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Wages and Ireland's International Competitiveness

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WAGES AND IRELAND'S INTERNATIONAL COMPETITIVENESS

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ABSTRACT

At the beginning of the crisis in 2008 it was a widely reported view that Ireland had become uncompetitive, leading to calls for wage cuts. Since then wage rates in the private sector have been largely stable. However, Ireland has shown a strong improvement in exports despite a difficult international trading situation. This presents a puzzle. If wages in Ireland were uncompetitive, how could Ireland improve its export position so rapidly, without a general fall in wages?

Ireland can best be described as having moved from a position of 'super-competitiveness' to 'competitiveness'. During the construction boom, exports remained an important driver of growth. Increases in nominal unit labour costs were driven by a general increase in inflation, rather than the labour market. Since 2008, the fall in nominal unit labour costs is almost entirely due to a move away from the labour intensive construction sector. However, while labour costs have been stagnant in Ireland, they have increased amongst our trading partners.

WAGES AND IRELAND'S INTERNATIONAL COMPETITIVENESS

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EXECUTIVE SUMMARY

At the beginning of the crisis in 2008 it was a widely reported view that Ireland had become uncompetitive. Due to a domestic building boom Ireland had lost international competitiveness and, as devaluing our currency was not an option, it was necessary to cut wages in order to restore competitiveness. Since then wages in the private sector have been largely stable. However, Ireland has shown a strong improvement in exports and its current account quickly moved into surplus, despite a difficult international trading situation. This presents a puzzle. If wages in Ireland were uncompetitive, how could Ireland improve its export position so rapidly, without a general fall in wages?

As a result of perceived imbalances in the Euro Area, a set of indicators was devised as part of the European Commission's 'Macroeconomic Imbalances Procedure'. The indicator of relevance to wage competitiveness is nominal unit labour costs. Though Irish wage competitiveness did decline, this must be seen in view of a starting point that has been described as 'super-competitive'. It was not until 2006 that Irish nominal unit labour costs (which take account of changes in labour productivity) exceeded those of Germany a pattern that had reversed by 2010. Though real wage increases exceeded productivity increases by about 0.4 per cent a year in the period 2000 to 2008, a far larger determinant of the increase in nominal unit labour costs was a general increase in inflation. Therefore, the increase in nominal unit labour costs is explained more as a monetary phenomenon than a labour market phenomenon. During this period productivity increased in all sectors apart from construction. This can be explained by diminishing returns to scale affecting an overheated construction sector.

Between 2008 and 2012 nominal unit labour costs declined by between 11.7 per cent and 15.1 per cent, depending on the method of measurement. However, over 90 per cent of this decline is due to a shift in the economy away from relatively labour intensive sectors such as construction. Despite calls for an internal devaluation, Irish wages only showed significant falls in the public sector. However, during this period labour costs (as distinct from unit labour costs) in the Eurozone increased by 8.1 per cent, representing relatively lower labour costs for Ireland. Productivity growth has increased in the industrial sector, but it is unclear to what extent this represents a shift within industry toward the relatively more productive pharmaceutical sector.

Overall Ireland can best be described as moving from a situation of super-competitiveness to competitiveness. During the years 2003 to 2007, exports remained a significant driver of growth, adding approximately 2.9 per cent per year. Any decreases in Irish labour costs relative to those of others are due to increases in other countries, rather than decreases in Ireland.

1. INTRODUCTION

At the beginning of the crisis in 2008 it was a widely reported view that Ireland had become uncompetitive. Due to a domestic building boom Ireland had lost international competitiveness and, as devaluing our currency was not an option, it was necessary to cut wages in order to restore competitiveness. Since then wages in the private sector have been largely stable. However, Ireland has shown a strong improvement in exports and its current account quickly moved into surplus, despite a difficult international trading situation. This presents a puzzle. If wages in Ireland were uncompetitive, how could Ireland improve its export position so rapidly, without a general fall in wages? This paper asks, to what extent has wages affected international competitiveness?

Promotion of an 'internal devaluation', whereby Ireland simulates currency devaluation by cutting prices and wages, no longer occupies a prominent place in the public discourse. Previously international institutions called for wage cuts. In 2010 an IMF staff position note (Allard & Everaert, 2010) called for a review of "the level of minimum wage to make it consistent with the general fall in wages". The European Commission and Ireland's "Memorandum of Understanding" of December 2010 included provisions to "Reduce by €1.00 per hour the nominal level of the current national minimum wage" and to "Enlarge the scope of the "inability to pay clause" permitting firms to invoke this clause more than once;" and also to "prevent distortions of wage conditions across sectors associated with the presence of sectoral minimum wages in addition to the national minimum wage" (Commission, 2010). Also, it was called for that "Although price competitiveness has improved, a sustainable economic growth path from 2011 onwards requires further relative price and wage adjustment" (European Commission, 2011). Such as narrative informed the creation of the European Commission's 'six-pack' rules and Macroeconomic Imbalances Procedure which monitors developments in indicators such as the current account and nominal unit labour costs.

However, average hourly wages have remained stable. It is possible for average wages to remain stable, while people have their pay cut. This can occur if lower paid workers lose their jobs, which would serve to increase the *average* wage, by changing the composition of the workforce. Jobs were more likely to be lost in smaller, and Irish owned firms (Lawless, 2012). Such firms tend to pay lower wages. Bergin, Kelly, and McGuinness (2012) looked at data from 2006 to 2009 and found that wages increased marginally, with gross hourly earnings increasing 7.4 per cent, with only a tiny part of this due to changes in the composition of the workforce. Looking at 2009 to 2011, Walsh (2012) found that some firms reduced their wage bill by means of redundancies, or a shorter working week. Only about 30 per cent reduced average hourly earnings. This was offset by a larger number of firms that increased wages, leading to an overall increase in wages when the composition of the workforce is controlled for. In the Eurozone from 2008 to 2012 labour costs did increase by 8.1% in the economy, compared to -0.1% in Ireland, representing a relative decrease in Irish labour costs. It is a stylised fact that nominal wages do not tend to fall, with employers fearing a demoralising effect on workers (Keeney & Lawless, 2010). Though workers are also likely to be demoralised if they are fired, this will be external to the firm.

It is true that from 2004 to 2008 Ireland had a current account deficit, reaching a trough of -5.6% of GDP in 2008. However, by 2010 this was closed, and by 2012 a surplus of 4.4% was achieved. Though there has been some discussion to the extent to which the current account has been boosted by foreign firms reclassifying their home location as Ireland (FitzGerald, 2013a), it

is generally agreed that Ireland has genuinely rebalanced its current account. If Ireland was indeed uncompetitive, such a turnaround of 10% of GDP within five years is quite remarkable given that wages were stable.

However, such a narrative relies on the assumption that Ireland became uncompetitive, and was reliant upon a domestic boom. Part of the common narrative of Ireland's 'Celtic Tiger' period is that an export led boom gave way to a domestic led boom from approximately 2002 onwards. However new data (from the OECD/WTO TiVA database) suggests that the importance of exports from 2002 onwards has perhaps been understated. Focusing on trade in value added (as opposed to total exports or net exports) Figure 1 shows that even during the construction boom exports continued to be an important driver of economic growth.

Figure 1: Contribution of external and domestic demand to Ireland's GDP growth
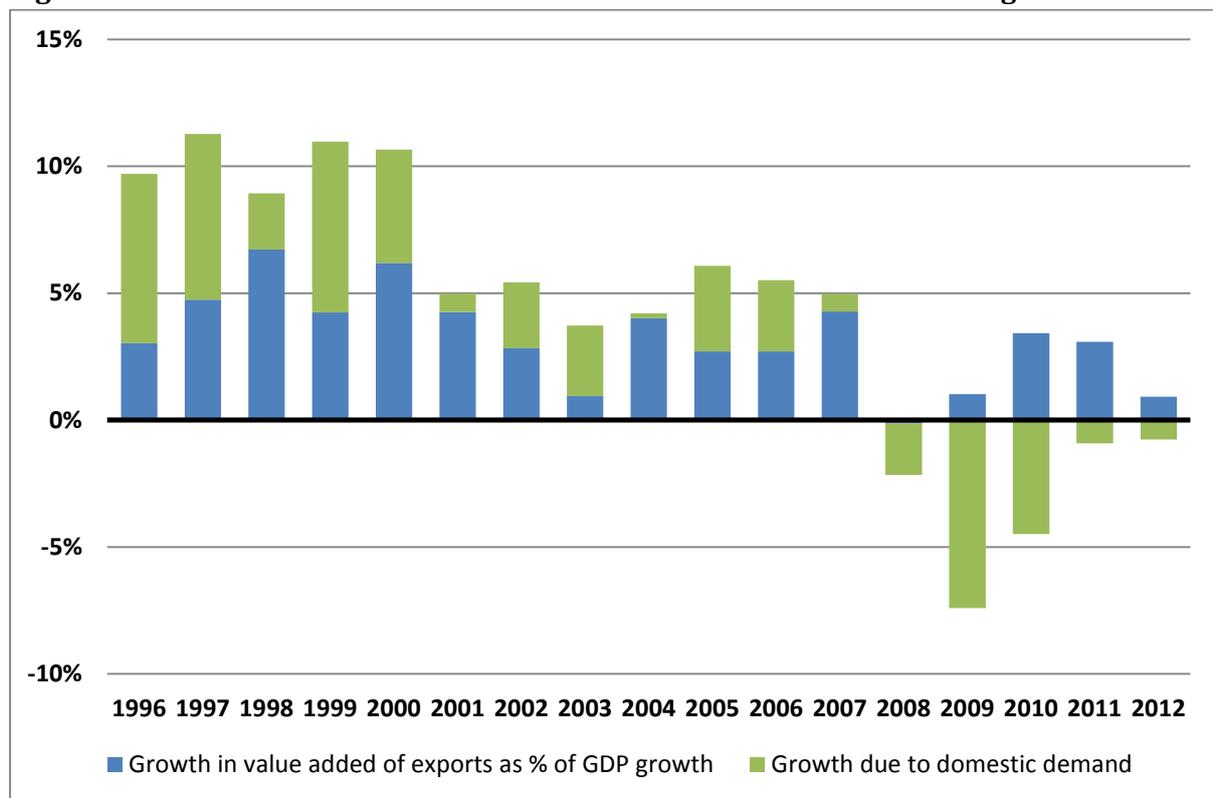
Source: TiVA database, CSO National Accounts, and author's calculations
Note: The TiVA database covers the years 1995, 2000, 2005, 2008, and 2009. For other years the total domestic value added share of gross exports (OECD code EXGRDVA_EX) has been inferred by linear interpolation.

This raises questions as to what extent competitiveness was actually lost. Did a change in Irish wages affect Irish competitiveness during the boom period, and if so do they explain Ireland's improved export position? This will be examined by focusing on the most policy relevant measure of wage competitiveness, nominal unit labour costs.

The paper is presented as follows. Section 2 gives an overview of various measures of competitiveness and the relevance of unit labour costs; Section 3 decomposes trends in unit labour costs and explains what has been driving changes in unit labour costs; Section 4 concludes.

2. MEASURES OF COMPETITIVENESS

International competitiveness is not a clearly defined concept. A discussion of some of the issues are given by Neary (2006) and O'Brien (2010). The World Economic Forum produces estimates of international competitiveness based on 12 'pillars' (and over 100 sub-indices). Most of these are qualitative measures and not direct measures of price or costs.

Nevertheless price or cost competitiveness is relevant. For countries (such as the UK) with a free floating currency cost competitiveness can be quickly achieved by devaluing the currency. However this option is not available to countries in the Eurozone, and so has led to interest in measuring 'macroeconomic imbalances'. The European Union's Macroeconomic Imbalances Procedure (MIP) forms part of the "Six-Pack" which entered into force in December 2011. The European Commission can issue fines when countries are not compliant (European Union, 2011)[1]. A total of eleven indicators are included in the MIP scorecard. Those related to external balances and international competitiveness are (Eurostat, 2012)[2]:

- External imbalances
    1. Current account balance
    2. Net International Investment Position
- Competitiveness
    3. Real Effective Exchange Rates (with harmonized index of consumer prices deflators)
    4. Export Market Shares
    5. Nominal Unit Labour Costs

The MIP scorecard measures of most interest when examining cost competitiveness are real effective exchange rates and nominal unit labour costs. The current account (indicator 1) and export market shares (indicator 4) can be viewed as the outcome of whether or not a country is competitive (whether it produces enough to pay for what its imports), and an aim of increasing competitiveness is to improve these measures. Also, if a country increases its imports the current account can worsen, without necessarily affecting competitiveness. A country may have a current account deficit due to the importation of machinery which ultimately improves a country's competitiveness. It is therefore more an outcome of competitiveness, rather than an indicator of whether a country is gaining competitiveness. Similarly, the change in share of world exports is more an outcome of a country's competitiveness rather than something that can be directly managed. A poor net international investment position (indicator 2) may not be due to a current lack of competitiveness, but due to excessive borrowing in the past (such as during the housing boom).

The real effective exchange rate (indicator 3) is something that can be directly influenced, to a certain extent, by domestic policy makers. It depends on the level of consumer prices in Ireland relative to our trading partners, and the exchange rate. When comparing the real effective exchange with a country that uses the same currency, one is simply comparing differences in prices (for example in 2012 according to Eurostat food in Ireland was 5.6% more expensive

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[1] At present the implementation of the Macroeconomic Imbalance Procedure has been suspended for Ireland (European Commission, 2013). The results for years up to 2011 can be found in European Commission (2012).

[2] The six measures of internal imbalances are House Prices, Private Sector Credit Flows, Private Sector Debt, General Government Debt, Unemployment rate, and Total Financial Sector Liabilities.

than in France). However, when making a comparison with a country that uses a different currency (e.g. the US uses the dollar, not the Euro) changes in the exchange rate must also be accounted for. For Eurozone members, exchange rate movements are beyond the control of national institutions. If a country such as Germany performs well this tends to lead to the value of the Euro increasing. This can lead to a country such as Ireland losing competitiveness, despite having no influence over Germany's performance. Also, when measuring competitiveness, it must be measured relative to another country. When measuring the real effective exchange rate, Ireland's performance relative to a weighted average of trading partners is measured.

2.1 Nominal unit labour costs

Although nominal unit labour costs (indicator 5) are just one measure of cost competitiveness (see O'Brien (2010) for a discussion of various different measures in an Irish context), of the measures monitored by the European Commission they are the most relative to wages. The European Commission aims that nominal unit labour costs do not increase by more than 9 percent over a three year period. Nominal unit labour costs are defined as nominal compensation per employee (that is, the average wage plus social security contributions per worker in cash terms), divided by real output per person in employment (that is, labour productivity). By allowing for productivity one can account for why workers in more developed countries earn higher wages, without losing competitiveness. Though it is the change in nominal unit labour costs that is usually analysed, looking at the absolute level of nominal unit labour costs can also be useful. The headline indicator included in the scorecard is simply the change in nominal unit labour costs over time. This is of limited usefulness as it takes no account of developments in other countries, but it is a measure that can be influenced by domestic policy makers.

As can be seen from Figure 2 there is a strong link between high nominal unit labour costs and economic development. This highlights the limitations in using nominal unit labour costs of the whole economy as an indicator of competitiveness. This is as non-traded services and services are included in the measure. It is well known that non-traded services (such as dentists or restaurants) tend to be cheaper in Eastern European countries than in Ireland and other Western European countries. This is as in richer countries the traded sector tends to have higher productivity than the traded sector of poorer countries. This higher productivity leads to higher wages in the traded sector of the rich country. Within the rich country, higher wages in the traded sector put upward pressure on wages in the non-traded sector. This leads to the rich country having higher wages in the non-traded sector than the poorer country does, even if productivity for both countries in the non-traded sector is equal. Therefore, nominal unit labour costs for the traded sector could be equal for both countries (with the higher wages in the rich country being offset by higher productivity), but nominal unit labour costs for the non-traded sector will be higher in the rich country. This will lead to higher *average* nominal unit labour costs in the rich country despite the rich country remaining competitive.

Figure 2: Nominal Unit Labour Costs, 2012
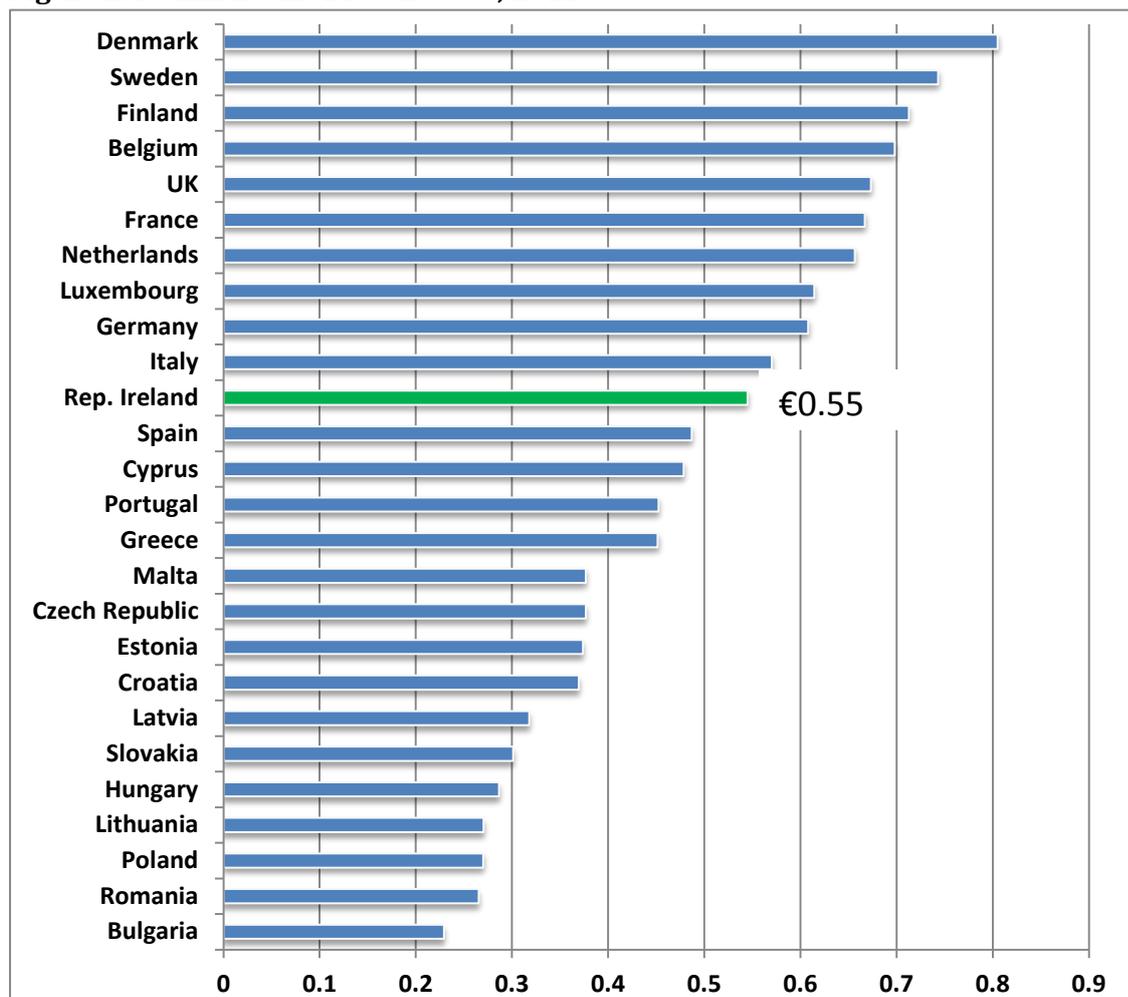
Notes: Price level indices are used as the GDP deflator. In 2012 it would be necessary to pay someone in Ireland €0.55 to produce €1 worth of average EU output.
Source: Eurostat national accounts, Eurostat price level indices for GDP, and own calculations

Of course, high costs in the non-traded sector (such as high legal fees) can affect the competitiveness of the traded sector, but this is due to a channel other than wages. It would be a more accurate measure of competitiveness if nominal unit labour costs could be measured for the traded sector alone (and perhaps the labour output for which the final use is in the internationally traded sector). This is not possible, and sometimes the manufacturing sector is used as a proxy, as most of the output of the manufacturing sector is traded. However, it is nominal unit labour costs for the whole economy that is monitored by the European Commission.

The scoreboard is complemented by other indicators such as changes in labour productivity and effective unit labour costs (explained below). The current account balance is the total amount a country as a whole saves or borrows (sometimes mistakenly referred to as the Balance of Payments); the net international investment position can be interpreted as the total amount owed by Ireland as a whole (public sector and private sector including private individuals) less assets; real effective exchange rates compare changes in the cost of living across countries, even for countries that use different currencies; export market shares is the share of foreign markets

for our exporters; and nominal unit labour costs show how much a worker must be paid to produce one unit of output.

Effective unit labour costs are included as an additional complimentary indicator to the MIP scorecard. These compare developments in Ireland's nominal unit labour costs with developments in other countries and also movements in currency exchange rates. While developments in Irish nominal unit labour costs can be influenced by policy makers in Ireland, Irish policymakers cannot influence changes in exchange rates or changes in unit labour costs in other countries. Between 2008 and 2012 changes with the US exchange rate made Irish goods 12.6% cheaper, but lost 1.8% more expensive for the UK (however this is offset by lower inflation in Ireland). At the same time UK nominal unit labour costs (as measured by the European Union) increased by 18.2% but fell by 14.2% in Ireland. So relative to the UK; Irish effective unit labour costs declined by 26.1% with currency changes playing a relatively minor role.

There are significant hurdles to the comparison of cross country prices and costs over time. There are various established ways of measuring changes in prices (such as the harmonised index of consumer prices) within countries over time. These typically include a "basket" of goods (or collection of occupation groups for labour costs) which is fixed from one period to the next. However, these do not account for the different compositions of "baskets" across countries. This means cross country comparisons are limited, and the interpretation of results can be heavily influenced by the choice of base year. For example, Ireland was described as unsustainably super-competitive in the year 2000 (O'Brien, 2010), so choosing the year 2000 as reference year will show Ireland's competitiveness to have declined (which is accurate) but ignore that this was a simple rebalancing. Similarly when comparing prices across countries (such as with purchasing power parities) a representative "basket" of goods is used across countries for a given point in time. However, the basket of goods used across countries may change over time, limiting comparisons across countries. As stated by Eurostat (2011) "The 'perfect', multi-purpose indicator that simultaneously captures both spatial and temporal aspects adequately simply does not exist."

In summary, though wages and unit labour costs are relevant to discussions of international competitiveness, they form just one element. As is generally agreed by economists working in the area, nominal unit labour costs should be evaluated in the context of other indicators.

3. DECOMPOSING TRENDS IN IRISH WAGE COMPETITIVENESS
In the early part of the 2000s the Irish economy has been described as unsustainably "super-competitive" (O'Brien, 2010), but according to Bergin et al. (2013) wages moved above their long-run equilibrium value from 2003. As can be seen in Figure 3, Irish labour costs (labour costs include wages, benefits in kind, and also employer social contributions) did rise when compared to other countries, however during the height of the boom, between 2004 and 2008, developments were broadly in line with Finland and the UK. Germany serves as an outlier, and all countries lost competitiveness relative to Germany.

Figure 3: Changes in Labour Cost Index 2000 to 2012
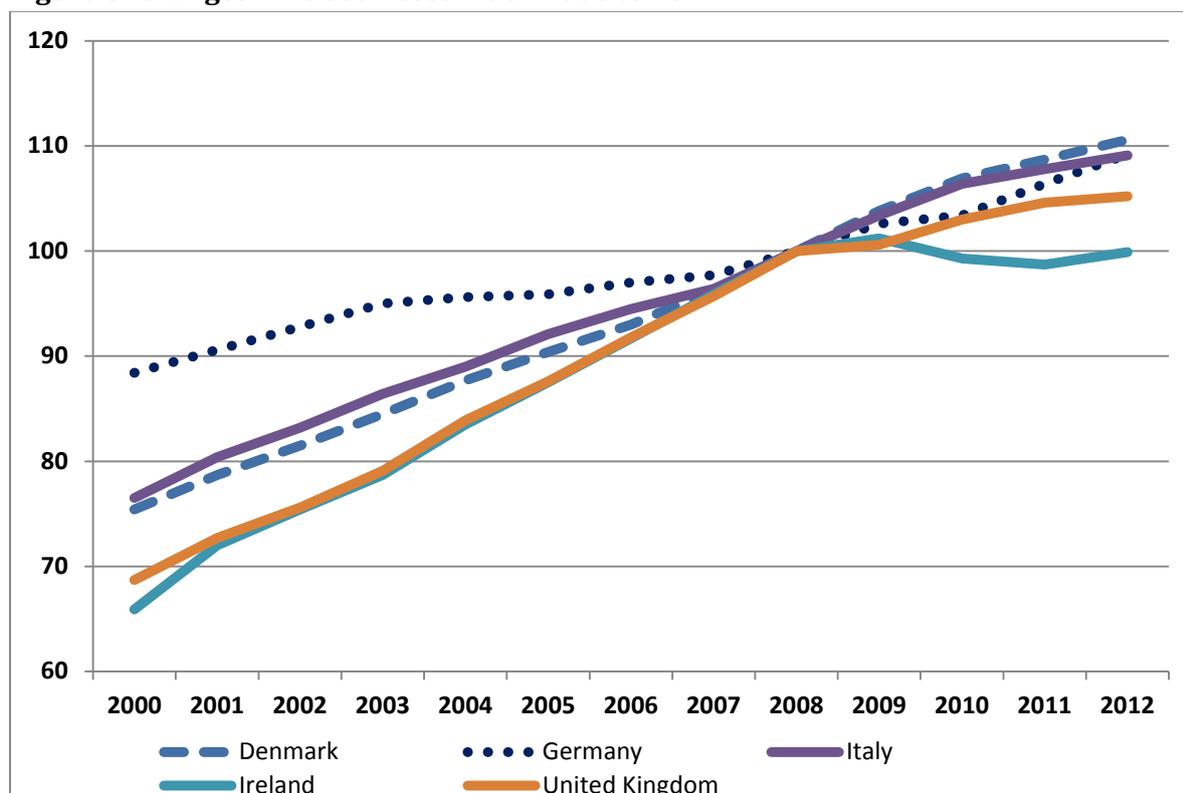
Note: Data refers to Industry, construction and services (except activities of households as employers and extra-territorial organisations and bodies). Indices are chain-linked Laspeyres indices, so help to account for changes in the composition of the workforce.

Base year 2008. As this is an index rather than absolute levels, the choice of base year can influence the perception gained by the graph. For example a base year of 2000 gives the impression of labour costs diverging, while a base year of 2012 gives the impression of convergence. The base year of 2008 was chosen by Eurostat.
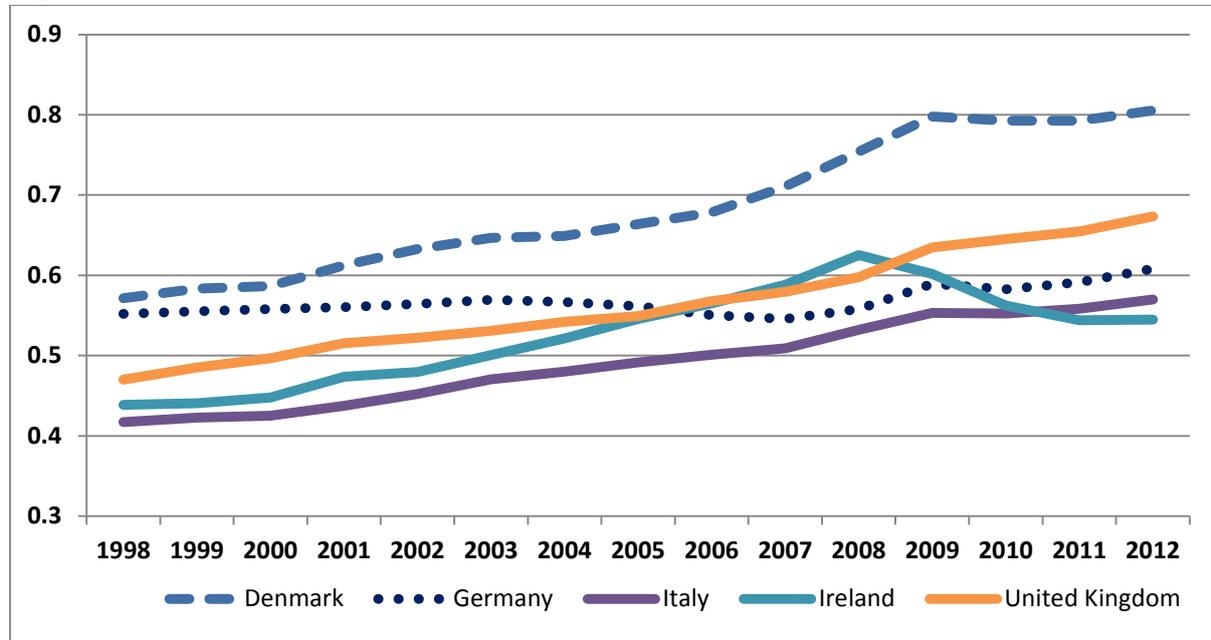
Source: Eurostat Labour cost index, nominal value - annual data (NACE R2) [lc_lci_r2_a]

A more dramatic story is told by Figure 4, which focuses on nominal unit labour costs[3]. As can be seen changes for Ireland have been dramatic. Part of the difference is that whereas the labour cost index takes account of changes in the labour force, the data for NULC does not. It has been suggested that changes in the composition of the economy following the end of the construction bubble (that is the loss of less productive construction and retail jobs) gives an exaggerated sense of the improvement in nominal unit labour costs. If so, changes in the composition of nominal unit labour costs is likely to also exaggerate the decline in nominal unit labour costs. Though there are issues with measuring price changes over time, Figure 4 gives an indication to the extent that Irish nominal unit labour costs were converging from a 'super-competitive' position. As can be seen, relative to Germany, Ireland converged and then exceeded

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[3] Cross country comparisons over time of nominal unit labour costs must be treated with some caution. Two options for price indexes (which are necessary to calculate productivity) are available. Data taken from Purchasing Power Parities allow comparisons across countries at one point in time. GDP deflators allow comparisons of a single country over time. These are distinct concepts. There is no ideal index available that allows reliable cross country comparisons over time.

Germany nominal unit labour costs. Part of this is due to Germany's policy of unusually low wage growth of the early 2000s. By 2012 Ireland's labour costs relative to Germany's had gone back to the position held in 2004. Data for the Eurozone as a whole is not available before 2008, but from 2008 to 2012 nominal unit labour costs for the Eurozone as a whole increased by 6.1%, indicating a relative improvement for Ireland.

Figure 4: Nominal unit labour cost index, rebased with 2012 absolute values

Note: The index is rebased to reflect the absolute values shown in Figure 2.
Source: Eurostat national accounts, Eurostat price level indices for GDP, and own calculations

3.1 Decomposing changes in nominal unit labour costs

Some sectors of the economy are more labour intensive than others, and so have higher nominal unit labour costs. For example the construction sector is more labour intensive than manufacturing. Even if nominal unit labour costs in each sector are constant, the *average* for the whole economy can change if the more labour intensive sectors of the economy contract. In a recent report Forfás (2013) stated "This means the composition mix is overstating our real productivity performance rather than any inherent structural improvements in labour costs." This issue is worthy of examination. If true, it also implies that any worsening of nominal unit labour costs can at least be partly attributed to changes in the composition of the economy.

When decomposing nominal unit labour costs it is important to recognise that there are several, complementary, approaches to measuring economic output and nominal unit labour costs. This is as Gross Domestic Product (economic output) can be measured in terms of the price at which goods are sold, called market prices; or in terms of the value added by producers, called factor cost. By adding taxes and subtracting subsidies from factor cost one arrives at the figure for market price. As output at the sectoral level is measured in terms of factor cost, it is necessary to decompose the figure for nominal unit labour costs in terms of factor cost. Also, there are issues with regard to the presence of a statistical discrepancy and the fact that the price deflator for the whole economy is not simply the sum of the price deflator for individual sectors. Also, given

the high level of self-employment in the agricultural sector, data for that sector should be treated with a degree of caution. Figure 5 shows that all three approaches result in the same pattern. Though Figure 5 shows the same pattern as Figure 4, the scale is different. This is as Figure 4 is an index (which only reflects changes over time). In contrast, Figure 4 shows how much a worker has to be paid to produce a unit of output that is worth €1 in 2011.

**Figure 5: Nominal unit labour costs using alternative measures of Gross Domestic Product**
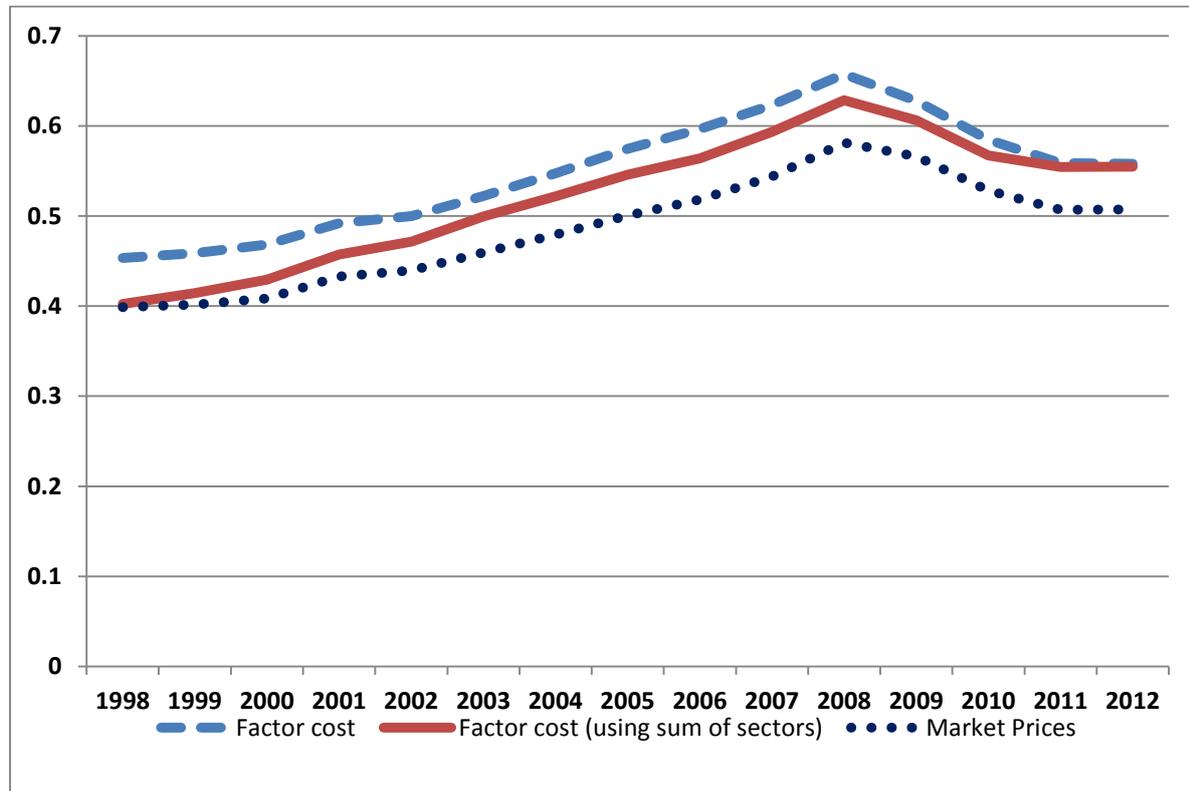
Note: Real values based on 2011 prices.
Source: Nominal remuneration and real GVA taken from CSO National Accounts (T02 and T04); Employment and Employee data taken from Eurostat National Accounts (nama_nace10_e); and authors own calculations

A less dramatic picture is seen by looking at changes in nominal unit labour costs across sectors. The economy is broken into four sectors 1) agriculture, forestry and fishing; 2) industry (excluding construction); 3) construction; and 4) services. Ideally a greater break down would be used, as there have been changes within sectors (particularly services) but such data is unavailable. As can be seen in Figure 6, when looking at individual sectors the dramatic increase followed by a dramatic decrease did not occur. NULC did increase in the construction sector and services sector until the years 2007 and 2008, before levelling off. Nominal unit labour costs has shown declines in the industrial sector since the crash, while trends in the agriculture have been erratic, which is to be expected given how agricultural output can be affected by bad weather. Nominal unit labour costs in the construction sector are abnormally high. This is as 2011 is used as the base year for calculating the price of output. In 2011 the price of construction output was abnormally low, meaning €1 would permit someone in 2011 to purchase an abnormally high amount of construction output. However the choice of base year has no impact on the trend of increases and decreases. Interestingly, industry, which is the most highly internationally

exposed of the sectors, had relatively minor changes in nominal unit labour costs up to 2008. Between 2008 and 2012 nominal unit labour costs in the industrial sector and services sector fell by 20.1% and 4.2% respectively, but increased in the agricultural sector and construction sector by 20.3% and 1.4% respectively.

Figure 6: Nominal Unit Labour Costs by sector
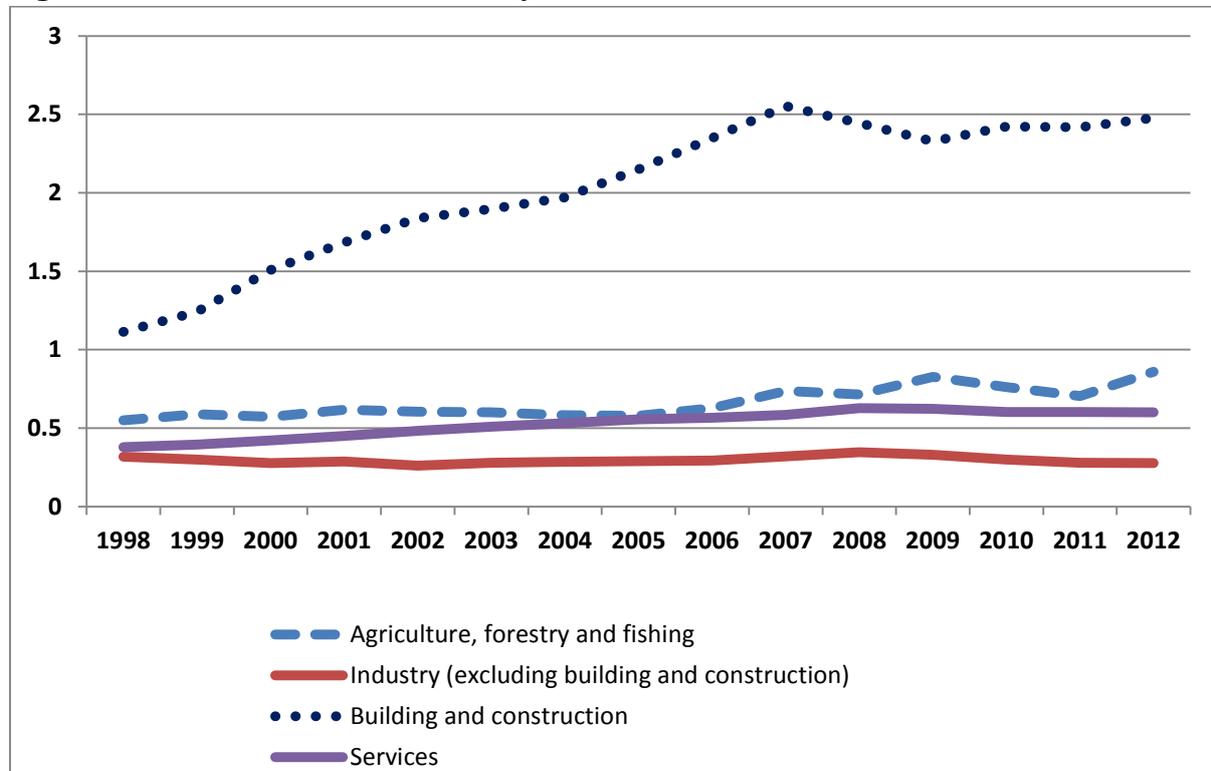
Note: The cost of hiring someone to produce one unit of output (that is valued at €1 in 2011).
Source: nominal remuneration (CSO N1202); Employees (Eurostat nama_nace10_e); real GVA by sector (CSO N1204); Employment (Eurostat nama_nace10_e), and authors calculations

As can be seen from Figure 5, from 2008 to 2012 nominal unit labour costs declined somewhere in the range 11.7% to 15.1% depending on the method of measurement. The total of nominal unit labour costs can be treated as the weighted average of the individual sectors. The weights account for the importance of a particular sector in contributing to nominal unit labour costs for a given year. The results are shown in Table 1. Using the weights of a given year it is possible to control for changes in the composition of the workforce. Using the weightings for 2008, nominal unit labour costs have only declined by 0.7%. Alternatively, keeping wages constant, but just altering the weights leads to a fall in nominal unit labour costs of 9.7%. Clearly the change in composition is the main cause for the improvement in nominal unit labour costs. Qualitatively similar results are gained by using 2012 as the reference year. Interestingly however the same is not true for the period leading up to the crash of 2008. Using 2008 weights, 2000 nominal unit labour costs were 32.5% below their 2008 level. Alternatively, using 2008 nominal unit labour costs levels, change in composition only has nominal unit labour costs 4.3% below the 2008 level.

Table 1: Decomposition of nominal unit labour costs, difference relative to peak of 2008

	2000	2004	2008	2012
Total change	-33.9%	-18.3%	0.0%	-16.4%
Total change (sum of sectors)	-38.1%	-18.6%	0.0%	-12.4%
Change holding sectoral composition constant	-32.5%	-19.4%	0.0%	-0.7%
Changing composition, fixed nominal unit labour costs	-4.3%	0.9%	0.0%	-9.7%

Note: Total change in nominal unit labour costs is based on factor cost. As the overall price index is not the sum of sectoral price indices, using the sum of sectors can give a different figure to using the headline figure. The fixed composition uses 2008 sectoral weights. As
Source: nominal remuneration (CSO N1202); Employees (Eurostat nama_nace10_e); real GVA by sector (CSO N1204); Employment (Eurostat nama_nace10_e), and authors calculations.

3.2   What drove the increase in nominal unit labour costs?

It is clear that, as in other countries, nominal unit labour costs did increase during the 2000s. Though nominal unit labour costs are used as a measure of labour market competitiveness, the driving force behind an increase in nominal unit labour costs may be from a source other than the labour market. Also, an increase in nominal unit labour costs does not necessarily mean that workers benefited from an increase in living standards. Nominal unit labour costs are calculated by the formula

$\frac{Nominal\ Compensation}{Number\ Employees} \div \frac{Real\ Output}{Employment}$ which is simply

$Average\ compensation\ per\ worker\ \div Productivity$

Therefore it is possible to decompose changes in nominal unit labour costs into changes in wages per worker and changes in productivity. An increase in compensation per worker will increase nominal unit labour costs, while an improvement in productivity will decrease nominal unit labour costs. Employment is simply the number of employees plus self-employed.

Table 2 shows the contribution to changes in nominal unit labour costs of nominal compensation versus productivity for 2000 to 2008 and 2008 to 2012. As an increase in productivity reduces nominal unit labour costs, productivity growth is presented with a minus sign.

Table 2: Percentage change in nominal unit labour costs caused by movements in compensation and productivity per worker

	2000 to 2008			2008 to 2012		
	Nominal Compensation	Productivity	Total	Nominal Compensation	Productivity	Total
Total economy	44.3	-10.4	33.9	-4.3	-12.1	-16.4
Agriculture, forestry and fishing	28.6	-6.4	22.2	26.3	-7.8	18.5
Industry (excluding construction	44.0	-21.7	22.2	0.1	-22.6	-22.5
Construction	39.8	8.4	48.2	0.2	1.2	1.3
Services	44.5	-4.6	39.9	-4.5	0.2	-4.3

Note: calculations based on log differences. An increase in productivity serves to reduce nominal unit labour costs. Therefore an increase in productivity has a minus sign in this table. Total based on factor costs. The total change in compensation does not account for the change in composition of the workforce.

As can be seen, between 2000 and 2008 there was a general increase in both nominal compensation per worker and productivity. Overall nominal pay increases outstripped productivity increases. In the industry sector, nominal compensation increased by 44 per cent (averaging 4.1 per cent annually) while productivity grew by 21.7 per cent (averaging 2.2 per cent annually). In the construction sector, productivity per worker decreased between 2000 and 2008. This is logical given the sector was overheating and diminishing returns to scale had set in. From 2008 to 2012 there has been a increase in productivity in the industrial sector of 22.6 per cent. Though this seems large, this is an annual average of 4.2 per cent. This represents an increase over the previous period, though it is not unprecedented. It is unclear to what extent this represents a genuine productivity increase or a change in composition within the industrial sector. The 2011 Census of Industrial Production showed that the share of industrial turnover in 2008 for the computer, electronic, and optical and electronic equipment sector was 19.6 per cent, and 30 per cent for the chemical and pharmaceutical sector. By 2011 the share of industrial turnover was 9.1 per cent and 39 per cent respectively. Other subsectors showed more modest changes in shares. Though turnover should not be confused with value added, this does indicate a shift in composition towards the relatively more productive chemical and pharmaceutical sector. Measuring value added in the pharmaceutical sector is always difficult, but is compounded by the recent 'patents cliff' (a discussion is given in FitzGerald (2013b) and Enright and Dalton (2013)), however the patent's cliff would tend to show a fall in productivity rather than exaggerate an increase. There were some small declines in productivity in the construction and services sector. However, as this is measured on a per worker basis rather than a per hour worked basis, and productivity per worker can decrease due to a decline in weekly hours worked, and the results are partially due to the choice of 2008 as a reference year (as the construction sector had already shown signs of slowdown by 2008, but employers were reluctant to fire construction workers in the initial stages of the slowdown due to recent staff shortages). Table 3 shows some complementary information.

Table 3: Change in nominal unit labour costs caused by movements in compensation and productivity per hour worked

	2000 to 2008			2008 to 2012		
	Nominal Compensation	Productivity	Total	Nominal Compensation	Productivity	Total
Total	48.7	15.1	33.5	-2.9	-14.2	-17.1
Agriculture, forestry and fishing	35.3	-10.2	25.1	29.3	-9.1	20.2
Industry (excluding construction	46.3	-23.9	22.4	1.3	-23.8	-22.5
Construction	45.8	2.6	48.4	6.6	-6.3	0.3
Services	48.1	-8.7	39.4	-3.9	-0.7	-4.5

Note: calculations based on log differences. Total values differ from those in Table 4 as hours worked of employees and the self-employed can evolve in a different manner. An increase in productivity serves to reduce nominal unit labour costs. Therefore an increase in productivity has a minus sign in this table. The total change in compensation does not account for the change in composition of the workforce.

Table 3 shows a broadly similar set of figures if compensation and productivity are measured on an hourly, rather than a per person basis. It should be noted however that hourly data is considered less reliable than data based on per worker basis. To the extent that the data is measured accurately, differences are due to changes in hours worked per worker. For example, Table 3 shows that hourly pay in the construction sector increased by 6.6% from 2008 to 2012, but pay per worker was largely stagnant. This would indicate a decrease in the average length of the working week in the construction sector. The only sector to show wage decreases from 2008 to 2012 is the service sector. This is in line with other research (Bergin et al., 2012; Walsh, 2012). Significant hourly pay reductions were largely limited to the public sector, which is predominantly made up of services.

3.3 Were nominal unit labour costs changes driven by the labour market?

However, the use of *nominal* compensation may distort what is actually pushing up nominal unit labour costs. If workers compensation increases in real terms at the same rate as productivity (which by definition is measured in real terms); then nominal unit labour costs will increase at the rate of inflation. Therefore increases in nominal unit labour costs can be due to monetary reasons rather than labour market reasons.

For example, in a period of inflation the real value of wages could potentially be eroded, while nominal unit labour costs increase. In such a case the driving force behind the increase in nominal unit labour costs could be due to an increase in non-wage costs, such as property prices, or a general increase in inflation. For this reason a measure that is sometimes examined is "real unit labour costs". Using the above, nominal unit labour costs (NULC) can be written as

$$NULC = \frac{Nominal\ Compensation}{Number\ Employees} \div \left(\frac{Nominal\ Output / Output\ Price\ deflator}{Employment} \right)$$

By deflating nominal compensation by a price index we can calculate the real value of workers compensation. The choice of price deflator is not clear cut. Typically wages are deflated by a consumer price index to arrive at the real value of wages. However, the standard way of calculating real unit labour costs is to use the output price deflator. Real unit labour costs (RULC) can be written as

$$RULC = \left(\frac{Nominal\ Compensation/Output\ Price\ deflator}{Number\ Employees}\right) \div \left(\frac{Nominal\ Output/Output\ Price\ deflator}{Employment}\right)$$

which can be further simplified as

$$RULC = \left(\frac{Nominal\ Compensation}{Number\ Employees}\right) \div \left(\frac{Nominal\ Output}{Employment}\right) = Labour\ share$$

Though this is the standard measure of real unit labour costs, this is not satisfactory as what is produced by workers need not necessarily match what is consumed. For example, Ireland produces far more pharmaceuticals that could be safely consumed by the population of Ireland, and imports many consumer items (such as citrus fruits). This issue is even starker when real unit labour costs are examined at a sectoral level. For example, during the 2000s the price of services output rose quicker than consumer prices. So for a given level of productivity nominal compensation could rise far quicker than consumer prices, but real unit labour costs would remain constant. This should not be taken as a normative point as it can be argued that it is only fair that workers gain from the increasing price of the fruits of their labour. Using the above formula real unit labour costs are identical to the wage share. Nominal unit labour costs can be decomposed as

$$NULC = Labour\ share \times Output\ price\ deflator$$

This is as real output is simply nominal output divided by a price deflator this can be rewritten as

$$\frac{Nominal\ Compensation}{Number\ Employees} \div \left(\frac{Nominal\ Output/Output\ Price\ deflator}{Employment}\right) or\ as$$

$$\left(\frac{Nominal\ Compensation}{Number\ Employees} \div \left(\frac{Nominal\ Output}{Employment}\right)\right) \times Output\ price\ deflator$$

which is simply the *Labour share × output price deflator*.

Table 4: Change in nominal unit labour costs caused by movements in wage share and price movements

	2000 to 2008			2008 to 2012		
	Wage share	Output Price movements	Total	Wage share	Output Price movements	Total
Total economy	13.3	20.6	33.9	-11.0	-5.4	-16.4
Agriculture, forestry and fishing	19.8	2.4	22.2	-6.1	24.6	18.5
Industry (excluding construction	10.0	12.3	22.2	-32.9	10.4	-22.5
Construction	28.7	19.5	48.2	76.0	-74.7	1.3
Services	8.3	31.6	39.9	-0.6	-3.7	-4.3

Source: nominal remuneration (CSO N1202); Employees (Eurostat nama_nace10_e); real GVA by sector (CSO N1204); Employment (Eurostat nama_nace10_e), nominal GVA by sector (CSO N1203) and authors calculations. Total based on factor cost.

Note: calculations based on log differences. Changes in wage share are relative percentage increases rather than absolute increases (e.g. a move from 50% to 55% is reported as the relative increase of 10% rather than the absolute difference of 5%)

Table 4 shows the contribution of the labour share and changes in output prices to changes in sectoral nominal unit labour costs. Overall, between 2000 and 2008 the majority of the deterioration in nominal unit labour costs was due to monetary reasons (a general increase in prices) rather than due to labour market reasons (which result in a higher wage share). In the agricultural sector there was a large increase in the wage share, but given the high level of self-employment in this sector this figure is unreliable. Of the other three sectors, only in construction was the majority of the increase in nominal unit labour costs due to an increase in the wage share. This is logical given the tight labour market in the construction sector. Given that the wage share did increase in all sectors, this suggests a relatively tight labour market, which one would expect. However, for the industry and services sectors the majority of the deterioration in nominal unit labour costs was due to changes in output prices. This shows that even with regard to nominal unit labour costs it was non-wage costs (such as rents and profits made by firms) that drove the loss in competitiveness, rather than the labour market for these sectors. A different trend is shown from 2008 to 2012. However the data for the construction sector should be treated with some caution. This is as the price of construction output has become unsustainably low, with many construction firms making financial losses during this period.

Table 5: Change in nominal unit labour costs caused by movements in real compensation, price movements and productivity

	2000 to 2008			2008 to 2012		
	Real Compensation	CPI	Productivity	Real Compensation	CPI	Productivity
Total economy	14.5	29.8	-10.4	-3.0	-1.3	-12.1
Agriculture, forestry and fishing	-1.3	29.8	-6.4	27.6	-1.3	-7.8
Industry (excluding construction	14.1	29.8	-21.7	1.4	-1.3	-22.6
Construction	9.9	29.8	+8.4	1.5	-1.3	1.2
Services	14.7	29.8	-4.6	-3.2	-1.3	0.2

Note: An increase in productivity serves to reduce nominal unit labour costs. Therefore an increase in productivity has a minus sign in this table.

Source: nominal remuneration (CSO N1202); Employees (Eurostat nama_nace10_e); real GVA by sector (CSO N1204); Employment (Eurostat nama_nace10_e), nominal GVA by sector (CSO N1203) and authors calculations.

A final decomposition is shown in Table 5. Though not the standard method of measuring 'real' unit labour costs, it is perhaps more intuitive as wages are normally deflated by the consumer price index rather than an output price index. As mentioned previously deflating nominal compensation by the output price in a particular sector is not particularly useful when one is interested in whether the living standards of workers increased. A far more useful index is the consumer price index (CPI) which is a standard measure of changes in the cost of living. Table 5 shows the change in nominal compensation per worker deflated by the consumer price index. Overall from 2000 to 2008 real compensation growth exceeded productivity growth by only 4.1 per cent (0.4 per cent annually), but the consumer price index increased 29.8 per cent, again showing that majority of the deterioration in nominal unit labour costs was due to monetary factors rather than the labour market. As can be seen for the service sector, from 2000 to 2008, real wage growth outpaced real productivity growth. Also, real compensation increased at a faster rate than the wage share. This is as output prices were rising faster in the services sector than consumer prices as a whole, and workers in the service sector were able to gain a share of these output price increases. Surprisingly real compensation for construction workers rose more slowly than their wage share. This is as construction output prices increased more slowly during the 2000 to 2008 period than average consumer prices, though again output prices for the construction sector must be treated with caution, and the results for the construction sector would be larger if the year 2006 (the peak for the construction sector) was chosen as the base year.

Table 6 takes the information in Table 5 and presents how much real compensation grew faster than productivity, and compares this to inflation. This allows a comparison to be made for how much a nominal unit labour costs increases were driven by a general increase in prices and how much by labour market pressures. It can be argued that a tight labour market drove inflation. However research by Bermingham, Coates, Larkin, O'Brien, and O'Reilly (2012) suggests this

was not the case during the boom. Also, intuitively given the small size of the Irish economy relative to the Eurozone a traditional explanation of "too much money chasing too few goods" seems more plausible. For all sectors, between 2000 and 2008 the general increase in prices explains most of the increase in nominal unit labour costs. In fact, in industry and agriculture compensation grew at a slower pace than productivity, so labour market pressures in these sectors served to lower nominal unit labour costs. Perhaps unsurprisingly, the sector where inflation had the smallest role (but this explains the majority of the increase) and the labour market the largest role is in the construction sector. This is intuitive given the labour shortages experienced in this sector during the construction boom.

Table 6: Contribution of a general increase in inflation to changes in nominal unit labour costs

	2000 to 2008			2008 to 2012		
	Real Compensation over Productivity	CPI	Contribution of inflation to change (%)	Real Compensation over Productivity	CPI	Contribution of inflation to change (%)
Total economy	4.1	29.8	87.9	-15.1	-1.3	7.9
Agriculture, forestry and fishing	-7.7	29.8	134.2	19.8	-1.3	-7.0
Industry (excluding construction	-7.6	29.8	134.2	-21.2	-1.3	5.8
Construction	18.3	29.8	61.8	2.7	-1.3	-100.0
Services	10.1	29.8	74.7	-3.0	-1.3	30.2

Source: nominal remuneration (CSO N1202); Employees (Eurostat nama_nace10_e); real GVA by sector (CSO N1204); Employment (Eurostat nama_nace10_e), nominal GVA by sector (CSO N1203) and authors calculations.

4. CONCLUSION

Ireland's competitiveness at the dawn of the century has been described as unsustainably super-competitive. It is true that Ireland's competitiveness has declined, but it would be inaccurate to describe Ireland as having become uncompetitive. During the peak of the construction boom a significant amount of GDP growth was due to exports. In fact, had the domestic economy remained largely stagnant GDP would have continued to grow at a respectable (and given today's conditions, rather envious) 2.9 per cent between 2003 and 2007. Also, the current account returned to balance far faster than if due to a fundamental restructuring of the export base of the economy. It would be more accurate to describe Ireland has having transitioned from a state of unsustainable super-competitiveness to a state of sustainable competitiveness; with an unsustainable credit boom also occurring in the meantime.

There is a strong consensus amongst economists that no single measure of competitiveness should be relied upon. However in the media debates regarding competitiveness usually degenerate into simplistic comparisons of nominal unit labour costs in one country versus another. As nominal unit labour costs are the only labour market element of the European Commission's Macroeconomic Imbalances Procedure they form the focus of this paper. As with

most other countries, nominal unit labour costs increased in the period up to 2008 and then along with the Baltic countries, Spain and Portugal, rapidly decreased. During this period labour costs did increase somewhat faster than most of the Eurozone, but at approximately the same rate as in the UK. However the main driver of this increase was a monetary phenomenon. Real wage increases exceeded productivity increases by only about 0.4 per cent per year, while inflation averaged closer to 3 per cent. Therefore the bulk in the deterioration of competitiveness (as measured by nominal unit labour costs) was due to a general increase in prices (most likely caused by excessive liquidity in the Irish banking sector at the time). The increase in inward investment is likely to have been spurred by falls in other costs (such as the cost of property) rather than relative changes in labour costs.

In Ireland labour costs have not declined since 2008 to any significant extent. However as they have increased in the Euro Area as a whole they now 8.2 per cent lower relative to the rest of the Euro Area than in 2008. In terms of exchange rates by 2012 Euro-Sterling exchange rates were back where they were in 2008, leading to no change in competitiveness with the UK due to exchange rate movements, but exchange rate movements did make the Eurozone as a whole (and therefore Ireland) more competitive relative to the dollar. The fall in nominal unit labour costs since 2008 (of 11.7 per cent to 15.1 per cent depending on method of measurement) has received much attention. However most of the decrease (over 90 per cent) is due to a change in the composition of the economy, with a shift away from the relatively labour intensive construction sector. Holding the composition of the economy constant, nominal unit labour costs only declined by about 0.7 per cent since 2008. There has been an increase in productivity within the industrial sector, but it is unclear to what extent this is due to a shift towards the more highly productive pharmaceutical sector, and to what extent it is a genuine increase in productivity.

The evidence from this paper shows a number of problems with using nominal unit labour costs as a measure of competitiveness. First it is a measure of developments within a country. However, as competitiveness is a relative concept, changes in nominal unit labour costs must be seen relative to developments in other countries. Though there is no perfect measure across countries and across time, an (admittedly imperfect) index could be created which aims to capture price developments in the traded sector across countries. Second, it is an aggregate measure of for the whole economy. Large changes can occur in the aggregate figure with no change at the sectoral level, if there is a shift in the composition of the economy. This could be overcome by the use of "chain-linking" as is done with the labour cost index (though currently the sectoral level data necessary for this is only available at a very broad level). Thirdly, again as it is a measure of the aggregate economy no focus is given to the traded sector. Though developments in the non-traded sector can possibly ultimately affect international competitiveness, these are best dealt with as internal imbalances. Finally, though uses of nominal unit labour costs are useful, they give no indication as to what is driving the change. It is sometimes misunderstood that changes in nominal unit labour costs are due to the labour market. However, as shown, factors other than the labour market contributed to the increase in nominal unit labour costs. Even where real compensation (as deflated by consumer prices) simply keeps pace with real productivity growth, nominal unit labour costs will still increase at the same rate as inflation. Such as scenario would be a monetary rather than a labour market phenomenon. Therefore, for a discussion on nominal unit labour costs to be useful it is necessary to examine what is driving these changes.

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