An Export-Based Measure of Competitiveness

Unit labor cost (ULC) developments have been receiving increased attention from policymakers throughout the euro area, as adverse developments in price competitiveness are commonly seen as one of the causes of the ongoing sovereign debt crisis in the euro area. Yet empirical results are often ambiguous on the link between ULC developments and export performance. This widely examined empirical conundrum, often referred to as "Kaldor paradox," naturally raises the question whether commonly used measures of ULC growth (such as total economy ULC) are a meaningful measure of mounting imbalances and persistent losses of trade competitiveness. Therefore, we propose a new ULC growth index that exploits disaggregated sectoral information and focuses on export-relevant sectors only. This trade-weighted ULC index is shown to have a substantially higher explanatory power for export growth than traditional ULC measures.

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One of the main lessons from the global financial crisis was that the European monitoring and coordination procedures were inadequate to prevent the buildup of both internal and external imbalances. On the one hand, the existing mechanisms for preventing and correcting fiscal imbalances, such as the Stability and Growth Pact and the Excessive Deficit Procedure, proved to be insufficient. On the other hand, there were no mechanisms for detecting and preventing imbalances in other macroeconomic areas, such as external trade, asset markets and the financial system.

The examples of Spain or Ireland illustrate this lack of appropriate monitoring devices: Both countries were judged to be model cases of fiscal consolidation with a solid catching-up process. Ireland managed to reduce its public debt-to-GDP ratio from more than 80% in the mid-1990s to 25% in 2006/07, while Spain halved its debt ratio from almost 70% to 35% in the same period. Today we know that much of this miracle was a by-product of domestic demand booms and the bubble in the housing market resulting from the rapid interest rate decline and capital inflows after monetary integration. Both in Spain and Ireland, residential construction accounted for about 11% of GDP on average between 2000 and 2008, as compared to only 5% or 6% in German, France or Italy. Data on credit growth, housing market dynamics or current account deficits may have given early warning signals but were not yet incorporated in existing surveillance procedures.

Excessive imbalances, however, have contributed considerably to the depth and persistence of the crisis. The necessary deleveraging of the private, corporate and public sectors aggravated the economic slump. In several countries the burst of house price bubbles and the overindebtedness of the private sector weighed heavily on the banking sector, and ultimately also on the public sector due to bank bailouts. One of the main lessons from the crisis therefore was that monitoring fiscal developments is not sufficient to prevent the buildup of

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excessive internal and external imbalances but needs to be embedded in a broader monitoring framework.

In 2011 the European Commission initiated the Macroeconomic Imbalance Procedure (MIP). The annual starting point of the MIP is an Alert Mechanism Report (AMR), which provides a snapshot of recent developments based on a scoreboard of indicators and predefined threshold values, covering current account balances, FDI, real effective exchange rates, export market shares, unit labor cost and house price developments, private and public debt, unemployment and financial sector liabilities. The AMR thus serves as a filter which enables policymakers to identify countries for which an in-depth analysis is deemed necessary. The purpose of this analysis is to establish whether imbalances are considered excessive, which would then trigger further steps such as recommendations, action plans and eventually financial sanctions.[2]

The development of unit labor costs (ULCs) plays a central role both in the AMR and the MIP.[3] ULC developments are considered to be good indicators for a country's competitiveness gains or losses, as they provide an indirect way of assessing export prices. Along this reasoning, excessive ULC growth, especially in relation to the most important trading partners, can give early signals about widening external deficits and a permanent loss in market shares. Similarly ULC developments are assumed to play a crucial role in the narrowing of external balances after the crisis.

While this reasoning seems consistent with basic economic theory, empirical results are less clear about the link between ULC developments and export performance, which is often referred to as the "Kaldor paradox" or – more recently – the "Spanish paradox" (see, for instance, Kaldor, 1978; Antrás Puchal et al., 2010). This widely examined empirical conundrum naturally raises the question whether commonly used measures of ULC growth are a meaningful measure of mounting imbalances and persistent losses of trade competitiveness.

In this study, we reassess the link between ULC developments and external imbalances for a set of euro area countries. Changes in ULC developments may in principle impact on external imbalances; on the export side, this may happen via gains or losses of price competitiveness, on the import side, this may occur via income effects and shifts in relative prices. In this study we are more interested in the direct effects of ULC developments on price competitiveness and therefore focus on the export side, i.e. we link ULC developments to export growth. Our analysis confirms that export dynamics are largely disconnected from total economy ULC developments. We propose a new ULC growth index that exploits disaggregated sectoral information and focuses on export-relevant sectors. Our "trade-weighted ULC index" (TWULC index) is shown to have a substantially higher explanatory power for export growth than traditional ULC measures.

Section 1 focuses on the theoretical background and illustrates the weak link between ULC developments and

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[2] *For details see the European Commission page on the MIP.*

[3] *The specific ULC figure entering the scoreboard is the percentage change in nominal ULC, measured as compensation per employee to real GDP per person employed, averaged over three years. In the course of the in-depth analysis the European Commission may take into account further wage cost-related measures such as labor productivity growth, nominal ULC growth over ten years, effective ULC growth versus the euro area and employment growth.*

export performance. Section 2 describes our dataset and introduces an alternative measure of cost competitiveness. Section 3 shows some empirical results for our trade-weighted ULC index, and section 4 concludes.

1 Theoretical Background
1.1 Total Unit Labor Costs As an Imperfect Measure of Competitiveness

Mainstream explanations for the pre-crisis loss of competitiveness of periphery countries such as Greece, Ireland, Portugal or Spain are commonly based on interest rate convergence across euro area countries following monetary unification, thanks to which countries benefited from a marked decline in interest rates. Favorable financing conditions and ample credit supply provided the ground for domestically driven growth. In some countries (e.g. Spain, Ireland) this also contributed to a construction boom and a housing bubble. Some argue that the domestic demand boom coincided with wage growth that was only partially matched by corresponding productivity gains. As a consequence, ULC growth increased rapidly, not only in the domestically oriented sectors but across the economy as a whole, due to wage growth spill-overs, which harmed countries' competitiveness. The subsequent loss of market share was thus – together with vivid import demand – responsible for the widening current account deficits in periphery countries. Based on this line of arguments, external rebalancing would be based on both depressed local demand and the recov-

ery of competitiveness after wage restraint.

At first sight, charts 1 and 2 seem to support such an interpretation. For these charts we group countries into three subgroups according to their respective ULC growth rates and show the unweighted averages for each country group. The five countries with the highest rates of ULC growth between 2000 and 2008/09 – Ireland, Greece, Spain, Italy and Portugal ("periphery")[4] – experienced a sharp correction in ULCs after the crisis. The only exception is Italy, where productivity growth continues to be weak and thus prevents a ULC correction in spite of recent wage moderation. This pattern is mirrored by widening current account deficits, which started to narrow only with the onset of the global financial crisis. Chart 1 would suggest that the marked decline in current account deficits in recent years was the result of the gain in competitiveness related to the correction in ULC trends. But declining wages and layoffs also have led to a collapse of import demand. This appears to have been the primary driver of declining external deficits. Furthermore ULC adjustments were to a large extent the result of the loss of low-productivity jobs, especially in the construction sector,[5] just as the past housing boom had promoted low-productivity jobs and thus boosted ULC growth.

In the two countries with the lowest ULC growth in that period – Austria and Germany ("core") – ULC growth was very low or even negative (Germany) until 2007, then acceler-

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[4] A referee recommended that we use "neutral" labels for the groups instead of those we apply in this study. However, we do not intend to express the hegemony of a specific group of countries but exclusively derive the labels from the development of unit labor costs.

[5] O'Brien (2011) estimates that about half of the decline in business sector ULCs in Ireland is the result of compositional effects when low-productivity workers are laid off.

Chart 1

Unit Labor Costs
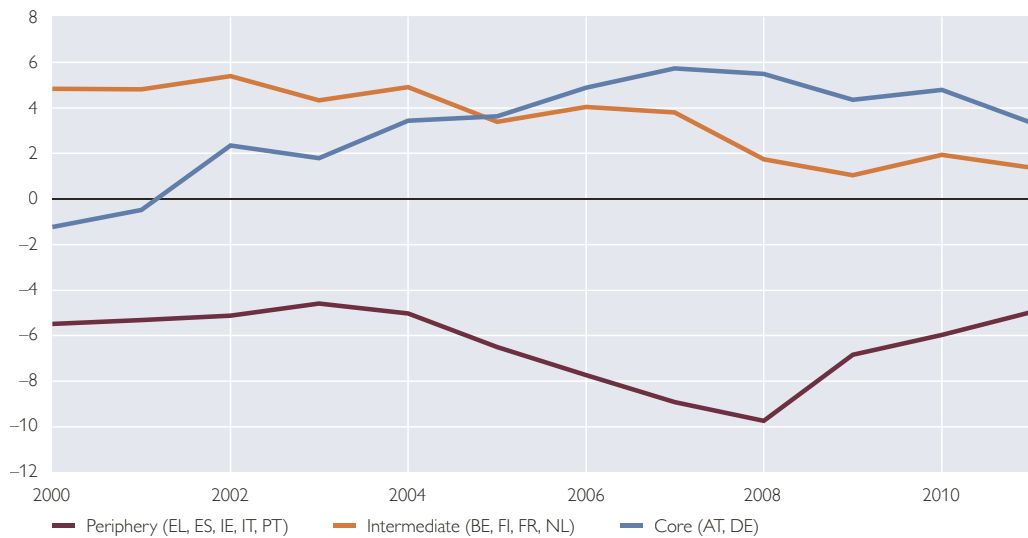
2000=100; unweighted averages within country groups

Periphery (EL, ES, IE, IT, PT) — Intermediate (BE, FI, FR, NL) — Core (AT, DE)
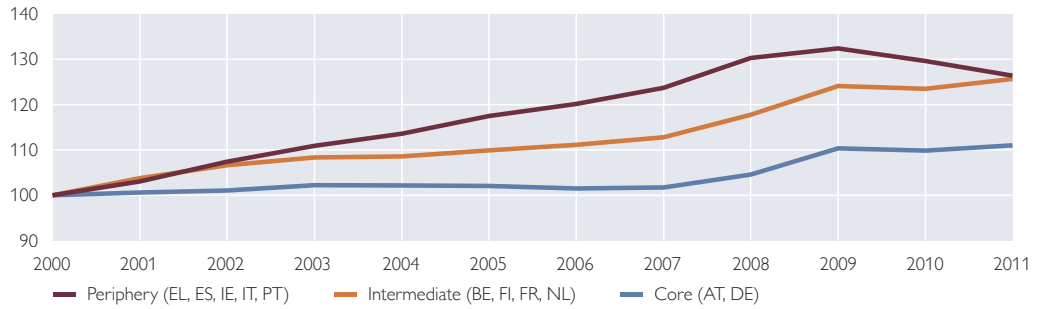
Source: Eurostat.

Note: The data for 2011 do not include Greece.

Chart 2

Current Account Balances

% of GDP; unweighted averages within country groups

Periphery (EL, ES, IE, IT, PT) — Intermediate (BE, FI, FR, NL) — Core (AT, DE)

Source: European Commission (AMECO database).

ated, slowed down a bit in the course of the crisis and continued to increase dynamically in recent years. Both countries experienced positive and widening current account positions, a trend that only reversed in the years following the peak of the crisis. The last group — Belgium, Finland, France and the Netherlands ("intermediate") — also experienced rapid ULC growth, but at less dynamic rate than the periphery countries. Their positive current account surpluses contracted steadily as their competitive positions weakened; in France the balance has actually been negative since 2005. This pattern did not reverse permanently after the global financial and economic crisis.

Overall, charts 1 and 2 would suggest that ULC developments have a central role in explaining current account imbalances and also in shaping

Chart 3

Nominal Exports

2000=100; unweighted averages within country groups

Periphery (EL, ES, IE, IT, PT)   Intermediate (BE, FI, FR, NL)   Core (AT, DE)

Source: Eurostat.

the rebalancing process. While restrained wage growth supported competitiveness in Germany or Austria, wage growth and/or modest productivity growth in periphery countries damaged the attractiveness of their products on the European export market. We would thus expect a disappointing export performance in the periphery, especially as compared to Germany and Austria. Data on export performance, however, only partly confirm this line of arguments.

Chart 3 shows the development of real exports of goods and services over the last decade, again as unweighted averages of the subgroups. It confirms that exports grew dynamically over the observation period in Austria and Germany. The periphery actually outperformed the intermediate group despite their much stronger ULC growth rates.

This suggests that ULC developments only weakly affect the export performance or export market shares. This is not a new observation; Kaldor (1978) found that the fastest-growing economies of the post-war period also experienced faster ULC growth, and vice versa. According to the Kaldor paradox, there is thus no correlation, or even a (weak) positive correlation, between ULC developments and GDP growth, export growth or export market shares.

1.2 The Missing Link?

The literature mentions several potential reasons why developments in ULC and export performance may be disconnected:

1. Nonprice factors such as quality, tastes, sales networks or the business environment may be more relevant for the export performance of a country than its export price structure (ECB, 2012).

2. Common shocks are the main driver of export performance whereas cost

competitiveness is only of minor importance (ECB, 2012). Crespo Rodríguez and Segura Cayuela (2012) for example estimate that the real exchange rate only explains about 10% of the variance in exports of industrial countries while world trade developments explain about 80%.

3. The internationalization of production has driven up the import content of exports and substantially lowered the domestic contribution to the final sales price, which would largely depend on ULCs. Globalization may thus have reshaped the link between cost factors and trade performance (Crespo Rodríguez and Segura Cayuela, 2012). The newly published WTO/OECD TiVA (Trade in Value Added) database is the first harmonized attempt to extract the domestic value added of exports for a broad set of countries. Especially for small and open economies the exports and value added of exports typically deviate substantially.

4. Overall ULC developments may be of relevance only as far as they deviate substantially from those of the most important trade competitors. Investigating relative ULC measures such as the real effective exchange rate (REER), either based on inflation or on ULC differentials, may thus be more indicative for explaining the export performance of a country.

5. Finally, the composition of export markets is relevant. Export industries may cater to more dynamic or already saturated markets.

6. Only a fraction of the production of goods and services is tradable. Wage and productivity developments in the closed sector may deviate substantially from those in the open sector. This relates both to the different level of competitive pressure

across sectors and diverging productivity patterns. Measures of economy-wide ULC growth may be dominated by developments in the closed sector and thus be an imperfect indicator for the export competitiveness of a country.

While there is ample literature on the first five hypotheses the last issue has typically been investigated for single countries only. We argue, however, that differentiating between ULC developments in the domestic industries and those in the export-oriented sector is crucial for understanding the sources of current account imbalances of European countries and for assessing the durability of past, and the need for further, ULC adjustments to restore competitiveness in countries with external deficits. A ULC measure that more closely focuses on export-oriented industries may furthermore have a higher explanatory power for export growth or the change in export market shares.

While typically wage trends of different industries are rather similar within a given country due to spillover effects, productivity trends may be quite different. According to the Balassa-Samuelson hypothesis (Balassa, 1964; Samuelson, 1964), productivity growth differentials between the tradable and nontradable sector are going to be largest in catching-up economies. Thus, we could also expect large ULC growth differentials across sectors in countries of the periphery. With booming domestic demand, resources and production are shifted from the tradable to the nontradable sectors, putting further downward pressure on total factor productivity, thereby accelerating total ULC growth while the external sector might remain competitive.

Recent literature using micro-level data (András Puchal et al., 2010) finds

that exporting firms are generally larger, more innovative and thus more productive than firms that do not export.[6] The causality appears to go mainly in the direction of only more efficient and productive firms venturing into exporting because of high fixed costs of exporting. But there is also evidence for "learning by exporting" effects. These productivity differentials may lead to an aggregation bias if large performing firms versus small underperforming firms enter aggregate ULC figures with weights that differ from their relative share in total exports. This line of argument suggests focusing ULC measures on those industries most relevant for the export sector. This is the approach we follow in the next section.

2 Data and Methods

2.1 Causes and Consequences of Large Sectoral Differences in ULC Developments

The MIP scoreboard defines unit labor costs as "the ratio of nominal compensation per employee to real GDP per person employed" (European Commission 2011, p. 9), which coincides with the definition of the OECD (2007). The related variables are consequently derived from aggregate data lumping together developments in the tradeexposed and nontrade-exposed sectors of the economy. A broad approach toward deriving a ULC measure that reflects export sector developments more closely is to focus on the manufacturing sector only.[7] Several data sources (e.g. Eurostat, AMECO, ECB and OECD databases) provide a rough distinction between ULC developments in manufacturing, agriculture, construction and some other sectors, in most cases at quarterly frequency. Some of these databases have the advantage of providing close-to-real-time data or even forecasts, which makes them suitable for policy purposes. But even this more detailed measure mixes very heterogeneous sectors.

However, as explained above, recent evidence demonstrates that nonconsideration of the deeper sectoral dimension of an economy can lead to misguided conclusions (Bechert et al., 2012). Kahn (1998) argues that different sectors might have systematically different wage-setting schedules. It is possible that one sector is bargaining for efficiency wages while wage growth in the other sector is constrained e.g. by pressures of competitiveness. This finding is corroborated by the fact that wagesetting in the trade-exposed sector has become increasingly interdependent within the EU (Traxler et al. 2008; Traxler and Brandl, 2009). Therefore wage developments in the exportoriented industry and in the sheltered sector of an economy might be structurally different. Thus aggregate ULC variables could be a poor indicator for the international competitiveness of the export industry of an economy.

We therefore start from the hypothesis that a further disaggregation at the sectoral level reveals important information about the true development of competitiveness in the export sector. For this reason we propose a sector-specific export-weighted unit labor cost measure. Even though this implies that we have to use data with long publication lags, our exercise with

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[6] Barba Navaretti et al. (2011) estimate that Spanish exports could be about one-fourth higher if Spain had an industrial structure and a firm size distribution similar to that of Germany.

[7] Another sector relevant for exports would be agriculture, where prices are highly subsidized and regulated (CAP). This decouples price and thus ULC developments in this sector from export patterns (Ferrucci et al., 2010).

pre-crisis data reveals the importance of making such disaggregated data available for all euro area countries and with shorter publication delays.

2.2 Data on Sectoral Unit Labor Costs

Sectoral labor market data on an annual basis for most euro area countries are only available from the EU KLEMS Growth and Productivity Accounts, the World Input Output Database (WIOD) and the OECD Structural Analysis Database (STAN). While the KLEMS database is updated only infrequently and the WIOD project has been discontinued, the OECD STAN database (Rev. 3) has the advantage of being updated regularly and of covering all 12 original euro area countries. It provides data on unit labor costs, labor compensation, value added, employment, imports and exports, all broken down by industry at the two-digit ISIC level; i.e. it distinguishes between manufacturing subsectors such as food products and beverages, tobacco products, textiles, wood and products of wood and cork etc.[8]

Data range back to 1970 in some cases but come with long publication lags. Some countries have published data up to 2009, but observations are missing for many economies, in particular for the more recent years. Any measure based on these sectoral data would therefore not be suitable for inclusion into an extended set of scoreboard indicators because of the long publication lags in some countries. However this article may contribute to further efforts to provide such data with shorter publication lags.[9] The data limitations also imply that we can investigate pre-crisis developments but not the post-crisis rebalancing process. Due to a lack of sufficient data for real value added for Ireland we also needed to exclude this country from the analysis so that we are left with a set of 11 countries.[10]

2.3 An Export-Based Measure of ULC Growth

As explained above, total ULC measures might be highly dominated by nontradable services and the construction sector, as is the case, for instance, in Spain and Ireland. It should not be surprising that the correlation between total ULC (TULC) growth and export growth is only weak, as hypothesized by the "Kaldor paradox."

Therefore, we construct an alternative measure of ULC growth that focuses on those sectors that are most relevant for exports. More specifically, we reweight ULC developments in the manufacturing subsectors according to their relative importance within the export basket of a country. The trade-weighted ULC index (TWULC) is then calculated as:

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[8] Other examples of studies using the OECD STAN database for similar investigations are Lewney at al. (2012) and Carlin et al. (2001).

[9] In 2012 the OECD published the first set of STAN Rev. 4 data, which will subsequently substitute the STAN Rev. 3. The new STAN Rev. 4 is based on the sectoral disaggregation of the ISIC 4. Thus disaggregated sectors differ with respect to the STAN Rev. 3. Currently the STAN Rev. 4 covers some countries up to 2011 and would therefore be more suitable for the real-time analysis of economic imbalances and the rebalancing process since the crisis. Unfortunately, however, STAN Rev. 4 only covered 8 euro area countries and only one periphery country (Italy) at the time of writing. More countries are going to be added, but for the moment we need to stick to STAN Rev. 3.

[10] One drawback of the OECD STAN database is that it does not cover the service sector. Trade of services, however, is of high and increasing relevance. The newly available Trade in Value Added (TiVA) database, that traces the value added of countries and sectors for final exports, shows the importance of services as input factors for export goods. Repeating our exercise with the TiVA database would be an interesting future extension of our research.

$$TWULC^k = \sum_{i=1}^{n} ulc_i^k \ast w_i^k$$

whereby

$$ulc_i^k = comp_i^k / va_i^k$$

and

$$w_i^k = x_i^k / X^k \text{ with } X^k = \sum_{i=1}^{n} x_i^k$$

where k denotes the country and i is one of n sectors. We use a total of 10 sectors spanning the entire manufacturing industry at the 1½-digit level according to the ISIC classification system rev. 3.1.[11] ULC is computed as nominal labor compensation of employees *(comp)* divided by real value added based on the output of total employment *(va)*. A sector k receives a higher weight in our TWULC measure if it has a high share within the country's export portfolio. This contrasts with the construction of TULC, where each sector is implicitly weighted by value added.

3 Empirical Results

### 3.1 Illustration: The Spanish Case

As argued above, Spain is a model case for the disconnection between total economy ULC figures and export performance. We will thus show the importance of investigating sectoral figures as well as the advantage of our new measure for the Spanish economy.

Chart 4 evidences how ULC developments may deviate substantially across sectors. More specifically, the chart illustrates that total ULC growth is to a large extent driven by services ULC growth. ULC dynamics in the very export-oriented manufacturing sector are far more modest over the observation period. The chart also highlights the peculiar pattern of the booming construction sector with very high ULC growth in the pre-crisis years and a sharp contraction since. Overall, we may conclude that an economy-wide ULC measure may be misleading for investigating the export performance of a country.

Chart 4

Spain

Annual change; 1999=100

Source: OECD (STAN database).
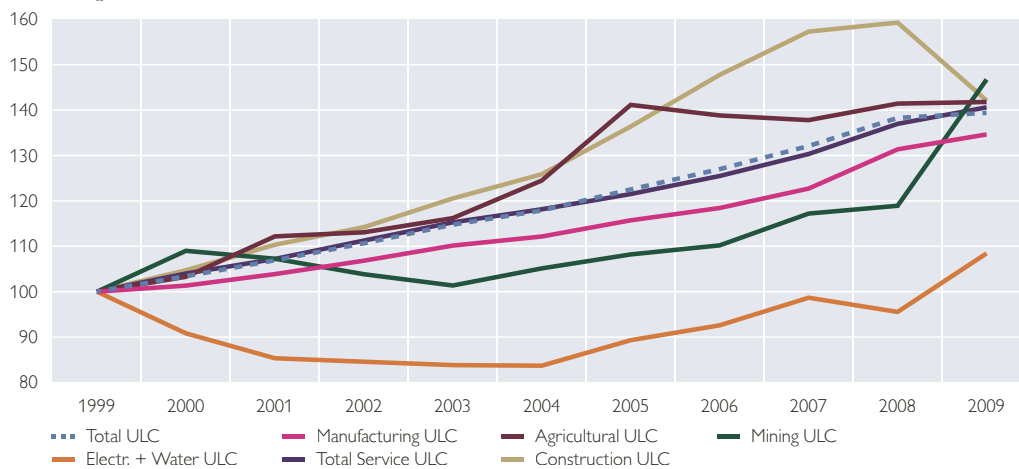
[11] See http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=17 for a detailed description of this classification system. The TWULC is based on the following subsectoral aggregates: 15—16, 17—19, 20, 21—22, 23—25, 26, 27—28, 29—33, 34—35 and 36—37.

The last country chart in chart 5 applies our new measure TWULC to the Spanish economy and shows substantial differences between labor costs of the total economy (TULC) and those of the manufacturing sector (MULC). In fact, ULC growth in the Spanish manufacturing sector was lower than in the total economy. This fits the interpretation that excessive wage dynamics are primarily related to the blown-up domestic industry and especially the construction sector. When focusing on those manufacturing sectors that are most relevant for external trade, how-

ever, ULC growth is even lower, in line with the hypothesis that the export sector is dominated by a relatively small number of large and highly productive firms very exposed to international competition in highly contested markets, such as the automobile sector.

3.2 Cross-Country Overview

When extending this analysis to the remaining countries, we observe a similar pattern as in the Spanish case for most economies: manufacturing ULC growth is typically smaller than total ULC growth. For Italy, however, the

Development of Unit Labor Cost Measures: Periphery Group
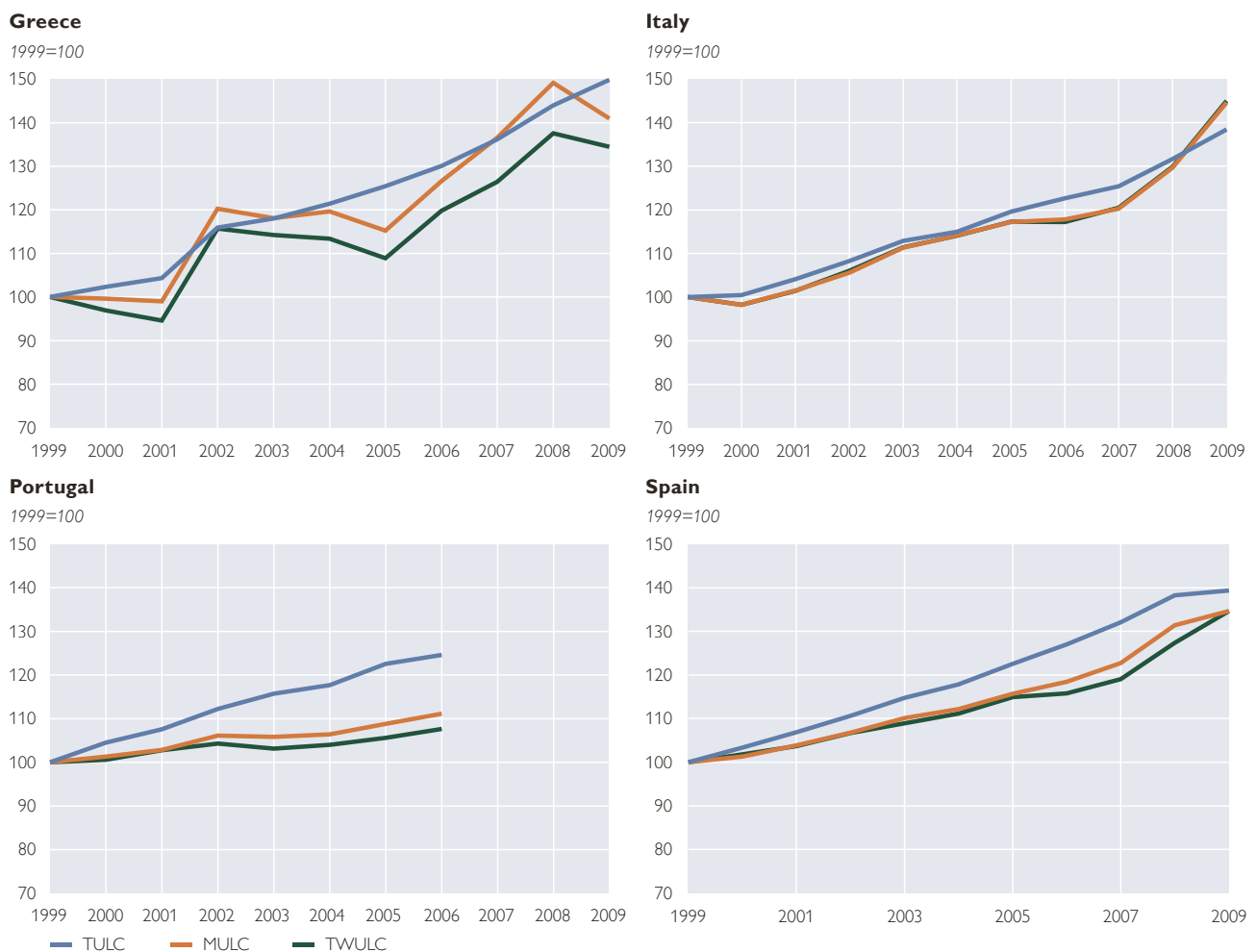
Source: OECD (STAN database).

difference is quite small. Interestingly, Greece and Luxemburg are exceptions, where the relationship between MULC and TULC even reverses in certain periods. This may relate to the importance of services in both countries (tourism in the case of Greece and financial services in the case of Luxemburg).

In general, while MULC growth was smaller than TULC growth in most economies, the periphery (chart 5) nevertheless experienced a rapid growth in manufacturing ULC, which, according to economic theory, might harm those countries' exports substantially. In Portugal, on the contrary, MULC growth was more modest, which may reflect the importance of the domestic textile industry (23% of total exports), a sector where international price competition is likely to be stronger than in the case of high-tech products.

In the intermediate group (chart 6), where we also observe substantial growth rates of TULC, manufacturing ULC increased by far less in Belgium, Finland, France and the Netherlands. Interestingly, this difference is very large in the case of Finland, where the difference between TULC and MULC growth appears to be especially large. Actually ULCs in the manufacturing sector declined between 1999 and 2007, while increasing in the total economy. This might be explained by the importance of the very innovative IT sector ("machinery and equipment," which among others included IT, which represented 39% of total Finnish exports in 2007).

In Austria and Germany (chart 7), where even TULC dynamics were rather moderate or even negative in the case of Germany, manufacturing ULC

growth rates are even lower, and were clearly negative between 1999 and 2007.[12]

In a further step, we calculated our alternative measure of manufacturing unit labor costs, weighted according to the export shares of the corresponding sector (TWULC). Interestingly, we find that in many cases (e.g. France, Germany, Portugal, Italy, Belgium and Austria) the difference between MULC and TWULC growth between 1999 and 2007 was either small or even negligible. There are, however, some interesting cases where these two measures differ substantially: In addition to the Spanish case described above, TWULC growth falls markedly short of MULC growth in Greece and the Netherlands. This implies that in these countries the export-oriented manufacturing sectors outperform the rest of manufacturing in terms of competitiveness. Finland is again an exception, being the only country (apart from Luxembourg in 2006) where TWULC growth exceeds MULC growth substantially, so that the export-oriented sectors gained less competitiveness than the total manufacturing sector. Again, it is possible that this reflects the importance of the high-tech IT sector, where Finland used to be the dominant global player. Compared to the value of the imported input factors, Finnish firms add only little value to these IT products; in other words, their export success depends mainly on their high level of technology and the cheap input imports.

Overall, the TWULC trend differs from ULC growth in the manufacturing sector in some interesting country cases. These differences may reflect

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[12] An analysis of the value added of exports shows that the domestic value added of this sector declined from 2000 onward reflecting the increasing share of re-exported goods. Still, the aggregate sector accounted for roughly 30% of value added of total exports in 2008.

Chart 6

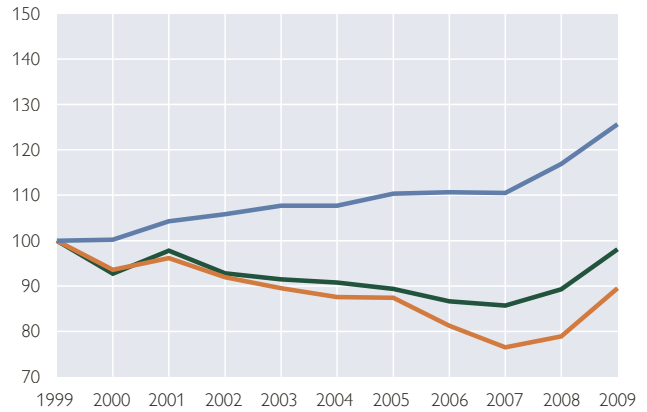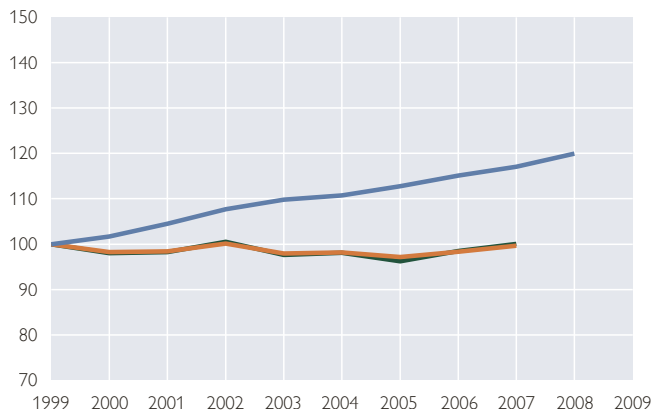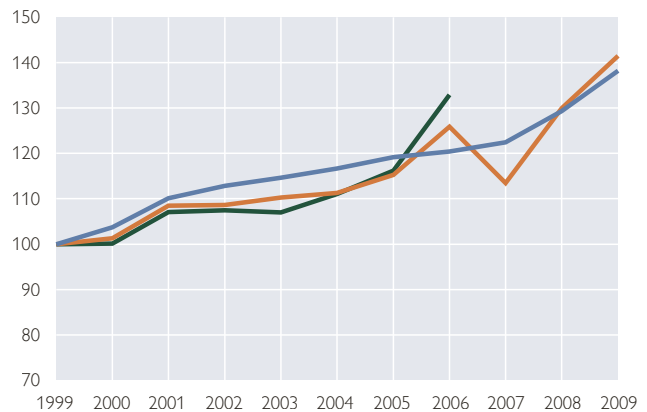## Development of Unit Labor Cost Measures: Intermediate Group

Belgium

1999=100
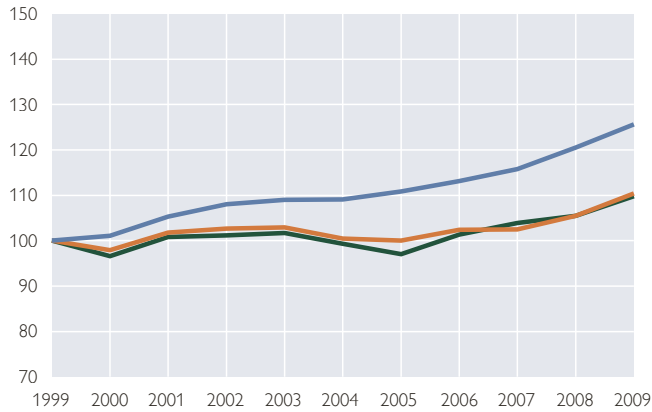
Finland

1999=100

France

1999=100

Luxembourg

1999=100

Netherlands

1999=100

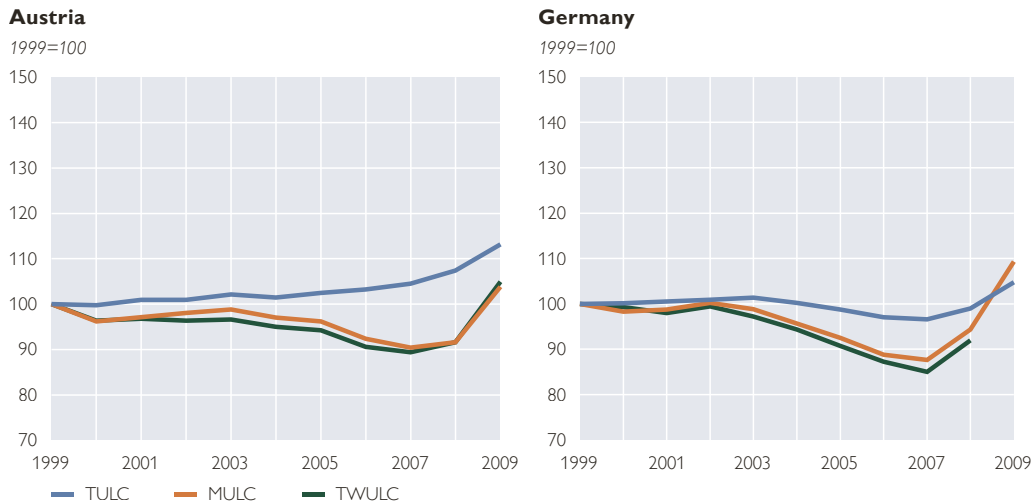— TULC — MULC — TWULC
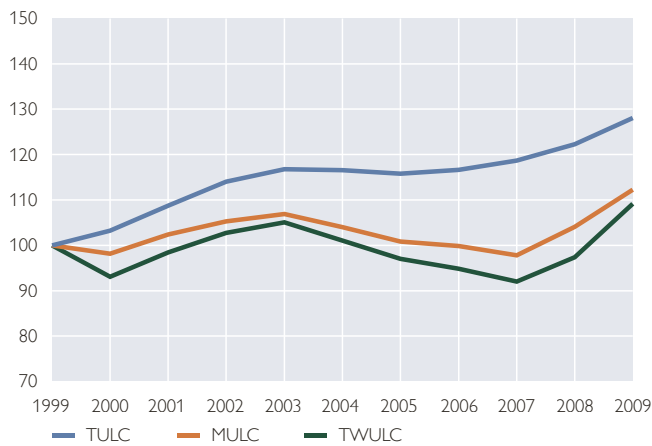
Source: OECD (STAN database).

Chart 7

Development of Unit Labor Cost Measures: Core Group

Source: OECD (STAN database).

differences in country size and in the diversity of the export sector, differences in the degree of similarity between domestic and export industries, and differences in the extent to which wage-setting procedures overlap (i.e. whether wage-setting is highly centralized, such as in Austria or Germany, or follows a less coordinated pattern). However, a detailed analysis of those determinants would clearly go beyond the scope of this paper.

3.3 Is the Kaldor Paradox Really a Paradox?

Chart 8 shows a scatter plot of average ULC growth and export growth over the pre-crisis period from 1999 to 2007, i.e. for the period for which we have TWULC values for most countries in our sample (except Luxembourg and Portugal). We focus on these long-term averages to relax the problem of endogeneity (i.e. the fact that ULC growth may depend also on the export performance) and to neglect the cyclicality of productivity. Furthermore, the price elasticity of exports could be rather low in the short run, as export volumes

react only after a certain time span following price increases (the "J-curve effect"). Nonetheless it needs to be pointed out that gross export growth might be biased by re-exports. This also might explain the persistent outlier position of the Netherlands in the charts below.

As suggested by theory and contrary to the commonly cited "Kaldor paradox," the link between TULC growth and export growth (cumulative growth rates 1999–2007) is negative, but the explanatory power is very small. This weak fit is explained by the fact that countries such as France or Belgium have a very different export performance despite similar ULC developments. Similarly, export growth in Greece or Spain did not differ that much from export growth in Germany in the observation period but was realized with completely different ULC developments: While ULCs grew by more than 20% between 1999 and 2007 in Greece and Spain, they actually declined in Germany. Several articles study the coincidence of high ULC growth and a favorable trade perfor-

Chart 8

Total Unit Labor Costs and Export Growth

Competitiveness indicator (cumulative change in %)

$y = -0.1375x + 35.885$
$R^2 = 0.1021$

Export growth (cumulative, %, 1999–2007)

Source: OECD (STAN database).

mance in the Spanish case under the heading "Spanish paradox" (e.g. Antrás Puchal et al., 2010; Maroto Sánches and Rubalcaba Bermejo, 2006; Crespo Rodríguez and Segura Cayuela, 2012). This conundrum is even more astonishing given that Spain has a more unfavorable geographical trade focus than other members of the currency union (like Germany), which weighs on its trade performance (Gaulier and Vicard, 2012). Darvas (2012) offers a similar study on Ireland.

Surprisingly, the link between MULC growth and export performance is even weaker, as shown in chart 9. The high export growth rates of the best-performing countries Netherlands, Austria, Germany and Belgium can be explained more conclusively, as MULC growth in those countries was considerable lower than in the total economy. The explanatory power for Finland and France, however, seems to decrease. While those countries exhibit very low (or in the case of Finland even consider-
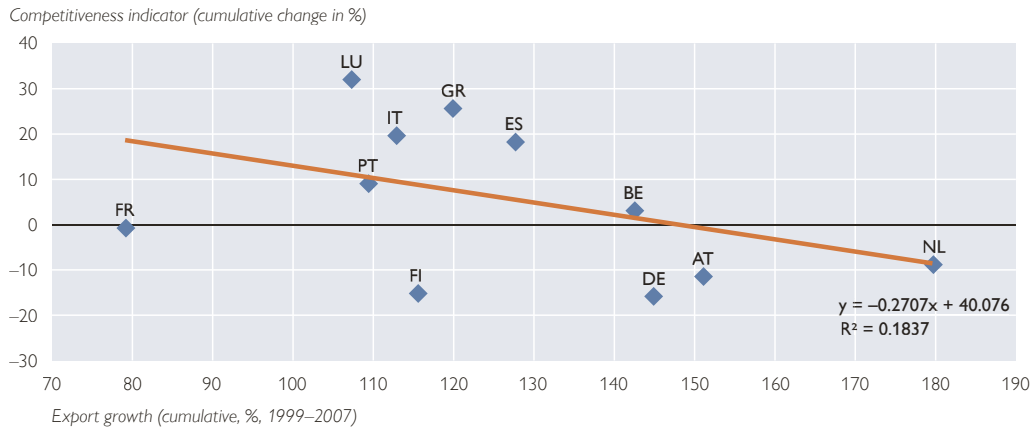
Chart 9

Manufacturing Unit Labor Costs and Export Growth

Competitiveness indicator (cumulative change in %)

$y = -0.1646x + 26.107$
$R^2 = 0.0643$

Export growth (cumulative, %, 1999–2007)

Source: OECD (STAN database).

Chart 10

Trade-Weighted ULC (TWULC) and Export Growth

Competitiveness indicator (cumulative change in %)

Export growth (cumulative, %, 1999–2007)

Source: OECD (STAN database).

ably negative) MULC growth rates, their export growth rates are much lower than expected. While the case of Finland was already discussed in detail above (including the high share of high-tech industry, where only a small part of value added in exports originates in Finland), French exports are dominated by machinery equipment, transport equipment, chemicals, fuels and plastic. In those sectors, nonprice factors, which are not covered by our analysis, might play a major role for export perfor-mance, causing countries mainly oper-ating in such industries to perform rather poorly in this very simple bivari-ate correlation analysis.

In a final step, chart 10 shows the same analysis for our newly introduced measure of competitiveness, the trade-weighted unit labor cost (TWULC) index. While the results have to be interpreted with caution due to the low number of observations (cross-country analysis with only 11 observations), it seems nevertheless interesting that the explanatory power of our TWULC measure is substantially higher than TULC and MULC growth rates (R2 of 18% versus 10% and 6%, respectively). The main differences are the much

lower growth rates of ULC in export sectors than in overall industries in Greece, Spain and Portugal, and also less negative growth rates of the TWULC than the MULC measure in Finland. Our new measure would thus appear to be a better indicator for emerging competitiveness problems than conventional measures, given its focus on export-oriented sectors only.

To conduct a robustness check, we repeated our analysis by changing the sample period for our regression to 2000–2007, i.e. starting one year after the introduction of the euro, or by using an alternative benchmark (export data as well as export shares according to the OECD Main Economic Indicators database). However, our results were qualitatively unaffected by these changes.

4 Discussion and Statistical Caveats

Measures of unit labor cost develop-ments are key indicators for assessing the competitive position of countries. Yet empirical evidence shows that total economy ULC figures are often largely disconnected from export growth figures. Our analysis confirms only a

weak link between these two variables for the euro area countries.

Different hypotheses have been brought forward in the literature for this "Kaldor paradox." In this paper we argue that total economy ULC measures may be misleading when judging the export competitiveness of a country because only a fraction of goods and services are in fact exported. ULC developments in the export-oriented sectors may be substantially different from those in the more domestically oriented industries, such as those related to the housing and construction booms in several euro area countries (Spain, Ireland).

We therefore propose an alternative measure of cost competitiveness, trade-weighted ULC (TWULC) growth, which uses disaggregate sectoral information and gives greater weight to those manufacturing sectors that have a higher relative importance within the export basket of a country. The TWULC measure thus better describes patterns in export-oriented industries. We find that ULC growth has typically been much higher in the total economy average than in the manufacturing sector since the establishment of the euro area. Manufacturing ULC growth exceeds ULC growth markedly in several cases in those industries that are highly exposed to international competition (TWULC). Especially in countries of the periphery and in countries affected by housing booms before the crisis we find evidence of a strong deviation of our TWULC measure from total economy ULC developments. In Austria, manufacturing ULC growth and trade-weighted ULC growth broadly coincide but both fall considerably short of total economy ULC developments. Furthermore, in a preliminary analysis, we find that TWULC developments appear to possess superior explanatory

power with regard to export performance as compared to more common measures of total or manufacturing ULC.

Overall, interpreting total economy ULC developments as indicators for external imbalances – as done in the Macroeconomic Imbalance Procedure and the Alert Mechanism Report at the European level (macroeconomic scoreboard) – may thus be highly misleading. The high ULC growth in periphery countries may be misinterpreted as being the main explanation for high current account deficits in the pre-crisis period. In reality, however, these external imbalances are to a large extent the result of strong import demand related to the interest rate decline after the introduction of the euro. A wrong diagnosis, in turn, may then lead to wrong policy recommendations.

In practice, however, the advantage of our newly proposed TWULC measure is limited on several accounts. First, unit labor costs may in general be a misleading indicator of competitiveness in industries where labor costs account only for a fracture of total costs; after all, this ratio differs substantially across sectors. Even when measured with more sophisticated measures, price competitiveness remains just one factor for export performance; other determinants such as quality, consumer preferences and common shocks also play a major role for export growth rates. Also the geographical pattern of trade specialization and the growth dynamics of export markets matter. Moreover, ULC data are based on value added, while export performance is measured by total revenues (based on sale prices). Clearly, final products include value added from various sectors, which can lead to considerable differences between sale

prices and deflators used to calculate ULCs. Unfortunately, however, this drawback cannot be solved in our study due to data constraints. The Kaldor paradox regarding the link between ULC developments and export performance thus remains a puzzle, as indicated by the low coefficient of determination in our correlation analysis.

Second, the TWULC measure gives low weight to sectors with low trading activity. Low trading activity in turn may result from low price competitiveness. In this sense the TWULC may be better suited to explain past export patterns. Our approach does, however, neglect the possibility of exploring new markets by improving the competitiveness of products. In this sense the TWULC measure may provide a biased impression of future export potential,

as the export orientation of sectors might be endogenous. Third, due to limited data availability, our TWULC measure is exclusively based on data for the manufacturing industry. This might cause a certain bias in our empirical results, as an increasing fraction of services is tradable today. The particular patterns of Luxemburg and Greece indicate the importance of also taking important service sectors such as tourism or financial services into account. Finally, sectoral data are currently only available with long publication lags. This makes the TWULC currently unsuitable for policy purposes such as the new surveillance procedures at the European level. Still, we hope that this paper may provide an impulse for a timelier and more reliable provision of sectoral ULC data.

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