Executive summary

1. Calculating equilibrium wages

A 'lack of international competitiveness' is often put forward as an explanation of the high current account deficits and rising private and public indebtedness that are at the root of the euro crisis. The southern euro-area member states are deemed to have overspent before the crisis and thus are now uncompetitive, while northern European countries have implemented structural reforms and restrained wage increases. Hence, large economic imbalances have accumulated and wages are a crucial variable for overcoming the economic crisis that has paralysed the European economy for over seven years.

Standard measures of competitiveness such as unit labour costs use indices that depend on the choice of base year. In addition, the focus on unit labour costs implies that non-price competitiveness factors are excluded from the analysis. As a consequence, they do not provide sufficiently useful information on the relative levels of competitiveness at a given moment in time nor do they explain the causes behind lack of competitiveness.

We develop the concept of nominal equilibrium wages, which avoids problems with the base year of price indices and provides useful information on the levels of the variable. We measure competitiveness as the deviation of actual wage costs from nominal equilibrium wage levels for countries and sectors. Equilibrium wages are not market clearing wages, but the wage levels at which all sectors in the euro area would be on a balanced growth path, defined by having the same return on the capital stock, so that all regions and sectors grow at a uniform rate. Wages higher

than equilibrium are 'overvalued' and cause competitive disadvantages; below equilibrium, they are competitive and accelerate growth. By including the return on capital in the analysis of competitiveness we also take into account some non-price competitiveness components, which are related to the amount of capital in the economy, as well as productivity.

The concept and analysis of equilibrium wages take into account both long-run supply side and short-run demand side conditions. Because wages are part of production costs, they must be related to broader productivity developments, technological progress (innovation, R&D) and the accumulation of capital, skills and knowledge. But demand side dynamics affect the rate of capital accumulation and economic growth. Reducing nominal wages through 'austerity' could improve competitiveness, but the resulting reduced output per unit of capital will lower productivity and therefore the equilibrium wage, which could translate into lower competitiveness. The alternative wage-led growth strategy would be counterproductive when wages are already above the equilibrium, although they may be appropriate when wages are significantly below equilibrium.

The famous *Rehn-Meidner rule*, whereby wages ought to increase by the rate of inflation plus labour productivity, ignores the impact of capital productivity on equilibrium wages. Balanced growth would require that nominal wages be equal to equilibrium wages and then vary with changes in national or sectoral equilibrium wages. Divergences may result from broad country-specific or sector-specific factors, such as infrastructure, R&D, skill building and so on, but they may also reflect different weights of economic sectors with diverse capital–output ratios.

The equilibrium wage will increase when labour and capital productivity rise. Higher productivity generates more output, which can be used to remunerate workers. If nominal wages do not increase in line with the higher efficiency of the aggregated capital stock, they will fall below the equilibrium wage level and the country's return on capital will rise above the euro average.

The long run supply-side conditions are related to capital productivity, the ratio of capital to labour and relative price effects. They depend on the international division of labour, skill distribution and biased technical change. In the European Union, an additional factor is the emergence of the central and eastern European countries as the main partner for the delocalisation of some stages of production.

We present empirical evidence for equilibrium and actual wage developments for country aggregates in section 1 and for economic sectors in section 2 (see also annexes). The main aggregate evidence indicates that in Germany, Spain and the United Kingdom, equilibrium wages have risen faster than actual wages, but in France and Italy the improvement of equilibrium wages has stagnated and nominal wages have outgrown them. Greece had moderately improved wage competitiveness before the crisis, but due to excessive austerity, equilibrium wages have fallen since then. In fact, for crisis countries, competitiveness levels do not seem to matter: Greece and Spain are always above the equilibrium wage, but Ireland and Cyprus are always below it. Portugal has improved its wage competitiveness since 2007, while

Italy has seen a persistent deterioration. Among the opt-out countries, Denmark has a stable negative wage gap, Sweden is too costly and the United Kingdom has gained cost advantages since the crisis.

Table 1 shows nominal amounts of actual and equilibrium wages and their gap. In 2015 the average monthly wage in the euro area was 3,250 euros (€); in Luxembourg it was €5,414, but the equilibrium level was €7,300. By contrast, in Lithuania actual wages were only €1,090 against the equilibrium wage of €1,803. German wages are in the middle with a gap of €146 below equilibrium, while Greek wages, at €1,884, are €512 above equilibrium.

In the transition economies of central and eastern Europe wages are highly undervalued. In Romania and Poland, nominal wages are more than a third below their equilibrium level; but even within the euro area, Lithuania, Slovakia and Latvia are more competitive. Polish wages could go up on average by €579 per month without pushing the return on capital below the euro area.

Wage gaps represent a competitive disequilibrium, which ought to be corrected over time. Unfortunately, the adjustment process is rather slow. Within the euro area, five countries, amounting to approximately 50 per cent of euro area GDP, are *above* equilibrium wage levels: Greece, Austria; Spain, Italy and France. Belgium, Finland and the Netherlands are *close* to equilibrium, Germany 4–5 per cent below. The other 10 member states – mainly in central and eastern Europe – all have massively *undervalued* wages, between 10 to 44 per cent. These wage gaps are important and they explain statistically the growth differentials between member states. Although we find that there is a tendency for the gaps to be corrected, the speed of adjustment is slow; on average less than 20 per cent of a given wage gap is corrected.

2. Sectoral equilibrium wages

In this section, we enter into the core of the report and show how the competitiveness of the different branches of the economy can be described and analysed by using our definition of competitiveness; namely, the gap between actual and equilibrium wages. We built a dataset including 14 EU member states, covered with sectoral breakdowns including 30 sectors (see Appendix Figure A4.1), with 13 manufacturing industries, 12 service activities, two primary sectors, construction and utilities (electricity, gas and water). The time span covers the period 1995–2012.

The sectoral composition of value added and the implied specialisation are important in explaining competitiveness patterns; in particular, the distinction between manufacturing and services is fundamental to understanding the aggregate dynamics. The manufacturing sector in Germany, Austria and in the eastern European member states (Slovenia and Slovakia) is important with a weight above 20 per cent of GDP in 2012, with some significant changes during the crisis (for example, in Finland). These countries form the main manufacturing production network of the European Union with strong vertical linkages. Due to the development of financial bubbles in the real estate market, the construction

industry had an exceptionally high share of GDP before the crisis, especially in Spain and Ireland. This dynamic halted and reverted after the global financial crisis. Figures 4–6 show that specialisation is quite varied between member states.

The ability to improve competitiveness by reducing the gaps between actual and equilibrium wages also depends crucially on labour market flexibility. One measure for estimating such flexibility is the wage spread between sectors. According to this measure, the northern Scandinavian countries have the most uniform wage levels across sectors, while the Anglo-Saxon leaning economies have the widest wage spreads. While this form of wage flexibility is uncorrelated with our wage gap *levels*, the more successful countries in coming out of the crisis, such as the United Kingdom, Denmark, Germany and the Netherlands, have *increased* their sectoral wage differentials, while the less successful countries (Spain, Belgium, France) have *reduced* these differences. In Germany sectoral wage variety increased with the Hartz reforms, suggesting an additional channel though which the country has improved its competitiveness with regard to the rest of Europe.

In the sectoral analysis the wage gaps are calculated in two different ways: first, by considering the average return on capital of the available EU countries; second, by considering the sector-specific return on capital for the average of EU countries. The former is our preferred measure as it includes also the effect of changes in the sectoral composition of output. The data are shown in Annex A. The overall picture is complex, highly diversified between sectors, countries and time periods. The dynamics of equilibrium wages seem to reflect in part sectoral specialisation, in particular for Germany, Italy and Spain, whereas for France such an association is not clear on a descriptive level.

While equilibrium wages were calculated by using average compensation per employee as a benchmark, we also calculated data based on hours worked. There are no significant differences between these two measures in manufacturing, although in services the match is less precise due to the higher importance of non-standard contractual forms of employment. This leads us to conclude that the analysis of labour remuneration per worker is not biased by neglected movements in the average number of hours worked per person employed. We therefore stick to the first measure as we have more complete data for this set.

Our theory in section 1 emphasised the importance of the relative efficiency of the capital stock, which depends on relative price effects and technical productivity. Figures 8–10 decompose these effects for major sectors of the member states divided into before and after the crisis. The sectoral dynamics provide interesting explanations for the competitiveness gains in terms of rising equilibrium wages in the manufacturing sector. In Germany, Austria and the Netherlands this effect was driven by capital accumulation, whereas in the two central and eastern European countries (the Czech Republic and Poland) catch-up output growth explains the result. Since the crisis, the overall change has been fairly low, with less significant sectoral differences. The service sector does not seem to be particularly affected by important changes in the relative ACE in either period, except in Italy and Poland.

The section concludes with an assessment of the performance of our measure of equilibrium wage and wage gap in explaining changes in the sectoral composition of value added. We find that while there is no large difference between our equilibrium wage and the wage gap – that is, the deviation from the equilibrium – both these indicators have better explanatory power and are, in general, more significant in explaining the recomposition of output across sectors. This confirms that wage gaps are a better measure of competitiveness than the traditional real exchange rate measures.

3. Determinants of competitiveness

In this section we provide empirical evidence, using econometric exercises, on the determinants of competitiveness at sectoral level. Because our theoretical definition of equilibrium wages (equation 9) links competitiveness to capital intensity, capital productivity and relative price effects, we inquire into the determinants of these factors. In a first step, we focus on the capital–labour ratio and use a production function approach to derive an empirical specification relating capital accumulation to the dynamics of relative factor prices and to factor biased technical change. The latter is a measure of how capital intensity has changed due to technological factors (the bias in technical change) and to exogenous movements in factor prices. In a second step, we use the measure of bias in technical change as a determinant of equilibrium wages, together with relative price effects. In both steps we introduce as additional explanatory variables two proxies for the globalisation process that have characterised both advanced and developing countries since the start of the 1990s: import outsourcing and export intensity. We test whether these factors explain the specific changes that have occurred in the different countries under our analysis. We find that in general

— a rise in equilibrium wages can be the consequence of actual wage increases, provided they are not inflationary and cause interest rate increases;
– a fall in the equilibrium wage may be caused by economic uncertainty and higher risk premiums in the interest rate;
– a rise in the equilibrium wage may be the consequence of capital-biased technological change;
– to the degree that outsourcing of low-skilled labour increases capital-biased technological change and the capital share (see below), outsourcing increases equilibrium wages and incentives for ‘keeping jobs at home’ may lower the equilibrium wage and competitiveness.

The importance of the bias in technical change is shown in Table 14. In Germany 75 per cent of all manufacturing sectors have shifted to more labour-saving technology, while in France only 25 per cent and in Spain even less. By contrast, in the service sector, the distribution is close to 50:50 in all countries.

Our estimates confirm recent findings in the literature on outsourcing lowering the K/L ratio, but they also indicate that the manufacturing and service sectors behave differently in all countries. We also find that the impact of inward outsourcing

– that is, of buying intermediary inputs abroad rather than producing them locally – is negative and significant in Germany and the Netherlands. While this effect would imply a reduction in equilibrium wages (see formula 9), the total effect of outsourcing on equilibrium wages depends nevertheless on its impact on capital productivity (see section 3.3).

We then check how the bias in technical change, relative price effects, inward outsourcing and export intensity affect competitiveness. The results are shown in Table 12 for manufacturing and in Table 13 for services, where a positive impact coefficient means a deterioration of competitiveness. The main results can be summarised as follow:

— in manufacturing, the common result is, not surprisingly, that above average inflation is bad for competitiveness. The only exception is Austria;
— the inward outsourcing variable is negative and significant in Germany, France and Austria, leading to higher competitiveness, whereas it is positive in Spain, causing competitiveness losses;
— the export intensity coefficient is positive and significant in all countries except Spain (where it is negative), while it is insignificant in Belgium and Finland;
— the bias in technical change has a differentiated effect: in Germany, Spain, Austria and the Netherlands, it is positive, lowering competitiveness; in Italy, Finland and France the coefficient is negative, increasing competitiveness;
— in the service sector (Table 13) the evidence is much weaker and we do not find significant associations between variables, mainly because of the heterogeneity of service activities and the lower effect of the two globalisation variables.

Our results indicate that the bias in technical change, outsourcing and export intensity exerts a strong impact on wage competitiveness and that these effects are concentrated in the manufacturing sector. We also find an interesting explanation for the German case:

— the outsourcing process has improved the country's competitiveness because the negative effect on capital intensity is more than compensated by the positive effect on capital productivity;
— on the other hand, the increased export intensity has lowered competitiveness because it has reduced both capital intensity and capital productivity.
— the actual changes in these two variables suggest that the net effect is positive, meaning an improvement in competitiveness.

4. Policy-relevant conclusions

Our measure for equilibrium wages and competitiveness defines conditions under which wage increases are compatible with competitiveness.

With regard to balanced growth in the European Union, it might be justifiable to accept competitive wage *undervaluations* in catch-up regions with low per capita income, but this cannot be a sustainable strategy for more advanced countries. In

fact, it would be reasonable to have wage levels slightly above equilibrium in rich countries and below it in poor countries.

Left to market forces – that is, relying on Philips-curve dynamics without deliberate wage policies – a correction of disequilibria is slow; a deliberate one-off wage increase would generate a significant demand boom in all member states. An increase of 20 per cent in all those countries in which actual wages are more than 20 per cent below equilibrium would yield a demand stimulus of 1.9 per cent for the EU (2.1 per cent for the euro area) in terms of GDP and 17.6 per cent in terms of intra-EU trade.

Trade unions seek higher wages for workers. Because the margins for wage increases depend on the development of equilibrium wages, capital productivity, technological change and the transformation of an economy's supply side, the process of wage bargaining must include these factors.

Consequently, wage setting rules become more complex than the *Rehn-Meidner* rule, whereby nominal wages ought to increase at the rate that is the sum of labour productivity growth and inflation.

In decentralised regimes, in which wage increases reflect marginal labour productivity, the gap between actual and equilibrium wages can be expected to be minimal. By contrast, with centralised wage setting, where actual wage levels reflect *average* productivity levels – for example, in Scandinavia (see Table 5) – highly productive sectors will gain competitiveness at the margin, therefore attracting investment, which might further improve productivity. By contrast, decentralised wage bargaining, as in Anglo-Saxon countries, can sustain competitiveness by wage flexibility, but this will slow down productivity improvements and technological progress.

The average efficiency of capital, which is a crucial variable in explaining competitiveness, depends not only on technological factors, but also on the relative prices of capital inputs and output relative to the euro area. In order to minimise distortions, economic and monetary policy ought to focus not only on the stability of average consumer prices, but also on regional and sectoral GDP deflators and capital goods prices.

What matters most in the long run, however, is the development of capital productivity. The long-run factors determining sectoral and regional capital and labour productivity are complex and require further research. We found that

— equilibrium wages in euro-area member states depend crucially on changes in the capital–labour ratio, which is dependent on the importance of relative factor prices (the cost of labour relative to the cost of capital) and technical change biases;
— actual performance in different countries varies partly because different sectors respond differently to changes in technological change: while technological progress has a tendency to affect manufacturing and services in similar ways, outsourcing and exports do not have the same effect;

— wage bargaining in different sectors has to be careful to take into account the effects that technology and the related reorganisation of labour relations will have on the productivity of capital and labour.

This analysis is of great importance for designing a balanced growth strategy for Europe. There is no simple rule of thumb, although better knowledge would help in negotiating wage deals that generate sustainable wage increases. When nominal wage setting affects productivity and production functions, wage restraint can be as detrimental as wage exuberance. A sustainable approach would require a coherent economic policy approach that removes inhibitions to technological progress and focuses on supporting the growth of productivity in labour and capital.

The European Commission has suggested that national governments set up **'National Competitiveness Boards'.** However, uncoordinated national boards will not take into account relative competitive positions, which depend on the average performance of the euro area. It would be a better idea to set up a **European Competitiveness Board**, possibly in the European Economic and Social Committee (EESC), where the national social partners are already represented.