The OECD Regional Outlook 2016 (OECD, 2016) highlights the growing regional divide in terms of labour productivity within countries. While the difference in productivity across OECD declined over the 1995-2013 period, the difference of productivity within countries did not. In the analysis, strong tradable sectors emerge as a critical driver for regions that defy the trend and "catch up" to their country's most productive regions. Tradable sectors are those that must compete in global markets and therefore tend to be among the most innovative and dynamic sectors. Their growth is also not limited by the size of their local market, which can also decouple the sectors performance from that of other regions in the country.

1. This strength of tradable sectors has a flipside: tradable sectors are directly exposed to international shocks and strongly affected by the overall competitiveness of a country. This can be a particular challenge for regions that are highly dependent on production in "mature" sectors, i.e. those where production is very standardised and technological replication is relatively easy, e.g. textile manufacturing. Cost competitiveness is often essential for such sectors and the regions where they are located to thrive. Without innovation and the introduction of new products or processes, firms need to rely on keeping unit costs in line with international competitors to remain profitable. Among the different factors that affect production costs, a main focus in the public debate is often on the cost of labour and either centres on workers basic salaries or employers' additional social contributions. But of course, many other factors contribute to the cost of producing a firm's goods or services, .e.g. purchasing of and maintenance cost for machinery, rent for office space, electricity and other utility costs, interest rates at which the firm can borrow, cost of imported intermediate products, etc.

2. A measure that captures the development of personnel costs in relation to productivity is "unit labour costs". It is calculated as the ratio between personnel costs per employee and labour productivity (i.e. real output per worker). Unit labour costs increase if the compensation of employees rises faster than their productivity and decrease if productivity gains outpace compensation. Unit labour costs are often considered in conjunction with exchange rates to translate "nominal exchange rates", i.e. how much currency is exchanged, into "real exchange rates" that indicate how much can actually be bought with the exchanged currency. Unit labour costs are used as one measure to capture cross-country cost differences. Price or cost changes are particularly relevant when countries are part of a fixed exchange rate regime, such as the member countries of the Eurozone. With flexible exchange rates, price changes can be compensated by changes in exchange rates, for countries in a fixed exchange rate regime they instead directly translate into changes in the real effective exchange rate, typically with a country's main partners.

3. In the run-up of the 2007-08 crisis unit labour costs in European countries that were hit the hardest by the crisis rose steadily and in many cases rapidly. While some growth in unit labour costs is natural and driven by inflation, excessive growth is an important warning sign for accruing imbalances. Annual increases in worker remuneration compensate for inflation. For real increases in workers' wages, i.e. wage growth in excess of inflation, to be sustainable, productivity growth is required. But in many countries personnel costs appear disconnected from productivity growth and inflation. For example, the 3-year growth in unit labour costs in Greece, Spain or Romania exceeded the 9% threshold (12% for non-Eurozone countries) set by the European Macroeconomic Imbalance Procedure (MIP) Scoreboard in each year between 2003 and 2007. This rapid growth in unit labour costs put them at the centre of many public debates on the drivers of the crisis and the resilience of affected countries.

4. This paper contributes to the discussion by developing indicators for unit labour costs and its components (personnel costs and real labour productivity) for 199 European NUTS 2 regions. The regional unit labour costs are then further disaggregated into unit labour costs in tradable and non-tradable sectors, as well as for a breakdown into up to 10 individual sectors. The analysis in this paper considers both the European-wide trends in unit labour costs, but focuses in particular on the developments in countries with low-income (50% below the EU average per capita GDP in 2013) and low-growth (less than 90% of average EU per capita GDP and less than EU-average per capita GDP growth between 2000 and 2013)

regions. Both the regional and the sectoral distinctions are crucial in understanding the drivers of growth in national unit labour costs and help in understanding factors that are holding back growth in low-income and low-growth regions.

5. The distinction between tradable and non-tradable sectors turns out to be essential in understanding the drivers of increases in unit labour costs and the challenge of regions in supporting tradable activities. The first result from this distinction is that for southern European countries it was the unit labour costs in non-tradable sectors that drove aggregate unit labour costs. In these countries unit labour costs tend to be highest in non-tradable sectors and faster growing than in tradable sectors.

6. The second result arises from separately considering the two constituent elements of unit labour costs: personnel costs and labour productivity. Whereas productivity in tradable sectors in southern and eastern Europe has been growing, at least until the 2007-08 crisis, productivity in non-tradable sectors is almost stagnant, if not declining. These patterns should be reflected in personnel costs, but this is not the case. Rather than depict an alignment with productivity in the regions' sectors, a spatial alignment of personnel cost arises. In eastern European countries, personnel cost in low-income regions is aligned between tradable and non-tradable activities. In southern Europe the alignment of personnel costs in non-tradable sectors is not limited within borders of the group of low-growth or other regions. Alignment rather appears to arise between the personnel costs in the regions with the most productive and fastest growing tradable sectors and non-tradable sectors in other regions.

7. Over the period 2000-13, growth in regions' income and export per capita is indeed negatively associated with increases in unit labour costs. An increase in a region's unit labour costs of 1 percentage point is on average associated with a 0.3 percentage point reduction in gross value added per capita growth. In other words, the "cost" in terms of economic output is 30% of the increase in unit labour costs. For exports that transmission is even stronger, a 1 percentage point increase in unit labour costs is associated with a nearly a 0.4 percentage point reduction in regional exports per capita. If the increase is driven by unit labour costs in the tradable sector, the impact on growth is even more pronounced, especially for regions with large shares of their workforce employed in manufacturing. The detrimental impact of increasing unit labour costs in tradable sectors is particularly pronounced before the 2007-08 crisis.

8. Market forces and policy contribute to the alignment of non-tradable and tradable personnel cost. The "invisible hand" of market forces aligns personnel costs through the labour market. In general, firms can choose the price for their goods and the wage they pay their employees. But prices in the tradable sector need to be aligned with international prices for the firm to be locally and globally competitive. This means that competition will result in wages for employees in tradable firms that reflect their productivity. Firms in non-tradable sectors are unconstraint by international or global prices since firms need to be locally present to provide services (goods are typically tradable). But if workers are capable of working in either tradable or non-tradable sectors, the non-tradable sector needs to match the wages paid in the tradable sectors, independent of a worker's productivity. To be able to align wages and productivity, prices of non-tradable services adapt. This stylised mechanism, known as the "Balassa-Samuelson effect" for the economists Paul Samuelson and Béla Balassa, who suggested the mechanism to explain the rise in prices of non-tradable services relative to prices of traded goods that accompanies increased economic development (Balassa, 1964, Samuelson, 1964).

9. The second mechanism is the aligning force of wage setting regimes across regions, especially in the public sector. Utilising a more stringent definition of "non-tradable" that is dominated by public and related sectors (public administration, defence, health care and social services) shows an even stronger alignment of personnel costs than in the main delineation used here and in the OECD Regional Outlook 2016 (OECD, 2016). This result points towards the importance of centralised wage setting and standardisation of wage regimes in aligning personnel costs.

10. The key challenge for policy arises from the disincentive to improve and invest in tradable sectors. The result can be a “lock in” of regions in a low-productivity equilibrium that can only be sustained through subsidies or the build-up of debt. Ultimately neither of those strategies will result in flourishing regions. Adjustments, especially ad-hoc adjustments, to counter a steady rise in unit labour costs are often socially and politically costly and can create significant short-term shocks for the economy. To avoid the need, strategies should focus on enhancing productivity in all types of sectors and encouraging investment in tradable sectors. This also requires strategies that support the upgrading of workers’ skills to ensure that they can adapt to the competitive pressures of the tradable sectors. It also requires that policies that set wages nationally need to be reassessed to ensure that tradable activities are not “priced out” in regions that are lagging behind their country’s best-performing regions.