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DECOMPOSING THE PRODUCTIVITY-WAGE NEXUS IN SELECTED OECD COUNTRIES, 1986-2013

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Decomposing the Productivity-Wage Nexus in Selected OECD Countries, 1986-2013

Abstract

Standard economic theory predicts that in the long run, productivity growth ought to drive aggregate real wage growth. We consider this prediction in the case of 11 OECD countries, and find that the majority have experienced much slower median real wage growth than labour productivity growth over the 1986-2013 period. We decompose the gap between labour productivity growth and median real wage growth into four components: inequality, data source differences, differences between the prices of output and consumption, and changes to labour's share of income. The decompositions ultimately show that there is no common cause for the productivity-wage gap, though most countries did see inequality grow and labour's share of income fall to some degree over our period of study.

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Executive Summary

In the face of growing inequality in advanced economies, the OECD (2014) has made a significant effort to add to the literature on ensuring that the benefits of growth are shared throughout an economy. Its mission of understanding and advancing policies promoting inclusive growth has been well received, as policymakers look for ways to ensure that rising tides do indeed lift all boats. Governments are now beginning to take a serious look at how they can best ensure that subsets of society are not left behind by future economic growth. For example, the new Canadian government has installed a Cabinet Committee on Inclusive Growth, Opportunities and Innovation with the mandate to "[consider] strategies designed to promote inclusive economic growth, opportunity, employment and social security" in Canada.

Standard economic theory predicts that in the long run, productivity growth ought to drive real wage growth. Assuming labour's share of income is fixed over time and that the prices face by producers and consumers grow similarly, there ought to be a one-to-one relationship between labour productivity growth and real hourly wage growth. Despite strong labour productivity growth across the 11 OECD countries studied, the prevailing wage in many countries grew significantly slower than labour productivity – in part because one or neither of these two assumptions held.

Our paper decomposes this productivity-wage nexus into two underlying relationships: the link between average hourly real wage and median hourly real wage, and the link between productivity and average hourly real wage. The former relationship captures the distribution of gains from productivity growth among workers. In some countries, the income benefits of productivity growth have increasingly gone to high wage earners, while the prevailing wage (the median, or the "true" middle of the distribution) has grown much slower. Also included in this relationship are differences between our two data sources (national accounts and household surveys).

The latter relationship is a matter of changes to labour's share of income and differences between the prices faced by producers and consumers. For decades, economists relied on the stylized fact that labour's share of income was essentially fixed over time. This stylized fact simply does not hold for most of the OECD countries in this report, where labour's share of income has been slowly falling over the last 20 years. The deviations in the prices faced by consumers and producers are a non-issue in many countries, however a commodity price shock or quickly rising living costs do create a gap in several countries.

The report covers 11 OECD countries: Canada, Denmark, Finland, France, Germany, Ireland, the Netherlands, Norway, Spain, the United Kingdom, and the United

States. The period of study for individual countries varies depending on the availability of household surveys, but generally speaking we cover a period from the mid-1980s to 2010 or 2013.

Of all the countries studied, the gap between labour productivity growth and median hourly real wage growth was largest in the United States and smallest in Ireland. There are some very general trends in the effects of the two relationships and their two respective underlying components. Rising wage inequality and labour's falling share of income both increased the productivity-wage gap in most of the countries studied. Differences in prices faced by consumers and producers were inconsequential in most countries, with the notable exceptions of Germany, Norway, and the United States. There was no obvious trend in data source differences.

Ultimately, we find that since the mid-1980s labour productivity grew faster than median real wages in 8 of the 11 OECD countries studied. There were, however, considerable differences in just how much productivity growth exceeded median real wage growth. For example, Denmark, the United Kingdom, and the United States experienced relatively similar labour productivity growth (respectively 1.61 per cent per year, 1.65 per cent per year, and 1.63 per cent per year), but extremely different median hourly real wage growth (respectively 0.97 per cent per year, 1.26 per cent per year, and 0.15 per cent per year).

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Introduction

In the face of growing inequality in advanced economies, the OECD (2014) has initiated a significant research effort aimed at understanding and promoting inclusive growth. The aim is to advance policies to ensure that the benefits of growth are broadly shared. Across OECD countries, governments are searching for ways to ensure that subsets of society are not left behind by economic growth. For example, the new Canadian government has installed a Cabinet Committee on Inclusive Growth, Opportunities and Innovation with the mandate to "[consider] strategies designed to promote inclusive economic growth, opportunity, employment and social security" in Canada.

These efforts are timely because evidence on wage growth suggests that economic growth has not been broadly shared in recent decades. In eight of the eleven OECD countries examined in this report, median real wage growth since the mid-1980s has not kept pace with labour productivity growth. The size of the growth gap between labour productivity and median real wages differs across countries, but the qualitative pattern is consistent: workers are growing more productive, but those productivity gains are not being matched by growth in the typical worker's wage.

Economic history and economic theory suggest that labour productivity growth should generate rising living standards for workers over time, so the apparent disconnect between labour productivity growth and wage growth is puzzling. What factors account for it? In this report, we show that the gap between labour productivity growth and median hourly earnings growth can be decomposed into contributions from the following four sources:

1. rising earnings inequality;
2. changes in the importance of employer contributions to social insurance programs as a form of labour compensation;
3. rising relative prices for consumer goods; and
4. a decline in labour's share of aggregate income.

Each of these components has its own implications for the welfare of workers. To the extent that the productivity-earnings gap simply reflects a rising share of labour compensation being paid in the form of employer contributions to social insurance plans, for example, it is not obvious that workers are any worse off. On the other hand, rising

[1] This report was written by James Uguccioni, an economist at the Centre for the Study of Living Standards (CSLS) at the time of writing, and CSLS Executive Director Andrew Sharpe. It is based on a paper presented at the OECD's First Global Forum on Productivity held in Lisbon, Portugal July 7-8, 2016: Emails: james,uguccioni@mail.utotonto.ca; andrew.sharpe@csls.ca.

earnings inequality or a decline in labour's share of income might represent more serious obstacles to broad-based prosperity.

We perform the decomposition for 11 OECD countries: Canada, Denmark, France, Finland, Germany, Ireland, the Netherlands, Norway, Spain, the United Kingdom, and the United States. As noted before, we find that labour productivity growth outpaced median real wage growth in eight of the 11 countries. The decompositions show that the productivity-wage growth gap has no single common cause across the countries, but most countries did experience rising earnings inequality and a decline in labour's share of income over our period of study. The decompositions typically run from the mid to late 1980s through to 2010 or 2013, depending on the availability of household survey data for a given country.

In the rest of this section, we discuss related literature that provides context for our analysis. In Section II, we describe our framework for decomposing the gap between labour productivity growth and median real hourly wage growth into the four components listed above. In Section III, we present and discuss the results of the decomposition. Section IV discusses wage growth throughout the wage distribution in more detail. Section V contains a concluding discussion.

Literature Review

The failure of real wages to keep pace with labour productivity is not a new observation. Fisher and Hostland (2002) observe that labour productivity outstripped real wage growth in Canada from 1994 to 2001. Bartlett and Tapp (2012) found that labour productivity growth outpaced labour compensation growth from the mid-1990s through to 2012 in Canada. The gap, however, is not limited to Canada. The International Labour Organization (2015) observed that labour productivity growth exceeded real wage growth from 1999 to 2013 in developed countries across the board.

Decompositions allow analysts to identify the proximate sources of the gap between labour productivity growth and real wage growth. In a study of the American non-farm business sector from 1970 to 2006, Feldstein (2008) found that average real wage growth was indeed lower than labour productivity growth. The difference was a matter of prices. When he adjusted wages for inflation using the non-farm business sector output price index (rather than the consumer price index), he found that wages grew at approximately the same rate as labour productivity. For the 2000-2006 period in particular, Feldstein did find that wage growth underperformed labour productivity growth even when the same price index was used.

For research that relates the growth of wages and labour productivity, Feldstein stresses the importance of accounting for differences in price indexes and the importance of using total compensation (i.e. including supplementary labour income and fringe benefits) instead of only wages and salaries when calculating a wage for comparison with labour productivity. We heed both of Feldstein's concerns in our analysis.

While Feldstein's decomposition provides a framework for relating labour productivity growth to average wage growth, he fails to consider how wage growth was

actually experienced by the workers near the median – a better measure of the wage of the typical 'middle class' worker. Sharpe *et al*. (2008a; 2008b)consider how wage growth was experienced by the middle class, decomposing the gap between labour productivity growth and real median wage growth in Canada into four contributing factors: rising inequality, poor terms of trade for labour, a decrease in labour's share of income, and measurement inconsistencies.[2] They find that from 1980 to 2005, labour productivity grew 1.26 percentage points per year faster than median real earnings. They decompose the gap into their four factors, attributing 0.35 percentage points per year to inequality, 0.42 percentage points per year to terms of trade for labour, 0.25 percentage points per year to labour's share of income, and 0.25 percentage points per year to measurement issues. This report follows the method of Sharpe *et al*. but extends the analysis to ten additional OECD countries.

Pessoa and Van Reenen (2012) perform a decomposition of median wage growth and productivity growth similar to the one presented in Sharpe *et al*. (2008b) for the United Kingdom and the United States. They propose that there are two different types of measurements for the divergence – "gross decoupling" and "net decoupling". The former measures differences in growth between labour productivity and median hourly real earnings, while the latter measures differences in growth between labour productivity and average labour compensation per hour (deflated with the same deflator). Gross decoupling accounts for changes to labour's share of income, labour's terms of trade, changes median and mean hourly earnings, and the wedge between labour compensation and earnings, while net decoupling accounts for changes to labour's share of income. Ultimately, Pessoa and Van Reenen (2012) find little evidence of net decoupling in the UK, but significant gross decoupling in the United States and the UK. In the UK, gross decoupling was driven by differences between mean and median earnings and the wedge between earnings and labour compensation.

Pessoa and Van Reenen (2012) recognize that both gross decoupling and net decoupling are important policy indicators. As gross decoupling relates the "true middle" of the earnings distribution to labour productivity, it avoids issues of a skewed average and uses a more tangible income concept from the point of view of the worker (e.g. contributions to social programs made by the employer may not be considered income by a given worker). As gross decoupling also deflates earnings with the CPI and labour productivity with the GDP deflator, it also captures any difference in the prices faced by firms and workers. This is an important distinction to make because firms and consumers can at times face very different prices. Changes in capital equipment prices affect firms more than consumers, for example.

Net decoupling, on the other hand, is important because it challenges one of the main stylized facts cited by economists – labour's stable share of income. Pessoa and Van Reenen observe that net decoupling could occur for many reasons, including shocks which disturb the long run equilibrium, technological biased against labour, changes to the level

[2] The term "labour's terms of trade" refers to the ratio of consumption goods prices to producer prices, while the term "measurement inconsistencies" refers to the combined effect of employer social contributions and changes in hours of work per worker.

of competition in the market (in the product market it results in setting higher prices, while in the labour market it results in setting lower wages), and finally changes to labour supply due to structural phenomena like globalization.

Mishel and Gee (2012) also employ Sharpe *et al*. (2008b)'s methodology. Much like us, they perform an analysis comparing median real wage in the United States with labour productivity. Like most of the literature, they also find that a significant gap between growth in labour productivity and median real wages: 1.56 percentage points between1973 and 2011.They find that rising wage inequality accounted for 0.61 percentage points, while labour's terms of trade accounted for another 0.44 percentage points. They specifically point to the erosion of labour standards, globalization, high trade deficits, and the rising share of capital depreciation in GDP to explain both growing inequality and the changes in the distribution of income towards capital.

Dufour and Russell (2015)argue that the distribution of the gains from productivity growth is governed by the relative bargaining power of employers and workers, and that a decline in workers' bargaining power can explain part of the productivity-earnings gap. They show that average real wages tracked labour productivity growth fairly well in Canada until the late 1970s, but thereafter the two diverged as average real wage growth slowed. Ultimately, Dufour and Russell argue that public policies led to the gap between productivity and wage growth by diminishing labour's bargaining power.

II. Empirical Framework

Our decomposition of the gap between labour productivity growth and median real hourly earnings growth follows the approach developed in Sharpe *et al*. (2008a). In this section, we formally describe this approach. The first subsection presents the technical details of the decomposition without much commentary. In the second subsection, we provide a conceptual discussion of each of the components of the decomposition and explain how they should be interpreted. In the final subsection, we describe the data sources we will use.

A. Decomposition Method

The starting point for the decomposition is the following accounting identity:

$$\frac{Y_L}{P_C \times L} = \frac{Y}{P_Y \times L} \times \frac{Y_L}{Y} \times \frac{P_Y}{P_C} \tag{1}$$

Here, Y_L is total nominal labour compensation, P_C is the price of consumption goods, and L is total hours worked.$Y$is total nominal output (or income) in the economy andP_Y is the price of output.

Thus, the ratio $\frac{Y_L}{P_C \times L}$ denotes average real hourly labour compensation in units of consumption goods (i.e. the "consumer wage"). On the right-hand side, the ratio $\frac{Y}{P_Y \times L}$

denotes real output per hour in units of output goods; that is, labour productivity. $\frac{Y_L}{Y}$is labour's share of total income in the economy. The remaining term $\frac{P_Y}{P_C}$ is the relative price of output goods in terms of consumption goods; following the literature, we will refer to this as "labour's terms of trade." More will be said about this in subsection B below.

For any variable X, let the notation $\Delta\% X$ denote the per cent growth rate of X. Then expressing equation(1) in growth rates, we obtain

$$\begin{aligned}\Delta\% \, Average\ Real\ Hourly\ Compensation \\ = \Delta\% \, Labour\ Productivity + \Delta\% \, Labour\ Share \\ + \Delta\% \, Labour\ Terms\ of\ Trade\end{aligned} \tag{2}$$

Our goal is to explain changes in the gap between labour productivity and median real hourly earnings. Let $\Delta\% \, Gap$ denote the productivity-earnings growth gap. Formally, it is defined by

$$\Delta\% \, Gap = \Delta\% \, Labour\ Productivity - \Delta\% \, Median\ Real\ Hourly\ Earnings \tag{3}$$

Rearranging (2) and using (3) to eliminate labour productivity growth, we obtain

$$\begin{aligned}\Delta\% \, Gap = \Delta\% \, Average\ Real\ Hourly\ Compensation \\ - \Delta\% \, Median\ Real\ Hourly\ Earnings - \Delta\% \, Labour\ Share \\ - \Delta\% \, Labour\ Terms\ of\ Trade\end{aligned} \tag{4}$$

Now, the change in average real hourly earnings relative to median real hourly earnings is an indicator of the change in earnings inequality over time. Thus, we define the change in inequality as

$$\begin{aligned}\Delta\% \, Inequality = \Delta\% \, Average\ Real\ Hourly\ Earnings \\ - \Delta\% \, Median\ Real\ Hourly\ Earnings\end{aligned} \tag{5}$$

Finally, we need to relate average real hourly compensation to average real hourly earnings. As we discuss in more detail below, the difference between these two measures reflects the impact of changes in employer contributions to social insurance programs:

$$\begin{aligned}\Delta\% \, Average\ Real\ Hourly\ Compensation - \Delta\% \, Average\ Real\ Hourly\ Earnings \\ = \Delta\% \, Employer\ Social\ Contributions\end{aligned} \tag{6}$$

Substituting (5) and(6) into (4) yields the overall decomposition:

$$\begin{aligned}\Delta\% \, Gap = \Delta\% \, Inequality + \Delta\% \, Employer\ Social\ Contributions \\ - \Delta\% \, Labour\ Terms\ of\ Trade - \Delta\% \, Labour\ Share\end{aligned} \tag{7}$$

Equation (7) is the final decomposition formula. Having presented the technical details of its derivation, we now proceed to discuss its interpretation.

B. Interpreting the Decomposition

The object of interest is $\Delta\% \, Gap$, the discrepancy between labour productivity growth and median real hourly earnings growth. Equation (7) expresses this gap in terms of four components, each of which has a precise economic interpretation. In this subsection, we provide a brief explanation of each of the four components. We then conclude with general comments about the decomposition.

Inequality

The inequality component is the gap between the growth rates of average and median real hourly earnings. Empirically, earnings distributions within OECD countries are positively skewed; the mean is greater than the median because the mean is dragged upward by very high earners. When earnings at the top of the distribution grow more quickly than those in the middle of the distribution, the mean rises relative to the median and earnings inequality rises. This would imply that the gains from labour productivity are flowing disproportionately to workers who were already high earners relative to the median worker, so $\Delta\% \, Inequality$ contributes positively to $\Delta\% \, Gap$.

Employer Social Contributions

In principle, the difference between average hourly earnings and average total labour compensation is that the latter captures employer social contributions (also called supplementary labour income) while the former may not.[3]It is possible that part of the gap between labour productivity growth and median hourly earnings growth is accounted for by workers receiving a growing share of their compensation in the form of employer contributions to social insurance programs rather than cash or in-kind earnings.[4] Whether this makes workers worse off depends on how much they value the social programs.

Employer social contributions as a share of labour compensation have been growing throughout the OECD over recent decades. In Canada, for example, employer social contributions as a share of labour compensation grew by about five percentage points from 1987 to 2010. This means that employer social contributions grew about 1.76 percentage points per year faster than wages and salaries over the period (Uguccioni, Murray and Sharpe, 2016).

In practice, we draw average hourly earnings from household surveys and average hourly labour compensation from the National Accounts. We believe that employer social contributions are the main source of the growth discrepancy between the two series (and that is why we have named this component of the gap 'employer social contributions'), but it is likely that other measurement discrepancies between the two data sources are

[3] Supplementary labour income includes contributions employers make on behalf of employees to state-run schemes such as national pension plans, unemployment insurance, and workplace injury insurance, as well as health and dental insurance plans provided by the employer, sickness and life insurance, and retirement allowances.

[4]It can be noted that definitional difference between the data sources for earnings and labour compensation, and changes in these differences over time, may also lead to different growth rates for earnings and labour compensation.

captured here as well. The definitions of labour income used in household surveys may differ across countries in subtle but important ways (e.g. in their treatment of bonuses or of non-cash income such as stock options). Sampling error in the surveys is another potential source of measurement discrepancies. (It is well known, for example, that super-high earners are difficult to capture in surveys.) These measurement issues will also impinge upon the employer social contributions component of the gap.

Labour Terms of Trade

The accounting identity in equation (1) includes two prices: the consumption goods price P_C and the output goods price P_Y. These average prices differ because, in general, the bundle of goods consumed by consumers is not the same as the bundle of goods produced in the domestic economy.[5]

Labour productivity is defined as the volume of output goods produced per hour of work, so the relevant price is P_Y. Workers ultimately want to use their compensation to buy consumption goods, so the relevant price for measuring real labour compensation is P_C. The discrepancy between labour productivity and real labour compensation is therefore influenced by the ratio $\frac{P_Y}{P_C}$. Following the literature, we refer to this ratio as "labour's terms of trade."[6]

When $\Delta\%\ Labour\ Terms\ of\ Trade > 0$, consumer prices are falling relative to output prices. Everything else being equal, this increases workers' purchasing power relative to labour productivity, and hence reduces the gap between labour productivity growth and real earnings growth. That is why labour's terms of trade enter equation (7) with a negative sign.

Labour Share

The final term in equation(7) accounts for changes in total labour compensation as a share of aggregate income in the economy. Labour productivity measures the economy's average output per hour of labour supplied by workers, but part of that output is paid to other factors of production (primarily capital). The remaining share accrues to labour. These aggregate shares are determined by technological and institutional factors in the long run, though they can be influenced by supply and demand conditions in the short run.

When labour's share rises, the gap between labour productivity growth and labour compensation growth falls. This is why labour's share enters equation (7) negatively.

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[5] For example, countries produce goods that are exported to other countries rather than purchased by domestic consumers. The prices of those exports are included in the output price P_Y but not in the consumer price P_C.

[6] Clearly, an analogy is being drawn between $\frac{P_Y}{P_C}$and the more common notion of "terms of trade," which is the ratio of a country's export prices to its import prices. Intuitively, P_C is the price of the goods workers buy and P_Y is the price of the goods workers produce and sell. It is to workers' advantage when the price of what they sell increases relative to the price of what they buy, just as it is to a country's advantage when the price of what it sells (its exports) increases relative to the price of what it buys (its imports).

General Comments

The decomposition in equation (7) represents an accounting exercise and does not, on its own, justify any statements about cause and effect. Did the gap between labour productivity and median real annual earnings increase *because* earnings inequality increased for some reason? Or did measured earnings inequality increase *because* the productivity-earnings gap increased for some reason? An accounting decomposition cannot answer a question like this.[7]To address such questions would require a structural model that explains why each of the components changed the way it did.

Nevertheless, we think the accounting approach is useful. It draws our attention to the relationships between the productivity earnings gap and several other economic phenomena − rising earnings inequality, falling hours worked per worker, the changing impact of laws governing employer contributions to social insurance programs, and so on. It lends a disciplined, quantitative characterization to those relationships. It suggests areas for future research that might clarify the causal mechanisms at play.

C. Data

Our analysis relies on two data sources.[8] For all of our estimates that rely on national accounts data, we employ the OECD National Accounts located in the *OECD.Stat* public-use database. For all of our estimates that rely on household surveys (median and average earnings from household surveys), we rely on the micro-datasets made available by the Luxembourg Income Study.Table 1details the specific survey(s) used for each country. The length of our time series varies by country with household survey availability. Generally, the series span from 1986 or 1987 to 2010 or 2013. Germany and Ireland are the two exceptions to the rule, with our time series for the two countries spanning 1994 to 2010.[9]

To create our median and average wage series for each country, we used the annual labour income for both part-time and full-time employees from the relevant household survey. We excluded self-employed from our sample when generating the distribution of annual labour income in a given country because of data issues in differentiating labour income from returns to capital.[10] In order to create average hourly real wage and median

[7] Similar questions can be asked about the other components as well. Did earnings grow more slowly than productivity because labour's share of income declined? Or did labour's share of income decline because earnings grew more slowly than labour productivity?

[8] The data series used in this study can be found in the data appendix at http://csls.ca/reports/csls2016-16-DataAppendix.pdf.

[9] Ireland began in 1994 simply due to data availability. We opted to begin our German series in 1994 because it was the first household survey after East and West Germany were reunited, and we lack micro-data from East Germany prior to the Wall coming down.

[10] The primary difficulty with self-employed data is that their annual income comes both from the labour the self-employed put in their business and the return on the capital they have invested in their business. Most countries have tax systems set up in such a way that dividends from an owned business are treated differently than salaries paid out from an owned business. As such, the self-employed will naturally take into account tax implications when deciding how they will be remunerated in a given year. By excluding the self-employed, we avoid any changes to labour income which are the result of changes to the tax treatment of dividends. Moreover, as our decomposition is an exercise in

Table 1 : Household Survey Micro-data Sources

Country	Survey(s) Used by LIS
Canada	Survey of Consumer Finance (1987, 1991, 1994, 1997), Survey of Labour and Income Dynamics (1998, 2000, 2004, 2007, 2010)
Denmark	Law Model (1987, 1992, 1995, 2000, 2004, 2007, 2010)
Finland	Income Distribution Survey (1987, 1991, 1995, 2000, 2004), Survey on Income and Living Conditions (2007, 2010, 2013)
France	Family Budget Survey (1984, 1989, 1994, 2000, 2005, 2010)
Germany	German Social Economic Panel Study (1994, 2000, 2004, 2007, 2010)
Ireland	Living in Ireland Survey (1994, 1995, 1996, 2000), Survey on Income and Living Conditions (2004, 2007, 2010)
Netherlands	Additional Enquiry on the Use of (Public) Services (1983, 1987, 1990), Socio-Economic Panel Survey (1993, 1999), Survey on Income and Living Conditions (2004, 2007, 2010)
Norway	Income Distribution Survey (1986, 1991, 1995, 2000, 2004), Household Income Statistics (2007, 2010)
Spain	Family Expenditure Survey (1980, 1990), Spanish European Community Household Panel (1995, 2000), Survey on Income and Living Conditions (2004, 2007, 2010, 2013)
United Kingdom	Family Expenditure Survey (1986, 1991, 1995), Family Resources Survey (1994, 1999, 2004, 2007, 2010, 2013)
United States	Current Population Survey – March Supplement (1986, 1991, 1994, 1997, 2000), Current Population Survey – Annual Social and Economic Supplement (2004, 2007, 2010, 2013)

hourly real wage estimates, we then divided through by the average hours worked per person employed and deflated each series with the CPI.[11]

III. Decomposition Results

This section presents and discusses the decomposition results. We begin with an overall summary of the results. We then devote one subsection to detailed analysis of each of the four components: earnings inequality, employer social contributions, labour's terms of trade, and labour's share of income.

growth, so long as "true" self-employed labour income did not grow faster or slower than labour income did for employees, we do not lose any information by dropping the self-employed.

[11] Admittedly, using average hours worked in an economy to generate an hourly wage series from the micro-data is not ideal. Ideally, the household surveys would also include a weekly or annual hours worked variable, from which we could create hourly wage (more recent surveys do tend to include such variables, but changes over short periods are less informative for productivity research). However, as average hours worked is driven by full-time workers, then we can interpret the general decline of average hours worked as a representative trend for all full-time workers. As our decomposition deals in growth rates rather than levels, our use of average hours worked to generate hourly wages should not introduce bias into our results, particularly for wages levels in the middle of the distribution (i.e. median and average). Bick et al. (2016) present a more detailed breakdown of the decline of hours across high income countries.

A. Summary of Results

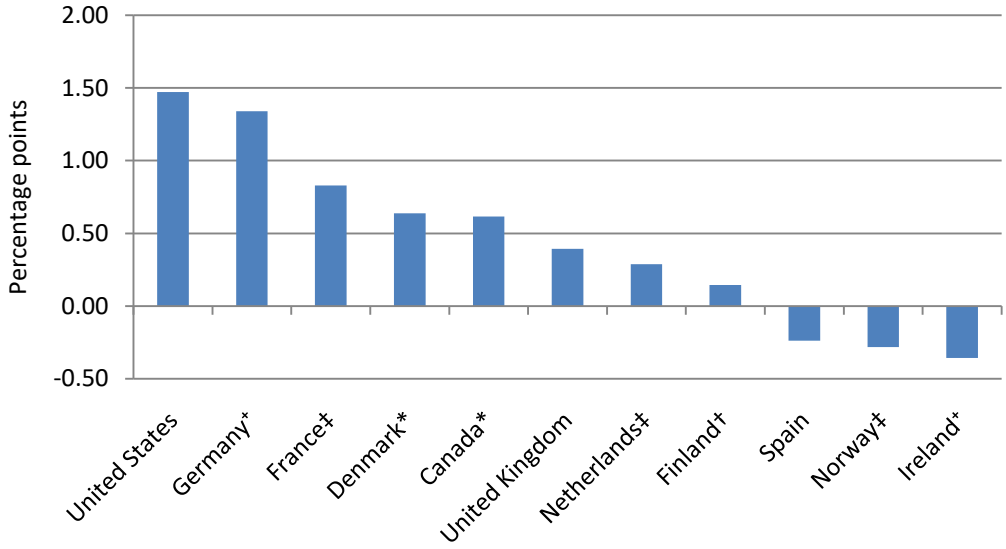
The decomposition results are summarized in Table 2. Overall, eight out of the 11 OECD countries studied saw labour productivity grow faster than median real hourly wages. The gap was largest in the United States, at 1.47 per cent per year from 1986 to 2013. On the other end of the spectrum, Spain, Norway, and Ireland all experienced faster median hourly real wage growth than labour productivity growth, resulting in a shrinking productivity-wage gap in those countries over their respective time periods.

Table 2: Decomposition of the Growth Gap between Labour Productivity and Median Real Hourly Earnings into Four Components, Selected OECD Countries, 1986-2013

	Labour Productivity	Median Real Hourly Earnings	Gap	Inequality	Employer Social Contributions	Labour Terms of Trade	Labour Share
	Growth (per cent per year)			Percentage Point Contributions to the Gap			
United States	1.63	0.15	1.47	0.52	0.24	0.57	0.16
Germany⁺	1.39	0.05	1.34	0.38	-0.07	0.59	0.44
France‡	1.71	0.88	0.83	-0.06	0.71	0.18	0.01
Denmark*	1.61	0.97	0.64	0.01	0.67	0.02	-0.06
Canada*	1.18	0.57	0.62	0.36	0.15	-0.02	0.12
United Kingdom	1.65	1.26	0.39	0.49	0.10	-0.32	0.11
Netherlands‡	1.27	0.98	0.29	0.09	-0.13	0.06	0.26
Finland†	2.20	2.06	0.14	0.11	-0.22	-0.04	0.29
Spain	1.05	1.29	-0.24	0.23	-0.27	-0.01	-0.18
Norway‡	1.80	2.09	-0.28	0.22	0.26	-1.16	0.38
Ireland⁺	3.75	4.11	-0.36	0.88	-2.03	0.20	0.57
				Per Cent Contributions to the Gap			
United States	--	--	--	35.0	16.0	38.4	10.9
Germany⁺	--	--	--	28.4	-5.0	43.7	32.7
France‡	--	--	--	-7.7	85.1	21.5	1.1
Denmark*	--	--	--	1.9	104.5	3.4	-9.7
Canada*	--	--	--	58.3	23.9	-2.5	20.0
United Kingdom	--	--	--	125.4	25.9	-81.0	28.2
Netherlands‡	--	--	--	31.4	-44.5	22.2	90.0
Finland†	--	--	--	79.3	-152.6	-29.2	198.0
Spain	--	--	--	-94.9	113.7	4.6	75.9
Norway‡	--	--	--	-78.3	-90.5	410.5	-133.7
Ireland⁺	--	--	--	-248.2	569.9	-55.6	-159.7

Note: *1987-2010, †1987-2013, ⁺1994-2010, ‡1986-2010. All others are 1986-2013.

Chart 1: Growth Gap between Labour Productivity and Median Real Hourly Wages, Selected OECD Countries, 1986-2013



Note: *1987-2010, †1987-2013, *1994-2010, ‡1986-2010. All others are 1986-2013.

The importance of the four components of the gap varied significantly by country. In Canada and the United Kingdom, rising inequality was the largest contributor to the gap. In Germany, the United States, and Norway, labour's terms of trade had the largest absolute effect on the gap. In Finland and the Netherlands, labour's falling share of income was the largest contributor to the gap. In the remaining countries, employer social contributions accounted for the largest contributions.

The importance of a component of the gap within a country can give some indication to policymakers where improvements can be made to the productivity-wage gap. However, some countries may not need to be as worried about their largest contributor as others need to be worried about their secondary or tertiary contributors. For example, inequality was the largest contributor to the gap in Canada, adding 0.36 percentage points per year. In the United States, inequality was not the largest contributor to the gap, but it still added 0.52 percentage points per year– nearly one and a half times as fast as inequality growth in Canada. While the Canadian productivity-wage gap has grown faster than more than half of the OECD countries, the magnitude of the growth also ought to be considered versus countries in more dire circumstances, such as Germany and the United States.

B. Inequality

The inequality component measures the difference in growth between median and average hourly real earnings. The 11 OECD countries in our sample had different experiences with inequality growth over their respective periods. Generally in line with the wage inequality literature, most countries experienced rising inequality in recent

decades according to our measure. As shown in **Error! Reference source not found.**, only France saw wage inequality

Table 3: Inequality Component and its Determinants, Selected OECD Countries

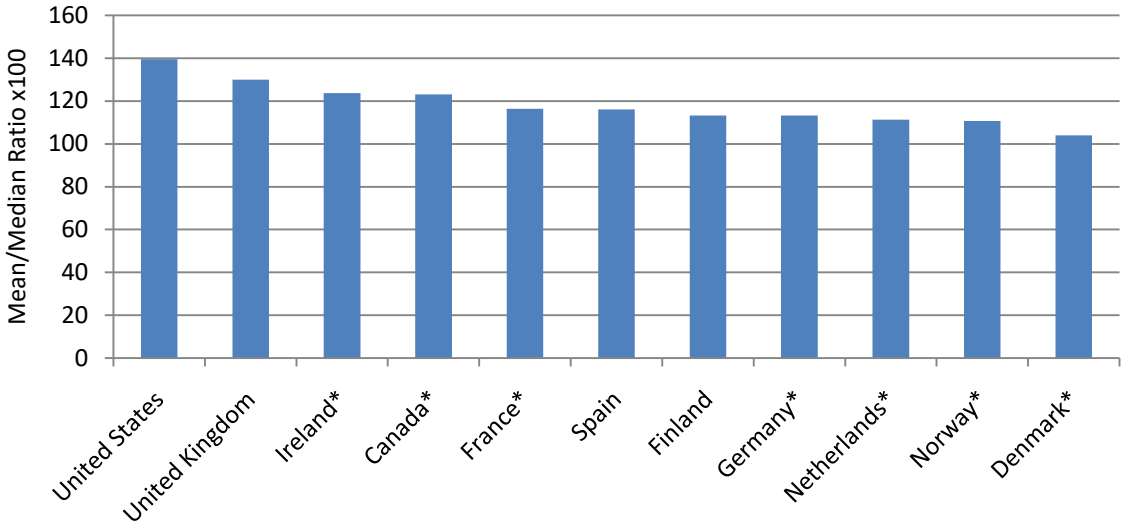
	Average Real Hourly Earnings	Median Real Hourly Earnings	Inequality Component
	A	B	C = A - B
United States	0.67	0.15	0.52
Germany	0.43	0.05	0.38
France	0.81	0.88	-0.06
Denmark	0.98	0.97	0.01
Canada	0.93	0.57	0.36
United Kingdom	1.75	1.26	0.49
Netherlands	1.07	0.98	0.09
Finland	2.17	2.06	0.11
Spain	1.52	1.29	0.23
Norway	2.31	2.09	0.22
Ireland	4.99	4.11	0.88
Growth rates are in per cent per year. See the note below Table 2 for the time periods over which growth rates are measured for each country.			

fall overall, though median hourly real wage growth only outpaced average hourly real wage growth by 0.06 percentage points per year.

As Chart 2 demonstrates, the *level* of inequality also varied significantly across countries: in 2013 in the United States the average real hourly wage was 139.5 per cent of the median hourly real wage, while in 2010 in Denmark the average real hourly wage was only 103.9 per cent of the median hourly real wage. The level of inequality in a country is very much the result of how the median and mean have grown relative to one another over time. However, it also has implications for future growth. For example, a country like the United States with a significant mean-median wage gap may well have more room for equality to grow in the future, which could result in its gap falling quickly should equality promoting policies be enacted in the future. Alternatively, the mean-median ratio may reflect the equality preferences of a given electorate, and a country like the United States may simply be made up of citizens who are more tolerant of inequality. As a result, a high mean-median ratio may indicate higher potential inequality growth in the future.

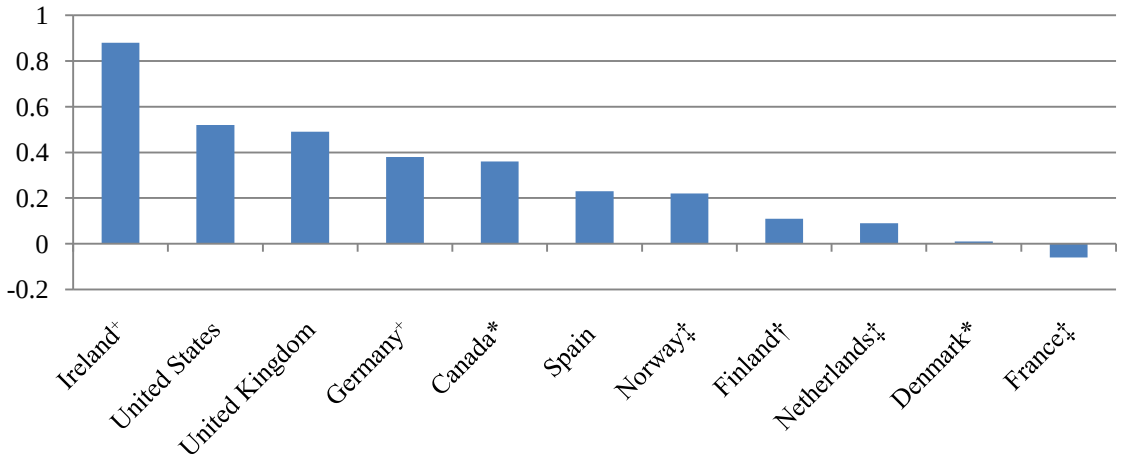
Chart 3 illustrates the percentage-point contributions of the inequality component to the gap in the eleven OECD countries. Inequality made the largest contribution in Ireland, where the average hourly real wage grew faster than the median hourly real wage by 0.88 percentage points per year. Inequality made large contributions to the gap in both

Chart 2: Ratio of Average to Median Hourly Real Wage, Selected OECD Countries, 2013



Note: *2010

Chart 3: Inequality Component, Percentage Point Contribution to the Gap, 1986-2013



Note: *1987-2010, †1987-2013, +1994-2010, ‡1986-2010.

the United States and the United Kingdom as well, contributing 0.52 and 0.49 percentage points per year, respectively. Nolan and Smeeding (2005) note that, in spite of Ireland's large recent increase in inequality, the *level* of inequality in Ireland still falls well short of the level in the United States. At current growth rates it would take decades for the Irish to reach American levels of inequality.

While evaluating the percentage point contribution of equality to a country's overall gap is important, Table 2 adds the dimension of how much of a country's gap is

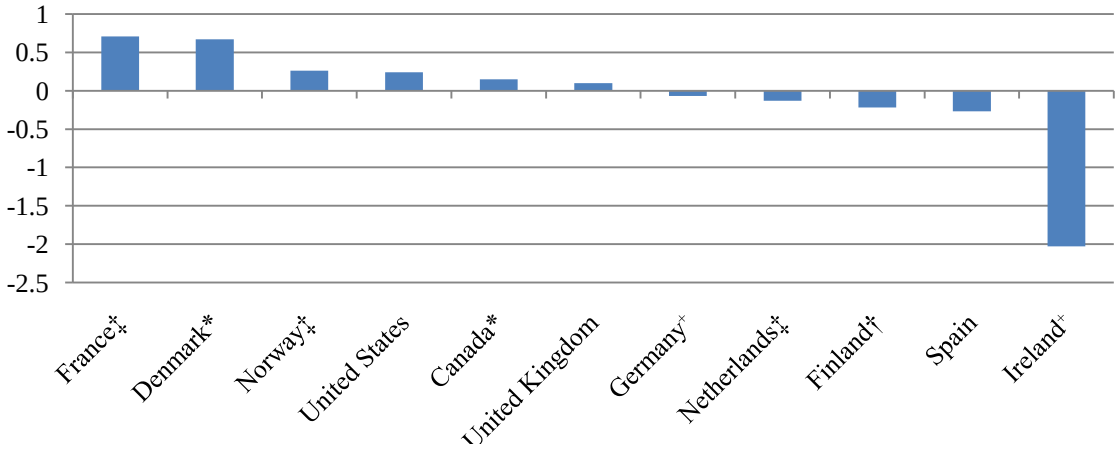
due to inequality. For example, despite inequality in Ireland making a large positive contribution to the gap, it was more than offset by the other three contributors and hence accounted for -244 per cent of Ireland's overall gap. Contrarily, in the Netherlands and Canada inequality contributed more than 50 per cent of the gap, and in the United Kingdom it accounted for more than 100 per cent of the gap.

Overall, there is no doubt that wage inequality has been growing across the OECD for decades. In most cases, the average hourly real wage grew around 0.10 to 0.50 percentage points per year faster than the median hourly real wage – equivalent to somewhere between 2 and 10 percentage points more cumulative growth over a 20 year period. Evidently, these minor differences in growth can have major ramifications on the overall income distribution in the long run. It is, however, important to bear in mind that differences in growth between the median and the mean may fail to capture some important changes in the earnings distribution. In Section V, we discuss alternative measures of inequality to learn about wage growth throughout the wage distribution.

C. Employer social contributions

Workers take part of their labour compensation in the form of employer social contributions. These contributions are included in real hourly labour compensation from the National Accounts, but are not necessarily included in real hourly earnings from the household surveys.[12] Thus, part of the gap between labour productivity growth and median hourly earnings growth may be accounted for by faster growth of employer social contributions than earnings.

Chart 4: Employer Social Contributions Component, Percentage Point Contribution to the Gap, Selected OECD Countries, 1986-2013



Note: *1987-2010, †1987-2013, +1994-2010, ‡1986-2010.

[12] As we noted in Section II, the country-level household surveys may differ in the definitions of labour income they use. Thus, the employer social contributions component includes the impact of these measurement discrepancies and not purely the effect of employer social contributions.

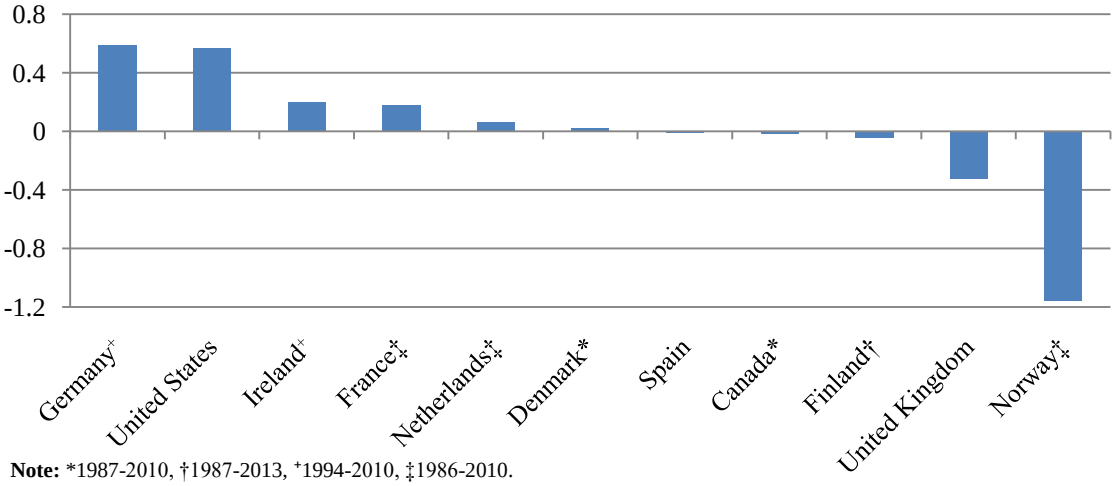
As shown in Chart 4, this component's contribution to the gap in Ireland, France, and Denmark exceeded 0.50 percentage points per year in absolute value. This indicates that there are significant differences between the labour compensation component of the SNA and the hourly earnings from the household surveys produced in by the national statistics agencies in these countries.

In per cent terms, employer social contributions (plus other measurement discrepancies) make enormous contributions to the gap in Ireland, Denmark, and France (Table 2). In Finland, Norway, and Spain employer social contributions make up a large share of the gap in relative terms, however these three countries have the three smallest productivity-wage gaps in absolute terms among the eleven countries studied. As such, the large shares are largely driven by a small denominator rather than large percentage point per year contributions.

D. Labour's terms of trade

As we explained in Section II, the term "labour's terms of trade" refers to the ratio of the output price P_Y to the consumer price P_C. These average prices differ because, in general, the bundle of goods consumed by consumers is not the same as the bundle of goods produced in the domestic economy. Workers produce output and receive compensation for their labour services, which is used to buy consumer goods. If consumer prices rise relative to output prices, workers' purchasing power falls compared to what it would have been if both consumer prices rose at the same rate as output prices. We would refer to such a situation as a deterioration in labour's terms of trade. Since labour productivity is measured in output units while real earnings are measured in units of consumer goods, a deterioration in labour's terms of trade decreases workers' real earnings relative to labour productivity, and hence increases the productivity-earnings gap.

Chart 5: Labour's Terms of Trade, Percentage point Contribution to the Gap, Selected OECD Countries, 1986-2013



Note: *1987-2010, †1987-2013, ⁺1994-2010, ‡1986-2010.

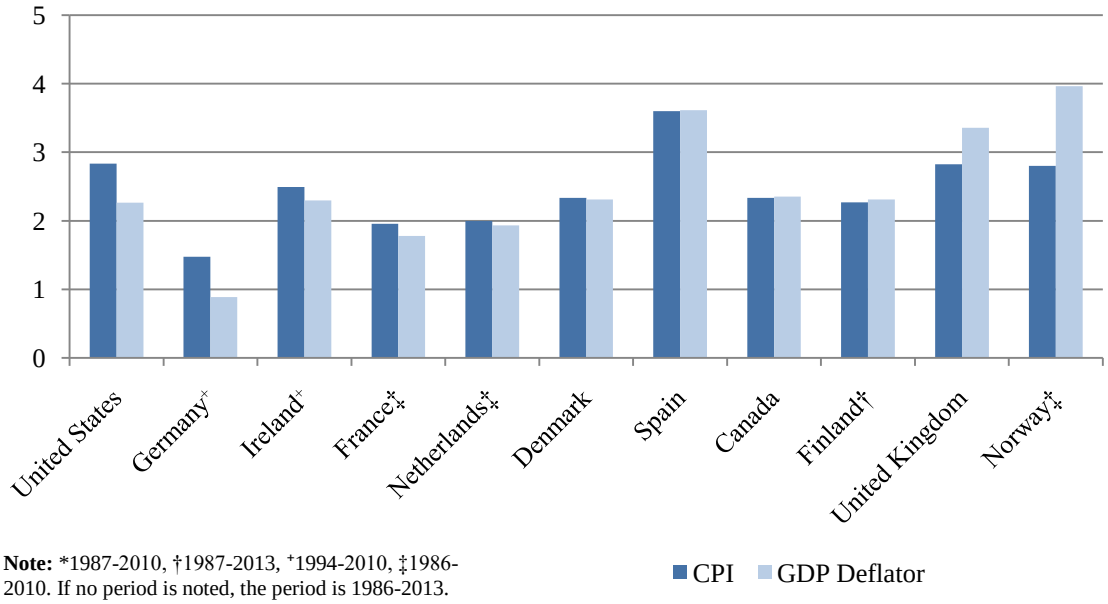
Labour's terms of trade made a sizeable contribution to the gap in six of the 11 countries. Norway, the United States, and Germany saw labour's terms of trade contributing more than 0.50 percentage points to the gap in absolute terms.

As illustrated in Chart 5 and Chart 6, labour's terms of trade in Norway contributed -1.16 percentage points per year. Norway was the sole country where the GDP deflator outpaced the CPI by such a wide margin (3.96 per cent per year versus 2.80 per cent per year). In Norway the main explanation was far stronger growth in export prices than consumption prices, driven by the commodity boom and large share of offshore oil and gas production in GDP.

Germany and the United States had the opposite experience than Norway did with labour's terms of trade. The two countries respectively saw the CPI grow 0.59 percentage points and 0.57 percentage points faster than the GDP deflator. In the United States, the relatively high rate of growth sustained by the CPI was driven by rising food, energy, and housing costs. In Germany, energy and housing prices were the primary sources of high CPI growth relative to the GDP deflator. In both Germany and the United States, investment prices grew much slower than the CPI. In the United States, prices for information technology goods, which represent a significant share of investment, have since the 1980s fallen drastically (e.g. the cost of a computer with 1 gigabyte of RAM) which reduced GDP deflator growth.

Table 2 illustrates the relative importance of labour's terms of trade to each country's overall productivity-wage gap. The relative importance of labour's terms of trade in Norway is in part driven by it being the component largest of any of the 11

Chart 6: CPI and GDP Deflator Growth, Per cent Per Year, Selected OECD Countries, 1986-2013



Note: *1987-2010, †1987-2013, +1994-2010, ‡1986-2010. If no period is noted, the period is 1986-2013.

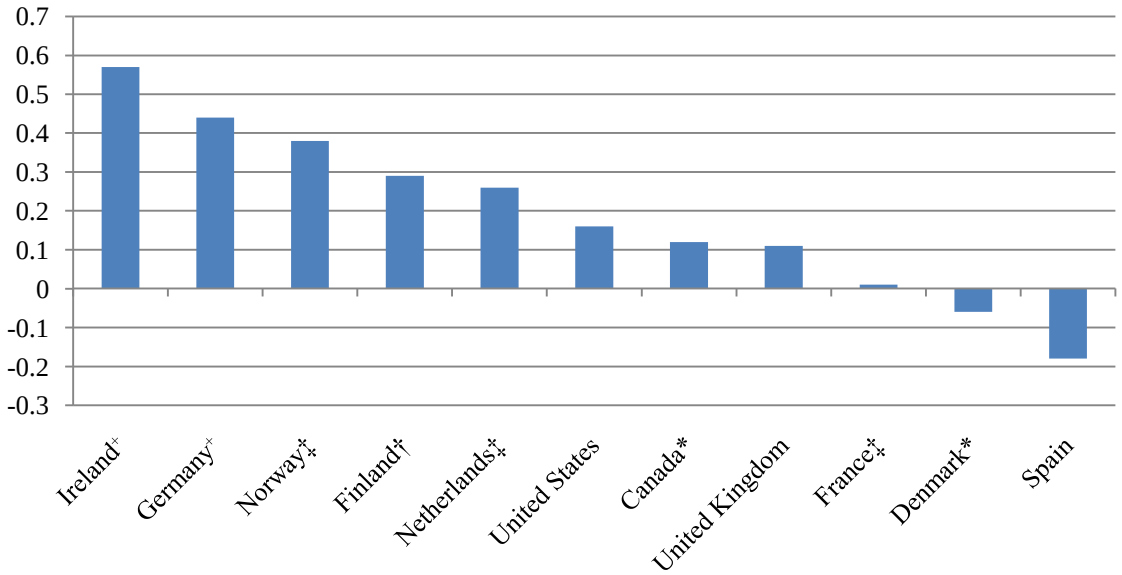
countries (Chart 5), but the relative size is even greater due to Norway's relatively small overall gap. Similarly, labour's terms of trade make a larger absolute contribution to the gap in the United Kingdom than in the United States or Germany because of the United Kingdom's relatively small overall productivity-wage gap.

E. Labour's share of income

Labour's share of income measures the fraction of aggregate income in the economy (i.e. GDP) which is paid to workers as compensation for labour. Up until quite recently, labour's share of income was considered constant by most economists, so much so that it became one of the main stylized facts presented in the very early days of introductory macroeconomics courses. Labour's falling share of income over the past decades in OECD countries has been well documented (OECD, 2012; International Labour Organization, 2015).

Chart 7 presents the percentage point contribution made by changes to labour's share of income over time. Notably, in three of the OECD's most "labour friendly" countries, Spain, Denmark, and France, labour's share of income either held steady or improved.[13] Labour's share of income fell the most in Ireland, in large part as a result of capital's share increasing as foreign firms moved their headquarters there due to

Chart 7: Labour's Share of Income, Percentage Point Contribution to the Gap, 1986-2013



Note: *1987-2010, †1987-2013, +1994-2010, ‡1986-2010.

[13] It is worth noting that Spain's labour's share of income was broadly unchanged until 2008, after which point it improved. Labour's increased share of income after 2008 was likely more a matter of capital's share of income falling in the wake of the Financial Crisis than labour's share improving. Moreover, our decomposition of Spain's productivity-wage wedge ends in 2013 – in the middle of a string of crises of confidence in Eurozone banks which included Spanish banks.

favourable tax treatment. Overall, there is a clear trend of labour's share of income falling across the majority of countries studied.

So far as the importance of labour's share of income to the overall productivity-wage gap, Table 2 presents the per cent contribution it made. In five of the 11 OECD countries studied (Finland, Ireland, the Netherlands, Norway, and Spain), labour's share of income made a contribution well in excess of 50 per cent in absolute terms. Accounting for more than 10 per cent of the gap in nine of 11 of the countries covered, labour's share of income is the most influential component in our decomposition in terms of its relevance across the board.

Ultimately, a decline in labour's share of income over the period as a whole indicates that labour's bargaining power has been falling relative to that of capital. In terms of our decomposition, a decline in labour's share of income over time leads to an increase in the overall gap.

The causes of labour's deteriorating bargaining power are hotly debated. One of the most trumpeted causes is globalization. Proponents argue that capital is far more mobile than labour in an increasingly globalized world, which makes the threat of outsourcing and offshoring far more credible. Due to the threat of offshoring to countries with less strict labour regulations and lower labour costs, domestic workers are increasingly prepared to accept lower wages.

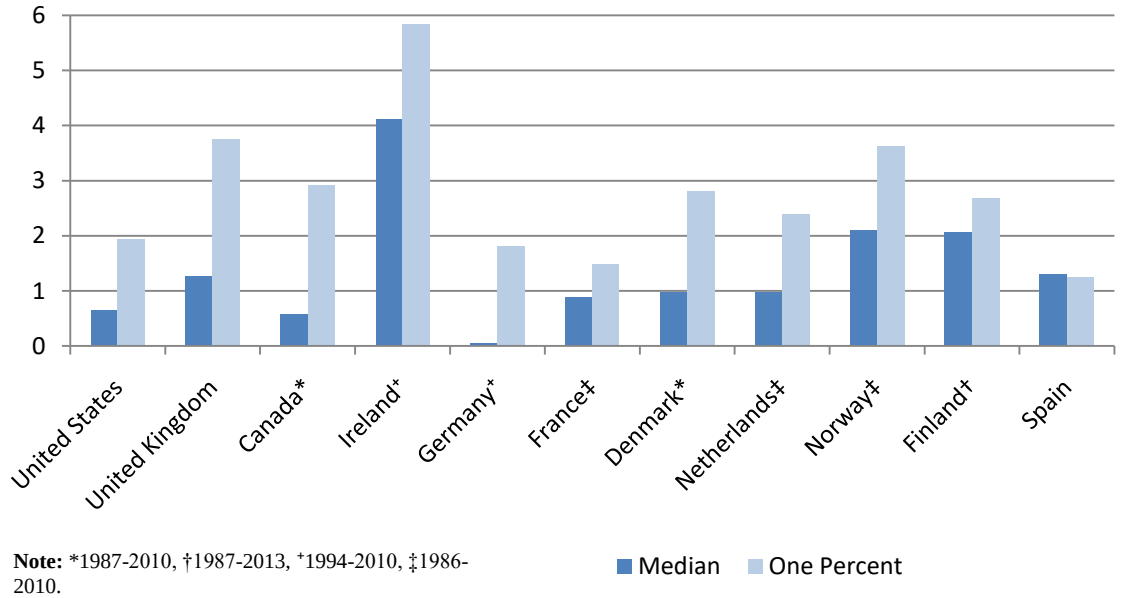
Some argue that labour's deteriorating bargaining power is less a matter of globalization and more a matter of technological change which is biased against labour. For example, the OECD (2012) argues that the spread of information and communication technologies have led to major innovation and productivity gains over recent decades, but have also had the effect of replacing workers altogether. The result is an increase in capital's bargaining power, and a decrease in labour's – particularly for workers in highly repetitive jobs which naturally lend themselves to automation.

IV. Alternative Measures of Wage Inequality

Our measure of inequality so far has been to compare median and average hourly real wages. While our measure captures whether or not the distribution is becoming more positively skewed overall, it does not necessarily speak to the developments throughout the distribution. For example, it may be the case that the median is growing at a similar rate as the mean, but the tails of the distribution are being stretched apart as those on the left tail experience little growth and those on the right tail experience extreme growth or vice versa (i.e. the distribution's skew may remain largely unchanged but the height of the distribution may be changing). There are several alternative measures of wage inequality, such as the wage Gini coefficient, the ratio of the 90^{th} percentile of wages to the 10^{th} percentile, or the ratio of the 90^{th} percentile to the 50^{th}.

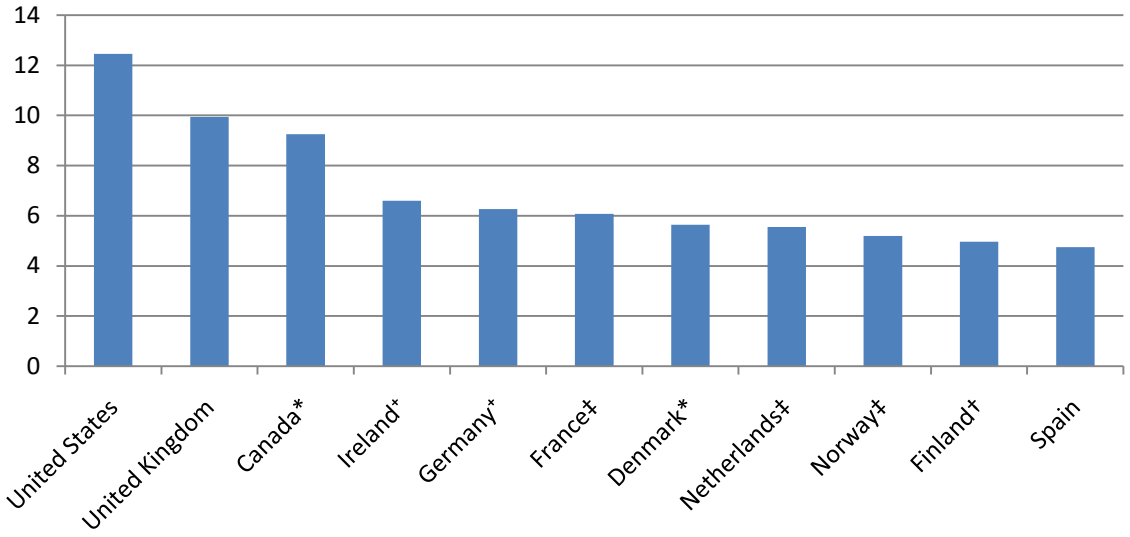
Chart 8 compares the real hourly wage growth of the median worker in a given country with the average real hourly wage growth of all workers in the top 1 per cent of

Chart 8: Hourly Real Wage Growth for Median and the One Percent, per cent per year, Selected OECD Countries, 1986-2013



Note: *1987-2010, †1987-2013, +1994-2010, ‡1986-2010.

Chart 9: Ratio of the Average Wage of the One Percent to the Median Wage, Selected OECD Countries, 2013



Note: *last year available is 2010.

all workers.[14] In every country except Spain, the average wage of the One Percent grew far faster than the median real hourly wage.

While Chart 8 shows the sobering fact that the wages of rich workers have outpaced the wages of middle income workers, it is also important to consider the levels

[14] For the remainder of the report, we will refer to the top 1 per cent of all workers as the One Percent.

of wages to gauge the degree of wage inequality in these countries. Chart 9 provides the proportion of the wage of the One Percent to median wage as a measure of the level of wage inequality in a given country. The United States has by far the highest level of inequality using this measure, with the One Percent earning on average more than 12 times median income. Canada and the United Kingdom also have far higher levels of inequality than the remaining 8 countries.

As shown in Chart 8, the One Percent have enjoyed stronger wage growth than the median in every country except Spain. As a result, the proportion that their labour income makes up of total labour income has grown. The OECD (2012) has documented labour's falling share of income, and found that removing the One Percent from labour income *doubled* the rate of decline of labour's share of income in Canada and the United States. In fact, the removal of the One Percent from total labour income hastened the decline in labour's share of income in all of the OECD countries they studied except Spain. Table 4 shows that labour's share of income in most countries has been buoyed by the One Percent.

Unlike SNA data, household surveys allow us to investigate how the distribution is evolving by focusing on the wage growth experienced by certain percentiles or subsamples to better understand where wages are growing faster and where wage growth has slowed. Mechanically, this decomposition is the same as the decomposition we have been employing throughout this paper, with one change: we replace the median with a percentile or a statistic of interest.

Table 4: One Percent's Share of Total Labour Income, per cent, Selected OECD Countries, 1986 and 2013

	1986	2013	Percentage-point Change
United States	6.3	9.1	2.8
United Kingdom	4.5	7.6	3.1
Canada*	4.8	7.5	2.7
Germany*	4.5	5.5	1.0
Denmark*	3.6	5.4	1.8
France*	4.6	5.3	0.7
France*	4.6	5.3	0.7
Netherlands*	3.8	5.0	1.2
Norway*	3.4	4.7	1.3
Finland*	3.8	4.4	0.6
Spain	4.4	4.1	-0.3

Note: *last year available is 2010.

Table 5: Decomposition of the Growth Gap between Labour Productivity and Real Wages at Six Points in the Wage Distribution, United States, 1986-2013

	Per cent per year			Percentage Point Contribution			
United States 1986-2013	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
Median	1.63	0.15	1.47	0.52	0.24	0.57	0.16
25th percentile	1.63	0.64	0.99	0.03	0.24	0.57	0.16
75th percentile	1.63	0.34	1.28	0.33	0.24	0.57	0.16
One Percent	1.63	1.94	-0.31	-1.27	0.24	0.57	0.16
the Rest	1.63	0.44	1.19	0.23	0.24	0.57	0.16
Below Median	1.63	0.56	1.06	0.11	0.24	0.57	0.16

For the decomposition, we consider the first and third quartiles (i.e. the 25th and 75th percentiles), as well as the prevailing wage of the One Percent, the Rest, and those below median wage.[15] For the three latter subsets, we use the average hourly real wage *of the subset* in our decomposition. We use the average of the subset rather than the median of the subset because we want to capture the effect of high- or modest-income earners pulling the average in one direction or another: we want to estimate how wages have changed for the group on the whole.

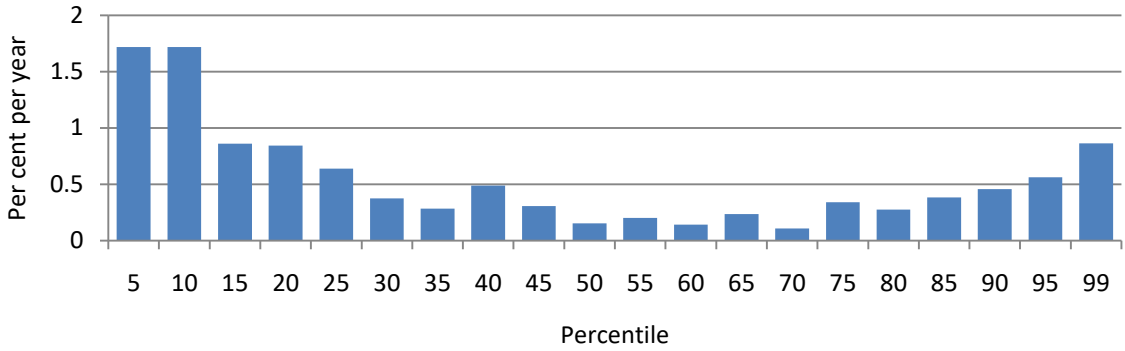
For the sake of brevity, we apply this decomposition solely to the United States, as Section III clearly showed that the inequality component there was the largest of any country and Chart 9 showed it had the highest level of inequality.

Table 5 displays the decomposition results using alternative wage measures in place of the median wage. (The results using the median are also displayed for the sake of comparison.) The productivity-wage growth gap is largest when the median wage is used. This reflects the fact that real wage growth over the 1986-2013 period was lower at the median than at other points throughout the wage distribution (Chart 10). That being said, four of the five alternative real wage measures grew more slowly than labour productivity over the period. Only the wages of the One Percent grew faster than productivity growth.

Chart 10 provides a closer look at the individual percentiles. Hourly real wage growth in the United States for the period studied was largely below 0.40 per cent per year roughly between the 35th and 70th percentiles. Otherwise, hourly real wage growth tended to be far closer to or above average hourly real wage growth for the whole wage distribution (0.67 per cent per year). By focusing on the median we inadvertently chose the group in the United States which has experienced the *least* hourly real wage growth from 1986 to 2013.

[15] The latter three groups are subsets of the population. The One Percent is the subset of all those with income above the 99th percentile. The Rest is the complement of the One Percent, and consists of all those who do not earn an income above the 99th percentile. The below median wage set is, as the name states, the subset of all of those with income below the 50th percentile.

Chart 10: Real Hourly Wage Growth by Percentile, United States, per cent per year, 1986-2013



These results convey a narrative all too familiar. In the United States, the middle income earners have experienced far less growth over the past decades than high or modest income earners. Specifically, hourly real wage growth of the One Percent exceeded average hourly real wage growth by 1.27 percentage points per year and hourly real wage growth of the first quartile was only 0.03 percentage points per year slower than mean hourly real wage growth for the population. The result is a "hollowing of the middle class", as modest income earners approach middle income levels and high income earners continue to outstrip either group in terms of wage growth.

The effect of the "hollowing of the middle class" in the United States in terms of inequality as a concept is somewhat mixed. Indeed, the average hourly real wage of the One Percent grew much faster than average hourly real wage of the Rest of the distribution and the median hourly real wage, and in that sense inequality has grown. Alternatively, modest income earners experienced much higher hourly real wage growth than middle income earners, and in that sense inequality has been reduced locally. Combining the two observations, the income distribution of the United States is transitioning towards a bimodal distribution, with a canyon gradually opening between the stagnant middle class and the rich.

Ultimately, overall inequality in the United States has being growing since at least the mid-1980s while, at the same time, inequality has been reduced at the lower end of the distribution. The implication on our decomposition and our inequality component is therefore that it captures global trends of the income distribution, but it lacks the capacity to unpack how wages are growing for specific subgroups.

V. Conclusion

Labour productivity growth outstripped median hourly real wage growth for the past few decades in eight of the 11 OECD countries studied. For these countries, we decomposed the growing productivity-wage gap into four components: inequality, measurement discrepancies, labour's terms of trade, and labour's share of income. The size of the productivity-wage gap varied by country, as did the components driving its growth. There are some very general trends in the effects of the two relationships and

their two respective underlying components. Increasing inequality and labour's falling share of income both increased the productivity-wage gap in most of the countries studied. The productivity-wage gaps in the United States and Germany were significantly larger than any of the other countries studied. The former's gap was driven by growing inequality and labour's increasingly unfavourable terms of trade, while the latter's gap was driven by growing inequality, labour facing increasingly unfavourable terms of trade, and labour's share of income falling over time.

We also show that despite indications of growing wage inequality in 10 of the 11 OECD countries, our inequality component is likely missing important information about how the labour income distribution is evolving over time. For example, while inequality in the United States has shown overall increases, there has been increased equality between middle and modest income earners. Future investigations into the productivity-wage nexus should strive to find alternative ways of decomposing the gap which better incorporate how the labour income distribution is changing on the whole.

Future research should seek to reduce the measurement discrepancies component of our decomposition by improving the compatibility of household surveys and SNA average hourly real wage estimates. The burden of data compatibility equally falls on the OECD and national statistics agencies, particularly for countries where there appear to be large measurement discrepancies, such as Denmark, France, and Ireland.

Future research should also improve our wage series by exploring annual household surveys alternatives to the Luxembourg Income Study. For example, using the Labour Force Survey for Canada it is possible to create an annual wage series without needing to interpolate missing values from 1997 to 2016. Ideally, such a data source would at least extend back to the early 1990s, as changes to productivity are long run phenomena which requires decades of data to produce good quality trends.

The lack of inclusive growth we observe in many OECD countries has significant societal implications. There may be less political support for productivity-enhancing policies in the future if the benefits of productivity growth are not shared equitably. The incentives for employees to work hard may diminish if they believe that they are not receiving their "fair share" of the firm's productivity gains. Finally, the current taxes and transfers system may not be well equipped to offset the growing trend of wage inequality among workers if it was designed assuming labour productivity growth will lead to real wage growth for all workers overtime.

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Appendix I : Alternative Decompositions

	Per cent per year			Percentage Point Contribution			
Canada 1987-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.18	0.40	0.78	0.52	0.15	-0.02	0.12
Median	1.18	0.57	0.62	0.36	0.15	-0.02	0.12
75th percentile	1.18	0.68	0.50	0.24	0.15	-0.02	0.12
One Percent	1.18	2.92	-1.74	-1.99	0.15	-0.02	0.12
the Rest	1.18	0.80	0.38	0.13	0.15	-0.02	0.12
Below Median	1.18	0.40	0.78	0.53	0.15	-0.02	0.12

	Per cent per year			Percentage Point Contribution			
Denmark 1987-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.61	1.08	0.73	0.11	0.67	0.02	0.06
Median	1.61	0.97	0.64	0.01	0.67	0.02	0.06
75th percentile	1.61	1.05	0.56	-0.07	0.67	0.02	0.06
One Percent	1.61	2.80	-1.19	-1.82	0.67	0.02	0.06
the Rest	1.61	0.90	0.71	0.08	0.67	0.02	0.06
Below Median	1.61	0.42	1.20	0.57	0.67	0.02	0.06

	Per cent per year			Percentage Point Contribution			
Finland 1987-2013	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	2.20	1.97	0.15	0.12	-0.22	-0.04	0.29
Median	2.20	2.06	0.14	0.11	-0.22	-0.04	0.29
75th percentile	2.20	2.04	0.07	0.05	-0.22	-0.04	0.29
One Percent	2.20	2.67	-0.55	-0.58	-0.22	-0.04	0.29
the Rest	2.20	2.06	0.05	0.03	-0.22	-0.04	0.29
Below Median	2.20	2.04	0.07	0.05	-0.22	-0.04	0.29

	Per cent per year			Percentage Point Contribution			
France 1986-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.71	0.64	1.07	0.18	0.71	0.18	0.01
Median	1.71	0.88	0.83	-0.06	0.71	0.18	0.01
75th percentile	1.71	1.22	0.48	-0.41	0.71	0.18	0.01
One Percent	1.71	1.49	0.22	-0.67	0.71	0.18	0.01
the Rest	1.71	0.78	0.93	0.04	0.71	0.18	0.01
Below Median	1.71	0.47	1.24	0.35	0.71	0.18	0.01

	Per cent per year			Percentage Point Contribution			
Germany 1994-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.39	0.64	1.07	0.18	0.71	0.18	0.01
Median	1.39	0.88	0.83	-0.06	0.71	0.18	0.01
75th percentile	1.39	1.22	0.48	-0.41	0.71	0.18	0.01
One Percent	1.39	1.49	0.22	-0.67	0.71	0.18	0.01
the Rest	1.39	0.78	0.93	0.04	0.71	0.18	0.01
Below Median	1.39	0.47	1.24	0.35	0.71	0.18	0.01

	Per cent per year			Percentage Point Contribution			
Ireland 1994-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	3.75	3.48	0.25	1.51	-2.03	0.20	0.57
Median	3.75	4.11	-0.36	0.88	-2.03	0.20	0.57
75th percentile	3.75	5.15	-1.43	-0.16	-2.03	0.20	0.57
One Percent	3.75	5.83	-2.10	-0.84	-2.03	0.20	0.57
the Rest	3.75	4.96	-1.24	0.03	-2.03	0.20	0.57
Below Median	3.75	3.75	-0.02	1.24	-2.03	0.20	0.57

	Per cent per year			Percentage Point Contribution			
Netherlands 1986-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.27	0.23	1.03	0.84	-0.13	0.06	0.26
Median	1.27	0.98	0.29	0.09	-0.13	0.06	0.26
75th percentile	1.27	1.24	0.03	-0.17	-0.13	0.06	0.26
One Percent	1.27	2.39	-1.13	-1.32	-0.13	0.06	0.26
the Rest	1.27	1.02	0.25	0.05	-0.13	0.06	0.26
Below Median	1.27	0.42	0.84	0.65	-0.13	0.06	0.26

	Per cent per year			Percentage Point Contribution			
Norway 1986-2010	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.80	2.34	-0.56	-0.03	0.26	-1.16	0.38
Median	1.80	2.09	-0.28	0.22	0.26	-1.16	0.38
75th percentile	1.80	2.15	-0.37	0.16	0.26	-1.16	0.38
One Percent	1.80	3.62	-1.84	-1.31	0.26	-1.16	0.38
the Rest	1.80	2.25	-0.47	0.05	0.26	-1.16	0.38
Below Median	1.80	2.11	-0.33	0.20	0.26	-1.16	0.38

	Per cent per year			Percentage Point Contribution			
Spain 1986-2013	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.05	1.39	-0.33	0.13	-0.27	-0.01	-0.18
Median	1.05	1.29	-0.24	0.23	-0.27	-0.01	-0.18
75th percentile	1.05	1.59	-0.53	-0.07	-0.27	-0.01	-0.18
One Percent	1.05	1.24	-0.19	0.28	-0.27	-0.01	-0.18
the Rest	1.05	1.53	-0.48	-0.01	-0.27	-0.01	-0.18
Below Median	1.05	1.28	-0.22	0.24	-0.27	-0.01	-0.18

	Per cent per year			Percentage Point Contribution			
United Kingdom 1986-2013	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.65	1.31	0.33	0.44	0.10	-0.32	0.11
Median	1.65	1.26	0.39	0.49	0.10	-0.32	0.11
75th percentile	1.65	1.50	0.14	0.25	0.10	-0.32	0.11
One Percent	1.65	3.75	-2.10	-2.00	0.10	-0.32	0.11
the Rest	1.65	1.62	0.02	0.13	0.10	-0.32	0.11
Below Median	1.65	1.30	0.35	0.45	0.10	-0.32	0.11

	Per cent per year			Percentage Point Contribution			
United States 1986-2013	**Labour Productivity**	**Hourly Real Wage**	**Productivity-Wage Gap**	**Inequality**	**Measurement Discrepancies**	**Labour's Terms of Trade**	**Labour's Share of Income**
25th percentile	1.63	0.15	1.47	0.52	0.24	0.57	0.16
Median	1.63	0.64	0.99	0.03	0.24	0.57	0.16
75th percentile	1.63	0.34	1.28	0.33	0.24	0.57	0.16
One Percent	1.63	1.94	-0.31	-1.27	0.24	0.57	0.16
the Rest	1.63	0.44	1.19	0.23	0.24	0.57	0.16
Below Median	1.63	0.56	1.06	0.11	0.24	0.57	0.16