Appendix II

How a divergence between labour productivity and wages influences unit labour costs and the labour income share

The widening gap between productivity gains and increases in real wages in many developed economies was highlighted by the *Global Wage Report 2010/11*. *Labour productivity* sets the output of a production process in relation to the input used to generate it – in this case, the labour input. It is commonly measured as either value added per employed person or per hour worked. The hour-based measure has the advantage that it is not influenced by changes in output that are due to variations in working hours. However, reliable information on hours worked is not always available, so value added per employed person is often the preferred measure (as, for example, is the case with the Millennium Development Goals Indicator "labour productivity"; see Luebker, 2011). Organizations such as the OECD therefore publish both indicators (see McKenzie and Brackfield, 2008). Labour productivity is always measured in real terms; hence the measure for value added needs to be expressed in constant currency prices (i.e. adjusted for inflation, using the double-deflation method where both inputs and outputs are valued in constant prices). However, since the implicit GDP deflator might diverge from the consumer prices index (which is used to deflate wages) it can sometimes be useful to compare nominal value added and nominal wages.

The two concepts "wages" and "compensation of employees" are closely related. The term "wages", as used in the *Global Wage Report*, refers to total gross remuneration, including regular bonuses, received by employees during a specified period of time for both time worked and time not worked, such as paid annual leave and paid sick leave. Essentially, it corresponds to the concept of "total cash remuneration", which is the major component of income related to paid employment. It excludes employers' social security contributions. This is the major difference from "compensation of employees" as found in the UN System of National Accounts (2008). This is made up of two components, namely "wages and salaries" (which corresponds to the concept of wages in the *Global Wage Report*) and "employers' social contributions" to pension and other social security schemes. The labour income share (LS) relates compensation of employees (CoE) to total value added (GDP). The unadjusted measure is obtained by dividing total compensation by total value added, either at national or at sectoral level:

$$LS = \frac{CoE}{GDP} \quad (1)$$

Alternatively, one can calculate the labour income share as compensation per worker over value added per worker:

$$LS = \frac{CoE \,/\, worker}{GDP \,/\, worker} \tag{1'}$$

Readers will recognize that the denominator – GDP per worker – corresponds to labour productivity as defined above. However, the numerator does not entirely match the concept of average wages as it is used in the *Global Wage Report*. First, CoE (unlike wages) also includes employers' social contributions. Secondly, "average wages" refers only to employees (and not to all workers, a term that also includes self-employed persons). Equation (1′) above can be rewritten so that it relates average wages directly to labour productivity:

$$LS = \frac{\alpha}{\beta} \times \frac{wage \,/\, employee}{LP} \tag{1"}$$

where α stands for CoE / wages and β for workers / employees. A common procedure (used also in Part II of the *Global Wage Report*) is to adjust the labour share for the share of employees in total employment. The adjusted labour share (LS′) can then be written as:

$$LS' = \alpha \times \frac{wage \,/\, employee}{LP} \tag{1'''}$$

Fortunately for analysts, the coefficient α is remarkably stable over time. This holds even for a country like Germany, which over the past 35 years has gone though substantial structural change, a reunification, and reforms designed to reduce employers' social contributions. Nonetheless, the coefficient of CoE over wages and salaries remained in a narrow range between 1.21 and 1.24 from 1976 to 2011 (see Federal Statistical Office, 2012, table 1.8). This means that changes in the labour share can be attributed almost entirely to changes in the relationship between average wages and labour productivity. The labour share is therefore a convenient statistic to track the disconnection between these two variables that has occurred in many countries over the past decade.

The labour share is closely linked to unit labour costs (ULC). These are commonly defined as the average cost of labour per unit of output. Although they are frequently used as an indicator for the competitiveness of an economy, the OECD cautions that "ULCs should not be interpreted as a comprehensive measure of competitiveness, but as a reflection of cost competitiveness".[48]

Unit labour costs are usually expressed in nominal terms by relating nominal labour costs to real value added:

$$nULC = \frac{nCoE}{rGDP} \tag{2}$$

where *n* and *r* denote nominal and real values, respectively. Real GDP is obtained by deflating nominal GDP by a price index *P*. An alternative way to calculate nominal unit labour costs is therefore to use the price index *P* alongside the nominal values for CoE and GDP:

$$nULC = \frac{nCoE}{nGDP} * P \tag{2'}$$

As can be seen from these two equations, nominal ULC can increase because nominal compensation of employees grows faster than nominal GDP, or because prices increase. Countries with high inflation will therefore usually see a faster increase in nominal unit labour costs than those with low inflation. This makes it difficult to compare nominal unit labour costs across countries that use different currencies.

The alternative is to calculate real unit labour costs, which sets the real (i.e. inflation-adjusted) cost of labour in relation to real output. In other words, both CoE and GDP need to be deflated with a price index *P*:

$$rULC = \frac{nCoE * 1/P}{nGDP * 1/P} = \frac{nCoE}{nGDP} \tag{3}$$

Since the price indices cancel each other out, real unit labour costs are therefore usually calculated on the basis of nominal values (OECD, 2008). This also avoids the spurious results that that can arise when the consumer price index (CPI) is used to deflate labour cost, but the producer price index (PPI) for GDP (see Fleck, Glaser and Sprague, 2011). For presentational purposes, unit labour costs are often expressed as an index that takes the value of 100 in a base year (e.g. 2005).

As it turns out, equation 3 for real unit labour costs is exactly the same as equation (1) for the labour income share. This is no coincidence, and in fact the terms "labour income share" and "real unit labour costs" are often used as synonyms (see McKenzie and Brackfield, 2008). What this implies is that policies to reduce real unit labour costs will in effect delink wages from productivity and reduce the labour income share (thereby increasing the capital income share).

Nominal unit labour costs can of course also fall as a result of a decline in the price index *P*. However, few policy-makers will aim for outright deflation – a phenomenon that made the Great Depression of the 1930s much worse and increases the real value of existing debts. When prices continue to rise, reducing nominal unit labour costs will therefore require an even sharper decline in the wage share than merely reducing real unit labour costs.

While a reduction in labour costs appears popular among some economic commentators, it is much less clear whether the implications for the functional income distribution have been thought though – and it remains unclear why increasing profits at the expense of wages should be good economic policy (the question addressed in Part II of the *Global Wage Report*).