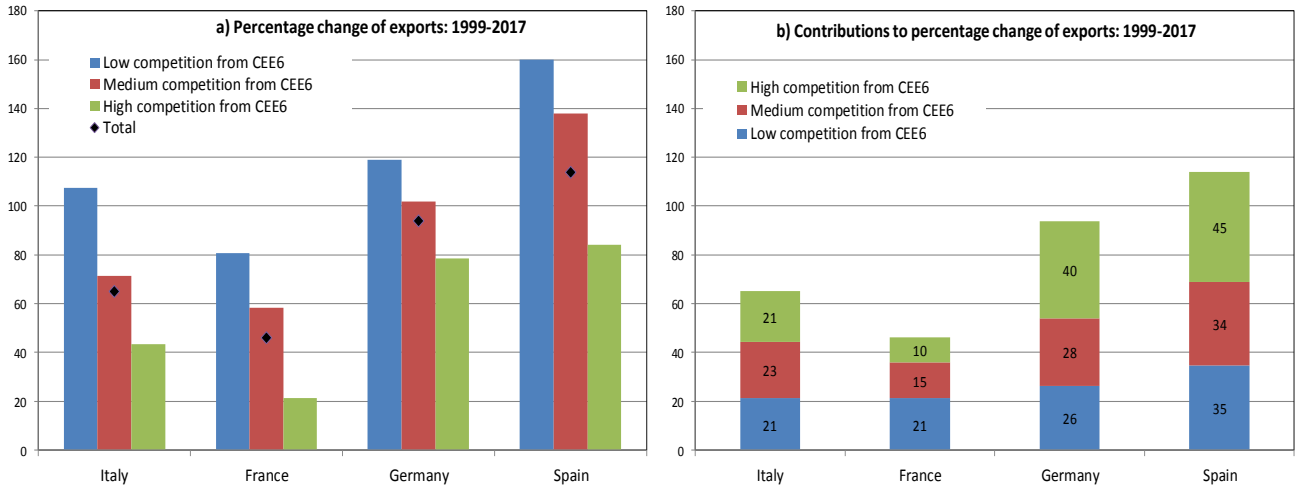
Italy's exposure to competition from China in the euro-area market by sector in 1999 and in 2017
(percentage shares)



Source: authors' calculations on CEPII-BACI data.
Notes: The size of the circles reflects the weight of each sector in Italy's total manufacturing exports in 1999. The full sector identification is the following: 1=Agricultural products, food, beverages and tobacco; 2=Chemicals; 3=Pharmaceuticals; 4= Rubber and plastic; 5=Leather and related products (including shoes); 6=Wood and wood products (excluding furniture); 7= Paper and paper products and printing; 8=Textiles; 9=Wearing apparel; 10=Non-metallic minerals; 11=Metals and metal products; 12=Machinery and equipment; 13=Electrical equipment; 14= Computer, electronic and optical products; 15= Motor vehicles, trailers and semi-trailers; 16=Other transport equipment; 17= Furniture, other manufacturing and unallocated goods.

Figure B4

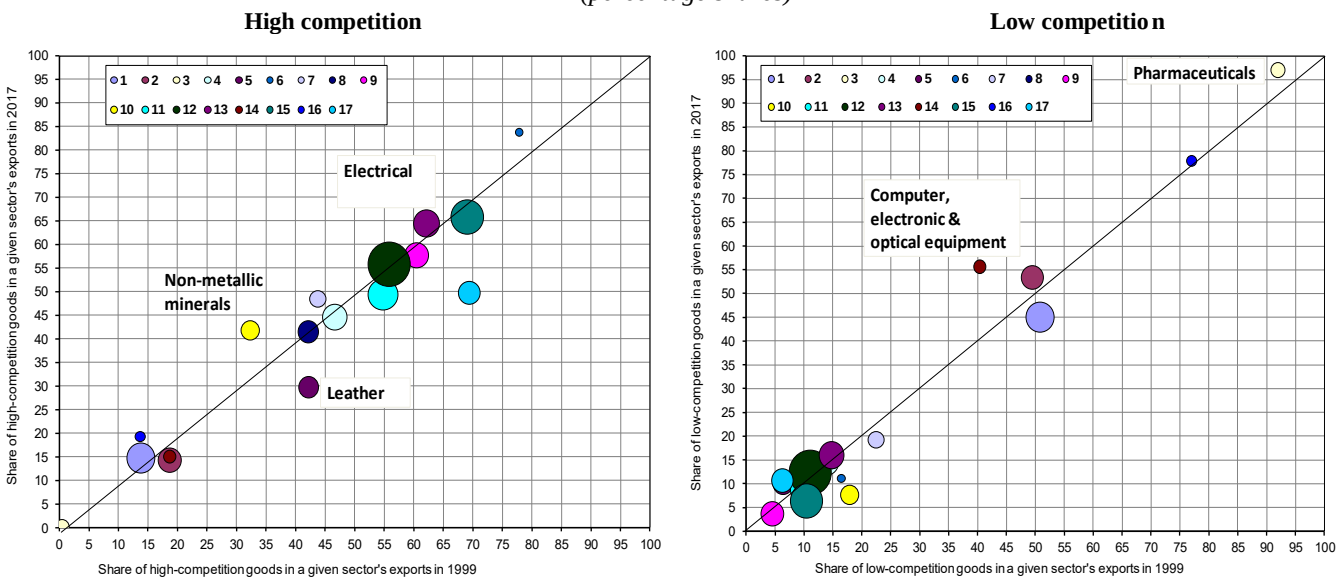
Export growth and intensity of competition from the CEE6 in the euro-area market



Source: authors' calculations on CEPII-BACI data.
Notes: See the main text for the definition of the intensity of competition.

Figure B5

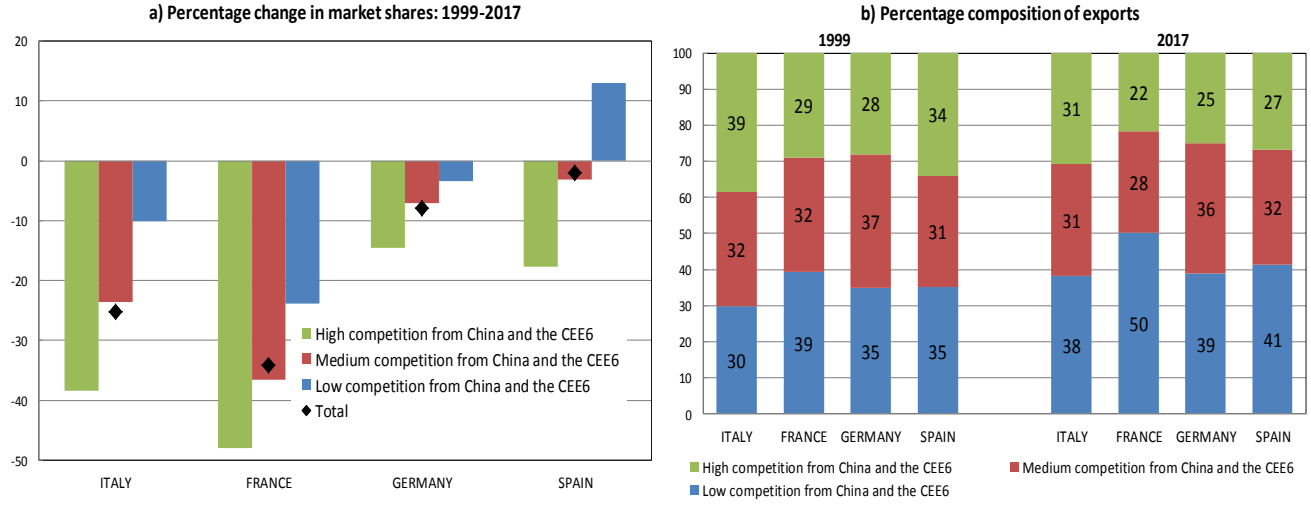
Italy's exposure to competition from the CEE6 in the euro-area market by sector in 1999 and in 2017
(percentage shares)

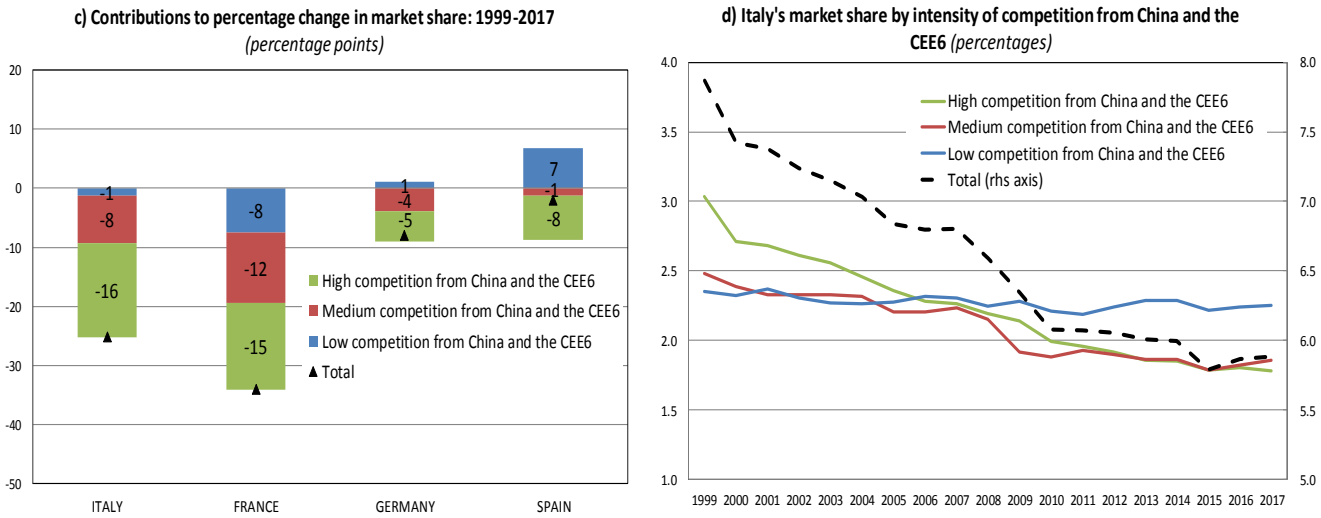


Source: authors' calculations on CEPII-BACI data.
Notes: The size of the circles reflects the weight of each sector in Italy's total manufacturing exports in 1999. The full sector identification is the following: 1=Agricultural products, food, beverages and tobacco; 2=Chemicals; 3=Pharmaceuticals; 4= Rubber and plastic; 5=Leather and related products (including shoes); 6=Wood and wood products (excluding furniture); 7= Paper and paper products and printing; 8=Textiles; 9=Wearing apparel; 10=Non-metallic minerals; 11=Metals and metal products; 12=Machinery and equipment; 13=Electrical equipment; 14= Computer, electronic and optical products; 15= Motor vehicles, trailers and semi-trailers; 16=Other transport equipment; 17= Furniture, other manufacturing and unallocated goods.

Figure B6

Export shares in the euro-area market and intensity of competition jointly from China and the CEE6





Source: authors' calculations on CEPII-BACI data. Notes: See the main text for the definition of the intensity of competition.

Annex C – Regression variables

The dependent variable of the bilateral export regressions (Δexp_{ijst}) is the change in the volume of bilateral good exports of France, Germany, Italy and Spain. It is derived from the value of goods exports – available until 2017 in the CEPII-BACI dataset– of the four reporter countries to 60 countries underlying the Banca d'Italia official price-competitiveness indicators (see Felettigh and Giordano, 2018 for a list of the countries) . The values are converted into euros by employing the annual average US dollar-euro exchange rate. Mineral and energy products are excluded and the values of exports are then aggregated up to the 14 manufacturing branches at the NACE Rev. 1 2-digit level.[38] Volumes of exports by country-sector-year are next computed by deflating the values with the closest available proxy to bilateral export price indices, that is producer prices of each reporting country's goods sold in the euro-area market (when the partners considered are euro-area members) and with those of goods sold in non-euro area markets (when the partners are non-euro area countries), broken down by sector. Since these price indices are available from Eurostat as of 2000, this was the starting year of our analysis (with the exception of France whose full set of sectoral series begins in 2005). When the euro vs. non-euro area market breakdown is not available, sectorial producer prices of exported goods in all markets are employed, regardless of the trading country. Price indices were rebased from 2015=100 to 2010=100. Resulting real exports of the reporting countries are thus measured in 2010 euros. Finally, in order to exclude outliers, the volume of exports was trimmed on two sides at the third percentile.

Turning to the explanatory variables, price-competitiveness pressures in market *j* by all competitors *k* of reporting country *i*, including country *j*'s local producers, is computed in the following manner. Let's define e_{ij} the index of the nominal bilateral exchange rate between reporter *i* and trading partner *j* (expressed in terms of *j*'s currency per unit of *i*'s currency, so that an increase indicates a loss of price competitiveness for *i*). We construct a price-competitiveness indicator $pricecomp_{ij}$, where for the sake of simplicity we have dropped the subscript *t*, which is given by the producer price index of domestically sold manufactures[39] of country *i* (expressed in *j*'s currency) divided by a weighted average of the same prices (again expressed in *j*'s currency) of all competitors *k* in market *j*, other than reporter *i*, and including domestic producers in *k*. Namely:

$$pricecomp_{ij} = \frac{P_i e_{ij}}{\prod_{k=1,k\neq i}^{60} (P_k e_{kj})^{w_k^j}}, \qquad [B1]$$

with

$$\sum_{k=1,k\neq i}^{60} w_k^j = 1 \quad for\ any\ j \quad [B2]$$

where w_k^j is the "import weight" of competitor country *k* in destination market *j*, defined as *k*'s share in market *j*, with market *j* in turn defined as the sum of *j*'s imports plus *j*'s absorption of domestic production. Note that in [B2] *k* runs also through *j*, i.e. the own-weight w_j^j is included, and is strictly

[38] The HS6 classification underlying CEPI-BACII data can only be matched with the NACE Rev. 1 classification.

[39] This price index is considered a good proxy of total production costs that firms face, regardless of the tradability of the considered good, as discussed in Section 3. Owing to the fact that this index is different to that used to deflate the dependent variable (which is sectorial and refers to exported goods only), no spurious relationship should emerge due to deflation procedures.

positive. The indicator $pricecomp_{ij}$ can be conveniently obtained by multiplying the bilateral real exchange rate between countries *i* and *j*:

$$RER_{ij} = \frac{P_i e_{ij}}{P_j} \quad \text{[B3]}$$

by the import-based real effective exchange rate of destination country *j* when country *i* has been excluded from the set of competitors and imports weights are computed gross of the destination country *j*:

$$PCI_j^M = \prod_{k=1}^{N} \left(\frac{P_j}{P_k} e_{jk}\right)^{w_k^j} = \frac{P_j}{\prod_{k=1}^{N} (P_k e_{kj})^{w_k^j}} \quad \text{[B4]}$$

where the property $e_{jk} = {e_{kj}}^{-1}$ has been used (together with [B2]). The resulting variable $pricecomp_{ij}$ is therefore expressed such that an increase implies a loss in price competitiveness of reporter *i*.

In order to disentangle the effect of overall price competitiveness from that of nominal exchange rates, [B1] can be rewritten as:

$$pricecomp_{ij} = \frac{P_i}{\prod_{k=1,k\neq i}^{N} (P_k)^{m w_k^j}} \frac{e_{i,j}}{\prod_{k=1,k\neq i}^{N} (e_{kj})^{w_k^j}} = =$$

$$\frac{P_i}{\prod_{k=1,k\neq i}^{N} (P_k)^{w_k^j}} \; e_{ij} \left[\prod_{k=1,k\neq i}^{N} \left(e_{jk}\right)^{w_k^j}\right], \quad \text{[B5]}$$

where the property $e_{jk} = {e_{kj}}^{-1}$ has been used. The term in square brackets in [B5] is the nominal version of [B4], i.e. the import-based nominal effective exchange rate of country j, $NEER_j^M$. To conclude, the effect of $pricecomp_{ij}$ can be broken into two terms: a) $e_{ij} NEER_j^M$, which isolates the effect of nominal exchange rates; and b) $relp_{ij} = \frac{PCI_{i,j}}{e_{ij} NEER_j^M}$, which isolates the effect of prices. All the necessary data for $pricecomp_{ij}$ and its components are sourced from Banca d'Italia (Felettigh et al. 2016; Felettigh and Giordano, 2018).

The variable $impdemand_{jt}$ is the sum of GDP and imports (the equivalent of the sum of domestic demand and exports) of each trading partner *j* in real terms expressed in 2010 euros, constructed by using IMF-WEO national account data. The variable $CEE6\_Chinaexpsh_{st}$ is the cumulated share of Chinese and CEE6 exports in the euro-area market for each sector (*s*) and year (*t*) constructed on CEPII-BACI data. We also include the two export shares separately. Similarly to Bugamelli et al. (2018), these shares proxy the displacement effect of these emerging economies on the four main euro-area countries foreign sales. Given how they are constructed, they are reporting country-invariant measures.

Annex D – Further details on the WIOD analysis

WIOD allows computing the exports of a given country that are activated by another country's demand. For instance, China activates exports (of final and intermediate goods and services) from Germany for three uses: (i) internal final uses (consumption and investment), (ii) intermediate inputs required for producing final goods and services to be absorbed in China, and (iii) intermediate inputs required for producing China's exports (of either final or intermediate goods and services).We regard components (i) and (ii) as German exports that are activated (directly and indirectly) by final internal demand of China, whilst component (iii) represents German exports that are activated by China's exports.[40]

In a world input-output setting, final internal demand by China and the Leontief inverse matrix are easily combined to account for components (i) and (ii). Instead, computing exports from Germany that are activated by exports of China is more intricate: we implement the Hypothetical Extraction Approach put forward by Los, Timmer and De Vries (2016) and, in order to reduce the complexity of our calculations, focus on overall exports of goods and services. Conceptually, this approach examines the effect on exports from Germany of setting all Chinese exports at zero. The algebra presented by Los, Timmer and de Vries (2016) is no longer valid if one is interested in setting only a subset of Chinese exports (such as merchandise exports) at zero.

Since any country activates, at least in principle, exports of all other countries, it is important to distinguish export activation from export destination. Pursuing with our example, China activates exports from Germany to any destination, not just to China itself. Indeed, French exports (say to China) will also be activated in the process, in turn spurring (intermediate) exports from Germany to France. These can be regarded as indirect exports from Germany to China, and their size will be larger the more countries are integrated into GVCs and the more internationally fragmented are production processes.

[40] A small portion of a country's exports (dubbed the "reflection term" in the GVC literature) is in turn activated by its own final demand. For instance, US-made Jeep cars bought in the US may require a Canadian component which in turn requires a sub-component to be shipped from the US to Canada. Throughout our analysis, we make sure not to double-count the reflection term.

References

Ahn, J.B., Mano, R. and Zhou, J. (2017), "Real exchange rate and external balance: How important are price deflators?", *IMF Working Papers* 17/81.

Amiti, M. and Freund, C. (2010), "The Anatomy of China's Export Growth", in Feenstra, R. C. and Wei, S-J, *China's Growing Role in World Trade,* University of Chicago Press: Chicago.

Auer, R. and Sauré, P. (2011), "Export basket and the effects of exchange rates on exports - Why Switzerland is special", *Globalization Institute Working Papers* 77, Federal Reserve Bank of Dallas.

Autor, D., Dorn, D. and Hanson, G. (2013) "The China syndrome: Local labor market effects of import competition in the United States", *American Economic Review* 103 (6), pp. 2121-2168.

Baldwin, R. E. (1995), "The Eastern enlargement of the European Union", *European Economic Review* 39, pp. 474-481.

Baldwin, R. E., J. F. Francois and R. Portes (1997), "The costs and benefits of eastern enlargement: the impact on the EU and central Europe", *Economic Policy*, April 1997.

Baldwin, R. and Taglioni, D. (2007), "Trade effects of the euro: A comparison of estimators", *Journal of Economic Integration* 22(4), pp 780–818.

Bayoumi,, T., Harmsen, R. and Turunen, J. (2011), "Euro Area Export Performance and Competitiveness", *IMF Working Papers* 140.

Bechetoille M., Blaize T., Campagne B. and De Waziers D. (2017), "Comment expliquer le niveau élevé de l'excédent courant allemand? ", *Trésor Eco* 209.

Benkovskis, K., Silgoner, M., Steiner, K. and Wörz, J. (2013), "Crowding out or co-existence? The competitive position of EU members and China in global merchandise trade", *ECB Working Papers* 1617.

Bernard, A.B., Jensen, J.B., and Schott, P.K. (2016), "Survival of the best fit: Exposure to low-wage countries and the (uneven) growth of U.S. manufacturing plants", *Journal of International Economics* 68, pp. 219–237

Bloom, N., Draca, M. and Van Reenen, J. (2016), "Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity", *Review of Economic Studies* 83, pp. 87–117

Bobeica, E, Christodoulopoulou, S. and Tkačevs, O. (2016), "The role of price and cost competitiveness for intra- and extra-euro area trade of euro area countries", *ECB Working Papers* 1941.

Bugamelli, M., Fabiani, S., Federico, S., Felettigh, A., Giordano, C. and Linarello, A. (2017), "Back on Track? A Macro-Micro Narrative of Italian exports", *Bank of Italy Occasional Papers* 399.

Bugamelli, M., Fabiani, S., Federico, S., Felettigh, A., Giordano, C. and Linarello, A. (2018), "Back on Track? A Macro-Micro Narrative of Italian exports", *Italian Economic Journal* 4, pp. 1-31.

Bugamelli, M., Fabiani, S. and Sette, E. (2015), "The Age of the Dragon: The Effect of Imports from China on Firm-Level Prices", *Journal of Money, Credit and Banking* 47(6), pp. 1091–1118.

Bugamelli, M. and Rosolia, A. (2006), "Produttività e concorrenza estera", *Rivista di Politica Economica* 9-10.

Bugamelli, M., Schivardi, F. and Zizza, R. (2009), "The Euro and Firm Restructuring", in A. Alesina and F. Giavazzi (eds.), *Europe and the Euro*, Chicago: Chicago University Press.

Burstein, A. and Gopinath, G. (2014), "International prices and exchange rates", in Gopinath, G., Helpman, E. and Rogoff, K. (eds.), *Handbook of International Economics, 4th Edition*: North Holland.

Bussière, M., Callegari, G., Ghironi, F., Sestrieri. G and Yamano, N. (2013), "Estimating Trade Elasticities: Demand Composition and the Trade Collapse of 2008-2009", *American Economic Journal: Macroeconomics, American Economic Association* 5(3), pp. 118-151.

Cabral, S., "Collateral Damage? Labour Market Effects of Competing with China – at Home and Abroad", Martins, P.S., Pereira dos Santos, P. and Tavares, M. (2018), *IZA Discussion Papers* 11790.

Chen, R., Milesi-Ferretti, G.M. and Tressel, T. (2013), "Eurozone external imbalances", *Economic Policy*, January.

Corbo, V. and Osbat, C. (2013), "Trade Adjustment in the European Union: A Structural Estimation approach", *ECB Working Papers* 1535.

Correa-López, M. and Doménech, R. (2012), "The Internationalisation of Spanish Firms", *BBVA Working Papers* 12/30.

Dauth, W., Findesein, S. and Suedekum, J. (2014), "The rise of the East and the Far East: German labor markets and trade integration", *Journal of the European Economic Association* 12(6), pp. 1643–1675.

De Nardis, S. (2018), "The unbalanced monetary union", *LUISS Policy Brief*, December 3, 2018.

Di Mauro, F., Forster, K. and Lima, A. (2010). "The global downturn and its impact on euro area exports and competitiveness", ECB Occasional Papers 119.

Eichengreen B., Yeongseop R., Tong H. (2004), "The Impact of China on the Exports of other Asian Countries", *NBER Working Papers* 10768.

Emlinger, C., Jean, S. and Vicard, V. (2019), "L'étonnante atonie des exportations françaises : retour sur la compétitivité et ses déterminants ", *CEPII Policy Brief* 24.

Federico, S. (2014), "Industry Dynamics and Competition from Low-Wage Countries: Evidence on Italy", Oxford Bulletin of Economics and Statistics 76(3), pp. 389-410.

Felettigh, A. and Federico, S. (2010), "Measuring the price elasticity of import demand in the destination markets of Italian exports", *Bank of Italy Working Papers*.

Felettigh, A. and Giordano, C. (2018), "Revisiting prices and markets underlying price-competitiveness indicators", *Bank of Italy Occasional Papers* 447.

Felettigh, A., Giordano, C., Oddo, G. and Romano, V. (2016), "New indicators to assess price-competitiveness developments in the four largest euro-area countries and in their main trading partners", *Journal of Economic and Social Measurement* 41(3), pp. 203-235.

Finger, J. and Kreinin, M. (1979), "A Measure of `Export Similarity' and Its Possible Uses", *The Economic Journal* 89(356), pp. 905-912.

Flam, H. and Nordström, H. (2006), "Trade volume effects of the euro: Aggregate and sector estimates", *Institute for International Economic Studies Seminar Papers* 746.

Fontagné, L., Martin, P. and Orefice, G. (2018), "The international elasticity puzzle is worse than you think", *Journal of International Economics* 115, pp. 115–129.

Gaulier, G., Sztulman, A. and Ünal, D. (2019), "Are Global Value Chains Receding? The Jury Is Still Out. Key Findings from the Analysis of Deflated World Trade in Parts and Components", *CEPII Working Papers* 1.

Gaulier, G. and Zignago, S. (2010), "BACI: International Trade Database at the Product-level: The 1994-2007 Version", *CEPII Working Papers* 23.

Giordano, C. (2018), "Price and cost competitiveness misalignments of the euro area and of its main economies according to a quarterly BEER model, 1999-2017", *Bank of Italy Occasional Papers* 444.

Giordano, C. and Zollino, F. (2016), "Shedding Light on Price- and Non-price Competitiveness Determinants of Foreign Trade in the Four Largest Euro-area Countries", *Review of International Economics* 24(3), pp. 604–634.

Giovannetti, G. and Sanfilippo, M. (2016), "China's competition and the export price strategies of developed countries", *International Review of Applied Economics* 30(2), pp. 238-254.

Giovannetti, G., Sanfilippo, M. and Velucchi, M. (2011), "The "China effect" on EU Exports to OECD markets – A focus on Italy", *Universita' degli Studi di Firenze Economics Working Papers* 17.

Goldstein, M. and Kahn, M.S. (1985), "Income and price effects in foreign trade", in Jones, R.W. and Kenen, P.B. (eds.), *Handbook of International Economics*, vol. 2. North Holland: Amsterdam.

Hagemejer, J. and Mućk, J. (2019), "Export-led growth and its determinants: Evidence from Central and Eastern European countries", *The World Economy*, DOI: 10.1111/twec.12790.

IMF (2013), "German-Central European Supply Chain – Cluster Report", *IMF Country Reports* 13/263.

Jaravel, X. and Sager, E. (2018), "What are the Price Effects of Trade? Evidence from the U.S. and Implications for Quantitative Trade Models", mimeo.

Lopez-Villavicencio, A. and Mignon, V. (2019), "Exchange rate pass-through to import prices: Accounting for changes in the Eurozone trade structure", *CEPII Working Papers* 08.

Los, B., M. P. Timmer, and G. J. De Vries (2016), "Tracing Value-Added and Double Counting in Gross exports: CoMment", *American Economic Review*, 106(7): 1958-1996.

Malgouyres, C. and Mayer, T. (2018), "Exports and labor costs: Evidence from a French policy", *Review of World Economics* 154(3), pp. 429-454.

Mirdala, R. (ed.), *Global Value Chains, International Fragmentation of Production and Implications for European Union*, ASERS Publishing: Craiova, Romania.

Osbat, C., Benkovskis, K., Bluhm, B., Bobeica, E. and Zeugner, S. (2017), "What drives export market shares? It depends! An empirical analysis using Bayesian Model Averaging", *ECB Working Papers* 2090.

Sato, K., Shimizu, J., Shrestha, N. and Zhang, S. (2015), "Industry-specific Real Effective Exchange Rates in Asia", *RIETI Discussion Papers* 15-E-036.

Schott, P. (2008), "The relative sophistication of Chinese exports", *Economic Policy* 23(53), pp. 5-49.

Stöllinger, R., Hanzl-Weiss, D., Leitner, S. and Stehrer, R. (2018), "Global and Regional Value Chains:

How Important, How Different?", *Wiener Institut für Internationale Wirtschaftsvergleiche Research Report* 427.

van Limbergen, D. and Vermeuelen, R. (2018), "How value chains and domestic demand shape euro area trade patterns", mimeo.

Wang, Z., Wei, S-J., Yu, X and Zhu, K. (2018), "Re-examining the effects of trading with China on local labor markets: A supply chain perspective", *NBER Working Papers* 24886.

Wierts, P., Van Kerkhoff, H. and De Haan, J. (2014), "Composition of Exports and Export Performance of Eurozone Countries", *Journal of Common Market Studies* 52(4), pp. 928-941.