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Piero Esposito
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IMPROVED STRUCTURAL COMPETITIVENESS OR DEEP RECESSION?

On the recent macroeconomic rebalances in the EMU*

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Abstract

One of the main problems facing the European Monetary Union is the macroeconomic imbalances between 'core' and 'peripheral' member states. Though they predated the union's creation, these problems were highlighted between 1999 and the advent of the international financial crisis. One significant indicator of these imbalances is the often divergent trade and current account disequilibria of these two groups of countries. With the events of 2007-08 and the subsequent 'flight to quality' of financial capital, the current account deficits of 'peripheral' member states became unbearable. By the end of 2014, all 'peripheral' countries had eliminated or drastically reduced their deficits. We show that this result is more dependent on the contraction of their GDP and relative reduction in their average real wages than on a productivity increase in their economy. To reach this conclusion, the paper empirically describes the determinants of the structural evolution in trade and current account imbalances and then offers econometric evidence of the impact of different components of unit labor cost on net exports. Based on this evidence, the paper points out the fragility of the European adjustments and suggests some policy implications.

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1. Introduction

One of the main problems facing the European Monetary Union (EMU) is the macroeconomic imbalances between ‘core’ member states (generally-speaking, Germany and other northern European countries) and ‘peripheral’ member states (Italy, Spain, Portugal, Greece, and other southern European countries). Though they predated the union’s creation, these problems were highlighted between 1999 and the advent of the international financial crisis (2007-08) and have continued to cast a shadow on Europe. One significant indicator of the macroeconomic imbalances is the often divergent trade and current account disequilibria of these two groups of countries. These disequilibria are not the only indicator of macroeconomic imbalances. The two European Regulations, which are part of the Six Pack (December 2011) and refer to macroeconomic imbalances, were originally based on a scoreboard composed of eleven indicators (recently increased to fourteen); Italy, despite its periods of low deficits and moderate surplus in its current account balances, has been included in the short list of member states with excessive macroeconomic imbalances. In any case, trade disequilibria remain important and can be considered a leading indicator of relative competitiveness.

Numerous studies on the increasing trend of current account imbalances in the first decade of the single currency’s life have identified three causes. The first concerns divergent national trends in unit labor costs (ULC), i.e., the cost of labor per unit of output. Up until the international financial crisis, the majority of the EMU’s ‘peripheral’ countries experienced a relatively large increase in average real wages, especially in comparison to the modest, or even nonexistent, increase in labor productivity (as well as total factor productivity). The opposite happened in a large number of ‘core’ countries (see also Dullien-Fritsche 2009, Stockhammer-Onaran 2012, Collignon 2013, Belke-Dreger 2013). This first element, in addition to being a crucial factor in the loss of competitiveness for the peripheral countries as a group,¹ was worsened by a second cause: increasing competition from emerging economies that impacted the most fragile and traditional parts of the European productive structure (see also Chen et al. 2013 and Guerrieri-Esposito 2012). The third cause does not negate the first two but, if anything, explains their persistence. It is linked to the fact that, until the beginning of the international financial and ‘real’ crisis (2007), the introduction of a single currency spurred the flow of financing and capital from the ‘core’ to the ‘periphery.’ These compensative flows made the growth in trade imbalances sustainable but, too often, did not translate into productive investment. In fact, they fed speculation and consumer demand in ‘peripheral’ countries (see also Giavazzi-Spaventa 2010, Borio et al. 2011, Schmitz-von Hagen 2011, Cesaroni-De Santis 2014, and Esposito 2015).

Recent research (Alessandrini et al. 2014; Baldwin-Giavazzi 2015a and 2015b; Canofari et al. 2015) has shown that all three cited causes contributed to the increasing current account imbalances in the EMU. With the events of 2007 and the subsequent ‘flight to quality’ of financial capital, the current account deficits of ‘peripheral’ member states became unbearable and, hence, had to be quickly reduced.² Further adjustments were due to fiscal consolidation policies

¹ A different view is maintained by Gros (2016).

² After 2007, the compensative effect resulting from financial and capital flows toward ‘peripheral’ countries was belonging to the eurosystem. This did not eliminate, however, the need for severe adjustments in the balances of ‘peripheral’ countries

implemented in the euro area after 2009. By the end of 2014, all 'peripheral' countries had thus eliminated or drastically reduced their deficits. The cost, however, was a prolonged recession and decrease in wages and prices (see also Lane 2013; Blanchard et al. 2015; Borio-Disyatat 2015). Moreover, a symmetric adjustment on the part of 'core' member states was not recorded. Many of them retained or, in fact, increased their current account surpluses (a result of the growing gap between flows of national savings and investment). The indirect effect was a strengthening of recessive tensions in the rest of the euro area (see also Sinn 2014).

This area went through a partial rebalancing between 'peripheral' and 'core' EMU countries by 2014. The re-adjustment was accompanied by improvements in indicators of competitiveness (unit labor costs, in particular) which, however, resulted more from the contraction of GDP and relative reduction in average real wages than from an increase in productivity. Additionally, other 2014 data show that the increase in exports of 'peripheral' countries was mainly due to positive trends in demand from outside the European Union (extra-EU countries), emerging economies in particular, and, to a lesser extent, to the internal rebalancing in the euro area. As highlighted by Canofari et al. (2015), these factors suggest that macroeconomic processes regulating internal adjustments within the EMU are more transitory than structural. In other words, these processes appear to represent a temporary deviation from the pre-existing long-run trend of imbalances, rather than a structural and permanent increase in relative competitiveness across EMU member states. In this perspective, the EMU's imbalances would once again become a problem when the European economy starts to grow.

Since 2015 was the beginning of economic recovery in the euro area and 2016 is expected to mark a slight consolidation, the previous statement has policy implications. Therefore, it is important to obtain robust empirical evidence on this subject. To pursue this goal, it is first necessary to distinguish the nominal effects of wage and price moderation from the 'real' effects of productivity as measures of competitiveness. Generally speaking, the empirical literature on imbalances is not very useful in this respect since it focuses on aggregate measures of competitiveness, which mix price and productivity factors. For example, Belke-Dreger (2013) and Sinn (2014) refer to the real exchange rate, while Dullien-Fritsche (2009) and Collignon (2013) make use of indexes derived from aggregate unit labor cost (ULC). A partial exception is Stockhammer-Onaran (2013), which focuses on wage dynamics.

The aim of this paper is to assess the short- and long-term impacts, respectively, of wage and productivity dynamics on net exports of goods and services, an assumed measure of competitiveness. To pursue this goal, we utilize a panel analysis on a quarterly sample including eighteen EMU countries with an observation period of 1997-2015. The exercise is carried out on the whole sample as well as on the three sub-groups of core, periphery, and new member states. The main aim is to assess whether the recent rebalancing in the EMU periphery is the temporary result of a prolonged recession and internal deflation or a more permanent outcome of improvements in structural competitiveness. To simplify a controversial issue, when referring to structural competitiveness, we mean a positive dynamic of hourly labor productivity and total factor productivity due to technical and organizational innovations and positive externalities. Conversely, when referring to temporary competitiveness, we mean decreases in ULC due to compressions of nominal wages and other related effects of high unemployment.

In this last respect, it must be noted that normal economic activity is not ideal for disentangling the dynamics of labor productivity from the impact of nominal wages. The latter is largely

determined by the former, along with bargaining processes in the labor market which, in line with the 'staggered models' introduced in the new Keynesian economics framework (Fisher 1977, Taylor 1979), influence wages for the years ahead based on inflation expectations. However, after the recent international and European crises, the dynamics of both nominal wages and hourly labor productivity have been greatly influenced by the negative economic cycle (see also Blanchard 2016). Hence, it becomes particularly important to distinguish between improvements in the structural competitiveness of a given country and temporary improvements in its ULC, which do not have any medium- or long-term effects on external balances. The latter point becomes still more important since the recent evolution in Global Value Chains (GVCs) can alter the relationships between ULC, competitiveness, and commercial imbalances of a given area.³

Our analysis is developed over two steps. In the first, we estimate the long-term relationships between each different component of ULC and trade balances in order to test whether significant structural changes in these relationships took place after the international financial and 'real' crises.

A structural break in the effect of average compensation per employee could have occurred since consolidation policies could have persistently reduced purchasing power in the countries more severely affected by these same policies. Moreover, the prolonged recession might have implied a flattening of the Phillips curve, such that small changes in wages would be associated with larger variations in unemployment and output (Blanchard 2016). Finally, the prolonged recession could have caused a break in the dynamics of potential output growth for the EMU as a whole (European Commission 2015b), more so for its periphery because of the disappointing dynamics between domestic investment and total factor productivity. These phenomena are highly interconnected and should flow into non-transitory changes in the elasticity of imports to domestic purchasing power. On the other hand, the break could be the result of improved price competitiveness of exports.

As for productivity, an increase in its impact on trade balances and on exports in particular would imply that the recent reforms have improved the structural competitiveness of EMU countries, especially in the periphery. In this respect, we separate the impact of hourly labor productivity dynamics, the main variable determining changes in structural competitiveness and trade balances, from the impact of variations in the average number of hours worked per employee. In fact, the latter takes into account the effect of temporary employment protection measures, which helped to mitigate short-term adverse consequences of the 'real' crisis, particularly in Italy and other 'peripheral' countries.

In the second step, we refer to the same relationships in order to measure the intensity and persistence of their short-term disturbances by estimating a panel Error Correction Model. This analysis will bring further insights on the transitory or permanent nature of the recent rebalancing in current account positions

This paper thus offers three main contributions. The first is empirical evidence on the

³ The impact of GVCs on competitiveness and imbalances of a given country or area goes beyond the points raised. In fact, GVCs tend to distort the economic meaning of current account imbalances (see Marin 2006; Timmer et al. 2013; Cheng et al. 2015; Cingolani et al. 2015).

determinants of the structural evolution in trade and current account imbalances in the EMU that includes three years of recession (2011-2013) and the subsequent years of stagnation and early recovery (2014 and 2015). Previous research analyzed the years up to 2012 (Sinn 2014), thus missing the possible early impact of consolidation policies and structural reforms implemented in 2013 and 2014. The second contribution is distinguishing between different components of ULC, improving upon previous literature by providing empirical analysis on the impact of productivity changes. The third contribution is the policy implications of the two previous points.

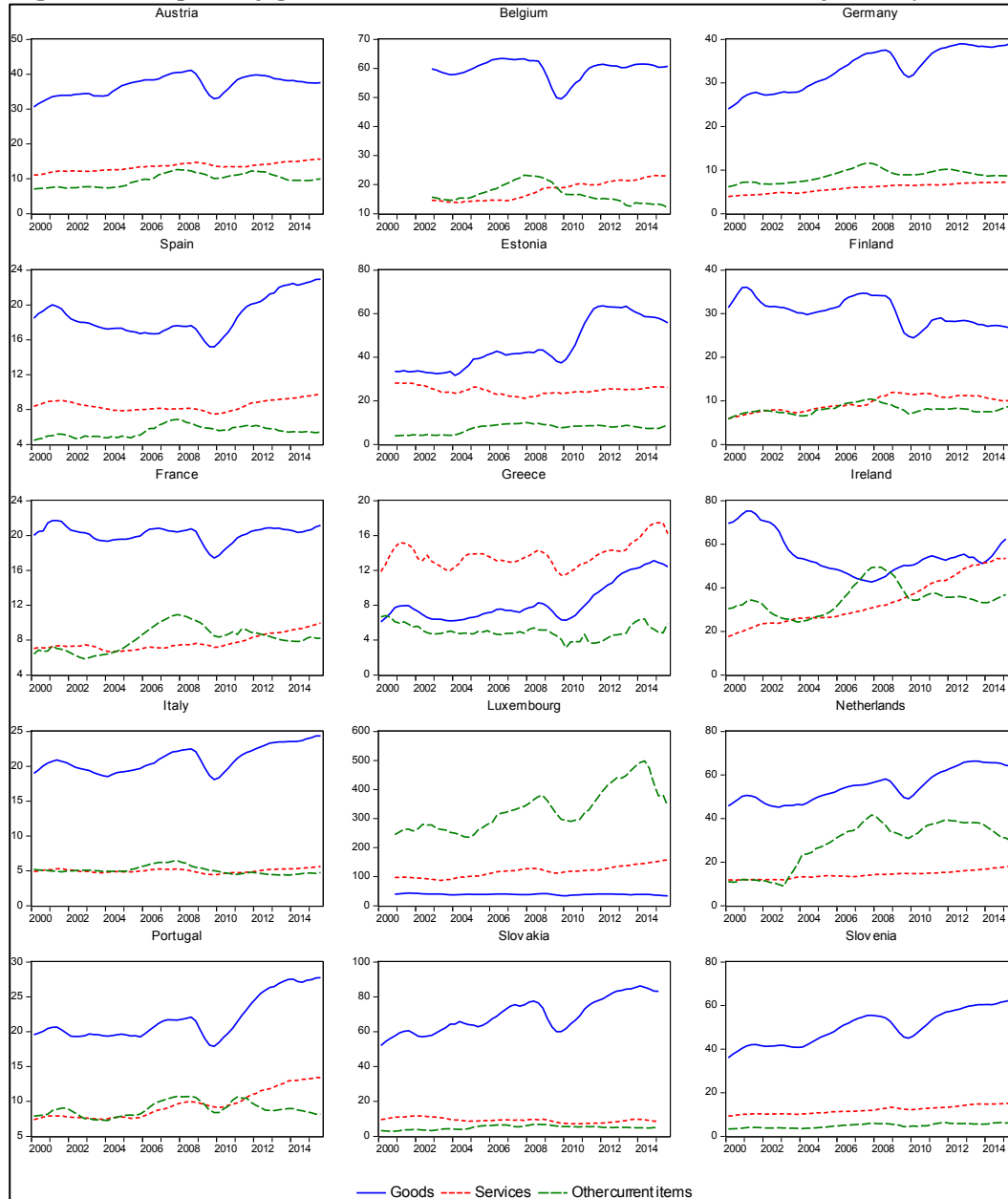
If the empirical evidence confirmed our thesis that the recovery of competitiveness based on organizational and technical innovations was overshadowed by the effects of downward pressure on nominal wages and prices, the criticism of many economists regarding the efficacy of fiscal consolidation policies aimed at improving structural competitiveness of 'peripheral' EMU countries would gain empirical support. This would underscore the necessity for national economic policies incentivizing various forms of productivity and a European plan for investment aimed at loosening constraints on the design and implementation of these policies and targeting mainly 'peripheral' countries.

The rest of the work is structured as follows. In section 2, a description of the recent evolution of trade flows and current account balances of euro area countries is provided; trade flows are also specified by their destinations. This allows examination of the possible competitiveness factors at the national level (section 3). A first round of empirical and descriptive analysis confirms the thesis presented above. It indicates that, with the partial exceptions of Ireland and Spain, the recent competitive dynamics that reduced the gap between 'peripheral' and 'core' countries could be attributed to compression of output and wages rather than increases in hourly labor productivity. The result is not enough to provide a robust proof, which requires an econometric exercise (section 4). Going into more detail on the primary components of unit labor costs, this exercise shows that, between 2008-10, a structural break occurred in the impact of labor costs on trade and current account balances of peripheral EMU countries. However, this structural break was only due to the relationship between imports and nominal wages, and it was reinforced by short-term dynamics. The results are robust even if we take into account the specificities of Ireland and Spain, which experienced high productivity increases between 2013 and 2015, and even if we change the breakpoint. Thus, the econometric results strengthen our thesis by showing that Ireland and Spain do not represent an exception. This conclusion allows us to recommend some policy implications (section 5).

2. Trade Flows and Current Account Balances

As mentioned above, from the euro's introduction in 1999 to the international financial crisis in 2007, divergences between the majority of EMU member states were aggravated by increasing trade deficits in 'peripheral' countries and increasing surpluses in 'core' countries (Germany and the Netherlands, in particular). With the worsening financial and 'real' crisis in 2008-09 and, above all, the consequent advent of the European sovereign debt and banking crises, negative imbalances were, to a large extent, reabsorbed. Here, we are interested in deepening our understanding of the re-adjustment period. The following figures examine the primary components of trade and current account balances with respect to a subset of euro area countries. All the variables are calculated as percentages of gross domestic product (GDP).

Figure 1 - Export of goods, services and other items as a % of GDP (4Q averages)

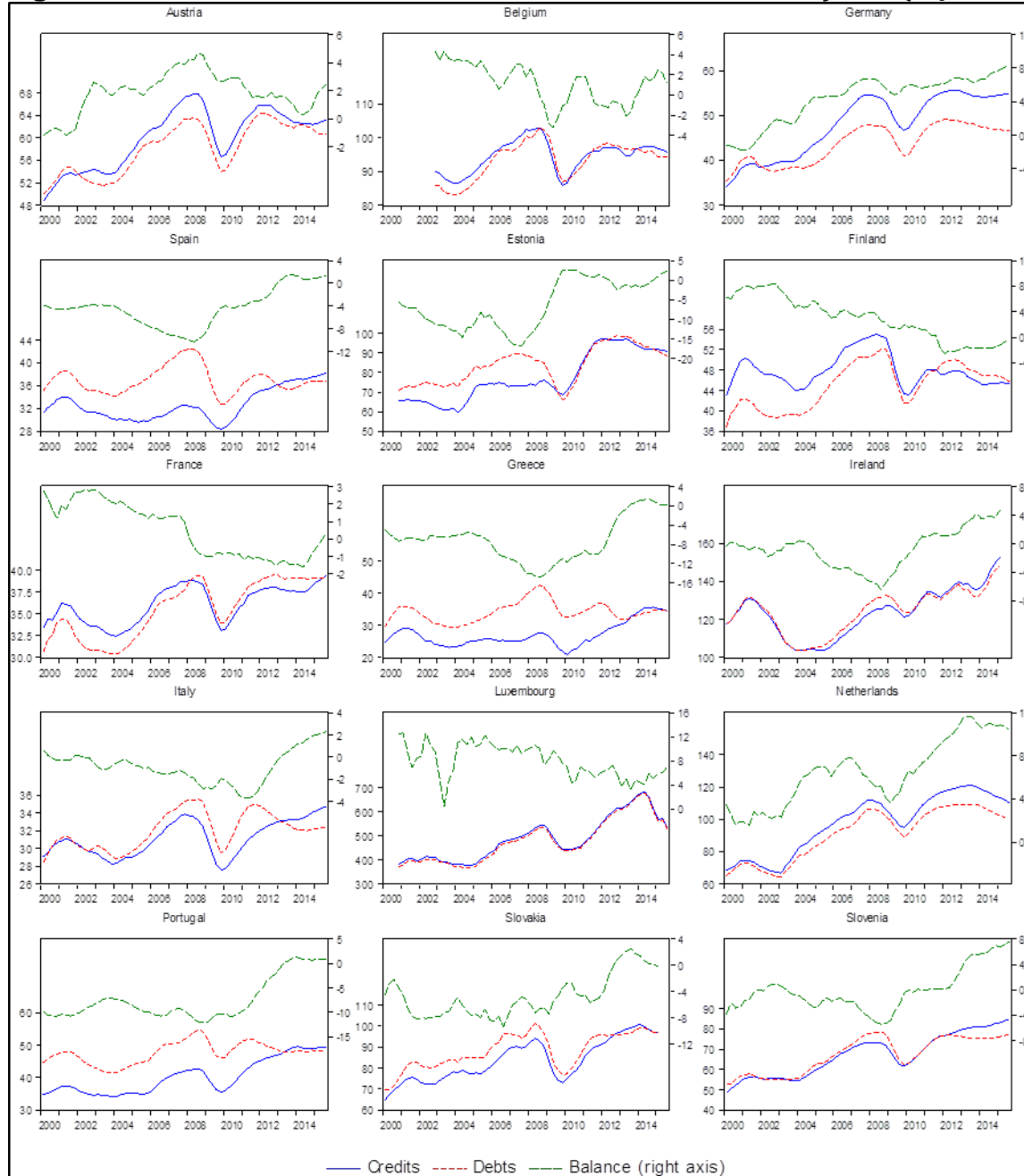


Source: Elaboration of Eurostat data.

Figure 1 shows the national dynamics of credits positions (exports of goods, services, and other items) that make up the current account. Between 2010 and 2015, Spain, Portugal, Slovakia, and Italy experienced significant increases in total exports of goods as a percentage of GDP. These increases were analogous with those achieved in the Netherlands, but greater than those recorded in Germany and France. A similar pattern can be observed for Greece, although its exports started to fall again in 2015. Conversely, exports of services as a percentage of GDP increased considerably not only in Ireland, Greece, Portugal, and Spain, but also in Luxembourg and France; to a lesser extent, the same trend applies to Germany and Italy. In any event, even if

the contribution of services to overall exports is less relevant than that of goods for the majority of European countries under examination, it played an important role in the rebalancing of their current accounts.

Figure 2: Current account - credits, debts, and balances as a % of GDP (4Q averages)



Source: Elaboration of Eurostat data.

Figure 2 confirms the pivotal role of exports in the improving balances of almost all ‘peripheral’ countries, in both absolute and relative terms. Ireland rebalanced its position in 2011 to reach a positive peak at the beginning of 2015; Italy, Spain, and Slovakia recorded positive balances

starting in 2013. Portugal and Greece substantially eliminated their imbalances in 2014. This strengthening of current accounts was not, however, the prerogative of only the more fragile countries. Beginning in 2008, Germany and the Netherlands notably increased their surplus, while Belgium went from a deficit of 3% to a surplus of 1.3% of GDP. On the other hand, Austria and Finland, which had significant surpluses in 2008, went through a perceivable adjustment and, starting in 2012, Finland incurred a deficit. Even France progressively worsened its position, coming close to -2% of GDP in 2013 and stopping around zero in 2014.

When considering liability positions, it is possible to also observe a correlation between improvement in the balances and the evolution of imports with respect to GDP. Imports recorded moderate decreases in the majority of 'peripheral' countries. The most perceivable fall of imports was recorded starting in 2011 in Italy, Greece, and Portugal, countries that had also experienced the greatest contraction in GDP and, especially between 2010 and 2013, in domestic consumption. If combined with the increased ratio of exports to GDP, these data suggest that the improvement in national imbalances of 'peripheral' countries was largely due to their recessions.

Tables 1, 2, and 3 explore the dynamics of exports, imports, and trade balances of each EMU member with other EMU countries (intra-EA), EU countries not part of the EMU (other-EU), and the rest of the world (extra-EU), respectively.

Table 1 - Exports to the euro area, the EU, and the rest of the world as a % of GDP

	Intra-EA				Other-EU				Extra-EU			
	2001	2007	2010	2014	2001	2007	2010	2014	2001	2007	2010	2014
Austria	20.8	23.1	21.2	21.3	6.1	7.6	6.6	6.8	9.0	11.6	11.2	12.6
Belgium	50.8	57.3	50.7	49.9	11.5	12.1	10.7	12.8	17.7	21.8	22.8	26.0
Estonia	25.3	15.4	18.4	18.2	17.8	19.3	22.3	25.5	9.9	14.7	18.7	16.8
Finland	11.7	11.6	8.8	9.0	8.5	8.4	6.4	6.6	13.2	15.2	12.8	11.7
France	11.6	10.6	9.5	9.6	3.4	3.1	2.5	2.7	8.4	7.2	7.7	8.2
Germany	13.0	16.8	15.0	14.0	5.6	8.0	7.1	8.1	10.7	13.5	14.7	16.4
Greece	3.6	3.6	3.5	4.8	1.7	1.7	1.6	2.5	3.0	3.1	4.2	8.0
Ireland	27.2	18.5	20.9	17.0	21.5	10.0	9.8	9.0	27.2	16.4	22.2	21.4
Italy	9.9	10.5	9.2	9.9	2.9	3.3	2.9	3.5	8.2	8.9	9.0	11.3
Luxembourg	34.4	31.7	23.8	21.3	6.6	8.2	6.0	3.1	5.4	5.6	6.1	5.2
Netherlands	35.0	40.0	42.3	44.4	9.1	11.2	10.6	13.5	10.0	14.4	15.6	18.5
Portugal	13.3	14.6	13.4	16.4	2.8	2.2	2.2	3.2	3.7	5.0	5.1	8.1
Slovakia	31.0	38.7	34.2	39.5	23.0	27.4	26.8	32.8	9.0	10.0	11.3	13.9
Slovenia	26.1	32.5	33.0	37.7	5.3	10.8	10.2	12.1	13.1	19.2	17.6	22.8
Spain	11.3	9.8	10.0	11.7	2.6	2.3	2.2	3.3	4.8	5.0	5.6	8.5

Source: Elaboration of Eurostat and COMEXT data.

In recent years (2010-14), 'peripheral' EMU countries, with the exception of Ireland and Estonia, increased the proportion of exports to countries in the euro area (intra-EA) (Table 1). Greece, Portugal, Spain, and Italy significantly increased their exports to countries outside the EU (extra-EU) as well. Greece and Italy (as Ireland had already done) reached a point where their extra-EU exports became greater than their intra-EA exports. In general, the proportion of exports of 'peripheral' countries to countries within the EU but outside the EMU (other-EU) was more modest. In the same time period, facing these changes in export trends, the majority of 'peripheral' countries recorded more limited variations in their proportion of imports (Table 2).

The latter only substantially increased in Slovakia, Estonia, Slovenia, and Greece. With Greece and Slovenia, these increases were due to imports originating in extra-EU and other-EU countries, respectively.

During the same period (2010-14), with the exception of Luxembourg and, only as far as exports are concerned, Finland, 'core' countries recorded increases, more or less consistently, in their exports and imports as a proportion of GDP, and, at least in the case of Germany, Belgium, and Austria, these increases could be attributed to extra-EA exports (Tables 1 and 2).

Table 2 - Imports from the euro area, the EU and the rest of the world as a % of GDP

	Intra-EA				Other-EU				Extra-EU			
	2001	2007	2010	2014	2001	2007	2010	2014	2001	2007	2010	2014
Austria	25.3	28.7	26.8	26.3	5.2	4.8	4.7	5.5	7.4	8.7	9.2	9.8
Belgium	44.4	51.7	47.4	46.8	9.6	9.8	8.5	8.8	21.0	25.6	25.0	29.9
Estonia	29.4	29.2	23.9	28.8	16.2	26.1	26.4	27.6	23.1	15.1	12.7	12.6
Finland	10.0	12.4	10.9	11.2	7.5	8.1	6.9	8.0	7.7	11.5	9.9	9.0
France	13.2	13.8	13.2	13.6	2.8	2.7	2.6	2.5	7.7	7.2	7.3	7.7
Germany	11.6	14.1	13.8	14.0	4.5	5.7	5.7	6.3	8.8	10.8	11.3	10.8
Greece	12.1	12.5	9.6	10.2	2.7	2.6	2.2	2.9	8.6	10.8	10.7	14.0
Ireland	9.7	8.1	6.5	7.7	21.3	13.6	11.9	12.3	15.3	9.3	8.9	9.1
Italy	10.3	10.9	10.2	10.0	2.2	2.5	2.3	2.5	7.7	9.8	10.3	9.6
Luxembourg	43.8	39.0	36.4	31.4	3.8	1.9	1.6	1.5	10.9	14.6	9.4	8.2
Netherlands	19.7	22.3	21.4	22.6	6.6	6.5	7.3	8.1	22.5	29.8	32.5	36.3
Portugal	22.2	23.8	22.5	23.0	2.7	2.3	2.4	2.4	7.6	8.0	7.7	8.6
Slovakia	29.0	33.1	27.4	34.9	22.0	25.7	25.0	27.0	13.0	20.0	20.4	19.7
Slovenia	31.7	41.1	35.7	36.2	6.0	7.3	6.8	8.2	11.1	17.2	20.1	24.1
Spain	14.3	14.0	11.1	12.1	2.6	2.6	2.4	2.8	7.7	9.7	9.4	11.1

Source: Elaboration of Eurostat and COMEXT data.

All the examined data allow a geographic separation of variations in the proportions of trade balances with respect to GDP of the main 'peripheral' and 'core' EMU countries (Table 3). Between 2010-14, Italian trade imbalances became positive due to increases in the preexisting surpluses with respect to other-EU countries, but mainly due to changes in its extra-EU trade, which went from -1.4% to 1.7%. Slovenia and Slovakia too recorded improving trade balances. The most significant adjustments occurred, however, in Portugal, which experienced a decrease of more than 2% in deficit with respect to both intra-EA and extra-EU trade, as well as a surplus in other-EU trade. Aside from minor negative imbalances, similar adjustments of lesser intensity were recorded in Spain. Greece, instead, remained in a problematic situation: despite adjustments in all three areas, its trade balance was still significantly negative for intra-EA, other-EU, and extra-EU countries at the end of 2014.

During the same period, certain 'core' countries (France and Finland) worsened their positions, experiencing either increasing or new negative imbalances attributable to intra-EA and other-EU trade, respectively. Austria recorded a slight and decreasing negative trade imbalance due to its intra-EA trade as well. The high and growing proportion of negative trade imbalances incurred by the Netherlands with respect to extra-EU countries was compensated with great excess by a growing surplus with respect to EU countries. To a lesser extent, this trend also applied to Belgium. On the other hand, Germany nullified its positive balance with respect to intra-EA

countries, although it more than proportionally increased its trade surplus with respect to other-EU and, above all, extra-EU countries.

The descriptive analysis up to this point suggests that adjustments in trade and current account balances achieved by ‘peripheral’ countries in the past five years resulted from two factors. On the one hand, there was a generalized increase in the proportion of exports with respect to GDP, which also occurred in a number of ‘core’ countries. This growth in exports is attributable to the aggregate demand from extra-EU countries and particularly from emerging economies. On the flipside, there was a more moderate and localized reduction in the proportion of imports with respect to GDP, which is attributable to the proportion of goods and services originating from other EU countries.

Table 3 - Trade balance with the euro area, other EU countries, and the rest of the world as a % of GDP

	Intra-EA				Other-EU				Extra-EU			
	2001	2007	2010	2014	2001	2007	2010	2014	2001	2007	2010	2014
Austria	-4.5	-5.6	-5.6	-5.0	0.9	2.9	1.9	1.3	1.6	2.9	2.1	2.8
Belgium	6.3	5.6	3.4	3.2	2.0	2.4	2.2	4.0	-3.4	-3.8	-2.2	-3.9
Estonia	-4.1	-13.8	-5.4	-10.6	1.6	-6.8	-4.1	-2.1	-13.3	-0.3	5.9	4.2
Finland	1.7	-0.7	-2.1	-2.2	1.0	0.3	-0.5	-1.4	5.5	3.7	2.9	2.7
France	-1.7	-3.1	-3.6	-4.0	0.6	0.4	-0.1	0.2	0.7	0.0	0.5	0.5
Germany	1.4	2.7	1.3	0.0	1.1	2.3	1.4	1.8	1.8	2.7	3.3	5.6
Greece	-8.5	-8.8	-6.1	-5.4	-1.0	-0.9	-0.6	-0.4	-5.6	-7.8	-6.4	-6.0
Ireland	17.5	10.4	14.4	9.3	0.2	-3.6	-2.1	-3.3	11.8	7.1	13.2	12.3
Italy	-0.4	-0.5	-1.0	-0.1	0.6	0.9	0.5	1.0	0.5	-1.0	-1.4	1.7
Luxembourg	-9.5	-7.3	-12.6	-10.1	2.7	6.3	4.4	1.6	-5.5	-9.1	-3.3	-3.0
Netherlands	15.2	17.6	20.9	21.8	2.5	4.7	3.3	5.4	-12.5	-15.4	-16.9	-17.8
Portugal	-8.9	-9.2	-9.1	-6.5	0.1	-0.1	-0.2	0.8	-3.8	-3.0	-2.6	-0.5
Slovakia	2.0	5.6	6.9	4.5	1.0	1.6	1.8	5.8	-4.0	-10.0	-9.1	-5.9
Slovenia	-5.6	-8.5	-2.7	1.4	-0.7	3.5	3.4	3.9	2.0	2.0	-2.6	-1.3
Spain	-3.1	-4.2	-1.0	-0.4	0.0	-0.2	-0.2	0.5	-3.0	-4.7	-3.8	-2.6

Source: Elaboration of Eurostat and COMEXT data.

3. Components of Competitiveness in the EMU

The previous data seem to indicate that the adjustments in the current accounts of ‘peripheral’ EMU countries resulted from the high rates of growth recorded in emerging economies during the entire period under consideration, as well as from the recession in the EMU’s more fragile regions that reduced internal purchasing power. It follows that the adjustments in ‘peripheral’ countries did not result from structural improvements in their ability to compete in the single European market or the international market. To this, it is possible to add that, at the beginning of 2015, at least one portion of emerging economies entered into a crisis that significantly slowed their economic growth, and that almost all ‘peripheral’ EMU countries emerged from recession to experience moderate rates of growth. The risk, therefore, is that adjustments in the current accounts of ‘peripheral’ EMU countries will be fleeting.

To provide a still descriptive but more robust analysis of these threats, it would be necessary to examine both the causes of the growing trade surpluses of Germany and other ‘core’ and

'peripheral' EMU countries in international markets and the impact of reforms implemented by 'peripheral countries. The first factor would allow us to connect the excess in national savings (with respect to national investments), which matches national current account surpluses, to variations in the external allocation of the corresponding net national financial flows. The second factor would allow verification as to whether these internal adjustments in the EMU were the fruits of structural gains in competitiveness on the part of 'peripheral' countries with respect to the rest of the euro area or mainly the temporary result of the positive international economic trend and internal recessive phenomena. Obviously, the two factors are related. At present, our work is limited to providing a partial response to the second question.

It is assumed that unit labor cost (ULC) is an indicator of competitiveness. A descriptive analysis of available data for 2014 and 2015 seems to confirm that the EMU experienced a fragile and incomplete rebalancing of competitiveness.⁴

In general, ULC is expressed as the ratio of average nominal wages (W) to average labor productivity (Λ) at constant prices, which can easily be transformed into the ratio of the total amount of wages to gross domestic product:

$$ULC = \frac{W}{\Lambda} = \frac{W \cdot L}{\Lambda \cdot L} \equiv \frac{W \cdot L}{GDP} \quad (1)$$

where L denotes the number of employed workers.

Average labor productivity, calculated using the number of employed workers, is not, however, an adequate measure of efficiency for the use of labor units since it does not take into account changes in the working time due to either automatic stabilizers, such as that of the *Cassa integrazione guadagni* in Italy and *Kurzarbeit* in Germany, or changes in the allocation of employment between part- and full-time employees. Therefore, it is more convenient to refer to hourly labor productivity, expressing the number of employed workers as the ratio between total hours worked (N) and the number of hours worked per employee (H):

$$L = N / H \quad (2)$$

From this, we can express average labor productivity (Λ) as a simple function of hourly labor productivity (HLP):

$$\Lambda = HLP \cdot H \quad (3)$$

Equation (3) leads to an alternative formulation of ULC:

$$ULC = \frac{W}{H \cdot HLP} \quad (1bis)$$

Equation (1bis) implies that the rate of growth of ULC can be expressed as the total sum of the rates of growth of its individual components:

⁴ The debate over the limits of ULC as an indicator of competitiveness between countries in international markets (OECD 2012) sheds light on its insufficiency for assessing non-price competitiveness. Nonetheless, we believe ULC to be a good empirical starting point. Our analysis hereinafter is founded on this assumption.

$$ulc = w - h - hlp \quad (4)$$

with lowercase symbols representing growth rates of specified variables.

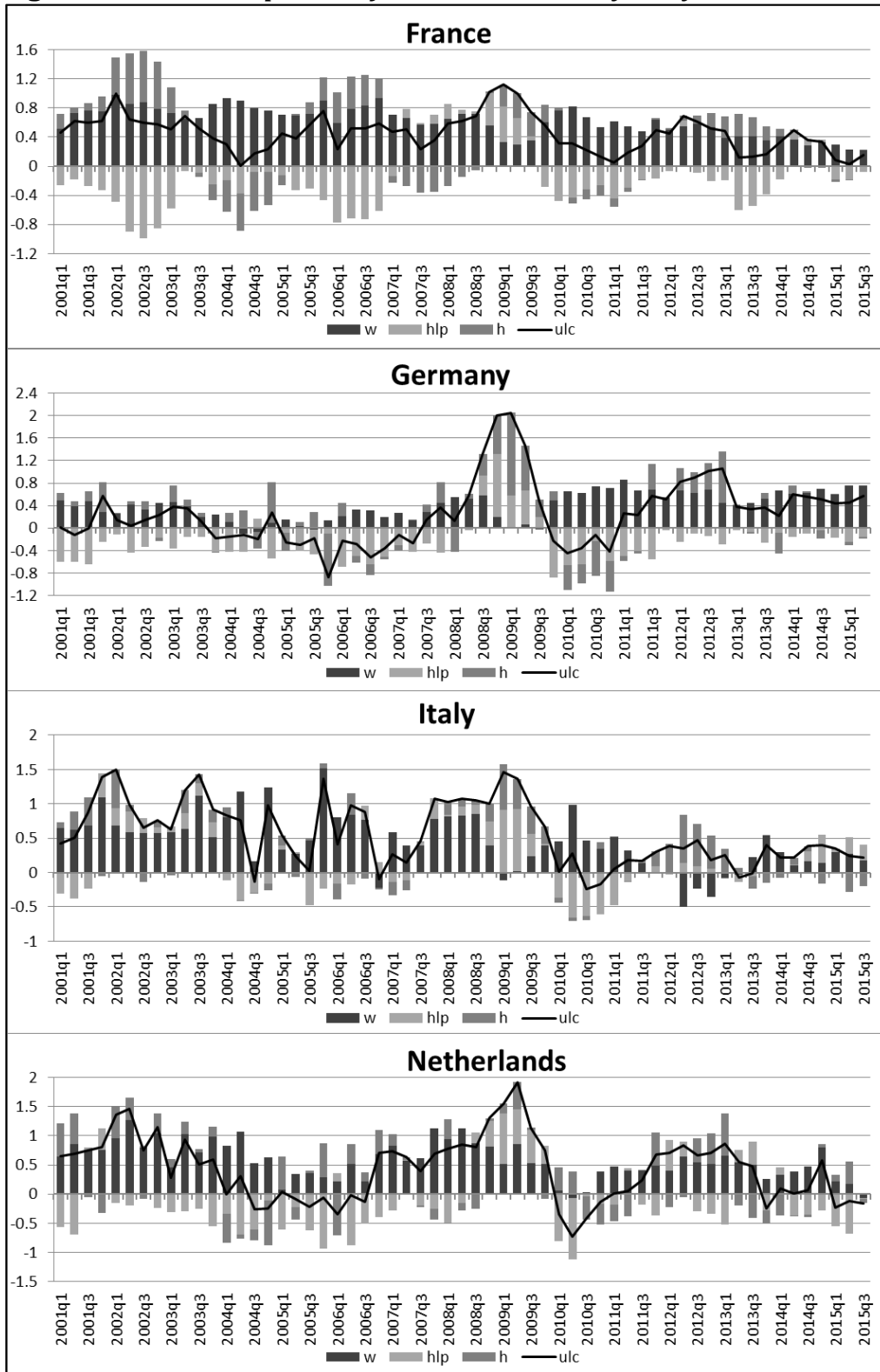
Equation (4) reveals that improvements in competitiveness, measured by decreases in ULC, can depend on three factors: an increase in hourly labor productivity (*hlp*), an increase in number of hours worked per employee (*h*), and a reduction in average nominal wages (*w*). Figures 3a and 3b show the trend in the rates of growth of ULC (*ulc*) and of their individual components for the eight primary EMU economies between 2001Q1-2015Q3. Determining a decrease in ULC, increases in hourly labor productivity and in the number of hours worked per employee are shown on the negative vertical axis. Conversely, determining an increase in ULC, increases in average nominal wages are shown on the positive vertical axis. Moreover, it is convenient to distinguish three sub-periods: the initial phase of the euro area (2000-2007), the advent of the international financial and 'real' crisis (2008-09), and the explosion of the EMU crisis (from 2010 to mid-2014) and its subsequent recovery.

In the first sub-period, the increasing divergence between the competitiveness of 'core' countries (*in primis*, Germany) and 'peripheral' countries is mainly attributable to different trends in average wages and, to a lesser extent, to different dynamics of hourly productivity. In Germany and, to a lesser degree and more haphazard manner, in the Netherlands, decreases in ULC were recorded thanks to moderate increases in average wages coupled with systematically higher, although not very significant, increases in hourly labor productivity. In France and the primary 'peripheral' EMU countries, average wages grew at a quarterly rate of around 1% while hourly labor productivity remained stagnant or even experienced significant rates of growth (such as in the case of Greece and Portugal), which nonetheless remained lower than those of wages. Most wage increases occurred in Spain, Ireland, and Greece; hourly labor productivity remained flat in Spain and Italy. Additionally, the reduction in work hours contributed to an increase in ULC in all aforementioned countries, but, above all, in Italy, France, and Spain.

The international crisis of 2008-09 brought a generalized slowdown in EMU wage dynamics that was, however, associated with a stronger reduction in GDP than employment. The final result was an increase in ULC in all countries under consideration. This increase was most intense in Germany and the Netherlands, followed by Italy and Greece. These trends were, however, not enough to result in a significant rebalancing of competitiveness within the EMU.

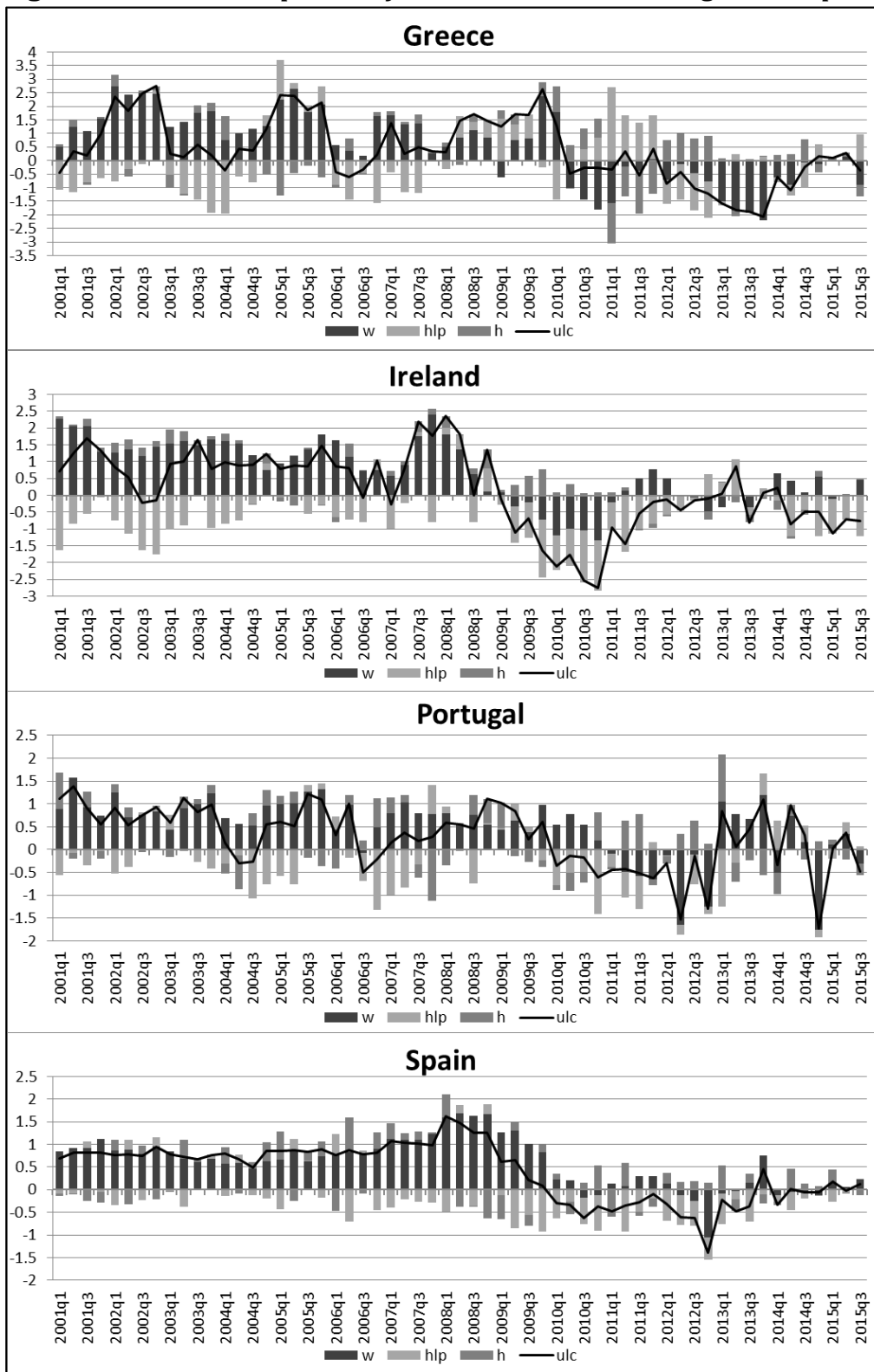
The inversion of the relative trends between the dynamics of ULC in some 'core' countries (Germany and the Netherlands) and those of a large number of 'peripheral' EMU countries started in 2010. Since that date, the German and, to a lesser extent, the Dutch economy underwent pronounced increases in average wages whereas they continued to register unimpressive increases in hourly labor productivity in line with the other 'core' countries. On the other hand, also after 2010, in 'peripheral' countries under duress (Greece, Ireland, Portugal, and Spain), the average wage dynamics either went into the negative or, at the very least, zeroed out. Additionally, while Greece and Portugal experienced trends in labor productivity that were discontinuous and just weakly positive on average, Spain and, even more intensively, Ireland recorded a significant increase in these same trends. This resulted in reductions in the competitiveness gap between Germany and the four cited 'peripheral' countries, which were particularly observable in the case of Spain and Ireland. These rebalancing processes in ULC dynamics were not evident in the case of Italy (and, in part, France), where average wages

Figure 3a ULC decomposition for France, Germany, Italy, and the Netherlands (4Q averages)



Source: Elaboration of Eurostat data.

Figure 3b - ULC decomposition for Greece, Ireland, Portugal, and Spain (4Q averages)



Source: Elaboration of Eurostat data.

continued to increase, albeit at a lower rate relative to pre-crisis years, and hourly labor productivity remained stagnant.

The Spanish and Irish cases require analysis beyond the empirical and descriptive evidence provided here. The recent recovery of competitiveness in each of these two countries does not seem to be only founded on downward pressure on wages, resulting from prolonged and profound economic recession and fiscal consolidation policies. In fact, between 2010-13, Spain and Ireland experienced substantial increases in their hourly labor productivity (Figure 3b), so it is convenient to assess the medium-long term robustness of these increases.

At least in Spain, a large part of the hourly labor productivity increases could result from a significant fall in employment levels that could have caused the expulsion of marginalized and less-productive workers from the labor market. If this hypothesis were correct, the Spanish competitiveness recovery could have been based on transitory factors. At the first sign of a significant economic recovery, the rate of increase in hourly labor productivity would scale back, with a subsequent reemergence of macroeconomic imbalances. We already have early evidence of that: between 2014 and 2015, the Spanish economy did pick up, earning it one of the most brilliant performances in the euro area. While this performance reduced the high rate of unemployment, it also halted the fall of ULC, resulting in almost no fluctuation in annual unit labor costs due to flat dynamics in wages and productivity. The Irish case appears, instead, to be more complex. The positive trend in Ireland's productivity continued in 2014 and 2015 as well, reducing ULC by 0.7% every quarter until 2015Q3. The difference between the two countries seems to be mainly due to the role of investment, which increased at a much faster pace in Ireland than in Spain. According to European Commission figures, investment contribution to GDP growth in Ireland was 2.5% in 2014 and 5% in 2015. In Spain, this contribution was much lower: 0.7% and 1.2%, respectively, in 2014 and 2015.

To summarize, the descriptive evidence suggests that wage moderation and economic recession played an important role in the adjustment process of most peripheral countries in terms of trade and current account imbalances. In the econometric analysis, we will provide more rigorous evidence in support of this assumption, and we will take into account the specificities of the Irish and Spanish cases, where increases in labor productivity seem to have played an important role.

4. Competitiveness and Trade Balance: an Econometric Test

Given the conclusions reached in previous sections, the aim of the following econometric analysis is to assess the impact of changes in both wages and hourly labor productivity on the recent evolution of trade balances in EMU countries. More specifically, we want to investigate whether the adjustments of trade imbalances, implemented by 'peripheral' EMU countries since 2009-10, are the result of long-lasting improvements in their structural competitiveness (cf *Introduction*) or a temporary outcome of their nominal deflation and recessionary economic activity. As stated, this investigation is particularly important in the case of Ireland and Spain.

In order to address these issues, we develop our econometric analysis in two steps. In the first, we estimate a long-run relation between the different components of unit labor cost on the one hand, and trade balances and imports/exports on the other; we then test whether these relations are characterized by a significant structural break with respect to either labor compensation or

hourly labor productivity. In the second step, we use a panel error correction model to estimate short-run deviations from long-run equilibria and their persistence.

We can check the existence of a structural break in the relations between *ulc* components and trade flows by testing for the existence of a regime shift, i.e., a change in parameters. A structural break in the effect of average compensation on import/export can occur when particularly severe consolidation policies cause long-lasting cuts in aggregate purchasing power and, hence, a flattening of the Phillips curve (cf. Blanchard 2016) and decreases in potential output growth (see European Commission 2015b). On the other hand, a structural break in the effect of labor productivity on trade balances and, most importantly, an increase in its impact on exports would prove that the consolidation policies improved the structural competitiveness of the EMU countries. For the reasons already stated, this would be particularly important for the EMU's peripheral member states.

In our econometric exercise, the break point must be exogenously imposed due to the lack of proper test procedures in a panel cointegration framework.⁵ It appears convenient to make the break point coincident with the occurrence of a significant external shock. Our obvious reference is, thus, to the peak of the international financial crisis (2008Q3). This break point would allow us to also specify if and how the structural relations between the three ULC components and trade balances changed after the crises. Even if plausible, our choice of the break point remains arbitrary in the sense that it would have been possible to select another quarter in the recent lengthy crises. Hence, the sensitivity of the results to different break dates will be assessed by means of a robustness check.

The two steps of our econometric analysis are carried out on a sample of quarterly data over the period 1997Q1-2015Q3. The sample includes all the EMU countries except Malta, for which data are unavailable. Separate regressions will be run for the three main groups of countries: the 'core' countries which include Austria, Belgium, Finland, France, Germany, Luxembourg, and the Netherlands; the 'peripheral' countries which group Greece, Ireland, Italy, Portugal, Spain, and Slovenia; and countries that joined the euro area after 2007, which are Cyprus, Estonia, Latvia, Lithuania, and Slovakia. The dependent variables of the analyses are: trade balance of goods and services (*trbal*) and its related import (*imp*) and export (*exp*) flows. The main explanatory variables are the three *ulc* components, described in section 3, which are normalized to the correspondent euro area values in order to set a simple measure of changes in the relative position of each member state in the EMU. We thus have the following independent variables: the relative nominal compensation per employee (*w_rel*), the relative average hours worked per employee (*h_rel*), and the relative hourly labor productivity (*hlp_rel*). In order to take into account the effect of changes in domestic and external demand, we also include the relative GDP (*gdp_rel*). Note that, in this case, the reference is to the international economy; hence, the normalization is to global GDP. We thus have:

$$trbal_{i,t} = \beta_1 w_rel_{i,t} + \beta_2 hlp_rel_{i,t} + \beta_3 h_rel_{i,t} + \beta_4 gdp_rel_{i,t} + \varepsilon_{i,t} \quad (5a)$$

$$exp_{i,t} = \beta_1 w_rel_{i,t} + \beta_2 hlp_rel_{i,t} + \beta_3 h_rel_{i,t} + \beta_4 gdp_rel_{i,t} + \varepsilon_{i,t} \quad (5b)$$

$$imp_{i,t} = \beta_1 w_rel_{i,t} + \beta_2 hlp_rel_{i,t} + \beta_3 h_rel_{i,t} + \beta_4 gdp_rel_{i,t} + \varepsilon_{i,t} \quad (5c)$$

⁵ Some structural break tests are available for standard stationary panels. See, for example, Pauwels et al. (2012).

where each of the symbols refers to country i (with $i = 1, 2, \dots, 18$) in the quarter t (with $t = 1997Q1, 1997Q2, \dots, 2015Q3$). All variables are in logs; consequently, the trade balance is expressed as log difference. Data are collected from the Eurostat National Accounts statistics.

In order to estimate a long-run and short-run relation, respectively, we need to perform a preliminary assessment of the time series properties of the data. The error correction model, used to estimate short-run deviations from long-run equilibria, will be allowed only if the time series had a unit root and if a relation of cointegration among variables existed. On the other hand, both the choice of the unit root test and the estimator of the long-run relation depend on the presence of Cross Sectional Dependence (CSD) in the series; hence, we will have to also verify if the data presented satisfies this condition. These tests are shown in the following sub-section (see 4.1). Sub-sections 4.2 and 4.3 will be devoted to the implementation and interpretation of, respectively, the long-run and short-run analyses. Finally, section 4.4 provides robustness checks of our main results. In particular, we first perform a cross validation analysis on the significance of the structural break for the group of 'peripheral' countries in order to check if the two potential outliers in our sample, Ireland and Spain, behave differently from the rest of the subset. We then test whether our results are sensitive to changes in the exogenous break point.

4.1 Cross-sectional Dependence, Unit Roots, and Cointegration

The existence of CSD in the units of a panel is one of the main problems characterizing a long-term relation, due to the possible presence of common stochastic factors impacting all panels in the sample. This causes diagnostic problems for unit roots and cointegration. First generation tests of panel unit roots are not robust to CSD (see, for example, Levin et al. 2002; Im et al. 2003). In Table 4, we apply the Pesaran (2004) test for CSD to all series used in the regressions. The results are straightforward: all variables present a significant cross-correlation among the units, which has particularly high values for *imp* and *exp*, implying that the first generation tests of panel unit roots are unable to properly inform us about the presence of a unit root in the series.

Table 4 - Pesaran test for Cross-Sectional Dependence

	CD-Test	Corr	abs corr
<i>trbal</i>	13.2***	0.12	0.42
<i>exp</i>	103.7***	0.96	0.96
<i>imp</i>	101.3***	0.94	0.94
<i>w_rel</i>	39.8***	0.39	0.68
<i>hlp_rel</i>	22.6***	0.22	0.58
<i>h_rel</i>	54.5*	-0.02	0.36
<i>gdp_rel</i>	59.2***	0.56	0.66

*significant at 10%, **significant at 5%, ***significant at 1%.

Therefore, we have to assess the presence of unit roots in the data by using the test developed by Pesaran (2003), which is based on the group means of individual Augmented Dickey Fuller statistics and is robust to CSD. The test is implemented by using time lags ranging, alternatively, from 1 to 4 quarters, as is typical in the case of quarterly data. We implement the tests in its standard form (columns 1-4) and with a deterministic trend (columns 5-8). The results, shown in

Table 5, are unambiguous. There is clear evidence that most of the variables have a unit root. Even in the case of *exp*, the evidence seems to be more in favor of the non-stationarity of the series.

Table 5 - Pesaran unit root test for cross sectional dependent panels

	Without trend				With trend			
	4 lags	3 lags	2 lags	1 lag	4 lags	3 lags	2 lags	1 lag
<i>trbal</i>	-0.8	-0.5	0.4	0.4	-0.9	-0.2	0.1	0.2
<i>exp</i>	1.6*	1.5*	1.8**	0.3	-2.1**	-1.6*	-2.2**	-0.3
<i>imp</i>	0.1	0.2	-0.3	1.5	-1.0	-0.9	-1.7**	0.2
<i>w_rel</i>	1.0	0.9	1.1	1.1	1.0	0.9	1.3	1.3
<i>hlp_rel</i>	0.4	0.6	0.3	0.5	-0.4	-0.5	-0.6	0.4
<i>h_rel</i>	-1.5*	-0.4	0.2	1.1	-2.1**	-0.6	0.1	0.4
<i>gdp_rel</i>	5.1	4.2	3.8	2.7	1.3	0.6	-0.3	0.6

*significant at 10%, **significant at 5%, ***significant at 1%.

The next step aims to test if there is a cointegration relation among variables. Since the results of the test might be affected by a potential structural break in the series, we must also verify the actual possibility that this is the case. To do that, we apply the test procedure developed by Persyn-Westerlund (2008). We run four tests differing in terms of their null assumption (see Table 6). The first two tests, represented by Ga and Gt, verify the null assumption of the cointegration's absence for at least one of the panels; the other two tests, represented by Pa and Pt, pool the information over all the cross-sectional units to verify whether cointegration exists for all panels. The results are shown in Table 6, where we utilize three different specifications (numbered 1 to 3 in the Table) of each of the dependent variables. The first specification just includes the three relative components of *ulc*; the second specification also takes into account the structural break in average wages; the third one adds the relative *gdp*.

Table 6 - Cointegration tests

	Ga	Gt	Pa	Pt
<i>trbal 1</i>	-3.2***	-15.9***	-15.7***	-15.4***
<i>trbal 2</i>	-3.2***	-15.9***	-16.9***	-16.4***
<i>trbal 3</i>	-3.4***	-13.6*	-15.8***	-14.3***
<i>exp 1</i>	-2.5	-11.3	-12.7	-11.0
<i>exp 2</i>	-3.2***	-14.5**	-14.6**	-12.1***
<i>exp 3</i>	-3.4***	-9.5	-13.0	-9.0
<i>imp 1</i>	-2.6	-11.5	-12.7*	-10.9***
<i>imp 2</i>	-3.3**	-14.5**	-12.1**	-11.6
<i>imp 3</i>	-3.4**	-9.4	-14.3**	-8.9

*significant at 10%, **significant at 5%, ***significant at 1%. Persyn-Westerlund (2008) cointegration test with 2 lags, 2 leads, and bootstrapped standard errors. Specification 1: $y=f(w_rel, hlp_rel, k_rel)$; specification 2: $y=f(w_rel, hlp_rel, k_rel, w_rel*crisis)$; specification 3: $y=f(w_rel, hlp_rel, k_rel, w_rel*crisis, gdp_rel)$.

The results indicate that a cointegration vector between *ulc* components and trade balance

exists; moreover, they show that the rejection of the null assumption of no cointegration is stronger when only the structural break in wages is included (specification 2). This is the first evidence that a structural break might have actually affected the long-run relations. The same results apply when either import or export is treated as a dependent variable. Hence, it is possible to estimate both a long-run relation and an error correction model for all the dependent variables of our exercise.

4.2 Competitiveness and Trade Balance: a Long-run Relation

The results reached in the previous section by means of different tests specify the conditions necessary for estimating a cointegration relation. We need an estimator capable of controlling for CSD that performs well when the number of individuals (in our case, the 18 countries) is small. The problems of CSD can be addressed by the dynamic OLS (see Mark-Sul 2003; Pedroni 2001) and the Continuously Updated Fully Modified OLS (Bai-Kao 2006). These techniques require, however, that both i and t are large, which is not our case. For this reason, we rely instead on the Common Correlated Effects Mean Group estimator (CCEMG) elaborated by Pesaran (2006). Mean Group estimators, as illustrated by Pesaran-Smith (1995), are based on an Auto-Regressive Distributed Lags model (ARDL), which is particularly suited for the estimation of long-term relations when coefficients might be heterogeneous and endogeneity problems exist. The CCEMG estimator is robust to the presence of various forms of CSD, and it works well when the number of individuals is small with respect to the time dimension (Kapetanios et al. 2011). The latter feature also allows us to estimate the long-run relation separately for the three groups of EMU countries.

The basic specification of the CCEMG estimator is the following:

$$y_{i,t} = \beta_1 w_rel_{i,t} + \beta_2 hlp_rel_{i,t} + \beta_3 h_rel_{i,t} + \beta_4 gdp_rel_{i,t} + \beta_5 shift_{i,t} + \Theta + \varepsilon_{i,t} \quad (6)$$

where y is a synthetic symbol to indicate—time by time— $trbal$, exp , imp ; i is the country index ($i = 1, 2, \dots, 18$) and t is the time index ($t = 1997Q1, \dots, 2015Q3$).

The variable shifts represent the regime shift, which is applied, alternatively, to nominal wages ($w_rel*crisis$) and to hourly labor productivity ($hlp_rel*crisis$). The ability of the estimator to control for the general forms of CSD is due to the vector Θ , which includes the cross-sectional averages of all variables in equation (6) and a set of panel-specific linear trends. These features of vector Θ are specified in equation (7):

$$\Theta = \gamma_0 E(y_{i,t}) + \gamma_1 E(w_rel_{i,t}) + \gamma_2 E(hlp_rel_{i,t}) + \gamma_3 E(h_rel_{i,t}) + \gamma_4 E(gdp_rel_{i,t}) + \gamma_5 E(shift_{i,t}) + \sum_i trend \quad (7).$$

Estimation results are shown in Table 7 with reference to the trade balance and in Tables 8 and 9 with reference to exports and imports, respectively. In each of these tables, there are three panels characterized by the following features. The first panel shows the estimates deriving from the basic form of equation (6) without introducing any structural break in the series. The second and third panels show estimates deriving from the introduction of a structural break in 2008Q3. In the second panel, the structural break refers to labor cost, and, in the third panel, it refers to hourly labor productivity. Within each panel, the first specification is an estimation of the whole euro area (EMU), whereas the other three offer an estimation, respectively, of the ‘core’ countries ($EMU-Cor$), the ‘peripheral’ countries ($EMU-Per$), and the new member states ($EMU-NMS$).

Panel 1 shows that labor productivity is a significant determinant of trade balances on average,

as well as in the cases of 'core' countries and new member states. The relative demand is barely significant in the aggregate, and its significance is mostly due to its impact on the trade balance of the new member states' (see Table 7). h too is significant and with the expected positive sign. The second panel confirms the results of Panel 1. Moreover, it indicates that the impact of wage dynamics became significant for the whole area after the peak of the international financial crisis thanks to the 'peripheral' countries. The third panel instead shows that a major break did not affect the relation between hlp and nominal trade balances (see also Gros 2016).

The empirical evidence from this first set of regressions indicates that, in recessionary countries, the relation between relative labor costs and trade balances became negative and significant after the peak of the international financial crisis. Considering the actual dynamics of relative wages since the second half of 2008, the estimates imply a rebalance in external positions since wage growth has been lower in recessionary countries than in the rest of the area. This evidence might be interpreted as an improvement in the structural competitiveness of recessionary countries due to consolidation policies. Nonetheless, this interpretation is opposed by the analysis of import and export flows. In fact, Tables 8 and 9 make it clear that the rebalancing effects can be hardly interpreted as a reduction in structural competitiveness gaps.

Looking at exports (Table 8), the break in labor compensation was significant only for the new member states. Moreover, there was a highly significant impact of gdp_rel . On the other hand, the dynamics of relative wages did not show any significant impact on export in the group EMU-Per and in 'core' countries; the latter recorded a positive effect of productivity and relative demand but no structural change in productivity. Turning to imports (Table 9), the picture changes. Relative demand has a generalized positive effect on imports in the whole area, but the positive break in relative wages was significant only in the EMU's 'peripheral' countries. Our consequent reading is that the recent re-equilibrating processes of trade balances in the latter countries were mainly due to long-lasting decreases in their internal purchasing power and not to increases in their labor productivity or in the price competitiveness of their exports. Additionally, there was also a break in the relation between relative wages and imports in the EMU new members; however, this break was negative, thus curtailing the impact recorded before the crisis. Combining this evidence with the mentioned break in export, it appears that, in new member states, the importance of price competitiveness in import flows decreased and its importance in export flows after the peak of the international crisis increased. However, these aspects seem to be unrelated to the dynamic of competitiveness in the rest of the euro area.

The general conclusion is that our long-term estimates do not support the assertion that consolidation policies actually had positive and structural effects on the competitiveness of the EMU's 'peripheral' countries. These estimates tell a different story. Based on our definition of structural competitiveness (see Introduction), they confirm and qualify the working hypothesis derived from the descriptive evidence of sections 2 and 3 above: the adjustment processes of negative imbalances in EMU 'peripheral' countries were based on economic recession and related compression in domestic purchasing power, whereas the impact of supply-side innovations was non-significant. Hence, negative imbalances would likely come into play again whenever economic growth rates of 'peripheral' EMU countries restarted. Moreover, since the import elasticity to nominal wages increased after the peak of the recent crises, the disequilibria could perhaps happen at an even higher speed. It is reasonable to maintain that the short-term

Table 7 - CCEMG estimates of the long-run relation between nominal trade balance and cost competitiveness.

	Basic specification				Break in labor compensation				Break in hourly labor productivity			
	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS
<i>w_rel</i>	-0.149 [0.111]	0.307* [0.177]	-0.048 [0.177]	-0.303* [0.166]	0.013 [0.116]	0.153 [0.165]	-0.029 [0.212]	-0.324* [0.177]	-0.143 [0.113]	0.172 [0.189]	-0.178 [0.217]	-0.378* [0.196]
<i>hlp_rel</i>	0.651** [0.257]	0.524** [0.263]	0.133 [0.460]	0.958** [0.343]	0.543** [0.220]	0.552** [0.230]	0.285 [0.385]	0.779** [0.360]	0.677** [0.260]	0.597** [0.214]	0.287 [0.410]	0.907** [0.403]
<i>gdp_rel</i>	-0.354** [0.173]	0.002 [0.158]	-0.137 [0.334]	-0.810** [0.319]	-0.300** [0.153]	0.018 [0.131]	-0.185 [0.345]	-0.710* [0.398]	-0.26 [0.166]	0.027 [0.148]	-0.175 [0.347]	-0.773* [0.405]
<i>h_rel</i>	0.288 [0.385]	0.289 [0.212]	-0.179 [0.730]	0.916** [0.346]	0.348 [0.223]	0.219 [0.219]	0.036 [0.585]	0.685** [0.226]	0.38 [0.290]	0.212 [0.237]	0.086 [0.613]	0.800** [0.258]
<i>w_rel*crisis</i>					-0.616** [0.207]	0.092 [0.159]	-0.355*** [0.068]	-0.097 [0.166]				
<i>hlp_rel*crisis</i>									-0.182 [0.213]	-0.304* [0.179]	0.174 [0.175]	0.08 [0.343]
chi2	10.854	39.418	1.361	37.131	18.281	127.943	170.969	15.213	8.366	76.053	2.72	12.787
N	1240	488	405	347	1240	488	405	347	1240	488	405	347

*significant at 10%, **significant at 5%, ***significant at 1%.

Table 8 - CCEMG estimates of the long-run relation between exports and cost competitiveness

	Basic specification				Break in labor compensation				Break in hourly labor productivity			
	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS
<i>w_rel</i>	-0.228** [0.098]	-0.120 [0.254]	0.132 [0.220]	0.000 [0.137]	-0.159 [0.153]	-0.182 [0.295]	-0.048 [0.208]	0.291* [0.168]	-0.233* [0.125]	-0.262 [0.188]	0.075 [0.187]	0.023 [0.181]
<i>hlp_rel</i>	0.797*** [0.227]	0.595* [0.309]	0.34 [0.455]	0.923** [0.318]	0.644*** [0.170]	0.561** [0.231]	0.402 [0.457]	0.306** [0.126]	0.684** [0.214]	0.617** [0.285]	0.179 [0.439]	0.604*** [0.136]
<i>gdp_rel</i>	0.421*** [0.123]	0.581*** [0.176]	0.119 [0.175]	0.101 [0.265]	0.641*** [0.117]	0.638*** [0.154]	0.103 [0.154]	0.688* [0.399]	0.548*** [0.118]	0.612*** [0.161]	0.137 [0.147]	0.561 [0.425]
<i>h_rel</i>	0.684** [0.213]	0.537 [0.359]	1.177* [0.619]	0.569* [0.337]	0.567*** [0.165]	0.402 [0.257]	1.248* [0.644]	-0.049 [0.153]	0.554** [0.174]	0.500* [0.297]	1.088* [0.597]	0.185 [0.224]
<i>w_rel*crisis</i>					-0.194 [0.157]	-0.205 [0.533]	0.439 [0.296]	-0.574** [0.202]				
<i>hlp_rel*crisis</i>									-0.149 [0.250]	-0.286 [0.350]	0.658 [0.423]	-0.295 [0.357]
chi2	54.165	64.712	32.777	8.593	79.455	524.258	293.506	82.205	69.692	89.282	87.961	71.558
N	1240	488	405	347	1240	488	405	347	1240	488	405	347

*significant at 10%, **significant at 5%, ***significant at 1%

triggering of a new path of growth in the ‘peripheral’ countries will be determined by increases in aggregate demand that are, in turn, at least partially based on increases in nominal wages. The latter can be strengthened in the medium- to long-term due to the reduction in unemployment. This result is consistent with the recent findings of a flattening Phillips Curve (Blanchard 2016) and a negative break in the dynamics of potential output (European Commission 2015b).⁶

4.3 Competitiveness and Trade Balance: a Short-run Relation

After having estimated the long-run relations described by equations (6), we now turn to the assessment of the short-run relations between the same variables included in the previous exercise. The existence of a cointegration relation implies that short-run effects cause only a temporary deviation from the long-run relations. We can thus rely on the following error correction specification:

$$\Delta y_{i,t} = \delta_1 \Delta w_{rel_{i,t-1}} + \delta_2 \Delta hlp_{rel_{i,t-1}} + \delta_3 \Delta h_{rel_{i,t-1}} + \delta_4 \Delta gdp_{rel_{i,t-1}} + \rho ECT_{i,t-1} + \sum_i \lambda_i + \sum_t \eta_t + \varepsilon_{i,t-1} \quad (8)$$

where y is a synthetic symbol to indicate—time by time— $trbal$, exp , imp ; ECT represents the error correction term with respect to the long-run relation; λ_i and η_t indicate, respectively, country- and time-specific effects.

All regressors are lagged by one period in order to eliminate a potential endogeneity bias.⁷ The model is estimated by using a mixed effects estimator, where the eighteen specific terms λ_i are treated as random variables with a zero mean, whereas the sixty-four specific terms η_t are treated as fixed. The presence of random effects implies that the estimator is more efficient than the fixed effects one, provided that we can assume the absence of a correlation between individual effects and regressors. The Hausman test, presented at the bottom of the results’ table (H-test), verifies if this assumption is correct.

Estimates of the error correction model are reported in Table 10. The first panel refers to the trade balance, while the second and third panel refer to exports and imports, respectively. It is interesting that the speed of adjustment was very high for the aggregate trade balance of the euro area since the error correction term (ECT) is above -0.6. This implies that approximately 40% of a disturbance is absorbed at the end of one quarter, and 86% at the end of one year. Values slightly lower than the aggregate were observed for the ‘peripheral’ and the new member states.

⁶ Obviously, there is an alternative interpretation: increases in nominal wages are not a necessary ingredient for a new path of economic growth in ‘peripheral’ countries, and the long-term Phillips curve in the EMU’s ‘peripheral’ countries is not just flattening (as in Blanchard’s findings) but has already become completely flat. This would be equivalent to stating that the structural changes in the workings of the ‘peripheral’ EMU labor markets were significant enough to eliminate the role of demand and supply in these markets. We disagree with this interpretation for two reasons: there is no evidence that the labor market ceased to be a market; our previous evidence also shows that the impact of wage dynamics on imbalance adjustment became stronger after the international financial crisis, such that, in the near future, even more moderate wage dynamics could have a significant impact (see Table 7, panel 2).

⁷ We do not introduce a structural change in the relation of equation (8) as several of our exercises showed that this change would never be significant.

Conversely, deviations from the long-run relations were more short lived in the ‘core’ countries: 90% of a transitory shock is absorbed within a year. In the case of both exports and imports, the speed of adjustment was lower than that of trade balance and group differences seem to be associated with the adjustment of exports.

As for the other variables, increases in relative wages worsened the trade balance in the ‘peripheral’ countries due to their effect on imports, similar to what happened for the long-run relation. These increases are also significant (even if barely) in the case of ‘core’ countries; however, in this case, we do not identify specific effects on imports or exports. Moreover, the ‘peripheral’ countries are characterized by a significant impact of relative demand, which is also mainly driven by imports. Finally, hourly labor productivity is significant and has the expected sign for the trade balance of the whole euro area. However, this effect is mainly due to the positive effect on the exports of new member states and to the negative effect on the periphery’s imports. Hourly labor productivity turns out to have a paradoxically negative impact on the export of core countries.

To summarize, the short-run results indicate that wage moderation in the ‘peripheral’ countries did not have significant effects on exports but had a strong impact on imports, directly and indirectly. Hence, wage moderation mainly contributed through the effects of both purchasing power and demand contraction on the re-balancing of external disequilibria of the EMU’s periphery. These results strengthen the previous long-run empirical evidence. Hence, we can state that our econometric exercises lead to a general conclusion: the recent trade re-balance in ‘peripheral’ EMU member states risks being transitory phenomenon mainly resulting from consolidation policies and related compression of domestic aggregate demand.

4.4 Robustness checks

In this section, the results’ robustness is tested with respect to two issues. First, as stated in section 3 by means of a descriptive analysis, significant improvements in productivity were recorded by Ireland and, to a lesser extent, Spain during the period 2013-2015. Hence, the stated results could apply to ‘peripheral’ EMU countries as a whole, but they might not fit well with the actual and most recent dynamics in these two countries. The problem could be of particular importance with respect to the structural break in the coefficient of relative wages. Second, the imposition of an exogenous structural break in 2008Q3 might be arbitrary since the international financial crisis started mid-2007 and had its ‘real’ peak at the beginning of 2009, whereas the following European crises started at the end of 2009 and could be conceived as distinct events. If we took into accounts these elements, the regime could have changed before or after 2008Q3.

To address the first issue, we perform a cross validation analysis by testing whether the exclusion of the two countries affect the significance of the structural break. Obviously, we would have to acknowledge that Ireland and/or Spain had a peculiar performance with respect to the other ‘peripheral’ countries if the effects of the structural break in the long-run relation recorded significant changes. In addition, we perform a similar analysis on the error correction model in order to test whether possible analogous differences had short-term impacts. To address the second issue, we re-estimate the model with different break points, 2009Q1 and 2009Q4, respectively. The first alternative break point refers to the peak of the ‘real’ instead of the

Table 9 - CCEMG estimates of the long-run relation between imports (goods and services) and cost competitiveness

	Basic specification				Break in labor compensation				Break in hourly labor productivity			
	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS
<i>w_rel</i>	-0.098 [0.133]	-0.405* [0.244]	0.234 [0.177]	0.321* [0.178]	-0.119 [0.153]	-0.142 [0.297]	-0.03 [0.160]	0.537** [0.262]	-0.029 [0.114]	-0.259 [0.216]	0.272 [0.178]	0.395* [0.211]
<i>hlp_rel</i>	0.167 [0.223]	-0.043 [0.253]	0.111 [0.650]	-0.05 [0.407]	0.111 [0.219]	-0.018 [0.175]	0.195 [0.596]	-0.368 [0.406]	0.051 [0.255]	-0.032 [0.200]	-0.128 [0.566]	-0.193 [0.507]
<i>gdp_rel</i>	0.757*** [0.153]	0.628*** [0.115]	0.545** [0.269]	0.992*** [0.295]	0.913*** [0.178]	0.643*** [0.107]	0.524** [0.244]	1.419*** [0.328]	0.740*** [0.178]	0.604*** [0.127]	0.541** [0.259]	1.329*** [0.347]
<i>h_rel</i>	0.32 [0.303]	0.091 [0.387]	0.931 [0.620]	-0.403 [0.319]	0.232 [0.217]	0.094 [0.329]	1.017* [0.537]	-0.674** [0.311]	0.211 [0.260]	0.178 [0.353]	0.765 [0.541]	-0.557 [0.339]
<i>w_rel*crisis</i>					0.366* [0.212]	-0.468 [0.472]	0.811** [0.307]	-0.356*** [0.101]				
<i>hlp_rel*crisis</i>									0.015 [0.305]	0.141 [0.347]	0.652 [0.518]	-0.294 [0.384]
chi2	27.673	81.666	5.792	20.687	52.782	67.407	2716.257	35.185	24.481	63.509	10.633	35.636
N	1240	488	405	347	1240	488	405	347	1240	488	405	347

*significant at 10%, **significant at 5%, ***significant at 1%.

Table 10 - Mixed Effects estimates of the ECM for the trade balance of goods and services

	Trade balance				Exports				Imports			
	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS	EMU	EMU-Core	EMU-Per	EMU-NMS
ECT	-0.636*** [0.039]	-0.808*** [0.071]	-0.554*** [0.127]	-0.648*** [0.037]	-0.430*** [0.099]	-0.636** [0.248]	-0.506*** [0.102]	-0.327*** [0.088]	-0.513*** [0.069]	-0.487*** [0.051]	-0.540*** [0.070]	-0.447*** [0.079]
Δw_{rel}	-0.086** [0.041]	-0.409*** [0.092]	-0.146** [0.062]	-0.101 [0.114]	0.272*** [0.066]	-0.166 [0.125]	0.152 [0.102]	0.153 [0.244]	0.271** [0.091]	0.113 [0.089]	0.294** [0.125]	0.112 [0.184]
Δhlp_{rel}	0.313*** [0.094]	-0.181** [0.092]	0.324 [0.337]	0.142 [0.135]	0.113 [0.091]	-0.334 [0.511]	-0.015 [0.313]	0.259*** [0.042]	-0.184* [0.110]	-0.22 [0.463]	-0.359** [0.176]	0.086 [0.173]
Δh_{rel}	0.307* [0.158]	0.025 [0.204]	0.289 [0.268]	0.120 [0.169]	0.155 [0.167]	-0.074 [0.463]	-0.052 [0.369]	0.252 [0.325]	-0.131 [0.149]	-0.227 [0.491]	-0.330 [0.246]	0.114 [0.265]
ΔGDP_{rel}	-0.499*** [0.101]	-0.100 [0.120]	-0.668*** [0.121]	-0.195 [0.154]	0.000 [0.102]	0.366 [0.459]	0.005 [0.218]	-0.24 [0.161]	0.482** [0.160]	0.632 [0.406]	0.649*** [0.172]	0.014 [0.203]
H-test												
R ² w	0.35	0.482	0.436	0.498	0.35	0.483	0.436	0.498	0.351	0.483	0.437	0.501
N	1212	477	396	339	1212	477	396	339	1212	477	396	339

*significant at 10%, **significant at 5%, ***significant at 1%. H-test=Hausman test of the validity of the Random Effect estimator (H0=FE and RE estimates do not differ significantly).

financial crisis; the second alternative refers to the starting point of the euro area crisis. The results of the cross validation analysis with respect to Ireland and Spain are shown in Table 11 for the long-run relation and in Table 12 for the error correction model.

Table 11 shows that the structural break in wages is significant in both trade balances and import flows, confirming the robustness of our original results. Moreover, it confirms the absence of a break in relative productivity. It is, however, interesting to note that the exclusion of each of the two potential outliers (that is, either Ireland or Spain) from the sample has interesting results: first, it increases the significance of the relative demand effect on imports; second, the exclusion of Ireland implies that the previously non-significant effect on export turns out to be significant. The first result signals that Ireland and Spain can have some positive specificities in their performance, though not important enough to alter the relation between trade performance and structural competitiveness. The second result confirms instead that improvements in the export performance are mainly driven by foreign demand in the large majority of ‘peripheral’ countries, with Ireland being an exception most likely because of its peculiar export structure.⁸ Hence, if the first result weakens our previous evidence, the second strengthens it.

The error correction model (see Table 12) shows that Ireland is an influential country for explaining the significance of relative wages; this result confirms that its short-term competitiveness gain is based on the previous compression of its economic activity. Moreover, the same model also shows that the exclusion of either Spain or Ireland renders insignificant the previously observed negative effect of the dynamics in hourly labor productivity.

This robustness check confirms our main results. The re-balancing of ‘peripheral’ EMU countries is due to higher elasticity of import demand to relative wages and to the effect of the contraction in domestic demand mostly caused by consolidation policies implemented after the international financial crises. The results seem to hold for Spain and Ireland as well, although the effect of relative demand in both countries has been weaker in explaining the import reduction, leaving room for other determinants (such as increases in hourly labor productivity). However, this possible interpretation is weakened by the fact that, in the short term, Spanish and Irish productivity dynamics do not seem to play a major role.

The sensitivity analysis of the structural break to different break points is shown in Table 13. The first panel reports the baseline estimates with the break point in 2008Q3, while the second and third panel show the result using the two alternative break points. The main results are unaffected by the break-point changing. The coefficient of labor compensation in the ‘peripheral’ EMU countries increased after the financial crisis, as shown by its stronger effect on imports. Moving the breakpoint forward has two consequences: first, it implies a further strengthening of the effect of labor compensation on imports, suggesting that wage and economic compression play a crucial role during the evolution of the different crises and not only at the ‘peak’ of the financial one. Second, it shows that, when we move the break point forward, the increased elasticity of exports to relative wages in the new member states disappears, implying that this outlying performance with respect to the other ‘peripheral’ countries is mainly a temporary result of the international crisis.

⁸ Irish export is based mainly on raw materials for the European market and service activities. The latter are mainly provided by subsidiaries of foreign multinational companies located in the country.

Table 11 – Cross validation of the long-run relation in the periphery

	Trade balance in goods and services					
	All 6	Excl. Spain	Excl. Ireland	All 6	Excl. Spain	Excl. Ireland
<i>w_rel</i>	-0.029	-0.171	-0.168	-0.178	-0.232	-0.374*
	[0.212]	[0.331]	[0.216]	[0.217]	[0.327]	[0.199]
<i>hlp_rel</i>	0.285	0.074	-0.202	0.287	0.017	-0.164
	[0.385]	[0.306]	[0.672]	[0.410]	[0.384]	[0.720]
<i>gdp_rel</i>	-0.185	-0.388	0.308	-0.175	-0.395	0.414
	[0.345]	[0.414]	[0.491]	[0.347]	[0.413]	[0.523]
<i>h_rel</i>	0.036	-0.213	-0.415	0.086	-0.172	-0.281
	[0.585]	[0.644]	[0.743]	[0.613]	[0.686]	[0.734]
<i>w_rel*crisis</i>	-0.355***	-0.146***	-0.345**			
	[0.068]	[0.043]	[0.175]			
<i>hlp_rel*crisis</i>				0.174	0.292	-0.211
				[0.175]	[0.251]	[0.698]
chi2	170.969	40.891	3.607	2.72	32.565	4.027
N	405	330	350	405	330	350
	Import of goods and services					
	All 6	Excl. Spain	Excl. Ireland	All 6	Excl. Spain	Excl. Ireland
<i>w_rel</i>	-0.03	0.115	-0.103	0.272	0.313	0.146
	[0.160]	[0.213]	[0.312]	[0.178]	[0.205]	[0.254]
<i>hlp_rel</i>	0.195	0.668**	0.09	-0.128	0.336	0.123
	[0.596]	[0.321]	[0.460]	[0.566]	[0.260]	[0.447]
<i>gdp_rel</i>	0.524**	0.884***	1.090**	0.541**	0.975***	0.896*
	[0.244]	[0.209]	[0.411]	[0.259]	[0.276]	[0.472]
<i>h_rel</i>	1.017*	1.143**	0.640**	0.765	0.957*	0.545**
	[0.537]	[0.460]	[0.308]	[0.541]	[0.525]	[0.249]
<i>w_rel*crisis</i>	0.811**	0.629**	0.439*			
	[0.307]	[0.250]	[0.234]			
<i>hlp_rel*crisis</i>				0.652	0.678	0.047
				[0.518]	[0.552]	[0.785]
chi2	2716.257	59.521	234.47	10.633	32.396	12.086
N	405	330	350	405	330	350
	Export of goods and services					
	All 6	Excl. Spain	Excl. Ireland	All 6	Excl. Spain	Excl. Ireland
<i>w_rel</i>	-0.048	-0.132	-0.16	0.075	0.027	-0.195
	[0.208]	[0.222]	[0.213]	[0.187]	[0.223]	[0.232]
<i>hlp_rel</i>	0.402	0.821**	-0.159	0.179	0.482	-0.01
	[0.457]	[0.329]	[0.239]	[0.439]	[0.417]	[0.302]
<i>gdp_rel</i>	0.103	0.186	1.207***	0.137	0.300*	1.214***
	[0.154]	[0.136]	[0.153]	[0.147]	[0.153]	[0.161]
<i>h_rel</i>	1.248*	1.409**	0.415	1.088*	1.289*	0.521*
	[0.644]	[0.693]	[0.262]	[0.597]	[0.672]	[0.316]
<i>w_rel*crisis</i>	0.439	0.621*	0.016			
	[0.296]	[0.321]	[0.286]			
<i>hlp_rel*crisis</i>				0.658	0.918	-0.109
				[0.423]	[0.615]	[0.282]
chi2	293.506	22.685	30.836	87.961	34.377	87.485
N	405	330	350	405	330	350

*significant at 10%, **significant at 5%, ***significant at 1%. Estimator CCEMG.

Table 12 – Cross validation of the error correction specification

	Balance			Export			Import		
	All 6	Excl. Spain	Excl. Ireland	All 6	Excl. Spain	Excl. Ireland	All 6	Excl. Spain	Excl. Ireland
ECT	-0.554*** [0.127]	-0.570*** [0.105]	-0.512*** [0.109]	-0.505*** [0.102]	-0.519*** [0.097]	-0.520*** [0.143]	-0.540*** [0.070]	-0.515*** [0.089]	-0.598*** [0.095]
Δw_{rel}	-0.146** [0.062]	-0.123** [0.047]	-0.08 [0.070]	0.174** [0.064]	0.226*** [0.052]	0.155*** [0.041]	0.294** [0.125]	0.339** [0.110]	0.192** [0.089]
Δhlp_{rel}	0.324 [0.337]	0.204 [0.405]	0.352 [0.530]	-0.018 [0.308]	0.052 [0.401]	0.059 [0.331]	-0.359** [0.176]	-0.122 [0.127]	-0.285 [0.338]
Δh_{rel}	0.289 [0.268]	0.139 [0.288]	0.39 [0.341]	-0.059 [0.364]	0.076 [0.424]	0.083 [0.313]	-0.33 [0.246]	0.029 [0.178]	-0.286 [0.263]
ΔGDP_{rel}	-0.668*** [0.121]	-0.621*** [0.158]	-0.826*** [0.151]	0.009 [0.211]	-0.101 [0.267]	0.024 [0.170]	0.649*** [0.172]	0.462** [0.173]	0.857*** [0.125]
R ² w	0.436	0.462	0.456	0.628	0.62	0.713	0.676	0.666	0.764
N	396	323	342	396	323	342	396	323	342

*significant at 10%, **significant at 5%, ***significant at 1%. Hausman=Hausman test of the validity of the Random Effect estimator (H0=FE and RE estimates do not differ significantly). Estimator Panel Mixed Effects (Random country effects and fixed time effects).

Table 13 – Sensitivity of the structural break to different breakpoints

		Break in labor compensation			Break in productivity		
		Balance	Export	Import	Balance	Export	Import
Break in 2008Q3	EMU	-0.616** [0.207]	-0.194 [0.157]	0.366* [0.212]	-0.182 [0.213]	-0.149 [0.250]	0.015 [0.305]
	EMU-Core	0.092 [0.159]	-0.205 [0.533]	-0.468 [0.472]	-0.304* [0.179]	-0.286 [0.350]	0.141 [0.347]
	EMU-Per	-0.355*** [0.068]	0.439 [0.296]	0.811** [0.307]	0.174 [0.175]	0.658 [0.423]	0.652 [0.518]
	EMU-NMS	-0.097 [0.166]	-0.574** [0.202]	-0.356*** [0.101]	0.08 [0.343]	-0.295 [0.357]	-0.294 [0.384]
Break in 2009Q1	EMU	-0.710** [0.221]	-0.144 [0.203]	0.258 [0.305]	-0.254 [0.264]	-0.348 [0.260]	-0.057 [0.346]
	EMU-Core	0.133 [0.152]	-0.236 [0.487]	-0.404 [0.502]	-0.037 [0.220]	-0.139 [0.342]	-0.001 [0.325]
	EMU-Per	-0.589*** [0.075]	0.338 [0.283]	0.910** [0.325]	0.191 [0.254]	0.576 [0.503]	0.431 [0.719]
	EMU-NMS	-0.076 [0.355]	-0.043 [0.338]	0.036 [0.239]	-0.237 [0.267]	-0.532 [0.383]	-0.14 [0.377]
Break in 2009Q4	EMU	-0.745** [0.279]	-0.314 [0.298]	0.345 [0.367]	-0.423 [0.288]	-0.513** [0.256]	-0.045 [0.378]
	EMU-Core	0.023 [0.279]	0.322 [0.547]	0.442 [0.689]	-0.159 [0.234]	-0.288 [0.312]	0.002 [0.205]
	EMU-Per	-0.657*** [0.136]	0.485** [0.233]	1.068** [0.344]	0.099 [0.345]	0.535 [0.504]	0.467 [0.747]
	EMU-NMS	-0.132 [0.221]	-0.089 [0.215]	0.033 [0.275]	-0.817** [0.357]	-1.008* [0.560]	0.129 [0.266]

*significant at 10%, **significant at 5%, ***significant at 1%. Estimator CCEMG

Referring to hourly productivity, the results do not change for ‘core’ and ‘peripheral’ countries, whereas the break turns significant and negative in the case of the new member states. In the latter, the coefficient before the break is 1, implying that, post-crisis, the effect of productivity became 0.183, but it is not significantly different from zero. This is an interesting result because it implies that the virtuous convergence of the new member states came to a halt in the later years.

5. Conclusions

The aim of this paper is to analyze the main determinants of recent changes in trade and current account imbalances of a large number of EMU countries through descriptive evidence obtained from empirical results, as well as long- and short-term econometric exercises. Our descriptive evidence indicates that the majority of ‘peripheral’ EMU countries were recently able to implement processes to correct their external imbalances, while our long-term econometric results prove that this achievement was mainly due to structural decreases in their own domestic purchasing power. Moreover, our long-term econometric results show no significant changes in the relation between labor productivity and exports among ‘peripheral’ euro area countries in recent years. By definition, this means that the consolidation policies in the EMU did not improve structural competitiveness of ‘peripheral’ member states because they did not boost labor productivity through technical and organizational innovations or positive externalities. Following this logic, if the GDP growth rate turns out to be positive for ‘peripheral’ EMU countries in the near future, the risk that these countries will once again experience negative trade and current account imbalances would be high.

Obviously, one could argue that this conclusion is due to an overly restrictive definition of structural competitiveness, which under-assesses possible permanent changes in the labor markets of ‘peripheral’ EMU member states. The labor reforms implemented in Spain, Portugal, and Italy could have weakened the causal relations between increases in GDP growth rate, decreases in unemployment, and increases in nominal wages. However, as long as these causal relations were not cancelled outright by the aforementioned reforms to a degree that the rules of demand and supply are no longer at work, the result reached in our long-term econometric exercise would remain relevant: the elasticity of imports to wages increased after the peak of the international financial crisis. Hence, even if structural reforms in the labor markets had permanently weakened the potential effects of the GDP growth rate on increases in nominal wages, more moderate wage increases could have a stronger impact on trade imbalances.

This assertion is further supported by the results of our short-term econometric analysis, which indicates that wage moderation in the ‘peripheral’ EMU countries had no effect on export but contributed to the re-balancing of external positions mainly through the transitory effects due to a contraction in purchasing power and domestic demand. Note that the latter elements are in addition to the long-run dynamics.

It could seem as if this econometric evidence is weakened by the fact that the positive outlook for economic growth in the euro area did not cause an increase in trade and current account imbalances for ‘peripheral’ countries. However, it should be noted that, after a promising start, the actual results of the first three quarters of 2015 were disappointing. The positive macroeconomic climate of early 2015 has, in fact, been weighed down by various factors during the year: the tumultuous Greek crisis, which risked Greece’s exit from the monetary union and ended in a positive but temporary solution in July-August; a recession in emerging economies

that, combined with international diplomacy snafus and increasing transitional difficulties of the Chinese economy, brought global trade to a screeching halt last summer; and the humanitarian tragedy in war-torn North African and Middle Eastern countries, which resulted in migratory pressure and a religious war for certain EU members and risks ending free movement within the area. Besieged by these problems, the EU is no longer able to hide its economic and institutional fragility.

The risk of Grexit revealed that the euro area is not a stable monetary union but is positioned in the difficult transition between a vulnerable fixed exchange rate system and a federal union. The setback in international trade pointed out that the economic growth of the EMU, one of the strongest areas in the world despite its fragilities, cannot be based on exports and, therefore, cannot be built on the foundation of growing trade balance surpluses. After all, the euro paradoxically depreciated despite a 3.5% overall current account surplus in the EMU with respect to the rest of the world. Finally, combatting the dramatic problems plaguing countries along the southern and eastern borders of the EMU would require centralized coordination in the euro area, with increased cooperation and the ability to guarantee rapid and widely shared political and institutional initiatives. Conversely, the end of 2015 brought a devolution of the EMU: progress toward various forms of federalism even ‘at low intensity’ are blocked⁹, projects to spur internal demand are meeting with lackluster European support, as shown by the meager impact of the ‘Juncker Plan’. National interests are prevailing over shared objectives, and coordination is increasingly interpreted as binding constraints and rules to be applied to ‘peripheral’ member states in a climate of mutual and increasing mistrust (see Gros-Alcidi 2015; Tamborini 2015; De Grauwe-Ji 2013).

This problematic climate prevents EMU countries from benefiting from the unconventional expansive monetary policies of the ECB and low energy prices. It is also turning the structural differences in competitiveness between member states and the resulting macroeconomic imbalances within the area into symbols of the difficulties of implementing the centralized coordination necessary for starting a federal union ‘at low intensity.’ The management and financing of these divergences and imbalances assume an importance in the EMU that would be inconceivable in a federal union. This situation pushes ‘core’ EMU countries to hide behind European rules and to refuse any intensification of cooperation with ‘peripheral’ countries without prior attenuation of their fragility. Conversely, this same situation pushes the latter to lobby for a further easing of European rules and strengthening of cooperation as a tool for overcoming their relative weakness.

⁹ Here, it is sufficient to refer to the evolution of the document compiled by the former President of the European Council in cooperation with three other Presidents of the most important European institutions (save the European Parliament) in June 2012 (see von Rompuy 2012). Initially, this document resulted in stimulating debate that seemed capable of paving the road towards the construction of a few federalist strongholds (see, in particular, European Commission 2012). However, the balance reached in the December 2012 meeting of the European Council was disappointing. The recent reappraisal of these problems is due to a new document compiled by the President of the European Commission in collaboration with four other Presidents of the most important European institutions (including the European Parliament) in June 2015 (see Juncker 2015), which was later expanded by the European Commission (2015a). The last two documents do not re-state all the fundamental federalist points raised by the European Commission in 2012. However, they re-opened the possibility of starting a process of federalism at ‘low intensity.’ At the moment, this new attempt seems dead in the water.

Applying the basics of ‘game theory’ to the current situation in the EMU reveals that we are faced with a “non-cooperative” solution of a “non-cooperative game” (that is, a one-shot “prisoner’s dilemma”). The crucial fact to underscore is that the non-cooperative equilibrium, created by a lack of trust and absence of coordination, results in the selection of the “bad” equilibrium from all the possible “Nash equilibria.” To substitute the selected equilibrium with a better (though not necessarily optimal) one, it would be sufficient to exogenously introduce a “weak coordination” factor in the “non-cooperative game.” In the case under examination, this factor could be the reduction of competitiveness differences between EMU countries below a given threshold. This move could allow centralized (i.e., cooperative) solutions within the area.

Our conclusion, which in reality opens new problems for research and policy, is twofold. First, it is necessary to create analytical and comparative models that allow us to determine the thresholds of convergence/divergence between EMU countries that are compatible with cooperative solutions, rather than decentralized moves. Second, we need to identify policy interventions that allow ‘peripheral’ countries to satisfy these thresholds at economic and political costs compatible with their fiscal constraints and the various aforementioned dramatic, meta-economic tensions. In this last respect, we maintain that the implementation of efficient public investment projects at the European level is necessary (see Canofari et al. 2015). Unlike what is happening in the case of the ‘Juncker Plan,’ these European projects should not be surreptitiously nationalized; instead, they would need to be asymmetrically pursued, favoring ‘peripheral’ countries that need a structural boost in competitiveness.

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