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## **Structural Adjustment and Unit Labour Cost Developments in Europe's Periphery: Patterns before and during the Crisis**



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## **Abstract**

*This paper analyses developments in production structures in pre-crisis and during the crisis years in the range of EU 'peripheral economies' (i.e. the lower- and medium-income economies in the South and the Centre/East). The emphasis is on the development of the tradable sector (and manufacturing in particular) relative to non-tradable sectors and whether these are reflected in longer-term trade imbalances. Different groups of economies emerge, some with a strong manufacturing base, others with a very weak one. We investigate whether and to which extent structural readjustments took place during the crisis years and also analyse in detail relative unit labour cost (ULC) developments across sectors. A decomposition analysis shows that ULC developments are mainly driven during the crisis by output and employment adjustments (rather than by labour compensation) posing the question of whether capacity contraction effects might make 'weak economies' in the EU's periphery even more 'trade balance constrained' in the wake of the crisis.*

**Keywords:** *tradable sector, non-tradable sector, real effective exchange rates, unit labour costs, Europe's peripheral economies, trade and current account imbalances, structural developments in Europe's periphery, Central and Southeast Europe*

**JEL classification:** O10, O14, J3





## **Structural adjustment and unit labour cost developments in Europe's periphery: patterns before and during the crisis**

### **1 Introduction**

This Research Report concentrates on structural development issues of – what we shall call – ‘Europe’s periphery’, i.e. the group of lower and middle income countries which includes the Southern cohesion countries Greece, Portugal, Spain (GPS; we shall add also Cyprus to this group), the new member countries of Central and Eastern Europe (NMS-CE or NMS for short, plus Croatia) and the Southeast European Countries (SEEC). The reason to focus on this group of economies is the following: in the run-up to the crisis we have witnessed in some of the ‘periphery countries’ very strong imbalances in the current accounts, in some of them there were real estate bubbles and what seemed like strongly diverging labour unit cost developments from the more competitive of the ‘Northern’ EU members (such as Germany and Austria). This has given rise to the view that the European Union is plagued by a ‘North-South Divide’ which might have very far-reaching consequences for the long-term coherence of the EU up to the point of potentially leading to a euro area (and even EU) break-up.

The main focus of the following analysis is to examine issues related to structural developments before and during the crisis as regards developments of tradable and non-tradable sectors of the different economies; we want to capture here the extents of ‘structural distortions’ which developed in the various countries prior to the crisis (over-expansion of some of the non-tradable sectors and a shrinking in the share of the manufacturing sector) and then examine to which extent structural re-adjustments have taken place in the course of the crisis. Such structural readjustments are particularly important in economies which have been prone to longer-term ‘structural trade imbalances’. The reason being that if such structural imbalances persist, they would jeopardise recovery in these economies and the resumption of a catching-up growth trajectory.

The report will thus analyse developments over the time period in the run up to the recent economic crisis and the period following the crisis (termed the ‘crisis period’). The centre of attention is put on the manufacturing sector as – we shall argue – this sector is particularly important for lower- and medium-income countries to assure longer-term sustainability of external balances.

Generally, the following questions are raised: What has happened in the run up to the economic crisis in the individual countries? Which sectors contributed most to growth and employment? Which structural changes have been taking place in different economies during the crisis period? To which extent have structural distortions been corrected since 2008?

What has been the development of unit labour costs (ULCs) in the different sectors of the economy, particularly those in the tradable sectors compared to the non-tradable sectors? Which factors account for the differential movements in ULCs, i.e. output, employment, or wage adjustments? And what was the role of exchange rate adjustments in those countries which still had flexible exchange rates (vis-à-vis the euro)?

Section 2 sets the scene and provides an introduction to distinguish ‘weak’ and ‘strong’ economies amongst the low- and medium-income economies with regard to the importance of the manufacturing sector and its impact on longer-term trade balances. In Section 3, development patterns of manufacturing compared to the economy as a whole are investigated, before the crisis and then during the crisis period. We check whether countries with weak manufacturing sectors and/or weak longer-term trade balances underwent an adjustment during the crisis or whether disparities between weak and strong economies further increased? Section 4 then takes a look at a wider range of sectors of the economy and looks at structural adjustment patterns between the tradable and non-tradable parts of the economy. In Section 5, trends in real effective exchange rates are investigated, while in Section 6, relative unit labour cost developments are analysed across the various sectors of the economy and we examine the various factors (wages, productivity, exchange rates) which drive these developments. Section 7 concludes.

## **2 The importance of manufacturing in the economy**

In the literature much has been written about structural change, the role of manufacturing at various stages of development and the process of tertiarisation in the course of development. Evidence has been found that the manufacturing share in an economy increases up to a certain level of income per head and then is expected to stabilise and subsequently to fall (see e.g. UN, 1977; Syrquin, 2008). However, other factors than simply real income levels affect the share of the manufacturing sector in different economies such as specialisation in foreign trade, current account imbalances, etc. (see also Haraguchi, 2010).

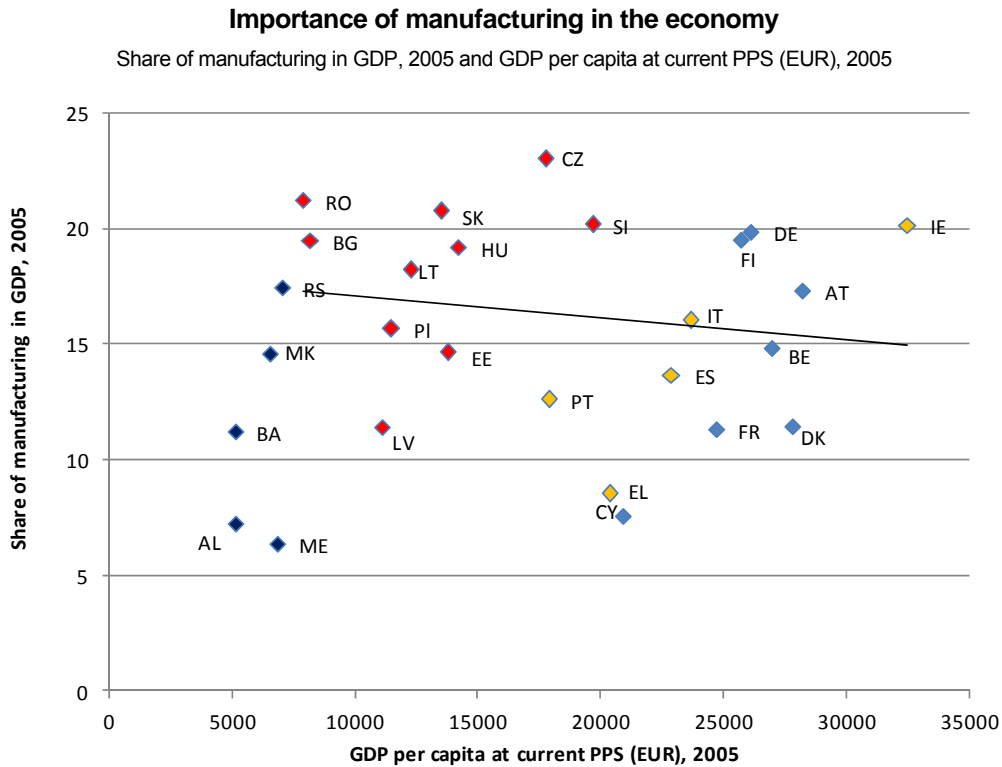
Figure 1 depicts the share of manufacturing in GDP in comparison to the GDP per capita in the year 2005 for the EU member countries plus Southeast Europe (SEE). The general tendency of the share of manufacturing declining with rising real incomes in this group of economies is confirmed (see the downward sloping regression line). However, what we want to focus on is the segmentation amongst the groups of economies in Europe’s ‘periphery’: we can see that the group of Central European economies (Czech Republic, Slovakia, Slovenia, Hungary) and also Bulgaria, Romania and Lithuania (in the case of the latter this is due to its important petroleum refining sector) lie above the regression line, the other Baltic states (Estonia, Latvia), Croatia, Poland, and all the Southern cohesion countries (Portugal, Greece, Spain, Cyprus) lie below the regression line. Also all SEE econo-

mies are located well below, with Albania and Montenegro having especially small manufacturing shares. Only Serbia is close to the regression line.

Furthermore, amongst the advanced European economies we can distinguish two groups of economies as well: Ireland, Germany, Austria, Finland and Sweden with a very strong position of the manufacturing sector and France, Denmark and the Netherlands with a weak manufacturing share; Italy and Belgium lie very close to the regression line.

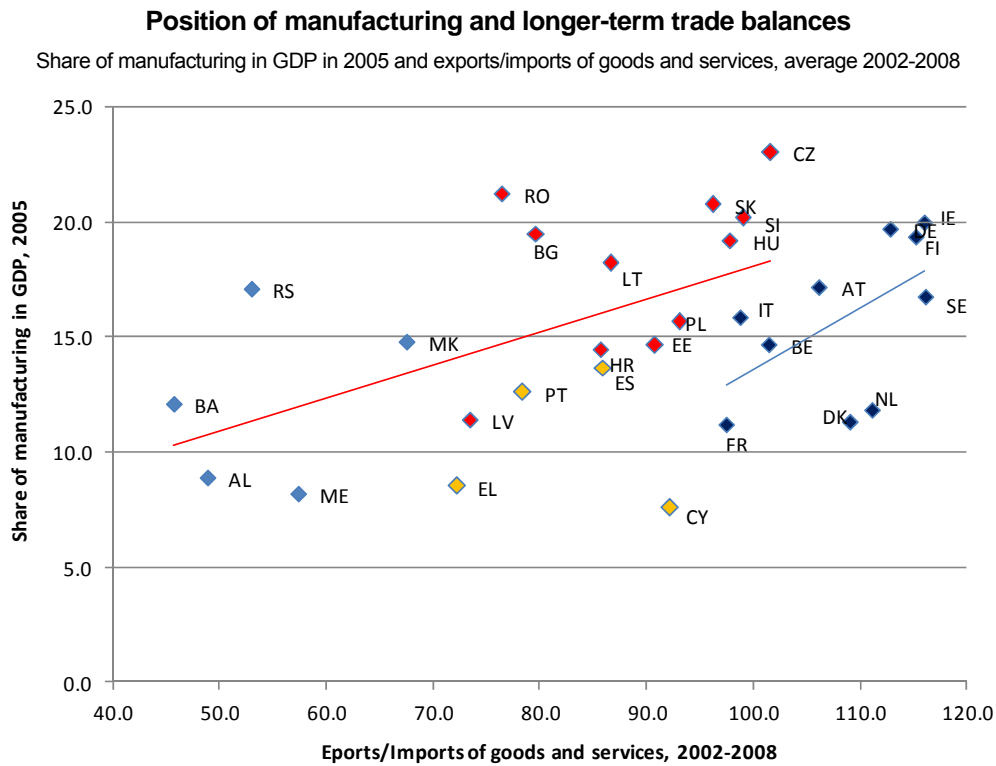
The next issue we want to point out is the relationship between longer-term trade balances and share of the manufacturing sector. Figure 2 presents two regression lines, one showing the relationship between trade balances and the share of manufacturing for the lower- and medium-income economies, and another showing this relationship for the more advanced EU member countries. We can see that the regression line for the less advanced economies is shifted upwards compared to that for the more advanced economies; this means that lower income economies require a higher share of manufacturing to achieve the same balance in the trade accounts (something like a 5-7 percentage point higher share of the manufacturing sector). The reason is that more advanced economies can compensate more easily for a smaller manufacturing sector by exporting tradable services than lower- and medium-income economies can. The group of economies which had relatively persistent and high deficits (export/import ratios below 95%) in the trade accounts in the pre-crisis period amongst the lower income economies includes the Baltic economies, Bulgaria, Romania and all the Southern cohesion economies. On the other hand, we can also see the relatively good performance of the Central European economies (Czech Republic, Hungary, Slovakia, Slovenia).

Figure 1



Source: Eurostat and wiiw own calculations.

Figure 2



Source: Eurostat and wiiw own calculations.

What has been established so far is the following:

Amongst the low- and medium-income economies of Europe ('Europe's periphery') quite distinct groups of economies can be distinguished: the group of Central European economies (Czech Republic, Hungary, Slovakia, Slovenia) as well as Bulgaria and Romania which show a high share of the manufacturing sector in GDP; and the rest of the low-/medium-income economies with shares which were rather below what one would expect at that level of income. Furthermore, in the pre-crisis period the Central European economies also showed a healthy longer-term trade balance, while Bulgaria, Romania, Croatia, the Baltics and the Southern cohesion countries (Greece, Portugal, Spain, Cyprus) showed rather high net import positions on the external trade accounts. With the exceptions of Bulgaria, Romania and Lithuania these economies also had a small share of manufacturing in GDP which we have shown to be correlated with weak trade accounts. This group of economies was thus particularly vulnerable to much more cautious capital inflows (or even capital flow reversals) which accompanied the onset of the financial crisis which took its starting point in the years 2008 and 2009.

We shall now follow the developments in the groups of low-/medium-income economies in relation to structural adjustment patterns which were expected to take place in the course of the crisis. In the next two sections we shall analyse the structural development patterns of tradable vs. non-tradable sectors in output and employment and after that we shall look at unit labour cost developments (split into wage, exchange rate, output and employment components) at the sectoral levels. We shall, again, find significant differences across the 'peripheral economies', in some of them strong readjustments taking place in favour of the tradable, and particularly the manufacturing, sector both with regard to differential growth in output and employment and also with regard to labour unit cost developments, while in others this was not the case. Furthermore, when we examine the factors behind relative labour unit cost developments (tradables vs. non-tradables) we find that the main factor behind these were relative employment and output contractions.

### **3 Changing patterns of manufacturing growth before and after the crisis**

The first feature we want to establish in this section is whether there was a process of 'convergence' or 'divergence' amongst 'peripheral countries' with regard to the shares of the manufacturing sector prior to the crisis.

Figure 3 depicts the developments in the share of manufacturing in the period prior to the crisis (2002-2008) and what we see is generally a picture of 'divergence', i.e. countries in Europe's periphery which already had a low share in manufacturing experienced lower growth rates in the manufacturing sector than in the economy as a whole, while countries with a strong manufacturing sector (the Central European economies) also experienced a

positive growth differential of the manufacturing sector relative to the economy as a whole. Hence the relative weaknesses and strengths of the tradable sectors – here proxied by the manufacturing sector - in the two groups of economies became more pronounced. Bulgaria and Romania are somewhat different, in that they had a relatively strong share of manufacturing but experienced relatively weak manufacturing growth prior to the crisis (and also had quite strong deficits on the current account).

Figure 4 plots differential growth in manufacturing vs. the economy as a whole against pre-crisis export growth: again, we can see a picture of ‘divergence’, i.e. the economies with low export growth also experienced relatively low growth in manufacturing vs. the economy as a whole, which means that in these economies the economic structure turned further away from manufacturing which – as we argued – is for low- and medium- income economies the most essential part of the tradable sector and thus for potential export growth. On the other hand, the group of Central European economies which showed rather strong export growth prior to the crisis also experienced higher growth in manufacturing than in the economy as a whole, hence further strengthening the position of the tradable sector; for Slovenia growth is balanced and export growth rather moderate.

Let us now come to the crisis period, which started in the Baltics a bit earlier than in the rest of the European economies. Over this period we can detect further segmentation into different groups of economies, some of which experienced a healthy readjustment in their economic structures, while others went through a further weakening of their tradable sector.

This segmentation into groups is depicted in Figure 5 where we plotted the export/import trade balances prior to the crisis and the differential growth manufacturing vs. the economy as a whole during the crisis years 2009-2011. What we see is that in a sub-group of those economies which had vulnerable positions in the trade balances prior to the crisis, their situation improved with a positive growth differential of manufacturing relative to the rest of the economy. This group comprised the Baltic economies, Romania, Greece and also Macedonia; the other Southern cohesion countries (Portugal, Spain, Cyprus) did not experience such a pattern. The relative position of the manufacturing sector did not improve. This was also not the case for Slovenia and Italy, both of which experienced a deteriorating relative position of the manufacturing sector.

In the following we shall analyse a wider range of sectoral (output and employment) developments in advanced and peripheral economies prior to and following the outbreak of the crisis.

Figure 3

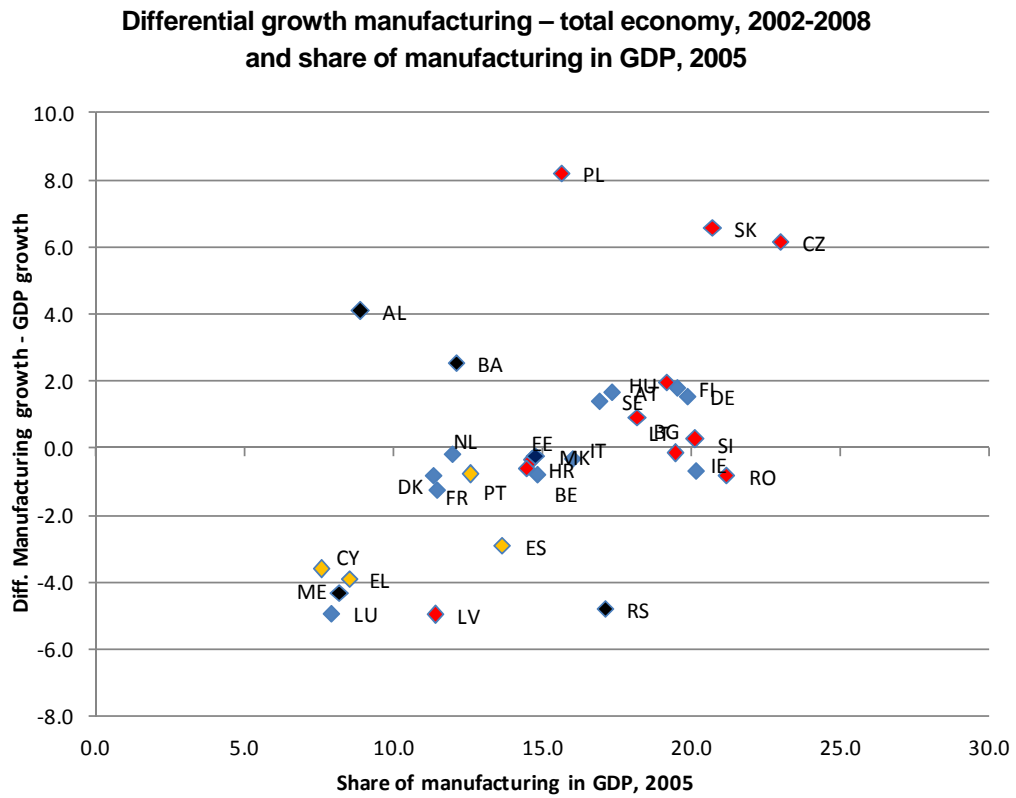


Figure 4

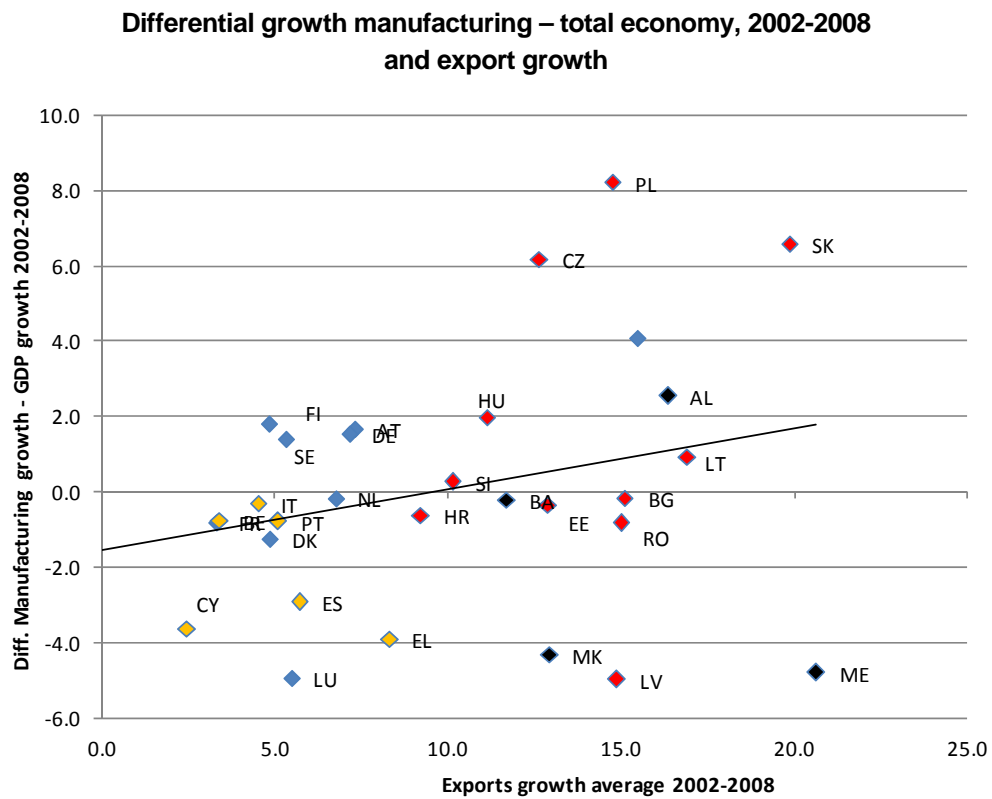
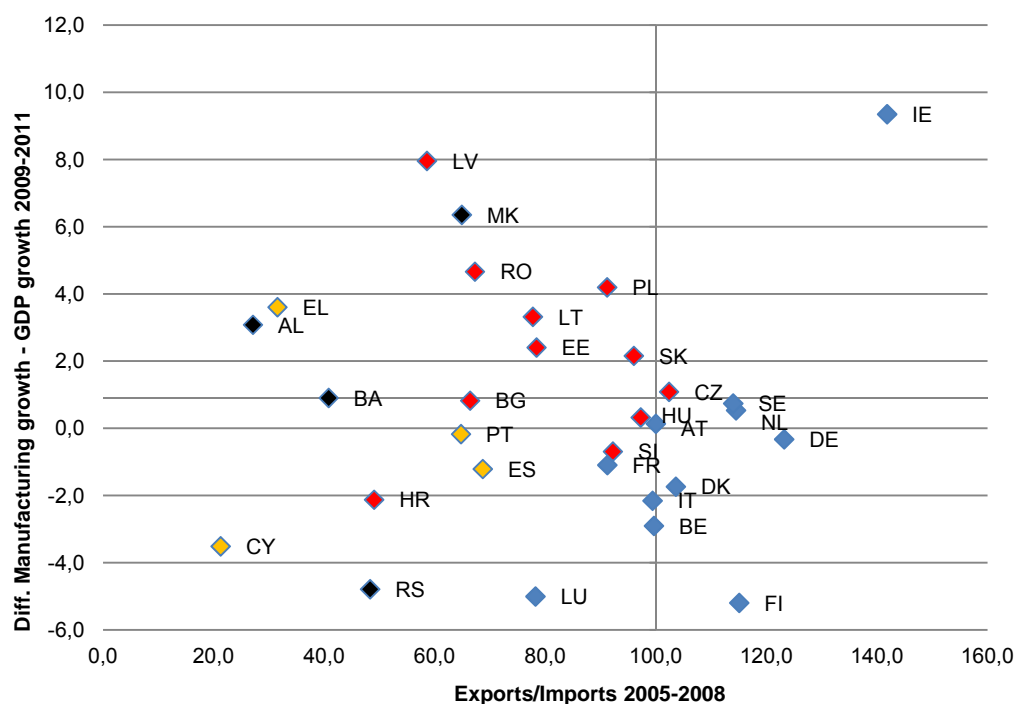


Figure 5

**Comparison growth performance 2009-2011 relative to exports/imports 2005-2008**



Source: Eurostat and wiiw own calculations.

#### 4 Balanced and unbalanced patterns of development

In this section we shall deepen our analysis of structural change prior to the crisis and the patterns of restructuring which occurred during the crisis. Here we look at a wider range of sectors than in the previous section where we concentrated on the manufacturing sector. We use a sector aggregation based on the NACE rev. 2 classification scheme (see Annex B for details). The following sectors are distinguished: manufacturing (C), as the classic tradable goods sector, construction (F), reflecting an important non-tradable part of the economy, tradable services (TS)<sup>1</sup>, including for example financial and insurance activities, non-tradable services (NTS)<sup>2</sup>, with wholesale and retail trade featuring prominently, as well as non-market services<sup>3</sup>. Three time periods have been chosen: two periods before the crisis 2001-2004 and 2005-2008 and the crisis period 2009-2011<sup>4</sup>. The distinction of the two periods prior to the crisis serves the purpose to check whether tendencies in unbalanced sectoral growth became more pronounced just before the outbreak of the crisis.

<sup>1</sup> Tradable services (TS) include Transportation and storage (H), Information and communication (J), Financial and insurance activities (K) and Professional, scientific and technical activities (M).

<sup>2</sup> Non-tradable services (NTS) include Wholesale, retail trade, repair of motor vehicles (G), Accommodation and food service activities (I), Real estate activities (L), Administrative and support service activities (N), Arts, entertainment and recreation (R), Other service activities (S), as well as Activities of households as employers & for own use (T).

<sup>3</sup> Non-market services include Public administration and defence, compulsory social security (O), Education (P), Human health and social work activities (Q).

<sup>4</sup> Disaggregated sectoral data are at the time of completion of this paper only available up to the year 2011.



Annex Figure A1 shows the contribution of the different sectors of the economy to economy-wide GDP growth in the individual EU Member States. There is quite a number of countries, where the tradable sector contributed most to GDP growth before the crisis, another set of countries where non-tradables together with tradables were pronounced sources of growth and finally there is a number of countries where tradables did not play or played only a small role in growth and non-tradables took that role. In the latter case one can speak of a “distorted pattern of development” or at least of a situation in which the economy moved away from the production of tradables, while in the other two cases either a more balanced picture or a strengthening of the position of the tradable sector occurred.

Before the crisis, the tradable sector, i.e. manufacturing, contributed strongly to growth in all the new EU Member States, but was especially pronounced in the Czech Republic, Hungary, Poland, and Slovakia. This was also true for Austria and Germany (less), where manufacturing growth contributed most to GDP growth.

Also in the other new Member States including the Baltics, manufacturing contributed strongly to GDP growth but the non-tradable services sector contributed even more. Tradable services and construction played an important role for growth. This picture is evident in Estonia, Latvia, Lithuania, Croatia, Bulgaria, Romania and Slovenia. In these last three economies, spending towards construction and non-tradable services increased strongly in the period immediately before the crisis (2005-08). Also for Albania, Bosnia and Herzegovina and Macedonia this pattern is evident, with Albania being an interesting case, as it was the only country where the construction sector was the largest contributor to GDP growth.

In another group of countries, non-tradable sectors (construction and non-tradable services) contributed most to GDP growth, while the tradable sector did not or only rather weakly. This points to the ‘distorted pattern of structural development’ mentioned earlier i.e. away from the tradable sector. This was the case in Greece and Spain, while in Cyprus, Italy or Portugal tradable services (mostly financial services) took the leading role. Also in Montenegro and Serbia manufacturing did rather poorly.

During the crisis period, adjustment processes took place in a number of countries. Construction showed huge declines in Bulgaria, Croatia, Estonia, Greece, Latvia, Lithuania, Romania, Slovenia and Spain. Also in Albania and Montenegro there was a large drop. The non-tradable services sector contributed strongly to the GDP decline in the Baltic countries, Bulgaria, Croatia, Greece, Hungary, Romania and Slovenia. However, also manufacturing suffered strongly in several countries such as Bulgaria, Croatia, Italy, Slovenia and Spain. Also in Macedonia, Montenegro and Serbia, the manufacturing sector suffered. Thus, adjustment processes following the crisis were clearly pointing in the right direction in the Baltic countries: they show a decline in construction and non-tradable services on the one hand and a slight increase in manufacturing on the other. There is a less

positive picture in Bulgaria, Croatia, Slovenia, the GPS, and most countries in Southeast Europe (only exception: Albania) where manufacturing shows no sign of recovery.

Looking at patterns of employment (rather than output as above), see Annex Figure A2, we can see that employment was primarily created in the non-tradable services sector before the crisis in almost all countries. There are only a few exceptions: in Slovenia, construction as well as tradable services contributed most and in Romania construction. Employment growth in manufacturing was either negative or weak and made a strong positive contribution only in Poland.

In the time period following the crisis, in those countries with a construction boom prior to the crisis, employment in the construction sector suffered most: This was the case in Ireland, Spain and the Baltics, and also in Croatia, Slovenia and Bulgaria. Also in Greece, employment contracted strongly in the construction sector. Overall, the manufacturing sector contributed strongly to the employment decline in the wake of the crisis in all countries. Interestingly, an adjustment in non-market employment took place in Bulgaria, the Czech Republic, Greece, Italy, Latvia, and Lithuania. In Latvia, the non-tradable sector (largely wholesale and retail trade) contributed most to the employment decline in this country, as was the case in Serbia.

*Overall, we can say that while output and employment patterns showed some positive signs of rectifying some of the pre-crisis distortions in production structures away from the tradable sectors in a number of economies, there are also signs that particularly the manufacturing sector took a very serious hit during the crisis thus affecting production capacities in this vital tradable sector. This is particularly problematic for those economies which moved into crisis with an already under-sized manufacturing sector and longer-term trade imbalances.*

## **5 Trends in real effective exchange rates**

This section gives a brief overview of trends in selected indicators of real effective exchange rates (REERs) over the period 2000 to 2012. Figure 6a shows the REERs versus the EU-27 countries based on unit labour costs for the total economy (ULCE). Immediately before the crisis ULCE-REERs rose in all Central and East European countries (less in Slovenia), while in the Cohesion countries the increase was moderate and in Germany the ULCE-REER declined.

Due to nominal depreciation in the countries with floating exchange-rate regimes, the ULCE-REERs fell sharply in these countries (CZ, HU, PL, RO) shortly after the crisis. In some of the Southern cohesion countries, ULCE-REERs fell most recently (GR, PG, ES). From a competitiveness point-of-view it is important to focus on the tradable sector rather

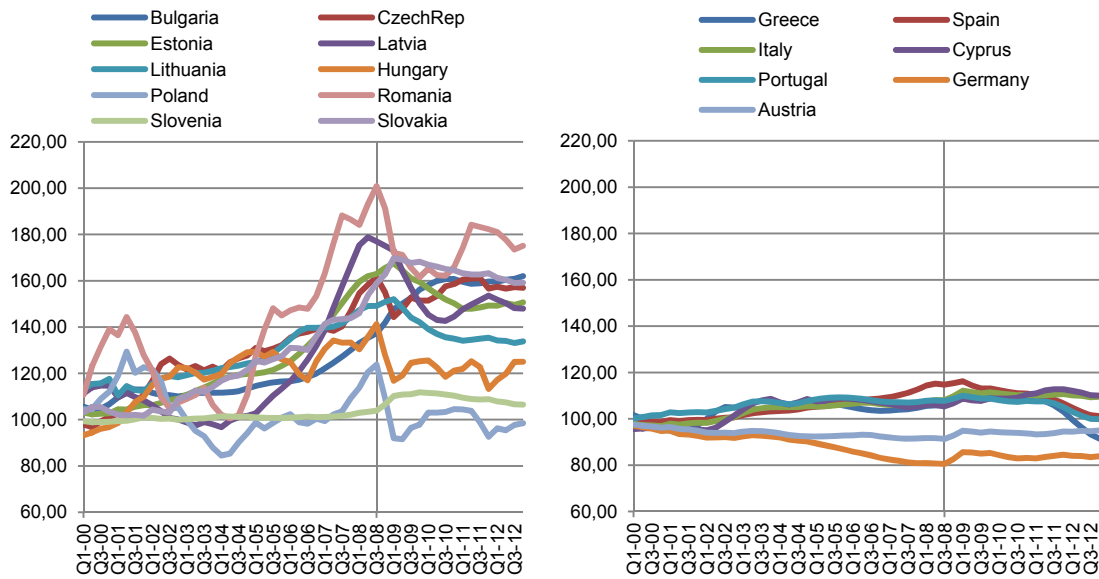
than the economy as a whole. Figures 6 show REERs based on nominal wage costs in manufacturing (ULCM). One of the interesting differences which emerge is that while in the Central and East European countries REERs in manufacturing showed more favourable developments in comparison to the total economy, this was the other way round for the Southern Cohesion countries.

Figure 6

### Real effective exchange rates vs. EU-27

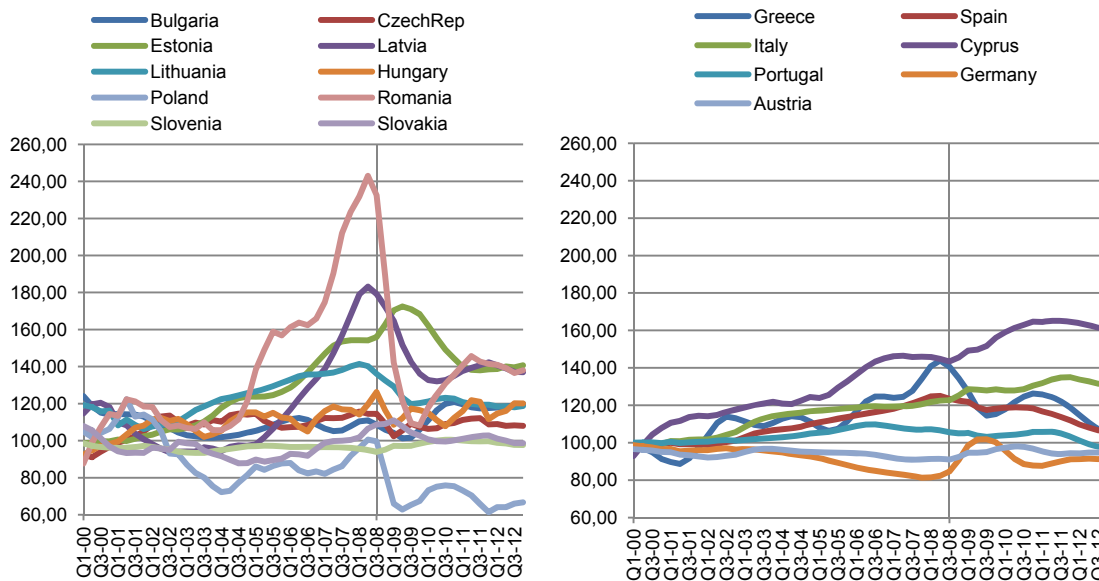
#### Nominal unit labour cost, total economy – ULCE-REER

average 1994-2004 = 100



#### Nominal unit wage cost, manufacturing – ULCM-REER

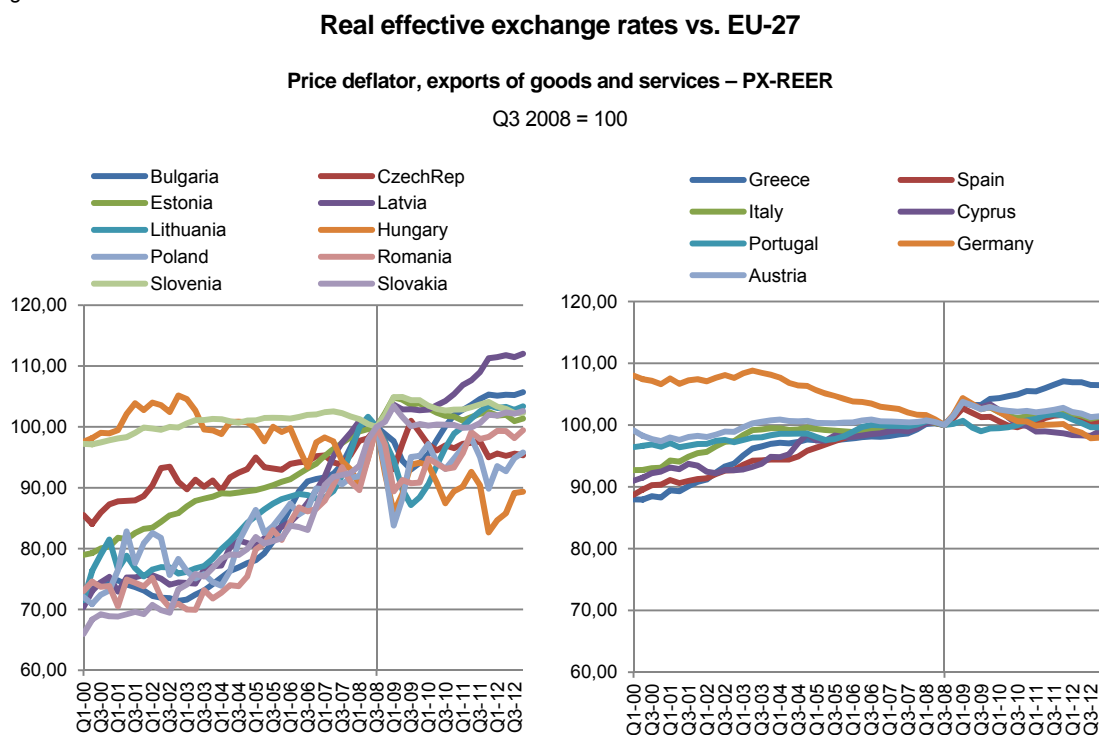
average 1994-2004 = 100



Source: European Commission, Ameco.

Finally, Figure 7 depicts REERs deflated by export prices (PX). While in most countries PX-REERs increased prior to the crisis that of Germany decreased<sup>5</sup>. After the crisis, PX-REERs dropped first but then increased in Latvia, Bulgaria, Lithuania and Greece. In most other countries PX-REERs tended to remain roughly at the same level, only in Germany and again Hungary the downward trend continued.

Figure 7



Source: European Commission, Ameco.

## 6 Unit labour costs

We have seen in section 4 that most low- and medium-income economies went through major structural adjustment processes (in output and employment) following the onset of the recent financial and economic crisis. In this section we deepen our analysis of such processes by focusing on underlying components of the chosen indicator of price competitiveness, i.e. unit labour costs (ULCs). Once again, we emphasise the importance of understanding the different patterns across the different sectors of the economy, particularly of tradables and non-tradables, using the sector classification adopted in the previous section.

<sup>5</sup> This was also the case with Hungary which pursued a highly problematic monetary policy in the period prior to the crisis which exposed the economy to bouts of depreciations.

As a preliminary, we consider ULC developments across all countries and focus on differences between the economy as a whole and the manufacturing sector in particular. We single out again the manufacturing sector as the principal tradable sector in most economies (data on ULCs for all sectors of the economy and the different periods are provided in Annex Tables A1 and A2); the differences in developments between the manufacturing sector and the economy as a whole are then interpreted as an indication of the degree to which cost-competitiveness in the tradable sector has deteriorated or improved relative to all sectors of the economy.<sup>6</sup> In Figure 8 we show developments in two periods: the pre-crisis period 2005-2008 (Figure 8a) and the crisis period 2009-2011<sup>7</sup> (Figure 8b).

The main patterns that the figures show are as follows:

- There are much stronger movements in ULCs in many peripheral economies than in advanced economies; this was the case both in ULC growth in the pre-crisis period (interpreted at the time partly as the workings of the Balassa-Samuelson process leading to price level convergence between advanced and catching-up economies, but partly also reflecting an overshooting in real exchange rate appreciation caused by strong capital inflows) as well as in ULC declines during the crisis period.
- In general, ULCs rise more moderately in the manufacturing sector than in the economy as a whole across most economies which is natural as manufacturing is also a sector with generally higher relative labour productivity growth.
- None the less, exceptions to that general trend are also to be observed. A number of economies either experienced very similar developments in ULC growth in manufacturing compared to the economy as a whole or the relative ULC position of the manufacturing sectors deteriorated in the pre-crisis period. Latvia, Romania, Croatia, Spain, Greece and Cyprus fall into this category.
- Moreover, some economies can be seen to have undergone major shifts during the crisis period, with ULCs in manufacturing dropping significantly (and competitiveness thus improving). Poland, Estonia, Lithuania, Latvia, Romania, and Ireland are among those countries.
- Furthermore, one group of economies displays a persistent and significant differential in terms of ULC developments in both periods (favouring the relative competitiveness of the manufacturing sector). This group includes the Czech Republic, Poland, Slovenia, Slovakia and Ireland. Yet another group of economies is characterised by low differentials or 'perverse' ULC developments in the manufacturing sector relative to the economy as a whole (i.e. by a deterioration in the relative ULC position of manufacturing). That particular group comprises Hungary, Spain, Italy, Portugal and Croatia. We con-

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<sup>6</sup> It is well-known that relative price and unit cost developments between tradable and non-tradable sectors are one of the indicators of real exchange rate developments and hence of competitiveness of an economy. See e.g. Goldstein et al. (1980), Harberger (2004).

<sup>7</sup> Owing to industry classification breaks we have slightly different periods for some of the economies.

sider developments in this latter group a problematic issue, unlike the pattern in the former group that we regard as a sign of healthy developments in the competitiveness of these economies.

Figure 8

**Development of unit labour costs – manufacturing and total economy**

average per annum growth in %

Figure 8a

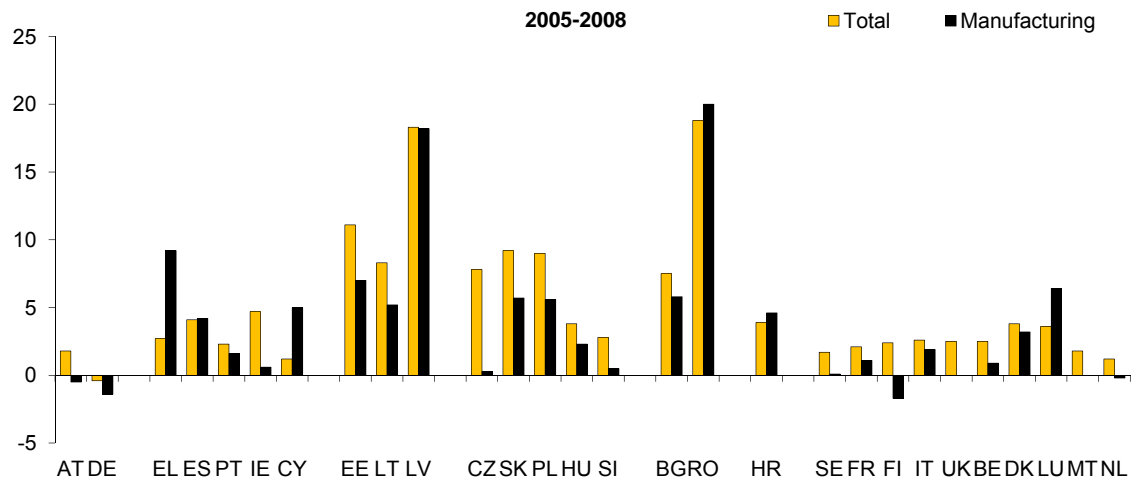
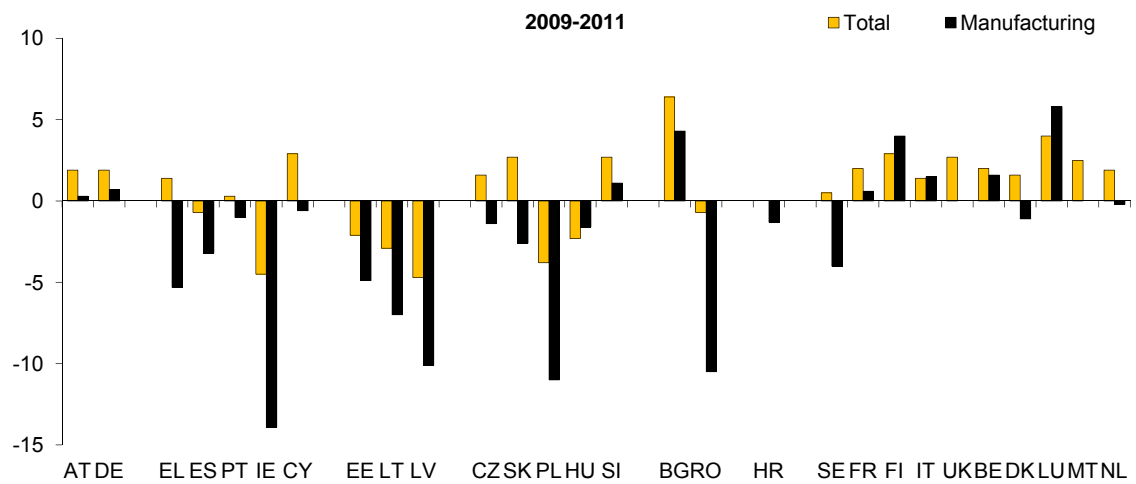


Figure 8b



Remark: BG, PL and RO are not fully comparable with other countries due to different classification used. No manufacturing data for Malta and UK.

Source: Eurostat, Statistical Office of Romania and wiiw own calculations.

Let us now discuss a number of specific country experiences, thereby analysing in greater detail those factors which drive relative ULC developments across sectors and time-periods.

The following decomposition formula is applied:

$$\Delta \text{ ULC} = - \underbrace{\Delta \text{ Output} + \Delta \text{ Employment}}_{\text{Change in labour productivity}} + \underbrace{\Delta \text{ Compensation Rate (in NCU)}}_{\text{Change in compensation per worker}} - \Delta \text{ Exch. Rate}$$

Exchange rate is defined as NCU/EUR. It is clear that for those countries that adopted the euro at a particular juncture or maintained a fixed currency regime in relation to the euro, changes in the exchange rate play no role in driving ULCs.

Using the above formula, we first present an overview across the entire range of economies and we then select a few country examples in order to point out diverse patterns of ULC developments that occurred in the pre- and crisis periods.

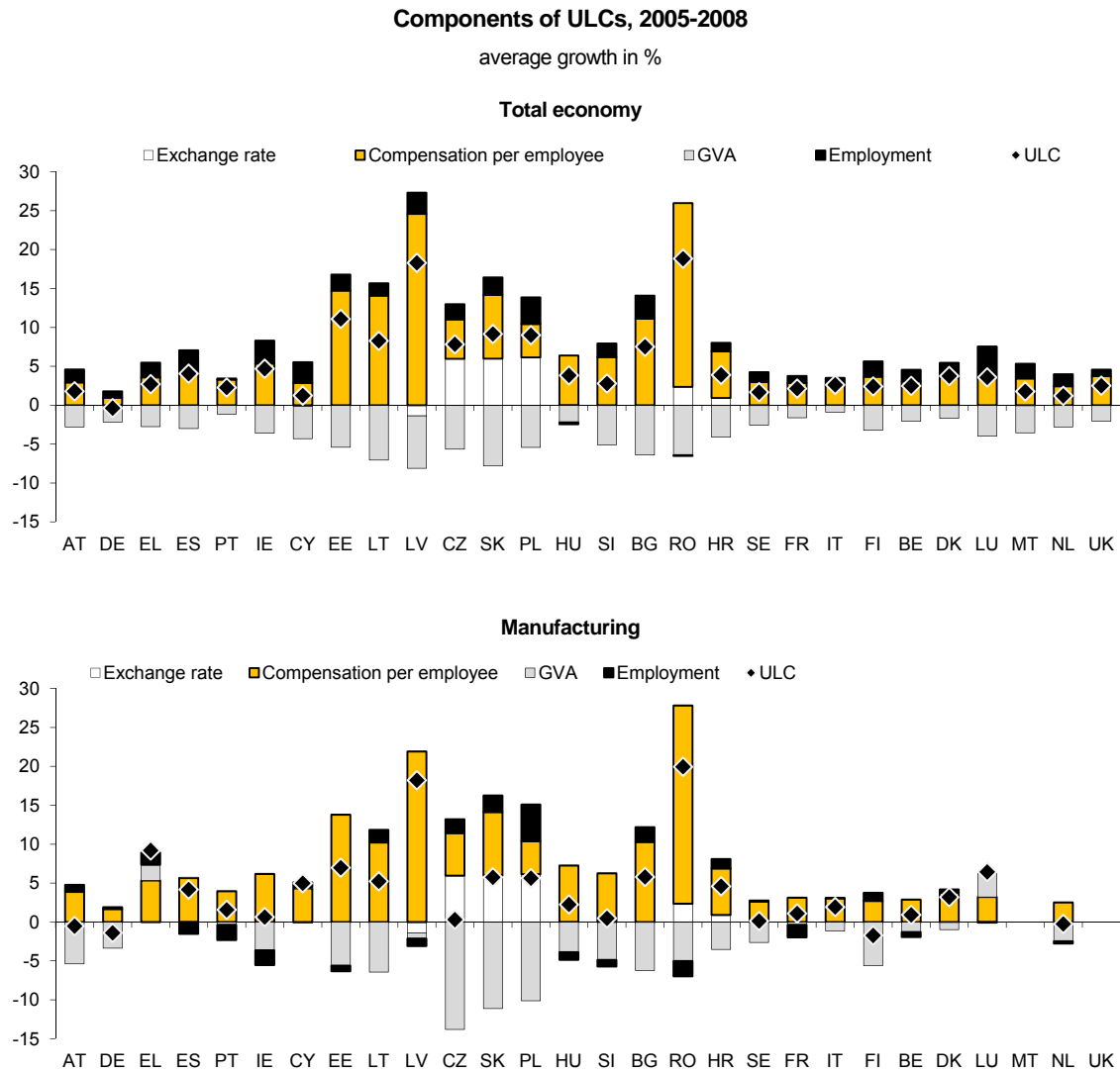
Figure 9 (a and b) shows the decomposition of unit labour cost developments into the various components (changes in output, employment, labour compensation, exchange rate) for the periods 2005-08 and 2009-2011 respectively. Without going over these developments in any detail, we want to point out the following features:

- Firstly, ULC developments are in general much more dramatic in CEECs than in the GPS or in the advanced EU economies; this likely reflects the stronger catching-up gap which still had to be covered by the new member countries in price level convergence compared to the GPS economies which had been EU (and thus Single Market) members for a much longer period and where the nominal convergence process had already taken place earlier.
- Secondly, we can see a marked difference between the pre-crisis period and the crisis period in that in the pre-crisis period labour compensation growth played a much bigger role in determining overall ULC developments than during the crisis years. During the crisis years, it is much more relative output and employment growth/contraction (and hence implicitly labour productivity) which had a dominating role to play in determining ULC developments. There are exceptions to these patterns: e.g. fast output growth played an important role for manufacturing productivity growth in the Czech Republic, Slovakia and Poland in the pre-crisis period, and wage growth was high in Bulgaria during the crisis years.
- Thirdly, we can see that exchange rate developments played a significant role only in very few economies as most economies were either members of the EMU or had opted for fixed (or quasi-fixed) exchange rate regimes. The economies where exchange rate flexibility still played a significant role in the pre-crisis period were the Czech Republic, Slovakia, Poland and Romania (all appreciating vis-à-vis the euro) and Poland, Hungary and Romania (depreciating vis-à-vis the euro) during the crisis years.

Figure 9

### Components of ULCs

Figure 9a



Source: Eurostat and wiiw own calculations.

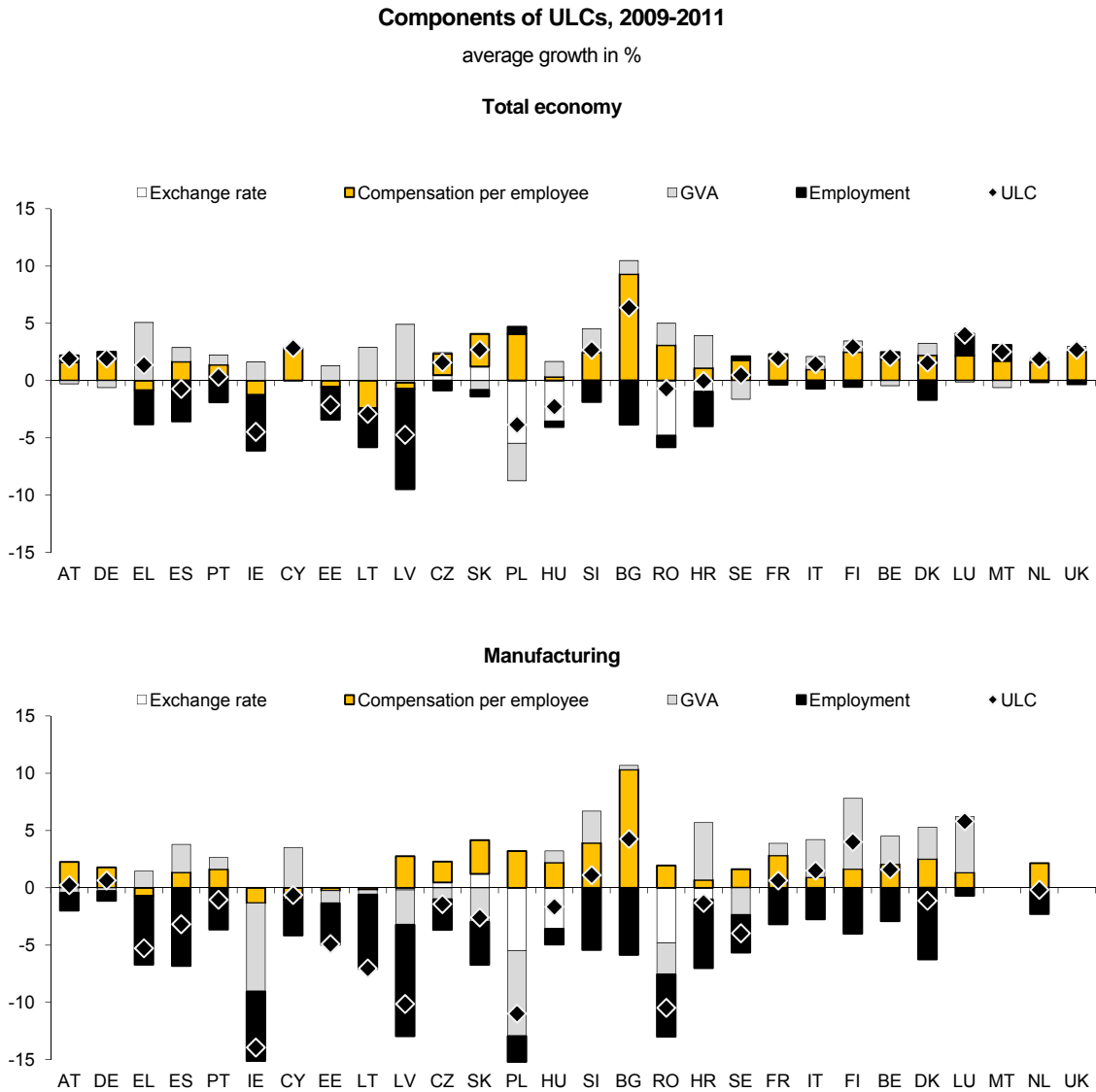
We shall now discuss a few **country examples** regarding the factors which played important roles in ULC developments and point to different developments in this regard in the different (tradable and non-tradable) sectors (see Figures 10). The examples chosen should demonstrate both differences in the weights which different factors had in driving ULC developments in different economies and the degree to which (particularly the vulnerable) economies manage to re-equilibrate real exchange rate distortions in the course of the crisis.

We start with **Latvia**: a country that went through rather dramatic structural adjustment processes, which were already apparent in the growth and employment adjustments



across sectors discussed in section 4. We saw there that over the period 2009-2011, Latvia experienced a sharp contraction in output particularly in construction and in non-tradable services, whereas the impact on manufacturing and tradable services was far less negative over the same period (see Annex Figures A1).

Figure 9b



Source: Eurostat and wiiw own calculations.

In terms of ULCs and their components, as shown in Figure 10a (Latvia), the country registered a steep rise in ULCs in the second period prior to the crisis (2005-2008) in the construction sector relative to the other sectors of the economy. In that period, wage compensation per worker in the construction sector rose by nearly 40% p.a.<sup>8</sup> while in the economy

<sup>8</sup> All growth rate figures refer to average per annum (p.a.) growth rates in the different periods.

as a whole it grew by some 22% (detailed figures are available in Annex Table A1). In that period, ULCs grew by 33.9% in the construction sector mainly driven by wage growth, while ULCs grew by 18.2% in the economy as a whole (see Annex Table A2). Once the crisis struck, ULCs fell by -4.7% in the economy as a whole, while decreasing by -10.1% in the manufacturing sector and by -4.7% in the construction sector. In that period, the crucially important component in the construction sector that drove ULCs down was a dramatic contraction in employment (-22.7%) accompanied by a decline in output of -19.4%. On the other hand, output in the manufacturing sector increased over the period 2009-2011 by 3.0% p.a. – manufacturing was the only sector where output did not decline (the decline in the economy as a whole was -4.7%). The developments favouring the tradable sector during the crisis period are also apparent if one compares the tradable and non-tradable market services sectors. The data show that the decline in output (and employment) was more substantial in the non-tradable services sector than in the tradable services sector. Hence overall there was a clear shift during the crisis period towards tradable activities (manufacturing and tradable market services) and away from non-tradables (construction and other non-tradable market services). Furthermore, the Latvian case clearly shows – and this finding applies to all economies – that over the crisis period, relative ULCs across sectors are driven far less by differential movements in wage compensation, but much more by the differentiated movements in output and employment (and hence in labour productivity).

In the case of **Slovenia** (see Figure 10b), as in the case of Latvia, exchange rate adjustments only played a role in ULC developments in the first period (2001-2004). Thereafter, in the run-up to joining the euro area and then having acquired EMU-membership in 2007, devaluations could no longer contribute to improving the competitiveness of the Slovene economy. From that point on the two other variables, labour productivity and labour compensation, determined ULC developments. Moving straight to the period 2009-2011, the period of adjustment, quite striking differences between the Slovene and the Latvian economies can be observed. The difference lies mostly in the productivity growth figures (see Table A1). In Latvia over the period 2009-11, productivity growth rates in the total economy, manufacturing and the construction sector were -3.8%, 14.2% and 4.3%, respectively, whereas the figures for the corresponding sectors in Slovenia were substantially lower -0.2%, 2.8% and -7.6%. If we take those figures together with the growth rates in compensation rates per worker, we obtain the corresponding ULC growth figures in Slovenia: for the economy as a whole +2.7% (Latvia -4.7%), manufacturing +1.1% (Latvia -10.1%) and the construction sector +8.4% (Latvia -4.7%). ULC developments in favour of manufacturing were corrected to a far greater degree in Latvia than in Slovenia. If we drill down behind the productivity growth figures, we can see that these productivity 'improvements' were due mostly to employment contraction in Latvia being much starker than in Slovenia.

**Romania** also offers evidence (from the standpoint of ULC adjustments) of comparatively pronounced adjustments favouring the tradable sector. Furthermore, given the country's flexible exchange rate regime, exchange rate adjustments still play a role in contrast to the two economies discussed above. Concentrating on the adjustment process during the crisis period, we can see (Figure 10c) that ULC developments are strongly differentiated across sectors. For the period 2009-2011, we find that ULCs fell for the economy as a whole by -0.7% p.a., but dropped in manufacturing by -10.5%; they rose in the construction sector by 10.9%, while the tradable services also developed differently (+2.2%) in comparison to the non-tradable services sector (+5.4%). Hence, overall the tradable sectors (manufacturing and tradable services) improved their relative positions in terms of ULCs compared to the non-tradable sectors. Over and above that, Figure 10c also shows that devaluation contributed to a decline in ULCs (expressed in EUR) by 4.8% per annum; this devaluation, of course, only bears relevance for the tradable sectors as it contributes to improving their competitiveness. Hence taking the differential impact of exchange rate devaluation into account, the difference in the impact of adjustments favouring the tradable sector as against the non-tradable sector over the crisis period is even more pronounced.

If we look in greater detail at the different components which explain the different ULC developments across sectors in Romania, we can see that the manufacturing sector, whose relative ULC position was greatly improved, (a) benefited from a far more moderate increase in wages (growth in employee compensation rose by only 2% p.a. as against 3.1% in the economy as a whole); and (b) underwent a much more pronounced decrease in employment (-5.4%) as compared to the other sectors (-1.0% for the economy as a whole). Moreover, output developments were distinctly more positive (+2.7%) as against negative growth rates in the other private sector activities. Furthermore, the different ULC patterns between tradable and non-tradable services sectors was mainly due to the far more moderate wage growth in the former; that effect was further bolstered by the exchange rate devaluation benefiting the tradable sectors.

Let us now shortly discuss developments in the GPS countries (Greece, Portugal, Spain): we have seen in the analysis of the previous sections that these economies were rather badly placed as far as the position of the manufacturing sector was concerned. What about unit labour cost developments prior to and following the impact of the crisis? Figures 10d-10f show the movements for the GPS economies. We observe the following:

**Greece** experienced rather unfavourable developments in ULCs in manufacturing relative to the economy as a whole prior to the crisis: while ULC grew on average by 2.7% per year in the economy as a whole in the pre-crisis period (2005-08), they grew by 9.2% p.a. in manufacturing; the main reason was particularly fast wage growth and negative output growth. The situation was better in tradable services (ULCs fell by -0.9% p.a. in that period driven by a relatively favourable output performance). When we come to the crisis period

(2009-2011), we see a pattern of ‘internal devaluation’: ULCs in manufacturing decline by 5.3% p.a. while they increase in the economy as a whole by 1.4% p.a.; there is output contraction in the economy as a whole while there is slight output growth in the manufacturing sector. However, most of the decline in ULCs in the manufacturing sector is due to a dramatic fall in employment (- 6.0% p.a.). In the tradable services sector there is a sharp decline in output by close to 10.0% per annum and the collapse in output and employment in the construction sector is dramatic. Hence we can see that the main drivers behind ULC developments in the different sectors during the crisis are output and employment developments.

In **Spain** we can similarly observe an employment and output driven process of adjustment of relative ULCs in the different sectors of the economy during the crisis: again, employment contraction in the manufacturing sector was very strong (-6.8% p.a. in the crisis period) outstripping output contraction, so that ULCs fell by -3.2% compared to -0.7% in the economy as a whole. The fall of employment in the services sectors and of ULCs was more moderate. Wage growth fell substantially compared to the pre-crisis periods, but remained in positive territory. Following a sustained boom of construction activity in the pre-crisis period, this sector experienced – like in Greece – a sharp contraction in employment and output (more in the former than in the latter) during the crisis.

Finally, the pattern of relative adjustment in ULCs in manufacturing compared to the economy is also visible in **Portugal** during the crisis years (with ULCs falling by -1.0% p.a. over the years 2009-2011 in manufacturing with a slight rise of 0.3% in the economy as a whole), again driven by a much stronger contraction of employment levels in manufacturing than in the other sectors of the economy with the exception of construction.

The findings of this analysis can be summarised as follows:

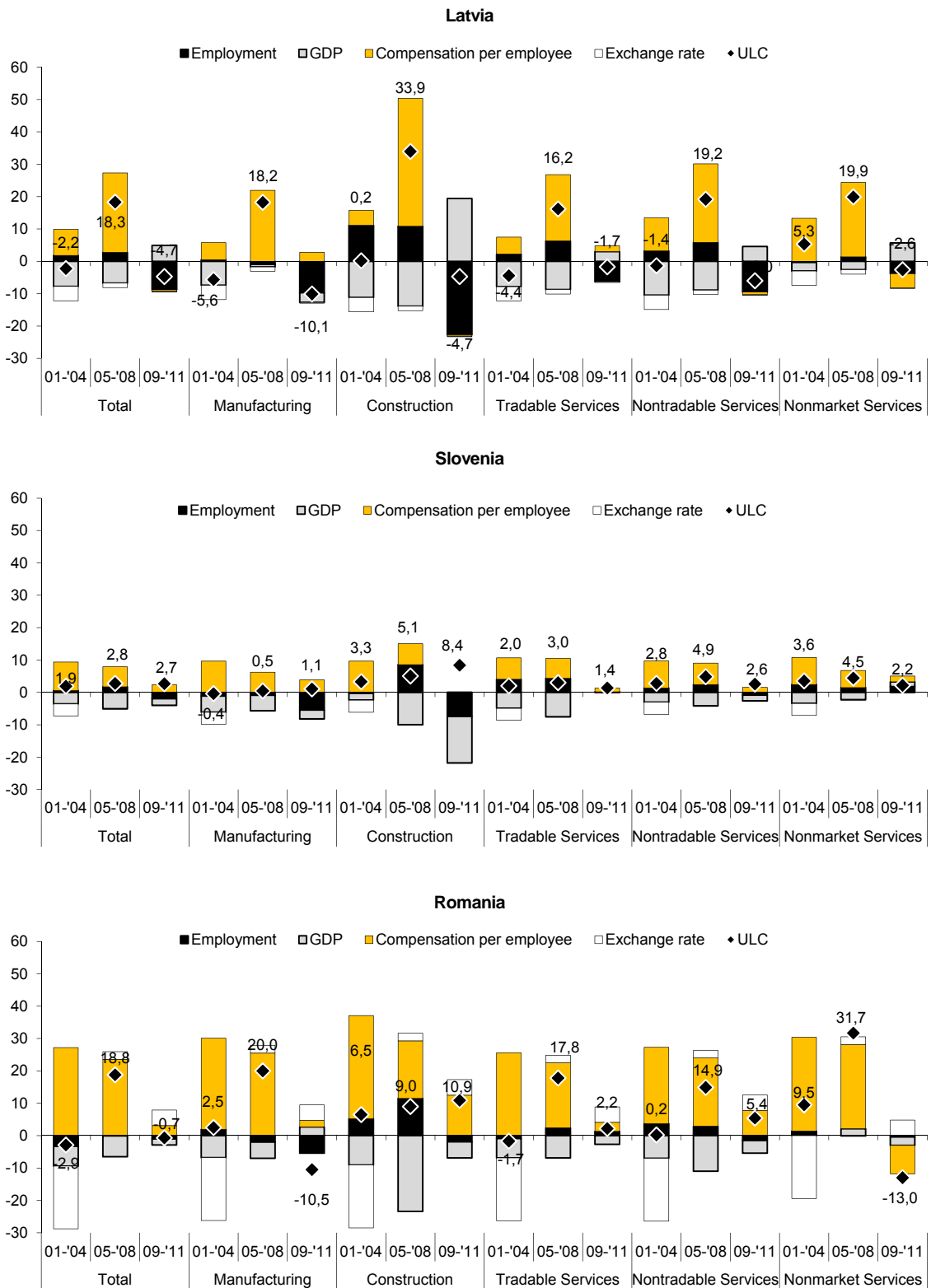
- The decomposition of relative ULC developments across sectors into employment, output, wage and exchange rate effects is of importance to understanding the manner in which the relative cost position of the tradable sectors improves or deteriorates (relative ULCs are one of the indicators of ‘real exchange rates’).
- Furthermore, an analysis by sector is important as drawing on information based solely on ULCs for the economy as a whole and then comparing those costs across countries can be quite misleading when assessing developments in different economies’ competitiveness (which should be based on an assessment of competitiveness of the tradable sectors; see the differential developments shown in Figures 9).
- Although we have instances of differential developments in compensation rates across sectors in the short to medium term, differential developments in output and employment (and hence in productivity) play – in most instances – a much more important role in driving relative ULCs across sectors. Two issues follow from this. First, although ‘wage flexibility’ (across sectors) might be an important determinant of competitiveness

in the longer run, in the medium and short term, the relative development of output and employment are a far more decisive factor in determining whether the tradable sector regains competitiveness. Thus, a sharp drop in output (and hence utilisation levels), if not matched by an even greater drop in employment, would be detrimental to this particular indicator of competitiveness. Secondly, it is important to assess the extent to which such productivity developments in a crisis period might just be short-term in nature or are indicative of long-run changes in productivity levels.

- The example of Slovenia and its comparison with Latvia show that Slovenia failed to make a successful transition to adjusting to firmly fixed exchange rates (by virtue of its being a member of the euro area). Once exchange rate flexibility was lost, Slovenia did not manage to maintain (or restore in the crisis period) competitiveness in its tradable sector. In the case of Latvia, on the other hand, the adjustment processes during the crisis period were dramatic (in terms of both output and employment in the non-tradable sector), thus supporting a shift towards competitiveness.
- In economies with flexible exchange rates, exchange rate adjustments – as demonstrated by the case of Romania – continue to play a role in supporting a return to competitiveness. They can further accentuate the differential impact that the other components of ULC developments have on the competitiveness of the tradable as distinct from non-tradable activities.

Figure 10

### Components of Unit Labour Costs, average growth in %

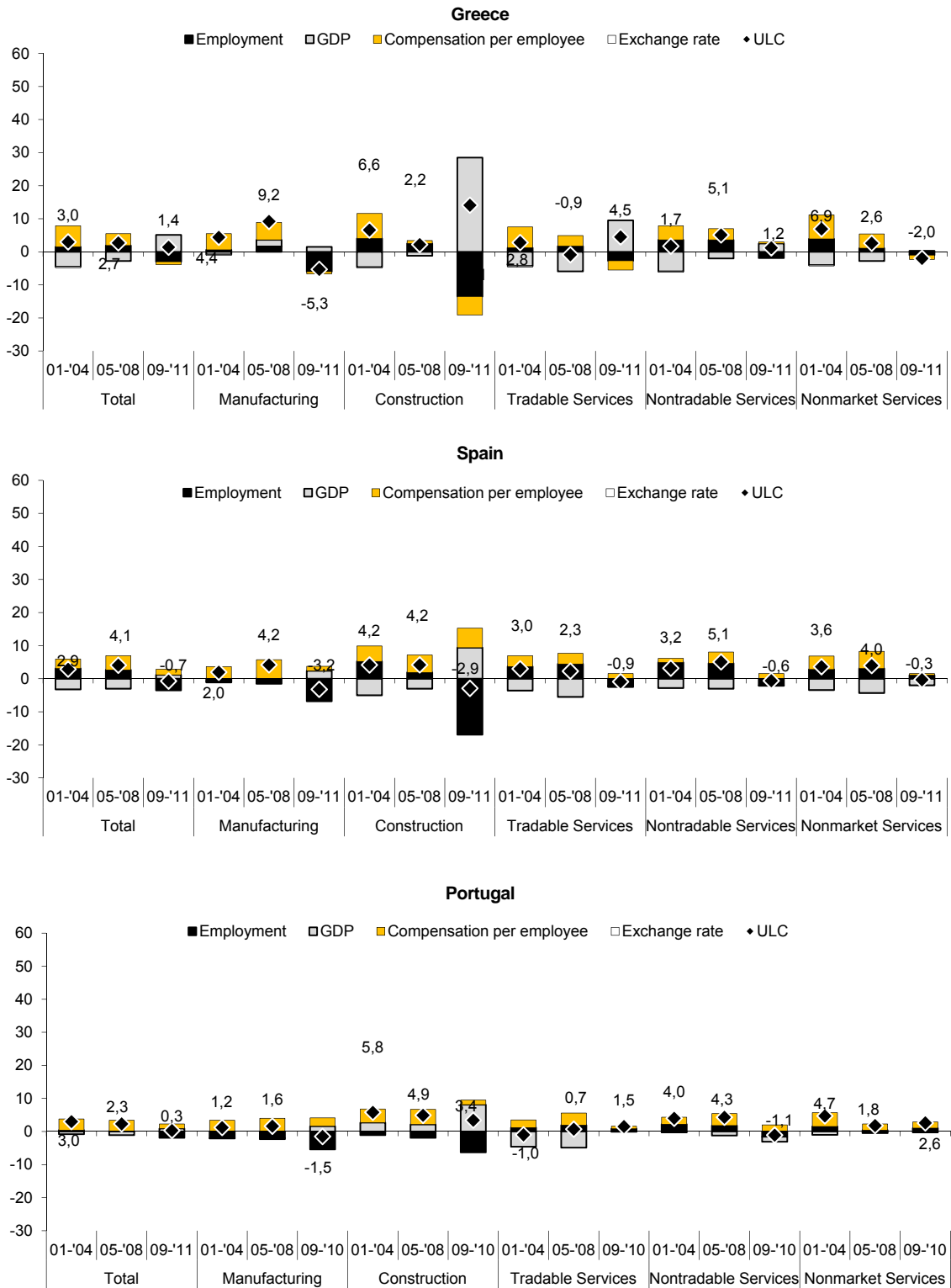


Remark: RO: Data are not fully comparable with other countries due to different revision of classification used.

Source: Eurostat, Statistical Office of Romania and wiiw own calculations.

Figure 10

Components of Unit Labour Costs cont., average growth in %



Remark: RO: Data are not fully comparable with other countries due to different revision of classification used.

Source: Eurostat, Statistical Office of Romania and wiiw own calculations.

## 7 Conclusions

The analysis in this Research Report is motivated by the concern about structural pre-crisis features amongst the lower- and medium-income economies of the European Union (we use the term ‘peripheral Europe’ for these). Such features have manifested themselves in longer-term trade imbalances and competitiveness problems which got reflected in the production structures of these economies (particularly the shares of tradable and non-tradable activities). The paper attempted to show that amongst the lower- and medium-income economies which comprise the Southern cohesion countries (Cyprus, Greece, Portugal, Spain), the Central and East European new Member States (CE-NMS or NMS in short) and other Southeast European economies, different groups could be distinguished: those which are characterised by a small share of the manufacturing sector pre-crisis and those economies (mostly the Central European NMS) which have built up a strong position in manufacturing. This sector has been shown to be particularly important for lower- and medium-income countries (as compared to more advanced economies which can rely on a stronger contribution by the tradable services sector) to make sure an economy does not suffer from chronic longer-term trade imbalances. This provides a basis for a ‘manufacturing imperative’ for low- and medium-income countries in order to avoid a ‘trade-balance constraint’ on growth and catching-up in a post-crisis world when sustained current account disequilibria will no longer be financed as easily as prior to the recent crisis.

In the pre-crisis period we have also given evidence for ‘structural divergence’ in that countries which had a weak manufacturing sector were moving further away from manufacturing. This was not the case for the Central European countries which saw a strengthening - with the exception of Slovenia – of the position of the manufacturing sector. Hence we talked of ‘vulnerability’ (on the external accounts) and of ‘distortions’ in production structures getting entrenched in an important sub-group of ‘peripheral economies’.

The next question we addressed was whether, to which extent, and in which way such ‘distortions’ were countered by structural adjustment processes during the crisis years. A thorough analysis of structural developments (output and employment) both pre-crisis and during the crisis years was undertaken across the entire range of tradable and non-tradable sectors in the different economies; furthermore, we analysed unit labour cost (ULC) developments in all these sectors. While the pre-crisis analysis has revealed groupings of economies with weak and strong tradable sectors, the analysis of the crisis period has shown that ‘structural readjustments’ also took place very unevenly across economies pointing to further evidence that in a sub-group of EU peripheral economies structural problems persisted and even deepened. A decomposition analysis of ULC developments across sectors before and during the crisis, which looked at the various components (wages, output, employment, exchange rates) responsible for ULC developments (an indicator of ‘real exchange rates’) further substantiated this insight. In this respect we discussed in detail a number of particular cases which served as examples for stronger or



weaker 'structural adjustment processes' during the crisis. We found that in most cases such adjustments were mainly a function of differentiated patterns of output and employment responses to the crisis across sectors and economies. We also pointed to examples of economies which had adopted the euro but where structural adjustment processes differed quite strongly (Latvia vs. Slovenia), as well as economies which had kept flexible exchange rates and where these had indeed played a significant role in structural adjustment (e.g. Romania).

Whether ULC (and thus real exchange rate) developments which are mainly based on sharp relative employment and output adjustments during the crisis years will lead to a sustained recovery of a tradable sector in vulnerable economies in the longer-term remains an open question. Real exchange rate adjustments could be short-term or lasting, and the gains made in ULC developments which might have involved substantial capacity contractions (and hysteretic effects in terms of skill attrition) might keep such economies 'trade-balance constrained' for a long time to come. Hence there are relative price and capacity effects to such adjustments which have to be considered in terms of their longer-term impact. The monitoring of these issues will remain a vital concern to understand the future course of 'North-South' gaps in the European Union.

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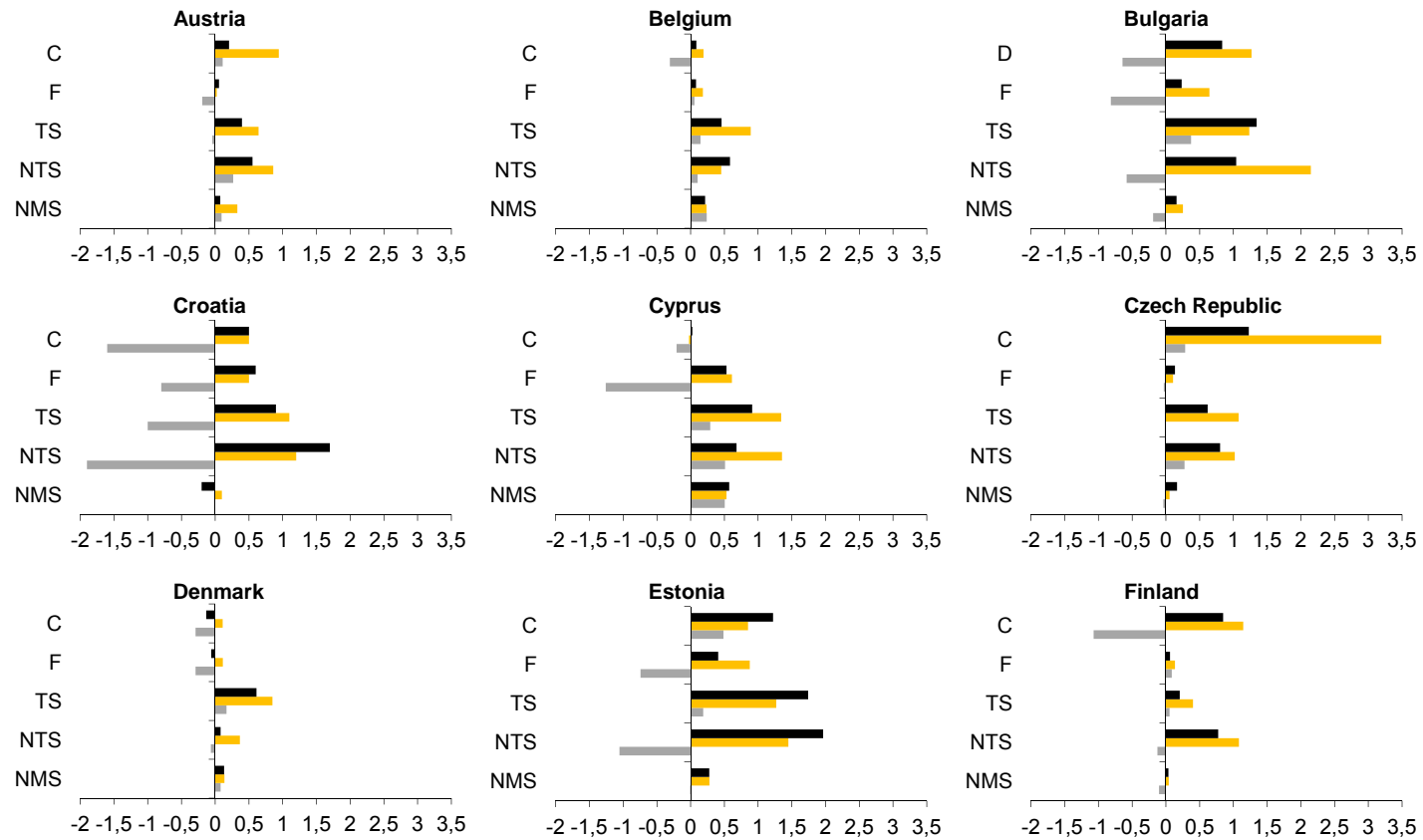
## Appendix A

Figure A1a

### Contributions to GDP growth rates at constant prices

averages over the time period

■ 2001-04 ■ 2005-08 ■ 2009-11



Bulgaria:2009, Romania 2009 based on NACE Rev. 1 Portugal: 2009-11; Spain 2009-11

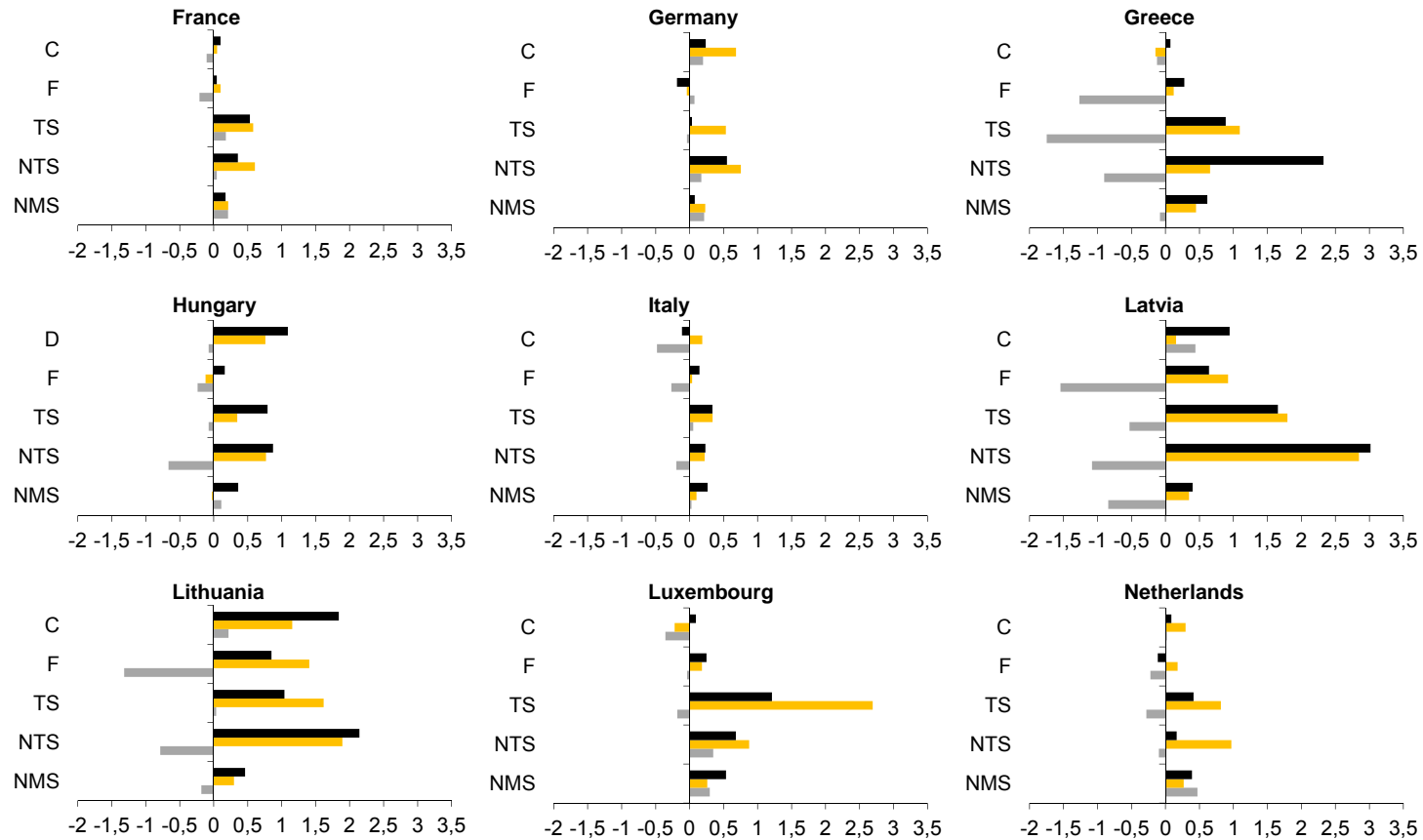
Notes: Based on NACE Rev. 2 classification scheme: C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices.

Source: wiiw Database incorporating national and Eurostat statistics.

Figure A1b

### Contributions to GDP growth rates at constant prices averages over the time period

■ 2001-04 ■ 2005-08 ■ 2009-11



Bulgaria:2009, Romania 2009 based on NACE Rev. 1; Portugal: 2009-11; Spain 2009-11

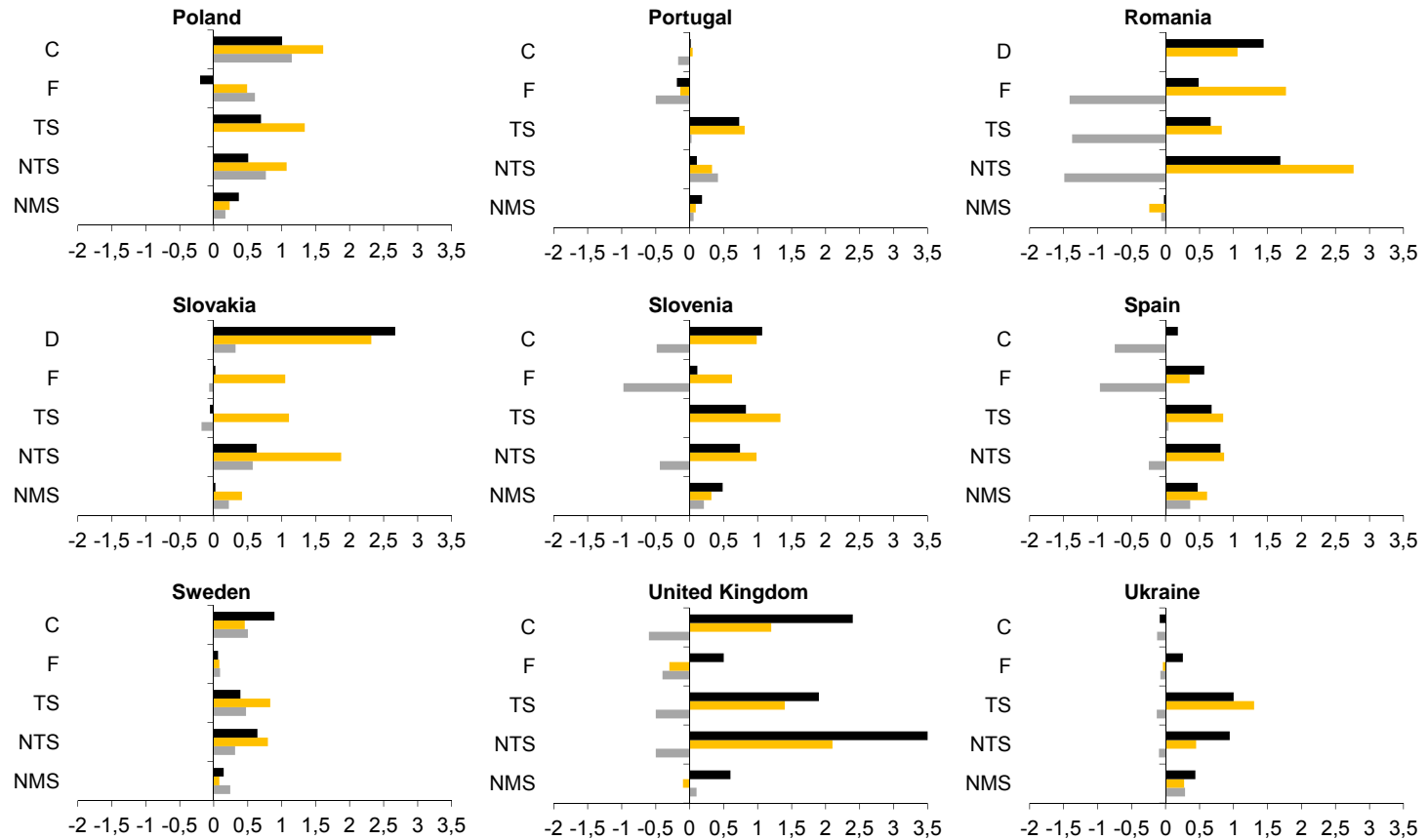
Notes: Based on NACE Rev. 2 classification scheme: C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices.

Source: wiiw Database incorporating national and Eurostat statistics.

Figure A1c

**Contributions to GDP growth rates at constant prices**  
averages over the time period

■ 2001-04 ■ 2005-08 ■ 2009-11



Ukraine, Bulgaria:2009, Romania 2009 based on NACE Rev. 1; Portugal: 2009-11; Spain 2009-11

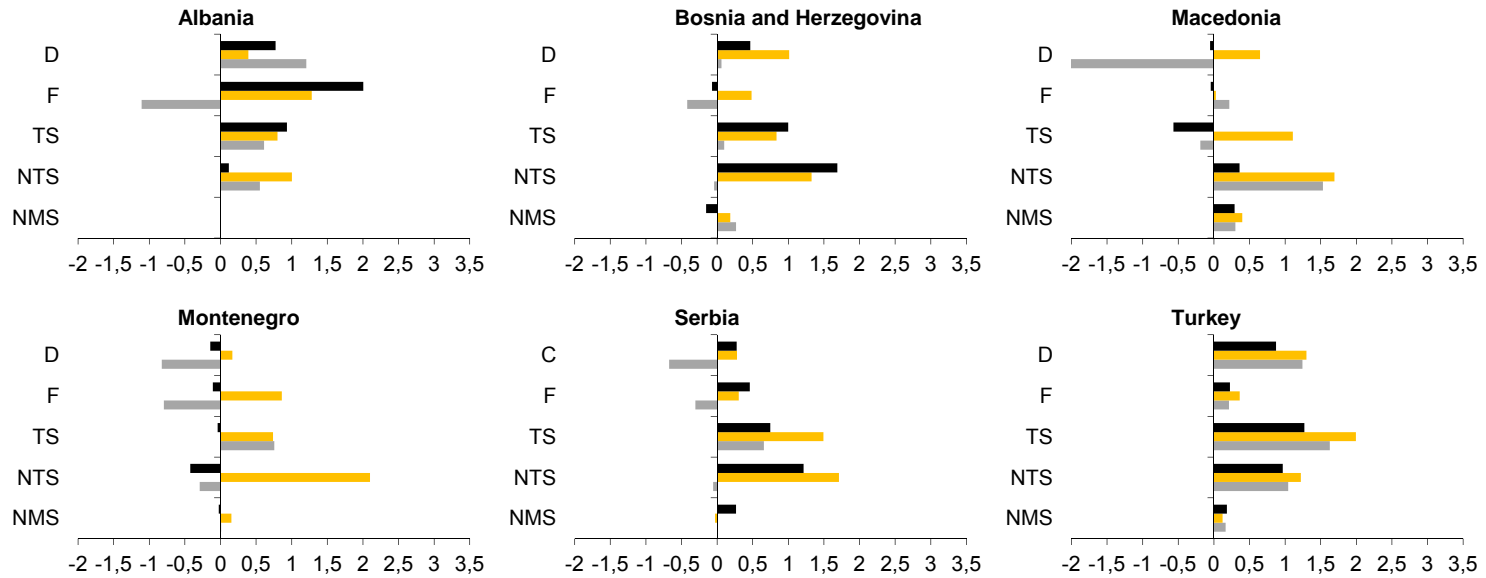
Notes: Based on NACE Rev. 2 classification scheme: C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices.

Source: wiiw Database incorporating national and Eurostat statistics.

Figure A1

**Contributions to GDP growth rates at constant prices**  
 averages over the time period

■ 2001-04 ■ 2005-08 ■ 2009-11

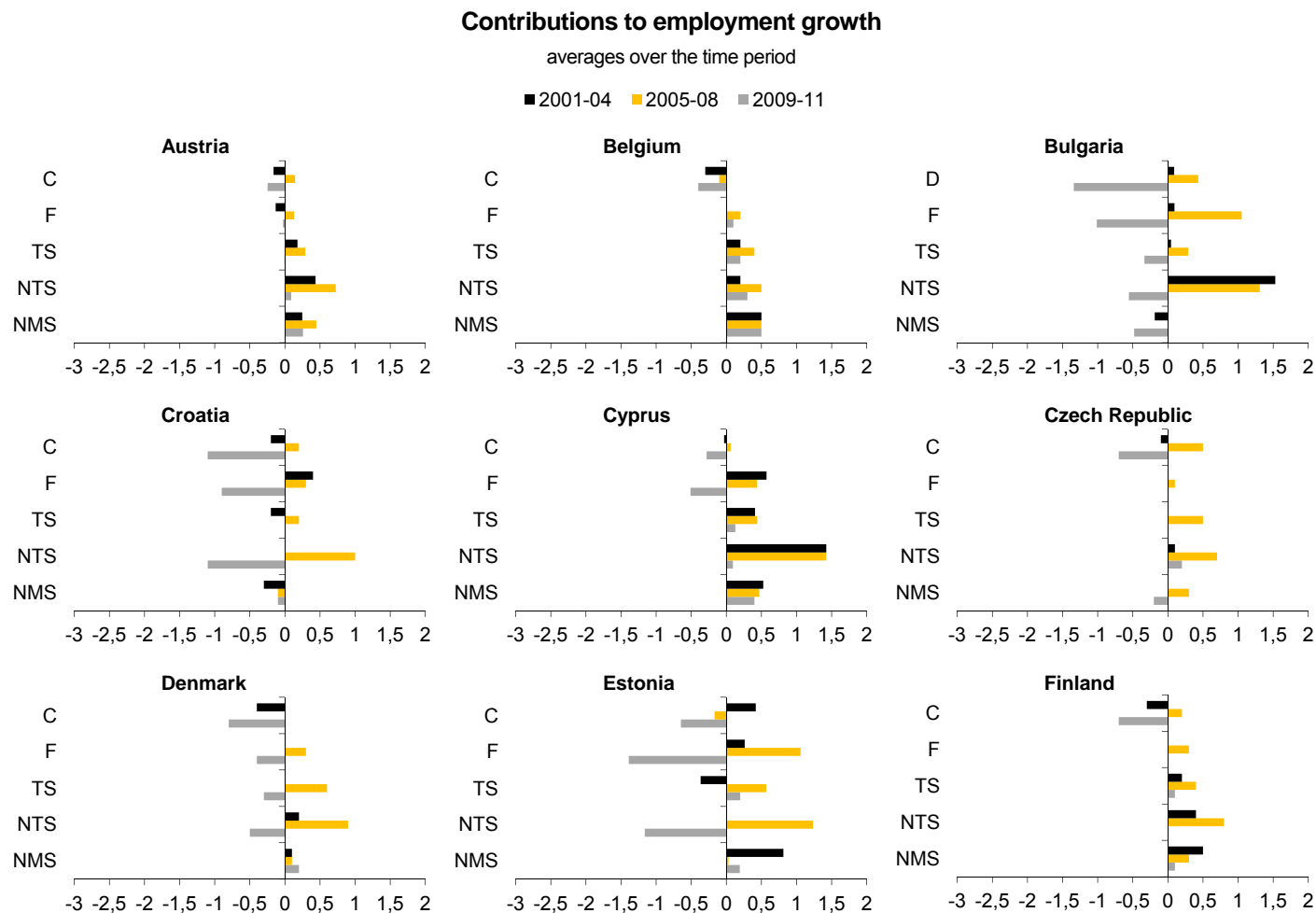


Based on NACE Rev. 1 classification scheme D (Manufacturing), F (Construction), TS (Tradable Services I,J), NTS (Non-tradable Services G,H,K,O,P), NMS (Non-market Services L,M,N). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices.

Serbia based on NACE Rev. 2 classification scheme: (C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices.

Source: wiw Database incorporating national and Eurostat statistics.

Figure A2a

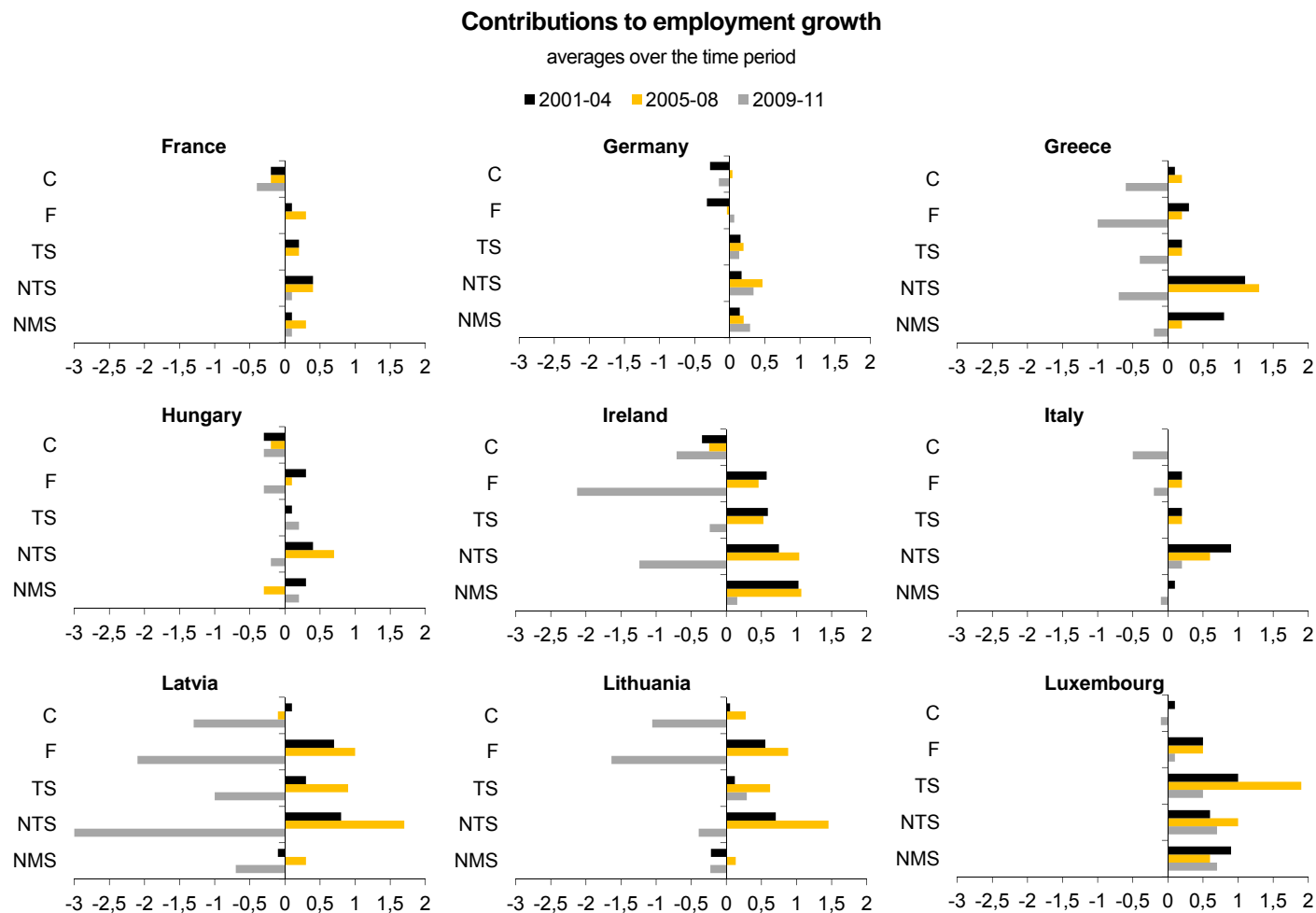


Bulgaria, Romania, United Kingdom, (LFS, 15+) Croatia, 2001-2008 based on NACE Rev. 1.: Portugal: 2009-10; Spain 2009-10, Poland 2005

Notes: Based on NACE Rev. 2 classification scheme: C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total employment by annual growth.

Source: wiiw Database incorporating national and Eurostat statistics

Figure A2b



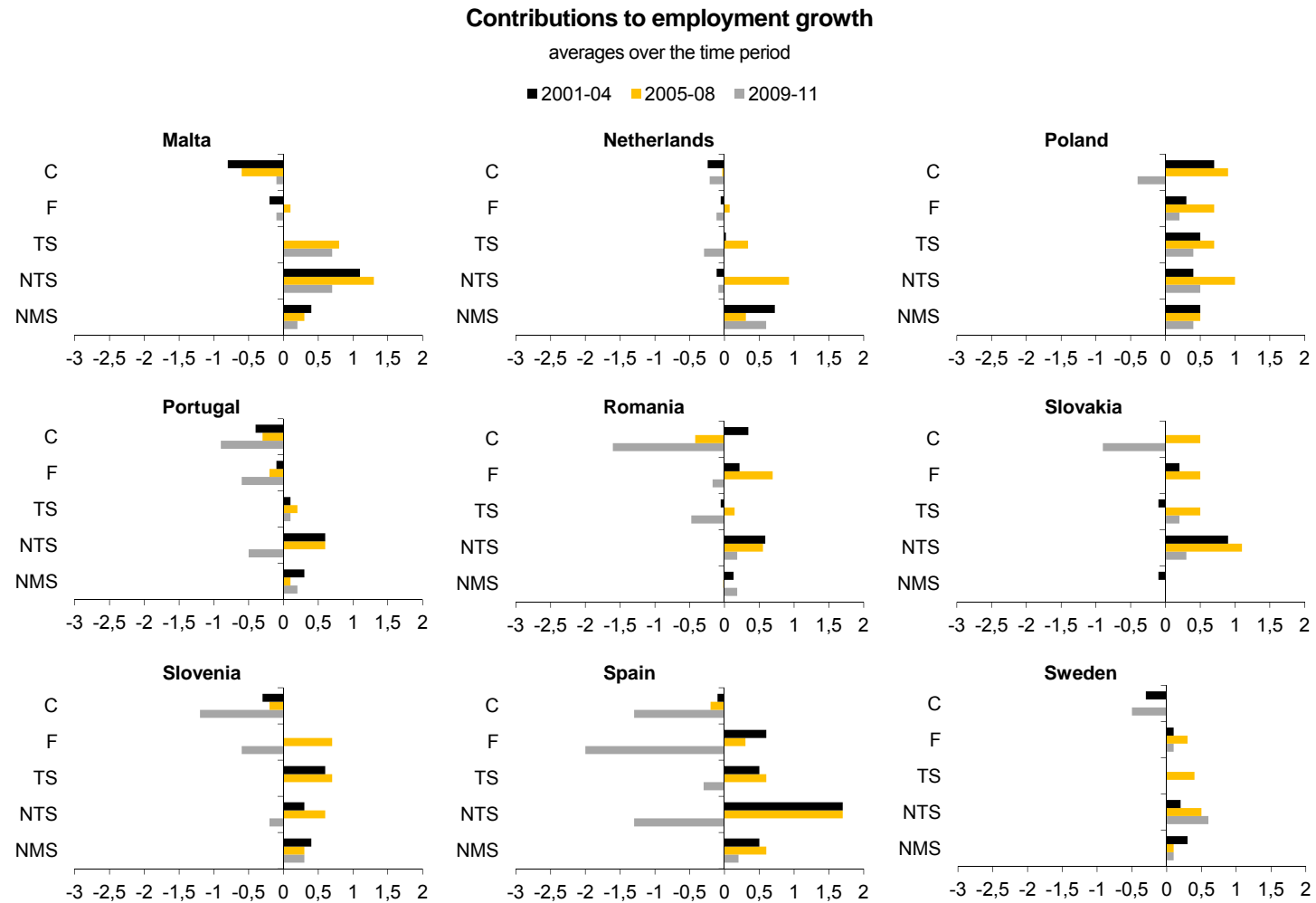
Bulgaria, Romania, United Kingdom, (LFS, 15+) Croatia, 2001-2008 based on NACE Rev. 1; Portugal: 2009-10; Spain 2009-10, Poland 2005

Notes: Based on NACE Rev. 2 classification scheme: C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total employment by annual growth.

Source: wiiw Database incorporating national and Eurostat statistics.

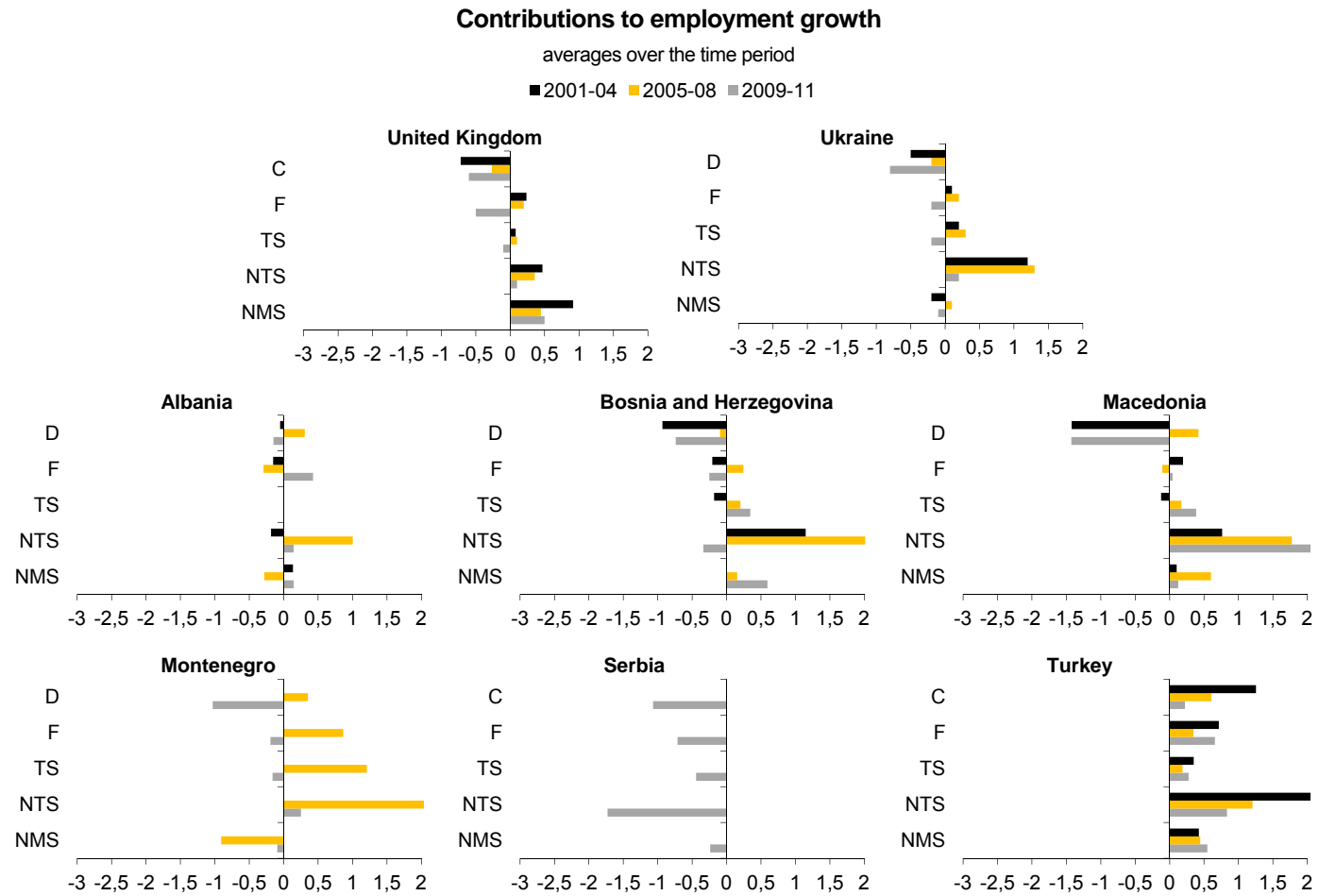


Figure A2c



Bulgaria, Romania, United Kingdom, (LFS, 15+) Croatia, 2001-2008 based on NACE Rev. 1; Portugal: 2009-10; Spain 2009-10, Poland 2005  
 Notes: Based on NACE Rev. 2 classification scheme: C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total employment by annual growth.  
 Source: wiiw Database incorporating national and Eurostat statistics.

Figure A2d



Albania, Bosnia and Herzegovina, Macedonia, Montenegro, Ukraine based on NACE Rev. 1 classification scheme: D (Manufacturing), F (Construction), TS (Tradable Services I,J), NTS (Non-tradable Services G,H,K,O,P), NMS (Non-market Services L,M,N). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices. United Kingdom (LFS, 15+), Serbia, Turkey based on NACE Ref. 2: (C (Manufacturing), F (Construction), TS (Tradable Services H,J,K,M), NTS (Non-tradable Services G,I,L,N,R,S,T), NMS (Non-market Services O,P,Q). Contributions are calculated by multiplying the share in total GDP at current prices by real growth at preceding year prices.

Source: wiiw Database incorporating national and Eurostat statistics.

Table A1

**Overview development of components of Unit Labour Costs, by time period and sector, average growth in %**

2005-2008

	Manufacturing				Construction				Tradable Services				Non-tradable Services				ER
	Emp	Out	Prod	Comp	Emp	Out	Prod	Comp	Emp	Out	Prod	Comp	Emp	Out	Prod	Comp	
CZ	1.8	13.8	11.8	5.5	1.4	1.7	0.3	5.5	3.1	6.0	2.9	5.5	2.7	4.4	1.6	4.2	-6.0
HU	-1.0	3.9	4.9	7.3	0.9	-3.0	-3.8	4.9	0.1	2.1	2.1	8.9	2.8	3.4	0.6	4.2	0.0
PL*	4.7	10.1	5.2	4.3	11.1	8.5	-2.3	3.1	5.8	7.8	1.9	4.1	4.5	4.0	-0.5	4.0	-6.1
SI	-0.8	4.8	5.7	6.3	8.6	10.0	1.2	6.4	4.3	7.5	3.0	6.2	2.4	4.1	1.7	6.7	0.1
SK	2.1	11.1	8.8	8.2	6.7	15.5	8.2	5.9	3.3	6.9	3.5	7.6	4.0	7.5	3.3	7.4	-6.0
BG*	1.9	6.2	4.2	10.3	19.3	13.7	-4.7	7.9	7.1	16.2	8.5	15.4	3.9	4.5	0.6	9.4	0.0
EE	-0.7	5.6	6.4	13.8	11.8	11.8	0.0	17.5	4.0	6.6	2.5	12.5	4.9	4.6	-0.2	12.0	0.0
LT	1.6	6.4	4.7	10.2	9.7	18.2	7.8	20.0	5.6	9.1	3.4	14.8	6.0	7.3	1.2	14.4	0.0
LV	-1.0	0.7	1.7	21.9	10.8	13.9	2.7	39.5	6.3	8.7	2.3	20.5	5.9	8.9	2.9	24.3	1.4
RO*	-2.0	5.0	7.1	25.5	11.5	23.4	10.7	17.8	2.4	6.9	4.4	20.1	2.9	11.0	7.9	21.1	-2.4
HR	1.2	3.5	2.3	6.0	3.4	7.0	3.5	6.1	1.9	5.8	3.8	5.8	3.6	4.8	1.1	6.0	-0.9
CY	0.6	-0.1	-0.8	4.3	4.3	6.0	1.6	2.8	2.8	7.3	4.4	4.0	3.6	4.4	0.7	0.3	0.1
ES	-1.5	-0.1	1.4	5.7	1.9	3.0	1.1	5.3	4.5	5.5	0.9	3.2	4.7	3.0	-1.6	3.4	0.0
EL	1.6	-2.0	-3.5	5.3	2.5	1.2	-1.3	0.9	1.7	5.9	4.1	3.2	3.6	2.0	-1.6	3.4	0.0
IE*	-1.8	3.6	5.5	6.2	3.8	2.4	-1.4	4.3	4.4	7.2	2.7	5.7	3.0	5.3	2.2	6.7	0.0
IT	0.0	1.1	1.1	3.1	2.3	0.7	-1.6	2.8	1.4	1.8	0.3	2.8	1.8	0.7	-1.1	2.1	0.0
PT	-2.0	0.3	2.4	4.0	-1.9	-2.1	-0.2	4.6	1.9	4.9	2.9	3.7	1.8	1.2	-0.6	3.6	0.0
AT	0.9	5.4	4.4	3.9	1.9	0.4	-1.5	1.7	1.8	3.9	2.1	3.4	2.3	2.9	0.6	2.9	0.0
DE	0.2	3.3	3.1	1.7	-0.6	-1.1	-0.5	0.9	1.2	3.0	1.8	1.3	1.4	2.6	1.1	0.8	0.0

(Table A1 ctd.)

Table A1 (ctd.)

	2009-2011																ER
	Manufacturing				Construction				Tradable Services				Non-tradable Services				
	Emp	Out	Prod	Comp	Emp	Out	Prod	Comp	Emp	Out	Prod	Comp	Emp	Out	Prod	Comp	
CZ	-2.7	1.0	3.8	1.8	-0.4	-0.5	-0.2	0.2	-0.1	-0.2	0.0	1.9	0.8	1.4	0.5	1.8	-0.5
HU	-1.4	-1.0	0.3	2.2	-4.5	-6.0	-1.6	2.5	1.1	-0.3	-1.3	-0.5	-0.7	-2.8	-2.2	0.7	3.6
PL*	-2.3	7.5	9.9	3.2	1.9	8.7	6.6	8.5	2.9	-0.3	-3.1	2.8	2.0	2.8	0.8	4.1	5.5
SI	-5.4	-2.8	2.8	3.9	-7.4	-14.4	-7.6	0.2	0.2	0.0	-0.2	1.2	-0.8	-1.8	-1.0	1.6	0.0
SK	-3.8	3.0	7.0	2.9	-0.4	-1.4	-1.0	2.5	1.2	-0.6	-1.8	1.7	1.2	2.0	0.8	2.1	-1.2
BG*	-5.8	-0.4	5.8	10.3	-12.0	-6.8	5.9	12.8	-1.6	3.2	4.8	7.2	-2.1	0.5	2.6	10.0	0.0
EE	-3.6	1.1	4.9	-0.2	-14.2	-8.9	6.3	2.7	0.9	0.4	-0.5	-1.7	-4.4	-4.3	0.1	0.3	0.0
LT	-6.5	0.4	7.4	-0.2	-17.4	-15.3	2.5	-2.1	1.9	-0.3	-2.2	-3.0	-1.5	-3.7	-2.2	-6.2	0.0
LV	-9.7	3.0	14.2	2.8	-22.7	-19.4	4.3	-0.4	-6.3	-3.0	3.5	1.8	-9.5	-4.6	5.4	-0.8	0.2
RO*	-5.4	2.7	8.7	2.0	-1.9	-5.0	-3.2	12.5	1.3	-2.7	-4.0	2.8	-1.5	-3.9	-2.4	7.8	4.8
HR	-6.0	-5.0	1.1	0.7	-10.6	-12.1	-1.7	-0.8	1.2	-0.8	-2.0	1.1	-5.5	-2.9	2.7	0.7	1.0
CY	-3.1	-3.5	-0.4	-1.0	-5.1	-12.5	-7.8	1.6	0.8	1.5	0.7	2.8	0.2	1.6	1.3	0.2	0.0
ES	-6.8	-2.4	4.7	1.4	-16.9	-9.4	9.0	5.9	-2.2	0.3	2.5	1.6	-2.0	0.1	2.2	1.6	0.0
EL	-6.0	-1.5	4.8	-0.7	-13.5	-28.5	-17.3	-5.6	-2.7	-9.5	-7.0	-2.8	-1.9	-2.5	-0.7	0.5	0.0
IE*	-6.1	7.7	14.7	-1.3	-23.1	-24.1	-1.2	-0.5	-2.5	-2.8	-0.3	0.7	-3.4	-4.8	-1.5	-2.3	0.0
IT	-2.7	-3.3	-0.6	0.9	-2.3	-4.8	-2.6	2.6	-0.2	0.3	0.5	0.4	0.5	-0.8	-1.3	1.4	0.0
PT	-5.4	-1.6	4.1	2.5	-6.3	-8.1	-1.9	1.4	0.8	0.1	-0.7	0.8	-1.6	1.5	3.1	2.0	0.0
AT	-1.6	0.4	2.0	2.3	-0.4	-3.0	-2.7	2.7	0.0	-0.1	-0.1	1.9	0.3	0.8	0.6	2.7	0.0
DE	-0.8	0.3	1.1	1.8	1.1	1.5	0.4	2.5	0.8	-0.1	-0.9	2.0	1.0	0.6	-0.4	1.5	0.0

*Abbreviations:* Emp: Employment; Out: GDP; Prod: Productivity; Comp: Compensation per employee (NC); Comp-EUR: Compensation per employee (EUR).

*Remark:* BG, HR, IE, PL and RO are not fully comparable with other countries due to different classification used.

*Source:* Eurostat, Statistical Office of Romania and wiiw own calculations.

Table A2

### Development of Unit Labour Costs, by time period and sector

average growth rates p.a. in %

	2001-2004					2005-2008					2009-2011				
	ULC-Total Economy and Sectors					ULC-Total Economy and Sectors					ULC-Total Economy and Sectors				
	ULC-T	ULC-M	ULC-C	ULC-TS	ULC-NTS	ULC-T	ULC-M	ULC-C	ULC-TS	ULC-NTS	ULC-T	ULC-M	ULC-C	ULC-TS	ULC-NTS
AT	0.5	0.0	-1.0	0.5	1.1	1.8	-0.5	3.3	1.3	2.2	1.9	0.3	5.5	2.0	2.1
BE	1.7	0.7	0.0	1.4	1.8	2.5	0.9	1.9	1.1	3.5	2.0	1.6	2.7	1.9	2.4
BG	3.3	-1.4	3.2	1.5	9.0	7.5	5.8	13.2	6.4	8.7	6.4	4.3	6.5	2.2	7.2
CY	4.2	4.5	2.0	2.7	4.8	1.2	5.0	1.1	-0.6	-0.5	2.9	-0.6	10.2	2.1	-1.1
CZ	7.2	4.7	6.3	8.4	8.4	7.8	0.3	11.9	9.0	9.1	1.6	-1.4	0.9	2.4	1.7
DE	0.4	-0.8	0.9	2.4	-0.7	-0.4	-1.4	1.4	-0.5	-0.3	1.9	0.7	2.1	2.9	1.9
DK	2.6	2.3	3.4	2.0	3.5	3.8	3.2	5.4	2.3	5.0	1.6	-1.1	1.2	0.4	-0.3
EE	4.6	4.0	10.3	2.5	6.2	11.1	7.0	17.5	9.7	12.3	-2.1	-4.9	-3.4	-1.3	0.2
EL	3.0	4.4	6.6	2.8	1.7	2.7	9.2	2.2	-0.9	5.1	1.4	-5.3	14.1	4.5	1.2
ES	2.9	2.0	4.2	3.0	3.2	4.1	4.2	4.2	2.3	5.1	-0.7	-3.2	-2.9	-0.9	-0.6
FI	1.3	-1.8	2.3	2.9	1.4	2.4	-1.7	7.6	3.9	1.9	2.9	4.0	-0.3	3.1	3.9
FR	2.1	0.3	3.9	1.7	3.2	2.1	1.1	4.7	1.6	2.0	2.0	0.6	5.4	1.9	1.8
HU	8.2	3.5	9.8	9.5	9.9	3.8	2.3	9.1	6.8	3.6	-2.3	-1.6	0.6	-2.6	-0.6
IE	3.9	-2.0	6.8	2.4	5.1	4.7	0.6	5.8	2.9	4.4	-4.5	-13.9	0.7	1.1	-0.9
IT	3.1	3.6	3.5	1.9	3.8	2.6	1.9	4.4	2.5	3.2	1.4	1.5	5.4	-0.1	2.7
LT	2.3	0.2	1.4	3.9	7.2	8.3	5.2	11.3	11.1	13.0	-2.9	-7.0	-4.5	-0.8	-4.1
LU	2.8	1.8	4.0	2.4	2.6	3.6	6.4	4.5	2.7	2.9	4.0	5.8	3.5	3.6	3.5
LV	-2.2	-5.6	0.2	-4.4	-1.4	18.3	18.2	33.9	16.2	19.2	-4.7	-10.1	-4.7	-1.7	-6.0
MT	2.6	.	.	.	.	1.8	.	.	.	.	2.5	.	.	.	.
NL	3.1	1.4	6.1	2.5	2.9	1.2	-0.2	0.8	0.8	1.1	1.9	-0.2	4.2	1.9	1.7
PL	-3.4	-8.8	-5.8	-6.7	-3.3	9.0	5.6	12.4	8.9	11.4	-3.8	-11.0	-3.5	0.6	-2.1
PT	3.0	1.2	5.8	-1.0	4.0	2.3	1.6	4.9	0.7	4.3	0.3	-1.5	3.4	1.5	-1.1
RO	-2.9	2.5	6.5	-1.7	0.2	18.8	20.0	9.0	17.8	14.9	-0.7	-10.5	10.9	2.2	5.4
SE	1.2	-2.6	2.9	1.3	1.5	1.7	0.1	6.1	0.6	1.6	0.5	-4.0	1.6	0.2	2.2
SI	1.9	-0.4	3.3	2.0	2.8	2.8	0.5	5.1	3.0	4.9	2.7	1.1	8.4	1.4	2.6
SK	5.0	-2.9	14.3	10.3	7.5	9.2	5.7	4.1	10.5	10.6	2.7	-2.6	4.9	4.8	2.6
UK	2.1	.	.	.	.	2.5	.	.	.	.	2.7	.	.	.	.
HR	1.4	2.7	2.8	-1.6	-0.9	3.9	4.6	3.5	2.8	5.8	0.0	-1.3	-0.1	2.1	-2.9

*Abbreviations:* ULT-T: ULC Total Economy; ULC-M: ULC-Manufacturing; ULC-C: ULC-Construction; ULC-TS: ULC-Tradable Services; ULC-NTS: ULC-Nontradable Services.

*Remark:* BG, HR, IE, PL and RO are not fully comparable with other countries due to different classification used.

*Source:* Eurostat, Statistical Office of Romania, wiiw Annual Database, wiiw own calculations.

## Appendix B

### Classification of Industries

#### N1 (NACE rev. 1)

A	Agriculture, hunting and forestry	
B	Fishing	
C	Mining and quarrying	
D	Manufacturing	
E	Electricity, gas and water supply	
F	Construction	
G	Wholesale, retail trade, repair motor veh.	NT
H	Hotels and restaurants	NT
I	Transport, storage and communications	T
J	Financial intermediation	T
K	Real estate, renting & business activities	NT
L	Public admin., defence, compuls.soc.sec.	NMS
M	Education	NMS
N	Health and social work	NMS
O	Oth. community, social & personal serv.	NT
P	Private households with employed pers.	NT
Q	Extra-territorial organisations and bodies	excluded

Note:

TS - Tradable Services	I+J
NTS - Non-tradable Services	G+H+K+O+P
NMS - Non-market Services	L+M+N

#### N2 (NACE rev. 2)

A	Agriculture, forestry and fishing	
B	Mining and quarrying	
C	Manufacturing	
D	Electricity, gas, steam and air cond.supply	
E	Water supply, sewerage, waste manag.,etc	
F	Construction	
G	Wholesale, retail trade, repair of motor veh.	NT
H	Transportation and storage	T
I	Accommodation and food service activities	NT
J	Information and communication	T
K	Financial and insurance activities	T
L	Real estate activities	NT
M	Professional, scientific and techn.activities	T
N	Administrative and support service activ.	NT
O	Public admin., defence, compuls.soc.sec.	NMS
P	Education	NMS
Q	Human health and social work activities	NMS
R	Arts, entertainment and recreation	NT
S	Other service activities	NT
T	Activ.of househ.as employers & for own use	NT
U	Activ.of extraterritorial organisat.& bodies	excluded

TS - Tradable Services	H+J+K+M
NTS - Non-tradable Services	G+I+L+N+R+S+T
NMS - Non-market Services	O+P+Q

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