

Rising wage and income inequality.

Reviewing a renewed debate

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Abstract: The debate about wage and income inequality is receiving in recent years a renewed interest, driven by the public perception of the recent evolution of this topic. This paper takes up the last twenty-five years of debate contrasting the “demand-supply” interpretation of inequalities with a more “institutional-based” view, and evaluates this debate in the light of some current issues, in particular the impact of immigration and of the Great Recession.

In this paper we offer a synthetic view of the debate about wage and income differentials in last twenty-five years. We report the content of some key contribution about ins and try to give an interpretative line, contrasting the “demand-supply” interpretation of inequalities and more “institutional-based” view. We also deal with the recent literature on the relationship between income inequality and economic crisis.

1. *Introduction*

In the beginning of the 1990s a series of papers addressed the topic of wage inequality, stimulated by the increase in wage differentials happened in the

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previous decade in many OECD countries, particularly in the United States and United Kingdom. In 2009 a book, “The Spirit Level”, by Richard Wilkinson and Kate Pickett, opened a series of even best sellers about the nature, the causes and the effects of economic inequality, like “The price of inequality” by John Stiglitz in 2012 and “Le capital au XXI^e siècle” by Thomas Piketty in 2013: this renewed interest, among the scholars and the public, was driven by the moderate but constant and widespread increase in income inequalities which worsened the economic framework characterised by a severe economic crisis and induced scholars to reflect on the causal relationship between the increase in inequalities and the negative economic phase; another important phenomenon, raised in last years, concerned the dramatic increase in top incomes which was observed particularly in Anglo-Saxon countries. In the meantime, between these two landmarks, along this over twenty-year period, the debate about wage and income inequalities indeed continued, sharpening the theoretical and empirical instrument of analysis, contrasting market-based views and other interpretations based on institutional settings and even changing the specific issue, according to the phenomena emerging from the real world, in any case marking a revival of interest in the subject of inequalities, that had long been shelved.

This renewed interest of the scholars about the topic of inequalities was certainly driven by the public perception of the importance of this subject, witnessed not only by the already cited commercial success of some books but also by some surveys, which demonstrated that inequality matters for European (Boeri, Boersch-Supan and Tabellini, 2002), American (Alesina and La Ferrara, 2000) and Japanese (Jacoby, 2005) people.

The aim of this paper is to offer a synthetic view of the debate about wage and income differentials, trying to give an interpretative line, particularly contrasting the “demand-supply” interpretation of inequalities and more “institutional –based” views. In fact, notwithstanding the prestige and authority of some explanations of phenomena based on pure market movements, the

abundance and significance of contribution which integrate and/or substitute such explanations with those based on the behaviour of institutions convinced us that is at least necessary to integrate the two kinds of explanations to understand the significant movements of inequalities in last thirty years.

The paper is so structured: after this introduction, Section 2 reports some relevant data concerning the phenomena introduced above; Section 3 concerns the debate about wage differentials which emphasises the role of technical progress and job polarisation; Section 4 discusses the role of globalisation; Section 5 analyses the impact of immigration on wage differentials; Section 6 synthesises alternative explanations to wage differentials, emphasizing the role of labour-market institutions; Section 7 focuses its attention on other aspects of income inequality: labour income share and household income inequality; Section 8 reports the debate about the increase of top incomes and the role of the “grabbing hand”; Section 9 synthesises the debate about the relation between inequality and economic crisis. A synthesis of the debate and some general considerations conclude the paper.

2. The data

As we mentioned in the Introduction, the renewed interest of the scholars toward inequalities, from the beginning of 1990s, was certainly driven by real phenomena. Therefore, this paper must necessarily begin with stylised facts about inequalities.

We firstly report data about income inequalities (the 90/10 percentile of gross earnings), from 1970s to nowadays for many countries, underlining the significant and constant, even though at different rates, increase in United States and United Kingdom, while in other countries the trend was more articulated. Then we report data about wage and employment differentials by skills, because this dimension of inequality was particularly emphasised by literature, with wage

differentials which particularly increased in USA and UK, while in other countries, particularly many European countries, the differentials by skills increased in unemployment rates, justifying therefore a framework based on an unemployment/wage trade-off. The reduction in the growth rate of wage differentials in the 1990s induced many scholars to explore other dimensions of inequalities, like the polarization of incomes and wages: this is the reason why we report data about different percentiles of income distribution (90/50 and 50/10 percentile of gross earnings and wage). The wage polarization was accompanied by job polarization, whose data, particularly about the United States, are also illustrated. Other streams of literature, which we may consider in a sense as “alternative”, explored different dimensions of inequalities, like the share of different source of incomes (wages and profits) on total national income, whose proportion changed in the period we are considering and whose data are therefore reported. We also report data about the recently increasing share of total incomes detained by the top of the distribution, an aspect on which many scholars recently focused; many papers hypothesized a link between the increase in these different dimensions of inequalities and the recent economic crisis, on the severity of which we report some data.

The 1980s were a period of dramatic increase in income inequalities, in the United States and United Kingdom, following a decade where inequalities were almost stable and followed by a period where inequalities continued to rise but at a slower rate.

Table 1 (all tables and figures are reported in the Appendix) illustrates the evolution of the 90/10 percentile ratio of gross earnings (OECD data): it usually refers to male earnings, in order to isolate the effects of gender differentials; nevertheless, we also report, for each country in the second row, the total (male and female) gross earnings ratio. The most recent figures date back to 2011; from here we go back to five years in five, until 1971. In the United States we may observe the slow increase of this ratio in the 1970s (the male ratio rose from 3.39

in 1973 to 3.66 in 1981), the dramatic increase in the 1980s (from 3.66 in 1981 to 4.28 in 1986 to 4.48 in 1991), followed by a continuous increase, but at a slower rate, from 1990s until 2006 (the ratio was 4.83 in 2001 and 5.01 in 2006); in more recent years the ratio showed a substantial stability (it was 5.09 in 2011). The trend was similar in United Kingdom: the rate fluctuated in 1970s (2.68 in 1971, 2.59 in 1976, 2.79 in 1981), increased significantly in the 1980s (it arrived at 3.30 in 1991), then continued to increase (3.54 in 2001, 3.78 in 2011).

Freeman (1995) makes a remarkable observation: the relative position of low-income people would not have attracted so great concern if their real wage had not diminished in real terms: he reports that the real hourly earnings of all men in the bottom decile of the earning distribution indeed fell, while that of men in the upper decile modestly rose.

While in the United States and United Kingdom wage inequalities increased substantially in last thirty years, the phenomenon of increasing inequalities, while somehow interested the large part of OECD countries, had different trends across countries. France, the Netherlands, Scandinavian countries like Sweden and Denmark, an extra-European country like Japan, knew a little increase of earnings inequalities in 1980s, while in Australia there was a decrease in the first half of the decade, followed by an increase in the second half. In the 1990s the trends of earnings inequality were rather diversified: it actually decreased in countries like France and Germany, remained almost constant in Finland and Japan and increased significantly in many European (Italy, the Netherlands, Sweden) and extra-European (Australia, New Zealand, South Korea) countries. In the first decade of the 21st century the trend were quite diversified too: in France inequality continued to decrease; in some countries, where inequality increased during the 1990s, differentials decreased but without returning to the level of early 1990s (Italy, Sweden); in other countries, where there was a decrease in the inequality along all the 1990s (Germany) or in the second half of the decade (Japan), an upward trend resumed; in Finland and the other, in addition to Japan, considered

extra-European countries (Australia, New Zealand, South Korea) in the first decade of the 21st century the upward trend of the 1990s continued.

Going into the dimensions of such increasing wage inequality, the attention of the scholars concentrated on wage differentials by skills (as proxied by educational attainment), particularly on its sharp increase in the 1980s after the decrease in the 1970s. In the United States the ratio between the wages of college graduated workers (6 and 7 ISCED levels) and the wage of workers with up to lower secondary education (0, 1 and 2 ISCED levels) was 1.49 at the beginning of 1970s, 1.37 at the beginning of the 1980s and 1.51 at the end of the 1980s. The trend was similar in the United Kingdom: the same educational wage differential decreased from 1.64 to 1.53 in the 1970s and increased up to 1.65 in the 1980s (see Table 2 in the Appendix). In other countries the increase was more limited (in Germany from 1.36 to 1.42; in Sweden from 1.16 to 1.19; in Canada from 1.40 to 1.42; in Italy from 1.60 to 1.61).

In many countries in the 1980s there was also a significant increase in differentials in employment and unemployment rates by skill, even in those countries where wage differentials increased slowly or did not increase at all. Table 3 reports data from the paper by Glyn (2000) about the change in percentage points of per year employment differences, during 1980s and 1990s, between fourth and first quartile of educational distribution (Glyn states that data about employment are more reliable than data about unemployment, because many of the least qualified who cannot find work drop out from the labour force, decreasing the unemployment rate of their group in front of a worsening of their situation in the labour market). Besides the positive changes in almost all countries, it is remarkable the data of the United States, where employment differentials by skills did not increase while wage differentials had a significant increase over all the period considered, as seen before.

In the beginning of the 21st century the attention of the scholars focused on the decreasing rate of growth in wage inequality, between high and low incomes,

during the more recent years; for many of them it appeared as the sum of two different effects: the inequalities between high and middle incomes, after the 1980s continued to increase at a high rate, while the inequality between middle and low incomes remained more or less constant or decreased. Figure 1 in the Appendix, reported from Autor, Katz and Kearney (2006), shows the 90/50 and the 50/10 percentile ratio of log hourly wages in the USA: it is possible to observe the similarity of two trends until the middle of the 1980s; then the 90/50 percentile ratio, after one year (1990) of sharp decrease, begun to rise again, while the 50/10 percentile ratio had a decrease in the second half of the 1980s, then it presented an erratic trend.

The divergent trends of these two ratios are observable in many countries where there was an increase in the overall inequality in the 1990s and/or in the first decade of the 21th century. Table 4 in the Appendix reports the 90/50 and the 50/10 percentile ratio of gross earnings, according to OECD data, every five years from 1991 to 2011, in some countries where overall inequality increased in one or both two last decades. In the United States, United Kingdom, Australia and New Zealand, where overall inequality increased from 1991 to 2011 (as shown in Table 1), in the same period the 90/50 percentile ratio sharply increased, while the 50/10 percentile remained at the same level or increased very weakly; only in South Korea the increase of overall inequality in the twenty-year period has been accompanied by a substantial increase of both 90/50 and 50/10 percentile ratios. In Italy and Sweden the overall inequality increased in nineties: even in these countries such increase has been clearly driven by the increase in the inequality between the high and middle incomes (the 90/50 percentile ratio increased), while the inequality between middle and low earnings remained more or less at the same level (the 50/10 percentile ratio was almost constant).

Such diverging trends of inequalities at different height of the income distribution in last twenty years led scholars to investigate the wage differentials by skills. Figure 2 and Figure 3 in the Appendix, taken from Autor (2010),

synthesise respectively the change overtime of the employment share and of hourly wage for different kinds of jobs in the United States. While from the middle of the 1970s and the end of the 1980s the trend is clear, as low-skilled/low-wage jobs decline in employment share and in relative hourly wage (percent change of hourly wage relative to the median), and high skilled/high-wage jobs increase both in employment share and in wages, from the end of the 1980s to 2006 the trends become more complex, consistently with the trends of overall income inequalities. In fact the trend of hourly wage shows an evident polarisation: hourly wages increase for very low-wage jobs (up to the 20th percentile) and for the high wage jobs (from the 60th percentile), while it declines or remains constant for the “middle-wage” jobs; the change in employment share shows a very similar U-shape trend in the 1990s (the employment share increases for very low-skilled and for high-skilled jobs and declines for the middle-skilled jobs), while from 1999 to 2007 the change in employment share is positive only for low-skilled jobs. Autor (2010) also emphasises that such trends are not unique to the United States but they are widespread across industrialised economies: he takes sixteen European Union countries into consideration, from 1993 to 2006, and he finds an increase of the share of employment for low-wage occupations in eleven of sixteen countries and for high-wage occupations in thirteen of sixteen countries. The paper by Goos, Manning and Salomons (2014), also considering sixteen Western countries, comes to a similar conclusion. These data are therefore explained with the theory of job polarisation.

If some scholars tried to explain the trends of the 90/10 percentile, decomposing it in the way described above, other scholars found the 90/10 percentile ratio unsatisfactory in another sense: they focused their attention on the incomes at the very top of the distribution, attributing to their dramatic increase the increase of overall inequalities. Piketty (2013) underlines the dramatic increase of the share of top-centile incomes on the total national income in the Anglo-Saxon countries from the 1980s to nowadays, while in Europe and Japan this ratio

had a much smaller increase: in the 1970s this ratio was around 9% in Canada, between 6% and 8% in United States and United Kingdom and around 5% in Australia; in the beginning of 10s of 21st century the ratio was 20% in the United States, between 14% and 15% in United Kingdom and Canada and between 9% and 10% in Australia. As regards Europe, in the same time interval the ratio goes from 9% to 11% in Germany, from 7% to 9% in France, from 4% to 7% in Sweden; in Japan it goes from 7% to 9%. Similar trends are observed if the top millile is taken into consideration.

The data so far illustrated regards wage differentials, which are the aspect of inequality that most concerns labour economists. As Checchi and Garcia-Peñalosa (2008) state in their paper, beyond inequality in earnings, the other relevant aspects of inequality concerns the reward of productive factors (therefore the shares of wages and capital income aggregate income), mainly analysed by macroeconomists, and the inequality in household incomes, mainly focused by policy-makers, which combines capital income from different sources received by the household, the different labour incomes of household members, and government transfers.

Table 4, taken from their paper, reports the trend of the wage share on household income (microdata, from Luxembourg Income Study) and of the share of wage in corporate value added (or aggregate wage share: macrodata, from OECD) from 1970s to the beginning of the XXI century for seventeen countries. While in the United States the trend of both measures is almost constant, in the United Kingdom the wage share on household income sharply declines from the middle of the 1970s to the beginning of the 1990s, the aggregate wage share slowly but constantly declines from the middle of the 1970s to the middle of the 1990s. In the other countries levels and trends differ substantially across countries, anyway, a negative trend for wage share prevails: while in some countries (Belgium, Finland, France –only wage share on household income- and Italy) there is a sharp decline throughout the period, there is no country with a constant

increase. Globally, it is possible to say that this dimension of economic inequality, that between the rewards of factors, is increasing too.

From the same source (Luxembourg Income Studies) and for the same period, Checchi and Garcia-Peñalosa (2008) also report data about inequality (Gini index) for disposable income: the majority of countries witnessed an increase in inequality; this happened in the United States, United Kingdom, Germany, Belgium and three of the Scandinavian countries (Sweden, Norway and Finland), Austria, Ireland, Netherland and Switzerland showed a decreasing trend, while in the other countries the trends were not uniform.

As it is well known, in 2007 a severe economic crisis begun in the United States, then in Europe. In many countries, like United States, Italy, Great Britain and Ireland, it was the most severe economic downturn since the 1930s; the OECD area as a whole reduced in size by 5 per cent between the first quarter of 2008 and second quarter of 2009 (Jenkins et al. 2012). The simultaneous existence of increasing levels of inequalities, which we discussed earlier, has made many scholars think that there was a link between two phenomena.

3. *Wage differentials, technical progress and polarisation*

The increase in wage differentials in the 1980s and 1990s, particularly between skilled and unskilled workers, stimulated an abundant literature on the causes of this phenomenon. Changes in relative wages were linked to changes in relative labour demand and supply and scores of papers focused on this relationship, highlighting the role of technical progress and globalisation.

A milestone in this literature is provided by Katz and Murphy (1992), who analyse the changes in relative wages in the United States from 1963 to 1987. They conclude that fluctuations in the college/high school wage differentials may be largely explained by fluctuations in the rate of growth of the supply of college

graduates and of the demand for more educated workers. From a theoretical point of view they introduce a simple model with two skill-groups of workers that provide different and imperfectly substitutable labour services. In a subsequent work, discussing the book by Goldin and Katz (2010), whose central idea is that the distribution of earnings in the 20th century may be explained by demand and supply of human capital, Acemoglu and Autor (2012) refer to this model as the “canonical model”. A simple and clear formulation of this model may be found in Machin (2011):

$$\ln(W_s / W_u) = (1/E)[D - \ln(N_s / N_u)]$$

where W_s / W_u is the relative wage of the two types of labour (skilled and unskilled), N_s / N_u is the relative supply of labour, D is a relative demand index of shifts favouring skilled workers and E is the ease of substituting the two types of workers.

Acemoglu and Autor (2012) follow Katz and Murphy’s method to estimate the college/high school wage premium from 1963 to 1987; in their empirical model the D from the previous equation is replaced by a linear time trend:

$$\ln(W_s / W_u)_t = \gamma_0 + \gamma_1 \text{trend} - \gamma_2 \ln(N_s / N_u)_t + v_t$$

Notwithstanding its simplicity, this specification performs well in explaining the evolution of the college wage premium: in particular, the increase of the premium from the end of the 1970s is consistent with the deceleration in the growth of college relative supply. This explanatory performance gave great credit to the canonical model.

Obviously, the evolution of wage differentials must be explained not only by the evolution of relative supply but also by an increasing trend in labour demand (the supply of college-educated workers always increased in the 1980s: in the absence of a positive demand trend, this would imply a decrease in college wage premium). Indeed, even before the formulation of the “canonical model”, changes in U.S wage structure were attributed to shifts in labour demand, as Katz

and Murphy (1992) themselves report. A wide debate concerned the causes of this trend in relative demand.

From the early stages of the debate (see Katz and Murphy, 1992), three main causes were identified: skill-biased technical change (SBTC), globalisation (mainly conceived as increase in foreign trade, as well as in labour offshoring) and the role of labour market institutions, particularly trade unions. According to the first hypothesis, the new technologies widely introduced in the 1980s, particularly Information and Communication Technology (ICT), are complements to skilled workers and substitutes of unskilled ones, therefore increasing the relative demand of skilled workers. According to the second hypothesis, globalisation intensified the international specialisation of production, with the western countries producing goods with higher technological content, requiring therefore a higher content of skills in the workforce (Murphy and Welch, 1991). According to the third hypothesis, the 1980s were characterised by a significant reduction of the strength of trade unions and of their capacity to impose levelling of wages (Freeman, 1992); changes in pay norm must also be kept into consideration (Mitchell, 1989).

The SBTC hypothesis emerged in the early 1990s as the more convincing one. Even before the formulation of the “canonical model”, some papers affirmed that technological changes (possibly associated with the computer revolution) raised the relative demand for more-educated and flexible workers and reduced the demand for physical labour (Davis et al., 1991; Krueger, 1993; Mincer, 1991). Then various papers (Berman, Bound and Griliches, 1994; Autor, Katz and Krueger, 1998) showed a strong correlation between skill upgrading and various measures of technological change, like computerisation and R&D expenditures.

The wide debate on skill-biased technical change (SBTC) theory led to identify some inconsistency of this theory. Already Card and Di Nardo (2002) had found that the main problem for the SBTC theory was that wage inequality stabilised in the 1990s despite continuing advances in computer technology. In fact, the “canonical model” generated an overprediction of the rise in wage

inequality, as was clearly shown by Autor, Katz and Kearney (2006). If the Katz and Murphy's model is plotted throughout 1987-2008, the fit remains quite good through 1992, then the model systematically deviates from the data, predicting a sharper rise in the college premium than actually occurs. Without further refinements, the model suggests that the trend in relative skill demand decelerated in the 1990s, but this does not accord with common knowledge about the nature or pace of technological change in this period.

The solution of this puzzle was found in a more articulated view of the labour market. A job polarisation or job-tasks approach emerged, first in Autor, Levy and Murnane (2003) and then, more fully, in Autor, Katz and Kearney (2006). The role of technology remains paramount but turning from SBTC, which explained the change in wage differentials until the 1990s, to a routine-biased technological change (RBTC). The RBTC approach overcomes the simple distinction between skilled and unskilled workers, and substitutes it with the double differentiation between routine and non-routine and between manual and non-manual jobs. Across these categories, four typologies of jobs are generated, whose relationship of substitutability or complementarity with ICT is analysed. Routine jobs are considered direct substitutes of ICT, therefore they are penalised by technological change; the "winning" category in the job market of the 1980s and the 1990s are the non-routine non-manual jobs, which are strongly complementary to ICT; the manual non-routines jobs are broadly neutral to ICT; demand for these jobs is however likely to increase following the increasing demand for the services they provide.

This state of affairs brings therefore about a polarisation of employment toward non-routine non-manual jobs and manual non-routines jobs. On the other hand, automation and offshoring substituted the middle-skilled routine tasks that were performed by workers with moderate education. Bookkeeping, clerical work and repetitive production tasks are some examples of such kinds of jobs; as computer and communication technologies improve in quality and decline in

price, the routine tasks are increasingly codified in computer software and performed by machines or, alternatively, sent electronically to foreign workers to be performed by comparatively low-wage workers.

This polarisation raises relative demand for non-routine tasks, that can be roughly subdivided into two major categories: abstract tasks and manual tasks; the first ones require problem solving, intuition and persuasion, therefore they must be performed by workers with high level of education and analytical capabilities; the second ones require situational adaptability, visual and language recognition and in-person interactions, then they require little formal education. Therefore, technical change—and offshoring are the more accredited explanation for the job polarisation phenomenon.

Michaels, Natraj and Van Reenen (2013) test the hypothesis that job polarisation is due to the development of ICT, using industry-level data on the US, Japan, and nine European countries for 1980-2004. They find evidence consistent with ICT-based polarisation. Trade openness is also associated with polarisation, but this result is not robust when controlling for technical change. Also Goos, Manning and Salomons (2009; 2014) document the pervasiveness of job polarisation in sixteen Western European countries over the period 1993-2010. They develop and estimate a framework to explain job polarisation through RBTC and offshoring. Their estimates suggest that RBTC is much more important than offshoring.

The evolution of wage differentials during the 1990s and the early 21st century is then explained by this new pattern of relative task demand. A process of wage polarisation should follow the declining demand for routine tasks, while changes in labour market institutions (declining trade union strength and minimum wage) do not have a great role, at least according to Autor and his American associates. However, the existing evidence is not entirely consistent with this view: virtually all European countries experienced job polarisation as much as the

US economy, yet most of them have not experienced wage polarisation but rather a continued increase in inequality across the board.

Besides, the capacity of job polarization to represent an universal explanation of the generalised increase in wage inequality has been questioned: The link between job polarization and increasing wage inequality is found in UK and USA.: Goos and Manning (2007), studying occupational demand shifts in the UK, find a relationship between the u-curve of occupational growth along the skill distribution and the rising wage inequality; Autor, Katz and Kearney (2008) draw a direct link between occupational and wage shifts in the United States; on the contrary Goos, Manning and Salomons (2009; 2014), in their above cited study about sixteen Western European countries, confirm an increase in job polarization and wage inequality, but they find no link between the two phenomena in a cross-country analysis. The same holds for Canada, according to Green and Sand (2014). Reinhold (2016), underlines that it is difficult to assess the impact of job polarization on wage inequality in cross-country and within-country analysis, because different levels of wage inequality may derive not only from different degrees of job polarization, but also from differences in the demand and supply for skills and in the institutional framework (employment law, union coverage, or social preferences to wage compression). This is the reason why he conducts an analysis at a regional level in Germany: institutional factors may be assumed alike between regions in one country and supply of high skilled labour is harmonised within a country; therefore he can relate the wage inequality across regions with their job polarization degree, without disturbing factors: he finds that regions in which job polarization occurs do not differ in structural wage inequality from regions in which job polarization does not occur; hence, in Germany job polarisation is an unlikely driver of rising wage inequality.

The contrasting results of these studies suggests distinct wage formation between Anglo-Saxon and Continental European countries (Acemoglu and Autor, 2011, Blau and Kahn, 1996, 2002), where the different institutional context,

particularly the different flexibility of the labour market, certainly plays a role. We return more extensively on this issue in Section 6.

This problematic evidence also raises the question of whether wage polarisation may also have been generated also by other factors than job polarization (e.g. a higher minimum wage, diminishing union strength, and of ‘classical’ SBTC) that have been unduly neglected. Cozzi and Impulliti (2016), developing a Schumpeterian model of endogenous technological progress, argue that a non-negligible part of US wage polarization may be due to a long-run technological globalization process, which caused a catching-up process of the USA by Japan and Europe and which plays a role in driving several dimensions of inequality.

The challenge of the theoretical complexity posed by these studies has been accepted by Autor, who continued to study the job-tasks issue, developing models which take many factors into consideration, like the dynamic aspects of skills supply and of technological capabilities, the trade and offshoring opportunities, concluding for an optimistic forecast for the potential of job tasks approach to account for the interactions of such aspects and for the evolution of the demand for skills, of the assignment of skills to tasks and of the wages (Autor, 2013; Autor and Handel, 2013).

4. Wage differentials and globalisation

As mentioned above, the other oft-mentioned motive power of skill upgrading is growth in international trade. The natural framework for analysing the impact of trade on labour markets, at least from a maintained assumption of competitive markets, is the Stolper-Samuelson theorem and its various generalisations. The implication of the theorem is that an increase in trade implies, for skilled-labour abundant economies, a reduction in the relative price of unskilled-labour intensive goods and of the relative wages for unskilled labour. Trade with countries having a

comparative advantage in unskilled-labour-intensive production stimulates specialisation in skill-intensive industries (between-industry effect). Therefore, the increased trade with China and India should have worsened, for Western countries, the distribution of earnings. Furthermore, firms reorganise their activities by outsourcing to foreign countries (where labour is cheaper) the less skill-intensive tasks of production (a within-industry effect).

Generally speaking, the evidence in favour of an important role of international trade is not very strong. Burfisher, Robinson and Thierfelder (1994) find small effects for the United States of liberalised trade with Mexico as a result of the North American Free Trade Agreement. Freeman (1995, p. 17) in a well-known paper states that “trade matters but it is neither all that matters nor the primary cause of the observed changes”. Krugman (1995) concludes that the effect on unskilled wages in developed nations of plausible levels of increased trade with developing countries is small (but negative), and is swamped by other, positive effects. Leamer (1998) and Feenstra and Hanson (1999) extend this framework to incorporate technological change. Leamer concludes that price changes dominated technological changes in the 1970s, but that the reverse was true for the 1980s. Feenstra and Hanson find that only under assumptions of exogenous commodity prices and exogenous sector-specific wage differentials does outsourcing play a large role in generating wage inequality. Feenstra and Hanson consider the effect of offshoring too, a rather little considered topic to which we come back below. They decompose their measure of technological change into components due to deployment of high-technology equipment and offshoring. They find that offshoring plays a large (though not precisely estimated) role in generating wage inequality, but technological change dominates other effects.

Gaston and Rajagur (2009) emphasise that the appropriate implementation of the Stolper-Samuelson framework and the interpretation of the empirical analysis are likely to be controversial. They reiterate, anyway, the conclusion that trade has a relative small effect on the skill premium and that, among other factors,

technological change is the more important. Counter to this runs, the important study of Kletzer (2001) documents the job loss in the US linked to the import of goods and services; yet its findings are differently interpreted: some commentators emphasise the strong and lasting loss of income (Levy, 2005), while others minimise the scope of this evidence assimilating it to the effects of technological change (Bhagwati, Panagariya and Srinivasan, 2004) or labour market rigidities (Amiti and Wei, 2005).

The conclusion that the impact of globalisation on the rising skill premium is negligible may be sensitive, above all, to the competitive-markets assumption. Few contributions try to overcome such hypothesis, even though the trade-based theory increases its explanatory power. Gaston and Nelson (2000) find that the impact of increased trade on the decline of relative wage of skilled labour, negligible in a perfect market competition context, becomes significant allowing for imperfect competition. Moreover, globalisation is thought to have reduced union density and the bargaining power of trade unions, leading to higher wage inequality (OECD, 1997). We will come back to this point in Section 6. This could imply that we are not dealing with exogenous skill allocations. The rise in inequality therefore crucially depends on public policies for skill formation and deployment (Levin-Waldman, 2015).

The interpretation derived from traditional international trade theory has linked globalisation to an increase in the relative wages of skilled workers in rich countries; however, empirical evidence is more diversified: a significant number of cross-country analyses shows that trade integration has increased inequality in both rich and poor countries (Milanovic and Squire, 2007).² Other studies suggest that the increase in imports from developing countries has reduced inequality in advanced countries (Papageorgiou, Jaumotte and Lall, 2008). Surely it is

² It should be pointed out that complex structure that the international division of labour has taken causes the breakdown of high or low-wage jobs to cut across economies at different stages of development (Bhorat and Lundall, 2004).

necessary to analyse the interactions of globalisation with such mechanisms as relocation, financialisation, foreign direct investments and so on (Scheve and Slaughter, 2007). Among these factors, the role of ITC is clearly paramount (IMF, 2007; OECD, 2007). In practice, however, it is difficult to separate the contribution of ICT per se from the effects that it has, for example, on offshoring. As said by Freeman (2009), “*offshoring and digitalization go together*”. Hence the necessity to allow more fully for offshoring in the analysis of the evolution of wage differentials (Mankiw and Swagel, 2006, for an important analysis; Bhagwati and Blinder, 2009, for a review of the empirical analyses of offshoring). Overall, also considering the confounding role of the change in the composition of output, it is difficult to quantify the role of offshoring on the rise in inequality, although it is undeniable (Feenstra and Hanson, 1999; Michaels, Natraj and Van Reenen, 2014). In particular, it is apparent that the most easily relocated jobs are those in which price competition is more intense (Autor, Levy and Murnane, 2003; Bardhan and Kroll, 2003; Van Welsum and Vickery, 2005; Blinder, 2006; Jensen and Kletzer, 2006; Levy and Yu, 2006; Blinder and Krueger, 2009; Kauhanen, 2013; Püschel, 2015; Artuç and McLaren, 2015).

Furthermore, empirical analysis emphasises that wage differentials are affected by the choice of the production steps to be relocated. The fall in transport costs makes it convenient to outsource labour-intensive production steps in low-wage countries and maintain more skill-intensive production in developed countries. Hsieh and Woo (2005) analyse this process in relationship to Hong Kong and China's surrounding regions, while Feenstra and Hanson (1997) focus on the relationship between Mexico and the United States.

Also important is the gradual decline of the manufacturing labour as a proportion of the labour force. The paper by Ebenstein et al. (2014) is very significant in this respect. They link industry-level data on trade and offshoring with individual-level worker data from the Current Population Surveys from 1984 to 2002. They find that occupational exposure to globalization is associated with

significant wage effects, while industry exposure has no significant impact. Their evidence shows that globalisation has put downward pressure on worker wages through the reallocation of workers away from higher wage manufacturing jobs into other sectors and occupations.

An increase in international workforce competition reduces the bargaining power of the workers (Borjas and Ramey, 1995). However, offshoring effects on inequality depend on social protections of a country (Milberg and Winkler, 2013) and on its sectorial specialization (Weyl, 2014; Alesina, Baqir and Easterly, 1999). The more labour market policies are wide and strong, the more effective they are to shield workers against offshoring (Belser and Lee, 2011; Behrendt et al., 2011; ILO, 2011; Baldwin and Huber, 2010).

The complex structure that the international division of labour has assumed means that high and low-wage jobs are not confined to developed or developing economies (Bhorat and Lundall, 2004). This confirms the need for an analysis of offshoring processes to understand the trends of the labor market (Blinder and Bhagwati, 2009, for an empirical analysis: Mankiw and Swagel, 2006). Broadly speaking it is true that globalization has intensified the competition on the labor market, thus making even more necessary a public intervention in this field (Garrett and Mitchell, 2001 and, for a different opinion, Kittel and Winner, 2002). The wage dynamics is also affected by the choice of what part of production to relocate. The fall in transport costs makes it convenient outsourcing of labour intensive activities, thus widening the income inequality (Hsieh and Woo, 2005, for Hong Kong, Feenstra and Hanson, 1997, for Mexico).

The different geographical distribution of the value chain has also increased the potential for contagion and systemic risk, making it difficult to assess the efficiency without considering also that dimension (Jackson, 2013). Overall, given also the change in the composition of the output, it is difficult to quantify the role of outsourcing on the rise in inequality, though its impact is undeniable (Feenstra and Hanson, 1999 Michaels, Natraj and Van Reenen, 2014). In general, it is clear

that the price competition is significant in low skilled jobs (Artuç and McLaren, 2015, Blinder, 2006, Autor, Levy and Murnane, 2003 Bardhan and Kroll, 2003 Levy and Yu, 2006 Van Welsum and Vickery, 2005, Jensen and Kletzer, 2006).

Offshoring, in particular, helps to reduce wages threatening the workforce to close the national plant. Moreover, as going abroad means an increase in FDI and a reduction of export, the country has a worsening of trade balance thus pushing for restrictive policies that increase income inequality (Dabla-Norris et al., 2015).

The labour market, with all the different agents involved, is a complex environment; globalization and immigration made it even more complex. The production of public goods, reducing income inequality and improving the welfare conditions can help immigration and outsourcing processes (Milberg and Winkler, 2013) to run smoothly and labour market to work in a far and efficient way and also empirically, it is possible to identify a connection between public good supply and economic inequality among different ethnic groups (the so called Between Group Inequality BGI; Rodrik, 2017).

The impact of globalization on wage differentials has been explored by other points of view.

The increase in the weight of services in GDP has also increased international trade in the service sector (Irwin, 2009). Regarding the effect of this evolution on wage inequality, it should be noticed that there exist measurement problems (Jensen, 2009). Liu and Trefler (2008, 2011) for the United States find very limited effects on wages and a significant increase in local wages.

A further area of investigation concerns the success of relocating companies in increasing their efficiency (Hummels et al., 2011, Hummels and Schaur, 2013). This has obvious consequences on wages so that companies in the same industry can show different wage developments for the same categories of workers.

In a world where production is dominated by large companies based in industrialised countries, connected in a complex network of suppliers all over the world (the global value chain), the difficulty of reaching unequivocal conclusions on globalisation also depends on the inability to accurately identify costs and benefits of changes in this network (Milberg and Winkler, 2013). Obviously, the relationship between offshoring and inequality is also affected by public policies. Offshoring is found to have less unfavourable effects where these policies are more pervasive (see also Belser and Lee, 2011; ILO, 2010).

Another fundamental aspect of globalisation is the increase in global finance integration. According to Gaston and Nelson (2000; 2002) the deregulation in goods and financial markets has a significant impact on inequality. [Furceri and Loungani \(2015\)](#) analyse the relation between financial globalization and inequality: as they argue, this is a surprisingly little studied issue. In their view, capital account liberalization may affect inequality in four ways: a first channel is through the liberalization of risk sharing, which may allow best consumption smoothing and may reduce volatility, therefore reducing inequality; a second channel is through an increase in the likelihood of financial crisis, which, in their turn, may have ambiguous effect on inequality, because falling asset prices may have greater impact on those who are better off but financial crisis may be associated with long-lasting recessions, which disproportionately hurt the poor; a third channel is through increased foreign direct investment, which increases in their turn the demand for skilled labour compared to unskilled labour; a fourth channel is through a change in the distribution of income: if capital account liberalization is a credible threat to reallocate production abroad, it may lead to an increase in the profit-wage ratio and to a decrease in the labour share of income. The empirical analysis is conducted on a large panel of 149 countries from 1970 to 2010. The key finding is that the capital account liberalization reforms are associated with a statistically significant and persistent increase in inequality. In particular, the capital account liberalization reforms typically increased the Gini

coefficient by about 0.8 percent one year after the occurrence of a liberalization reform and by about 1.4 percent 5 years after. In addition, the authors find that capital account liberalization reforms lead to larger increases in inequality in countries with a weak level of financial institutions and when they are followed by episodes of financial crises. They also find evidence that capital account liberalization episodes affect the distribution of income by reducing the labour share of income.

From this survey about the effect of globalization on inequality, the need emerges to assess the institutional context beyond the theory of comparative advantages. This context includes, the institutional situation of the labour market, corporate governance and various forms of public regulation, the degree of finance liberalization, the strength of financial institutions.

and finance,

5. Wage differentials and immigration

Besides offshoring, workforce from abroad can be employed at home thanks to immigration. Immigration can reduce wages through increasing supply of workforce but can increase the labour share of national income due to an increase of total workforce. To assess exactly the different effects of immigration on the labour market it is important to observe the institutional features of the market itself and the skills of different layers of the market. An overall assessment of immigration contribution to the economy is important but it is also important to analyze its effect on different sections of the labour market in terms of spatial dimension, different skills and so on. Natural experiments analyses have been stimulated by the work of Card (1990) that studied the impact of Cuban immigration on the labour market in Miami, when, in 1980, more than 125,000 Cuban immigrants arrived in the city; he finds no effect on wage or unemployment

of low skilled workers. Angrist and Krueger (1999) objected that the experiment was not methodological significant but they did observe a parallel fact when in 1994 a similar episode occurred and data registered a strong increase in black people unemployment. In other situations there were no effects (Hunt, 1992; Carrington and Lima, 1996). Many scholars have criticized the approach of Card that is based on a local market, although the dynamics of labour market are not local. More interesting approaches are based on the substitution elasticity of different workers (Borjas, 2003), to analyze how much this kind of elasticity can resist, so to speak, the capital mobility that is basically perfect in modern conditions. Ottaviano and Peri (2012, for the US) and Manacorda, Manning and Wadsworth (2012, for the UK) studied the real substitutability between immigrant and native workers that is very important to understand the impact of immigration. Because most immigrants are low skilled, native workforce tends to specialize more to escape competitive pressure from below (Amuedo-Dorantes and De la Rica, 2011, for Spain).

Many studies tried to assess the effect of the immigration on native wages, someone focusing on the overall effect, someone distinguishing the effects across groups (blue collars vs. white collars; less educated workers vs. highly educated workers; dropouts vs. college graduates). Results are not uniform: some papers find that immigrants do not affect native wages, like Cortès (2008) and Manacorda, Manning and Wadsworth (2012), or do not affect wage differentials, like LaLonde and Topel (1991), Card (2005), Dustman, Fabbri and Preston (2005), Gonzalez and Ortega (2008); a few papers find that immigration decrease wage inequality (according to D'Amuri, D'Ottaviano and Peri, 2008, immigrations raises less educated worker's wages and lowers wages of highly educated workers; according to Card, 2009, immigrants lowers the differentials between wages of college graduates vs. high school graduates), many papers find that immigration increases wages inequality across groups of differently skilled workers; inside this group, some papers find a negative effect for each group (De New and

Zimmermann, 1994; Borjas, Freeman and Katz, 1997; Borjas, 2003; Bonin, 2005;), a few papers find that average wage increases (Dustmann, Fratini and Preston, 2008).

According to Borjas (2011), immigration has been an important contributor to the rise of income inequality of the United States, depressing the economic opportunities faced by the least skilled workers.

In fact, Borjas himself (2013) concludes that some groups of workers face a great deal of competition from immigrants. These workers are primarily, but by no means exclusively, at the bottom end of the skill distribution, doing low-wage jobs that require modest levels of education.

Nevertheless, Card and Peri (2016) argue that this dismal view about immigration is only half the story about the economics of immigration; the other half primarily concerns the positive externalities coming from immigration.

Some researchers found that immigration also affects production in itself, for instance, reducing the automation of some industry. The empirical assessment of this trend has been made for different countries such as the USA (Hanson and Slaughter, 2002; Lewis, 2003) and Spain (Gonzalez and Ortega, 2011), and they found that the change is basically in how much immigrant workers are absorbed by local markets more than a change in sectorial composition. Analyses at plant level shown that firms use different specific competences but their output mix does not change (Dustmann and Glitz, 2013). The discussion about immigration and production has yielded many outcomes as far as productivity (Di Giovanni, Levchenko and Ortega, 2012), output mix (Docquier, Machado e Sekkat, 2013), innovation (Hunt and Gauthier-Loiselle, 2010) are concerned.

6. The wage-unemployment trade-off and the criticisms to market-based explanations of wage differentials: the role of labour market institutions

SBTC and RBTC are essential parts of an explanation of wage and employment differentials obtained through a demand-supply framework. This explanation, progressively refined, from a theoretical and empirical point of view, came to a “unified theory” of the labour market (Blank, 1997; Howell, 2002). In this view, an imbalance in relative demand and supply of skills in the labour market was common to both United States and Europe. On the supply side, there was a decreasing growth of the college graduates; on the demand side, the computerisation in the workplace drove a strong increase in the demand for skilled workers. Then, the flexibility of the labour market in the United States and in the United Kingdom led to an increase in wage differentials; in the rest of Europe the greater rigidity of the wage structure brought about an increase in the unemployment of unskilled workers.

The “unified theory” recognises therefore to demand and supply movements the main role in change of inequalities; the labour market institutions have an important but one-dimensional role, as they are simply reduced to the distinction between flexible and rigid labour markets: if labour market is flexible variations in demand and supply leading to increasing inequality imply more wage inequality: this is the case of the United States and United Kingdom; if labour market is rigid, variations in demand and supply leading to increasing inequality imply more wage inequality: this is the case of the rest of Europe.

Divergent labour-market trends in flexible United States and United Kingdom and inflexible rest of Europe are interpreted in this way, among others, by Krugman (1994) and OECD (1994). Burneaux, Padrini and Brandt (2006) conclude that in the 1990s the increase in wage inequality has been compensated, in OECD countries, by a decrease in unemployment. Machin (2008) states that

unemployment in Europe and inequality in the United States are two sides of the same coin.

Despite the success of this interpretative line, other papers suggest a more nuanced framework, which observes more in depth actual differences across countries and takes into account more factors than a simple distinction between “flexible” and “rigid” labour markets. Croci Angelini and Farina (2006), analysing the 1980s and 1990s, emphasise the differences inside Europe, finding many exceptions to the trade-off view. In United Kingdom and Ireland the wage dispersion was not accompanied by an increase in employment; in Mediterranean countries (Italy, France, Spain) and continental countries (Germany, Belgium, Netherlands, Luxembourg) wage inequality is similar but occupational levels are higher in the second ones. Indeed, not only a pure market view fails to account for the differences between countries, but different outcomes can be explained only taking into account the mix between labour market institutions and the mechanism of income redistribution, which are themselves affected by the kind of welfare state and by the cultural traditions of different countries.

Indeed, as seen in Section 3, the importance of labour market institutions in explaining wage differentials was emphasised already at the beginning of the debate; the difficulties encountered by the “canonical model” and by the “unified theory” caused a renewed interest on such explanation. The role of trade unions and the structure of wage bargaining and its impact on wage inequality has been widely analysed. Koeniger, Leonardi and Nunziata (2007) and Card, Lemieux and Riddell (2004) find a correlation between the centralisation of wage bargaining and a low wage dispersion. According to Gürtzgen (2009), who studies the German case, powerful unions and a decentralised bargaining positively influence the division of earnings with employees. More interestingly for our issue, if wages largely depends on firm’s earnings, it will happen that employees with the same skills and the same productivity will gain different earnings; the actual relevance of this hypothesis has been confirmed by several studies: Margolis and Salvanes

(2001) for France, Martins (2009) for Norway, Rusinek and Rycz (2009) for Belgium; Card, Devicienti and Maida (2014) studied this issue in an Italian region (Veneto) and Pistoresi and Strozzi (2001) in an Italian industrial sector (heavy metals). Jirjahn (2010) finds that the presence of work councils reduces the wage dispersion, likely to increase cohesion and solidarity among workers.

The role of institutions is highlighted by Koeniger, Leonardi and Nunziata (2007) who, developing Wallerstein (1999)'s approach, studied wage differentials in eleven countries in a period of twenty-five years (1973-1998). They find that changes in labour market institutions can account for much of the change in wage inequality: it increases if there is a reduction in the union density, in the strictness of employment protection law, in the unemployment benefit duration and generosity and in the size of the minimum wage. In this light the increased wage differentials in the United States and in the United Kingdom may be well explained by the reduction of union power (and by the reduction of the minimum wage in the United States), while the reduction in male wage differentials happened in France may be explained by the increase in minimum wage and by the stricter employment protection.

A more radical criticism of the “unified theory” is put forward by Howell (2002). He observes that wage inequality growth is not pervasive across OECD countries and it is not consistent with a pervasive technological trend; then he states that the view of wage/unemployment trade-off between United States and Europe, as different ways to react to demand/supply shifts, given by different labour market institutions, has not real empirical support, as the US did not show lower unemployment until the late 1980's and lately European unemployment rates converged to US levels, despite only minor changes in labour market institutions; besides, according to the unified theory, it should be observed a relative worsening of unemployment for less skilled workers respect to more skilled ones: actually in Europe unemployment rose for all skill groups (Nickell and Bell, 1996; see Glyn (2000) for an early review). Given such poor empirical

support to the Unified theory, Howell (2002) concludes that its appeal is certainly due to its clarity and simplicity, but also to pro-market, ideological reasons, as it explains the phenomenon of wage differentials with a classical demand/supply vision of the labour market; moreover its implications are clearly ideologically characterised, as low wages in the United States cannot be blamed on political and managerial decisions but on technological changes in the workplace and on the failure of workers to upgrade their skills and European high rates of unemployment, particularly for low skilled people, depends on less flexible labour market institutions, with an obvious policy implication toward a liberalisation of the labour market. On the contrary, according to Howell, political and institutional decisions are at the basis of the phenomena: in the United States political and managerial decisions promote low wage strategies in the interests of firms and consumers; the increasing European unemployment is better explained by macroeconomic factors, such as the combined effect of anti-inflation monetary and fiscal policy that have severely constrained aggregate demand.

Mishel, Schmitt and Shierholz (2013) agree that technological change generated a need for greater skills in the job structure, but, in their view, it is not responsible for the growing wage inequality in the post-1979 period: like Howell (2002) in criticising the “unified theory” as an explanation of wage and unemployment differentials of the 1980s, even in their opinion the more complex inequality of the 1990s must be explained by the shifts in the labour market driven by policy changes. First of all, they affirm that the expansion of high wage occupations and the diminution of middle-wage ones is a process ongoing from 1950, therefore denying its novelty; then they claim that the finding of job polarisation trends is not statistically robust and that the job polarisation view may barely explain wage trends in the 1990s, but in no way it may explain wage trends in the 2000s. In their opinion wage differentials may be better understood if the models based on two types of workers, like in the “canonical model”, or on three types of workers, like in the job polarisation approach, are overcome by a

subdivision of workers at four key point of the wage distribution: bottom (10th percentile), middle (50th percentile), top (90th percentile) and very top (beyond 90th percentile): the real deciding factors in explaining the wage differentials of the last three decades had different effects on workers at each of the four points in wage distribution. Such deciding factors are the different policies, ranging from macroeconomic ones (fiscal policy, exchange policy and monetary policy affecting unemployment and trade), to trade policy to financialisation, to those affecting institutions and particular sectors (unionisation, minimum wage, deregulation, etc.).

Both Howell and Mishel, Schmitt and Shierholz., therefore, starting from a criticism of the usual interpretation of the data, crucially emphasise the relevance of institutions and policy decisions in explaining wage differentials.

7. From wage inequality to other aspects of inequality: wage share and household income inequality

The literature review so far made regards wage differentials, which are the aspect of inequality that most concerns labour economists. As already cited in the second section, discussed in the second section, according to Checchi and Garcia-Peñalosa (2008), beyond inequality in earnings, the other relevant aspects of inequality are the wage share on total income and the household income inequality.

They develop a unifying theoretical framework to explain the relationship between the three concepts of inequality and their correlation with labour market institutions, also keeping into account the wage differentials by skills. In fact, in their model, the Gini coefficient of income inequality is a function of three fractions of the labour force (unemployed, skilled workers and unskilled workers), of the number of capital owners, of the wage share on income, of the wage

differentials between skilled and unskilled workers and of the size of government transfers.

They test their model using a data set which covers seventeen industrial countries over the period 1969 to 2004. Overall, they find that labour market institutions are the central element linking the three variables; more in detail, their results are in line with other studies already cited: stronger unions and a more generous unemployment benefits are associated with lower income inequality; they reiterate the existence of a trade-off between inequality and unemployment, as they find that institutions that decrease inequality are associated with higher unemployment; besides, they find that tax wedge is associated with a more dispersed distribution of income (on the contrary Arpaia and Carone, 2004, find that in European countries a small increase in tax wedge increase has only a temporary and limited effect on real wages).

In the same paper, Checchi and Garcia-Peñalosa state that changes in the wage share received less attention than changes in wage and unemployment inequality: we reported in the second section the data they analyse, which show an overall decreasing trend in the share of income detained by wages in last thirty years. Not only the share of wages declined in Europe: according to Salverda, Nolan and Smeeding (2009), from 2003 to 2008 real wages declined for one third of European workers, for almost all the other two thirds real wages increased but less than the increase in productivity; on the contrary, the share of incomes from capital increased because of several reasons: the increased liberalisation of capital movements and the increase in financial activities (Glyn, 2006); technological change, which favoured profits more than wages, so that wages increased only in research intensive sectors (Pianta and Tancioni, 2008); offshoring, which reduced domestic employment, depressing wages (Feenstra and Hanson, 2005); labour-market deregulation, which caused, especially in small firms, a reduction in labour productivity; moreover the uncertainty of workers' condition caused a reduction in their propensity to consume, therefore in the aggregate demand.

The role of the public sector, which emerges as relevant in shaping the inequality in the remuneration of factors, is obviously prominent if we analyse the determinants of the trends in disposable income inequality: again Checchi and Garcia-Peñalosa (2008) report that the overall impact of taxes and transfers on distribution can be large and indeed these account for a large fraction of cross-country differences in income inequality. According to Gottschalk and Smeeding (1997) and Aaberge et al. (2000), despite increases in the dispersion of earned incomes, inequality in post-tax income has not grown in many small open economies.

From this synthetic overview of the explanations for reducing wage share, it is easy to see that political decisions have a fundamental role in shaping the economic inequality: legislative changes about the functioning of the labour market, the movement of productive factors, the extension and functioning of welfare state, the system of taxation may have deep impact on the redistribution of economic resources. In fact Franzini and Pianta (2011) claim that increasing income inequality derives from the changes of relations between capital and labour, in their turn depending on the changes in production and in labour market, as well as from the welfare redistributive activity.

A traditional debate on public policy concerns the existence of the trade-off between efficiency and equity, a concept introduced by Okun (1975). Piguillem and Schneider (2009) verify that each fiscal policy has two sides: one addressed to efficiency, one to redistribution. They develop a complex model, where the median voter during economic cycles balances her desires for efficiency and redistribution. Given an infinite horizon economy in which agents are heterogeneous with respect to both initial wealth and labor skills, the authors evaluate the effects of labour taxes and pro-cyclical taxation: their impact will depend on skill distribution and on the correlation between inequality and TFP. The interest of this model lies in that it warns us about the complexity of the evaluation of the redistributive effect of a policy. The issue of pro-cyclical

taxation is particularly important in a context, like the European one, where states have faced both economic recession and debt crises, often implementing pro-cyclical policies.

In this stream of literature, it may be placed the paper by Agell (2004), who reflects on costs and benefits of welfare state intervention in the labour market and discusses the possible impact of labour market reforms that may improve its efficiency, without violating principles of equality.

Another aspect of public policy which may affect inequality is the monetary policy. As Furceri, Loungani, and Zdzienicka (2016) report in their paper, in theory the effect of monetary policy on inequality is ambiguous: on one side expansionary monetary policy can increase inequality by boosting asset prices and/or inflation, therefore favouring top-income households who receive higher shares of financial income and disfavouring low-income low-households relying primarily on labour earnings; on the other side, expansionary monetary policy can reduce inequality through savings retribution and stabilising the economy, favouring therefore labour earnings at the bottom of the distribution which are most affected by changes in economic activity (Heathcote and others 2010). From an empirical point of view, a growing literature has usually found that the effects of monetary policy on income inequality have been relatively modest—even sometimes of different signs—and varying across countries (Coibion and others 2012; Bivens 2015; Adam and Tzamourani 2015; Guerello 2016, O’Farrell and others 2016). In their study conducted on a panel of 32 advanced economies and emerging market countries over the period of 1990-2013, Furceri, Loungani, and Zdzienicka (2016) find that an unexpected increase of 100 basis points in the policy rate increases inequality by about 1¼ percent in the short term and by about 2¼ percent in the medium term. The effect is also economically significant, given the high persistence and limited variation in the Gini coefficient, and is robust across different measures of inequality (top income shares and the share of wage income in GDP).

It deserves a citation the paper by Krueger (2002), who reflects on positive and negative effects of inequality in a democratic society.

8. *The increase of top incomes and the “grabbing hand” theory*

Another form of criticism to the wage differentials literature may be considered the claim of its irrelevance: in his very successful book on income inequalities, adopting a neo-Marxian point of view, Piketty (2013) recalls the issue of increasing wage differentials by skills, reconsidering its importance: even if it is a real phenomenon, its importance in explaining total income inequalities is limited; the effect on total inequality of the increasing top incomes is much more significant. But such sharp increase of top incomes (Piketty refers to the first centile, even to the first millile) is not common to all advanced countries: even though in Europe and Japan as well the share of global income owned by top incomes significantly increased in last thirty years, this did not happen in the proportion of the United States. Such different trends may not be attributed to a cause like the technological change biased toward more educated/skilled people, because such phenomenon is naturally widespread and substantially uniform across different countries. After all, very top incomes are not related to a logic of productivity: they do not depend on their marginal productivity, which is substantially unobservable, but on their “grabbing hand”, that is their capacity to convince shareholders and subordinates that they are worth a lot, therefore they deserve high remuneration. It follows that differences between countries may be better explained by political, institutional and cultural reasons, like social norms: some societies more than others let better paid workers to establish themselves their wages; some societies, like the American one, are characterized by a sort of “meritocratic extremism”, a need to proclaim the winners and remunerate them

with stratospheric earnings, to demonstrate that they have been chosen according to their merit, non to the unfair logic of the past.

Other important references in the context of the debate on top incomes inequalities are Atkinson, Piketty and Saez (2011) and Saez (2004), which analyse the long run, historical trends in income inequalities. Saez (2006) analyses the role of taxation in favouring the top incomes. Piketty (2011) reflects on the role of inheritance in a long-run perspective. The importance of inheritance is given by the comparison between aggregate inheritance flow and aggregate labour income: when the rate of return of capital is higher than the product rate of growth, the importance of inheritance is higher; the fluctuations of those two rates caused a sharp decline of the importance of inheritance in the first half of 20th century, but then it begun to rise again, implying a reduction in the role of human capital and a substantial “illusion of meritocracy”.

9. Income inequality and the crisis

As we reported in the Introduction, the debate on inequalities returned at the centre of general attention in the recent years of economic crisis, as the reduction in the growth of income (sometimes and somewhere the reduction in absolute terms) was accompanied by an increase in income inequalities, inevitably stimulating the debate about the causal relationship between the two phenomena

A body of literature analysed the impact of the macroeconomic condition on the inequalities, another stream of literature considered the opposite causal relationship. **Being this paper a literature review on the causes of inequality, the former topic is of particular interest to us; anyway, given the importance assumed by the debate on the second argument, we cannot avoid to make some insights on it, referring to Van Treek (2014) and Bazillier and Hericourt (2017) for more comprehensive discussion.**

About the effect of macroeconomic condition on inequalities, it must be cited the work by Marrero and Rodriguez (2012); a model for the empirical analysis of the relationship between income growth and inequality is given by Blank et al. (1993).

Some papers analyse the impact of the Great Recession on inequality. The Great recession is mainly a financial crisis and, as reported in Section 4, on a theoretical point of view, financial crises may have ambiguous effect on inequality: top-income households on average have a greater share of their income deriving from financial assets, therefore falling asset prices have greater impact on them, then on middle or low income households, therefore reducing inequality; but if financial crisis is associated with long-lasting recessions, as happened for the Great Recession, this disproportionately hurt the poor, increasing inequality (Furceri and Loungani, 2015; Atkinson and Morelli, 2011; Agnello and Sousa, 2012).;

Jenkins et al. (2012) analyse the impact of the Great Recession on the distribution of household income in twenty-one OECD countries, finding that the impact of the recession on the distribution of household incomes and on poverty rates has been quite different in different countries, anyway quite limited, considering the dimension of the fall in production activity. Addabbo et al. (2011) analysed the impact of the crisis on unemployment and incomes in Italy and Spain.

As concerns the opposite causal direction, from inequality to income changes, the impact of inequality on growth has been analysed on a theoretical and empirical point of view. Among the theoretical literature we can cite the work by Bhaduri (2006). An empirical analysis is conducted by Berg and Ostry (2011): considering a wide sample of countries, they find that longer growth periods are associated with more equality in income distribution; taking into consideration several variables which may influence growth, inequality is the more significant variable in having a negative impact on growth. Their analysis is not conclusive about the existence of possible short period trade-off between equality and growth,

while they are sure, as the title itself of their paper suggests, that equality and sustainable growth are two sides of the same coin. Therefore, policies addressed to the reduction of inequality have to be without doubt favoured. An interesting literature review about the effect of inequality on growth can be found in Ehrart (2009).

As Van Treek (2014) reports, in recent years there has been a proliferation of studies, by authors with different backgrounds, about the relationship between inequality and the financial crisis which led to the Great Recession.

The idea of a strong link between income inequality and financial crisis was brought back to public attention by Rajan's widely discussed book 'Fault Lines' (2010); he argues that low and middle income consumers reduced their savings and increased their debt since income inequality started to soar in the United States in the early 1980s. This has temporarily kept private consumption and employment high, but it also contributed to the creation of a credit bubble.

Morelli and Atkinson (2015) review the reasons why income inequality may cause an economic recession:

a) an increase in the inequality of incomes reduces the aggregate demand, given the proportionality between income and the marginal propensity to consume: as riches consume a lower portion of their income, if some income goes from poors to riches, the global consumption, therefore global income, declines;

b) the increase in income inequality increases the living standards of the riches; giving the "relative income hypothesis", this pushes households to desire higher standards of life, therefore to work more, consume more and take on more debt (if inequality happens in a context of income stagnation, this explanation equally holds, in the sense that households desire to keep they standard of life constant);

c) inequality and the depressed aggregate demand create pressure for redistribution, pushing governments to ease access to credit.

The first reason links inequality to a depression in the real economy, the second and third reasons link inequality to an unsustainable surge in household indebtedness, therefore to a financial crisis. More subtly, the authors underline the impact both of a high level of inequality and of an increasing inequality on banking crisis (according to the first one a crisis arise when inequality goes beyond a certain threshold, according to the second one when the growth rate of inequality is too high). They test such “level” and “growth” hypothesis using five different measures of inequality, trying in this way to capture its multidimensional nature. The overall aggregate evidence does not provide any convincing statistical support for either of the hypotheses; nevertheless, the authors themselves advise that this result does not rule out the economic relevance of this question.

In fact Morelli and Atkinson (2015) themselves report that the empirical evidence about the link between growing inequality and a financial crisis is ambiguous: Atkinson and Morelli (2011), Bordo and Meissner (2012) find no statistical evidence of such relationship across different countries and time periods; on the contrary, Bellettini and Delbono (2013) and Perugini, Hölscher and Collie (2013) find support to the hypothesis; the last paper, analysing a panel of eighteen OECD countries in the period 1990-2007, find empirical support to the hypothesis that rising inequality leads to private sector credit booms, which are widely accepted as a macroeconomic risk factor. The paper by Kumhof, Rancière and Winant (2015) also supports the view that high leverages and crises may arise as a result of changes in income distribution. Morelli and Atkinson (2015) explain such different results as a consequence of the multidimensionality of inequality and of the difficulty to establish a causal relationship between inequality and the stability of the financial sector.

Castells-Quintana, Ramos and Royuela (2015) study the link between inequality and the Great Recession at a regional level. They find a large diversity in inequality patterns, anyway they come to the general conclusion that an increase in inequality is associated with economic growth; the link does not appear as

direct, but the factor which are likely to be associated with economic growth (tertiary specialisation, openness and technological change) are also associated with increasing inequalities.

10. Synthesis and conclusion

This paper presents a synthesis of the debate about the more discussed topics about wage and income inequalities in last thirty years. The interest about wage inequality arose in 1980s because of the increasing wage differentials between college educated and non-educated workers in the United States. The most accepted explanation of the phenomenon was based on a demand-supply model, with an increasing demand of skilled workers, due to the diffusion of new technologies, particularly ICT which are complementary to skilled workers, and a decreasing rate of growth of college-educated workers. According to the same framework, such demand and supply shifts in Europe had an effect on relative unemployment rates, rather than on wages, because of market rigidities.

This simple but powerful model was challenged by the wage trends in the 1990s and at the beginning of 21th century, with an improvement in relative wages not only at the top but also at the bottom of the distribution; a polarisation of the labour market which is explained, according the job polarisation or job-tasks approach, by the nature of the tasks required: the demand for middle-skilled routine jobs is decreasing because of their easy substitutability by computers or machines; the demand for non-routine jobs is stable or increasing, because that may be unlikely replaced by machines or outsourced.

Such explanations of the wage differentials trends, completely based on supply and moreover on demand shift, received great consensus, but they also face some difficulties, as the poor relationship between job polarization and wage inequality in many countries different from UK and USA; therefore, such pure

market-based views are challenged by those authors who underline the importance of institutional settings and political decisions in shaping income and wage trends. The focus on labour market institutions and their redistributive effect inevitably imply an attention to the redistributive policies and their effect on the other forms of inequality, that are wage share and household income inequalities. The degree of liberalization of financial markets and the strength of financial institutions are other institutional aspects whose importance has been established in affecting inequality.

The importance of the non-market factors for the increasing inequality has been particularly underlined in explaining the great increase in top incomes in last decades, a macroscopic phenomenon in the Anglo-Saxon countries but present in all OECD countries, whose relevance is so high that it can explain a large part of the global income inequalities. Some scholars also underlined the renewed relevance of inheritance, clearly another non-market factor, in determining inequalities.

The debate on inequalities came back in the spotlight in recent years of economic crisis: concurrency between the phase of economic recession and the widespread increase of inequality has led many scholars to investigate the causal relationship between the two phenomena.

Many scholars hypothesised that income inequalities cause financial crises, then the crisis of the real economy: the debate on this point is open, as some studies find empirical confirm to such hypothesis, other influential papers do not report empirical support to the assumption; all scholars anyway agree on the importance of this topic.

A general overview on the literature on economic inequalities in last thirty years certainly runs the risk to lack a unifying view, as it covers issues, reports explanations significantly different from each other. However, looking for a line of continuity that runs through the whole debate, it may be found in the contrast

between explanations based on pure market mechanisms and other based on the role of institutions. Wage differentials are explained by changes in demand (driven by technology or by trade) and supply (e.g. the college choices) or by the laws on minimum wage, by the degree of unionization, etc. The recent rise of top incomes may be explained by a disproportionate increase in productivity of some categories of workers or by changes in laws on taxation, inheritance, etc. The reduction in the wage share may interpreted as a result of real changes in the world of production or in the social and political impact of the workers. And so on. But, if we reflect that changes in social and political weight of a group or of a “class” are not independent from the real changes, happened in the relations of production, we grasp an aspect of continuity and inseparability between “market” and “institutional” changes. More generally, those that appear as alternative explanations are usually indeed complementary: the abundance of convincing studies based both on “market-based” and “institution based” views of movements of inequality clearly shows that both kinds of explanations are needed to understand an issue as complex as economic inequality.

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Appendix

Table 1

90/10 percentile ratio of gross earnings: male (first row) and all (second row in italic)

	1971	1976	1981	1986	1991	1996	2001	2006	2011
United States	3.39 ^a <i>3.66^a</i>	3.51 <i>3.69</i>	3.66 <i>3.77</i>	4.28 <i>4.14</i>	4.48 <i>4.33</i>	4.70 <i>4.63</i>	4.83 <i>4.63</i>	5.10 <i>4.84</i>	5.09 <i>5.03</i>
Finland		2.53 ^b <i>2.65^b</i>	2.43 ^c <i>2.47^c</i>	2.59 <i>2.48</i>	2.51 <i>2.43</i>	2.34 <i>2.29</i>	2.59 <i>2.44</i>	2.53 <i>2.47</i>	2.65 <i>2.58</i>
France	3.77 ^d <i>3.74</i>	3.53 <i>3.42</i>	3.44 <i>3.26</i>	3.44 <i>3.20</i>	3.50 <i>3.30</i>	3.33 <i>3.12</i>	3.26 <i>3.06</i>	3.16 <i>2.96</i>	3.16 ^e <i>2.97^e</i>
Germany					3.28 ^f <i>3.42^f</i>	2.85 <i>2.89</i>	2.89 <i>3.01</i>	3.16 <i>3.36</i>	3.19 <i>3.34</i>
Italy				2.20 <i>2.22</i>	2.14 <i>2.31</i>	2.44 ^g <i>2.33^g</i>	2.50 ^h <i>2.22^h</i>	2.17 <i>2.36</i>	2.33 ⁱ <i>2.22ⁱ</i>
Netherlands		2.57 ^b	2.53	2.55	2.61	2.71 <i>2.78</i>	2.86 <i>2.93</i>	2.88 ^l <i>2.91^l</i>	
Sweden		2.11 ^m <i>2.15^m</i>	2.01 <i>1.97</i>	2.08 <i>2.00</i>	2.17 <i>2.12</i>	2.34 <i>2.27</i>	2.41 <i>2.30</i>	2.40 <i>2.31</i>	2.36 <i>2.31</i>
United Kingdom	2.68 <i>3.43</i>	2.58 <i>2.99</i>	2.79 <i>3.01</i>	3.06 <i>3.25</i>	3.30 <i>3.38</i>	3.45 <i>3.49</i>	3.54 <i>3.53</i>	3.72 <i>3.62</i>	3.78 <i>3.61</i>
Australia		2.52 <i>2.64</i>	2.85 <i>2.87</i>	2.79 <i>2.87</i>	2.86 <i>2.85</i>	2.96 <i>2.96</i>	3.26 <i>3.07</i>	3.51 <i>3.31</i>	3.62 <i>3.38</i>
New Zealand				2.23 <i>2.25</i>	2.53 ⁿ <i>2.40ⁿ</i>	2.65 <i>2.69</i>	2.84 <i>2.64</i>	3.04 <i>2.84</i>	3.15 <i>2.91</i>
Japan		2.53 <i>2.94</i>	2.66 <i>3.04</i>	2.77 <i>3.14</i>	2.81 <i>3.10</i>	2.77 <i>3.00</i>	2.76 <i>2.96</i>	2.89 <i>3.11</i>	2.89 <i>2.97</i>
South Korea				3.16 <i>4.35</i>	3.16 <i>3.84</i>	3.41 <i>3.75</i>	3.81 <i>4.09</i>	4.41 <i>4.56</i>	4.64 <i>4.85</i>

a:1973; b:1977; c:1980; d:1970; e:2010; f:1992; g:1995; h:2000; i:2010; l:2005 m:1975; n:1990.

Source: OECD data

Table 2

Ratio between the wage of high (college graduated) and low (up to lower secondary education) education workers.

	Early 1970s	Early 1980s	Late 1980s
United States	1.49	1.37	1.51
Canada	1.65	1.40	1.42
Germany		1.36	1.42
Italy	1.96	1.60	1.61
Netherlands		1.50	1.22
Sweden	1.40	1.16	1.19
United Kingdom	1.64	1.53	1.65

From Nickell and Bell, 1993, pag. 303.

Source: OECD Employment Outlook (1993); Steven J. Davis (1992 table 5.6)

Table 3

Employment differentials by skills: change in percentage points of per year employment differences between fourth and first quartile of educational distribution (Q4-Q1)

	1980s	1990s
United States	0	-0.2
Finland	0.5	0.9
France	1.3	1.4
West Germany	0.6	0.6
Italy	0.9	1.1
Netherlands	0.4	-0.6
Sweden	-0.1	0.6
United Kingdom	1.3	0.3
Japan	0.1	

From Glyn (2000)

Table 4

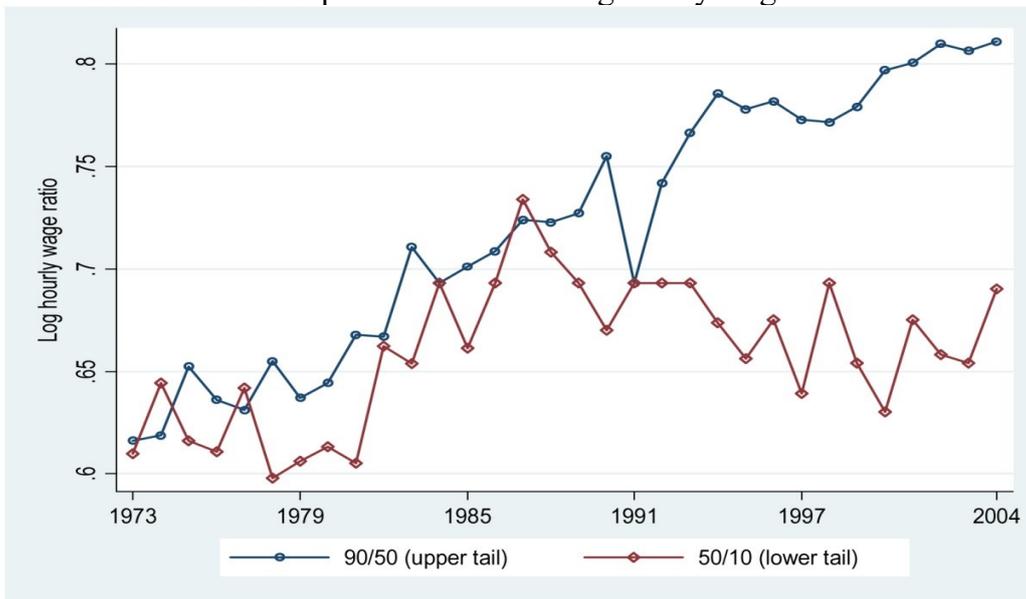
90/50 (first row) and 50/10 (second row) percentile ratio of male gross earnings

	1991	1996	2001	2006	2011
United States	2.09	2.12	2.24	2.36	2.31
	2.14	2.21	2.15	2.17	2.20
Italy	1.50	1.62 ^a	1.67 ^b	1.61	1.56 ^c
	1.43	1.50 ^a	1.50 ^b	1.34	1.49 ^c
Sweden	1.60	1.68	1.72	1.71	1.67
	1.36	1.40	1.40	1.40	1.42
United Kingdom	1.82	1.88	1.93	2.02	2.06
	1.81	1.84	1.83	1.84	1.83
Australia	1.74	1.79	1.87	2.00	2.08
	1.64	1.66	1.74	1.75	1.74
New Zealand	1.61 ^a	1.67	1.82	1.87	1.98
	1.57 ^a	1.59	1.56	1.63	1.59
South Korea	1.78	1.82	1.92	2.05	2.17
	1.77	1.88	1.98	2.15	2.14

a:1995; b: 2000; c: 2010; d:1990.

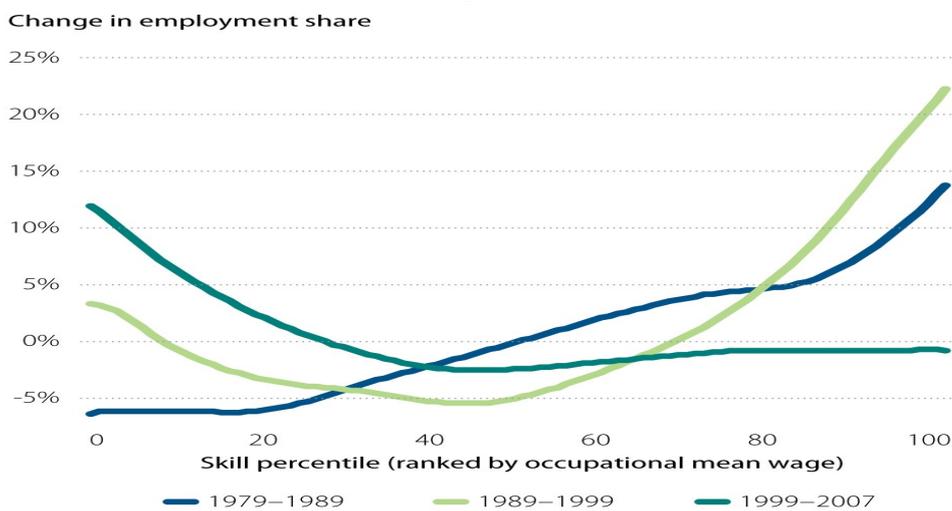
Source: OECD data

Figure 1
90/50 and 50/10 percentile ratio of log hourly wage in the USA



From Autor, Katz and Kerney (2006), pag.18.
Source: Current Population Survey May and Monthly Files, 1973-2004.

Figure 2



Source: Data are Census IPUMS 5 percent samples for years 1980, 1990, and 2000, and U.S. Census American Community Survey 2008. All occupation and earnings measures in these samples refer to prior year's employment. The figure plots log changes in employment shares by 1980 occupational skill percentile rank using a locally weighted smoothing regression (bandwidth 0.8 with 100 observations), where skill percentiles are measured as the employment-weighted percentile rank of an occupation's mean log wage in the Census IPUMS 1980 5 percent extract. Mean education in each occupation is calculated using workers' hours of annual labor supply times the Census sampling weight. Consistent occupation codes for Census years 1980, 1990, and 2000, and 2008 are from Autor and Dorn (2009a).

From Autor (2010), pag.9.

Figure 3

Percent change relative to the median

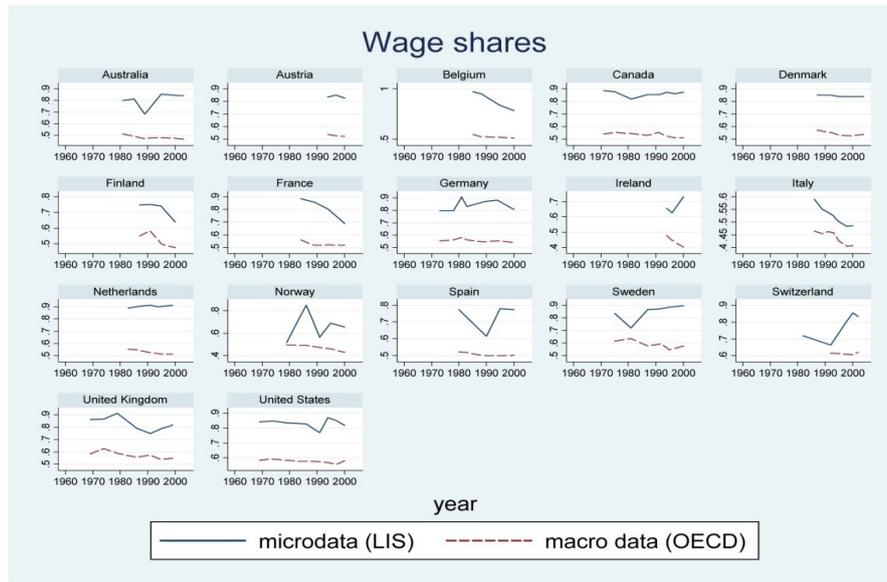


Source: May/ORG CPS data for earnings years 1973-2009. Each year comprises a three-year moving average (e.g. 1974 contains May/ORG data from 1973, 1974, and 1975), with years equally weighted. The real log hourly wage is computed by year for each percentile between the 5th and 95th percentiles. In every year, real log hourly wages are adjusted such that they equal zero at the respective year's median (50th percentile). The percent change represents the difference in the log wages values (relative to the median) at each percentile between the relevant years.

See Data Appendix for more details on treatment of May/ORG CPS data.

From Autor (2010), pag.9.

Figure 4
 Wage shares on household income (microdata) and on corporate value added (macrodata)



From Checchi and Garcia-Peñalosa (2008), pag.46.