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**Wage and income inequality between market forces and institutional settings:
a review of the cross-country literature**

Abstract: 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 contributions and try to give an interpretative line, contrasting the “demand-supply” interpretation of inequalities and more “institutional –based” views. We also deal with the recent literature on the relationships between income inequality and economic crises.

1. Introduction

The interest of economic studies toward inequalities has known, in last thirty years, two moments of peak: at the beginning of the 1990s and in last two-three years: in the first case it was stimulated by the increase in wage differentials happened in the previous decade in many countries (particularly in the United States and United Kingdom, but also in many European countries); in the second case, the moderate but constant and widespread increase in income inequalities worsened the economic framework characterised by a severe economic crisis and induced students to reflect on the causal relationship between the increase in inequalities and the negative economic phase. Another important debate, raised in last years, concerned the dramatic increase in top incomes observed in last years particularly in Anglo-Saxon countries.

In this paper we offer a synthetic view of the debate about wage and income differentials, briefly reporting the content of some key contributions. The second paragraph reports some relevant data concerning the phenomena introduced above; the third paragraph concerns the debate about the increasing wage differentials by education happened in the 80s, synthesizing the debate about the causes of the phenomenon; the fourth paragraph discusses the debate about job polarization, the more nuanced view of wage differentials by skills which characterized the 90s and the beginning of the twentieth century; the fifth paragraph synthesizes alternative explanations to wage differentials, emphasizing the role

of labour market institutions and political decisions; the sixth paragraph focus its attention on other aspects of the increasing inequality: the reducing wage shares and the increasing household income inequality, with a special attention to the effect of policy changes; the seventh paragraph reports the debate about the increase of top incomes and the role of the “grabbing hand”; the eight paragraph synthesized the debate about the relation between inequality and economic crisis and other issues at the centre of economic debate concerning income inequalities; a synthesis of the debate and some general consideration conclude the paper.

2. The data

The 80s have been a period of dramatic increase in income inequalities, in the United States and United Kingdom, following a decade where inequalities was almost stable and followed by a period where inequalities continued to rise but at a slower rate.

Table 1 reports 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 70s (the male ratio goes from 3.39 in 1973 to 3.66 in 1981), the dramatic increase in the 80s (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, until 2006 (the ratio is 4.83 in 2001 and 5.01 in 2006); in more recent years the ratio showed a substantial stability in (it is 5.09 in 2011). The trend was similar in United Kingdom: the rate fluctuated in 70s (2.68 in 1971, 2.59 in 1976, 2.79 in 1981), increased significantly in 80s (it arrived at 3.30 in 1991), then continued to increase (3.54 in 2001, 3.78 in 2011). United States and United Kingdom were the countries where inequality grew more substantially in last thirty years, but the increase of inequality largely characterised all the OECD economies during the last decades. Many European (Italy, Netherland, Sweden) and extra-European (Australia, New Zealand, South Korea) countries experienced in 90s a dramatic increase of the 90/10 ratio; for some countries this trend continued in the beginning of new century (Australia, New Zealand, South Korea), while in other countries the inequality decreases, but without returning to the level of the beginning of 90s (Italy, Sweden). In some countries, where there was a decrease of inequality in 90s,

the upward trend resumed in the 21th century (Germany, Japan). In other countries there was a slow but constant increase of the inequality over the period (Finland).

Looking for the determinants of such increasing income inequality, the attention of the scholars concentrated on wage differentials by education, particularly on its sharp increase in 80s after the decrease in the 70s. 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 70s, 1.37 at the beginning of 80s and 1.51 at the end of 80s. The trend was similar in the United Kingdom: the same educational wage differential decreased from 1.64 to 1.53 in the 70s and increased up to 1.65 in the 80s. (Table 2 –from Nickell and Bell, 1993, pag. 303). 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 80s there was also a significant increase in differentials in unemployment rates by educational attainment, even in those countries where wage differentials increased slowly or did not increase at all.

Goldin and Katz (2010) enlarge their analysis to a ninety years period for the United States: Figure 1, reported from their paper (pag.36), shows the log college wage premium (college vs.high school) and the log high school wage premium (high school vs. eight level of schooling) in the United States from 1915 to 2005. The college wage premium decreases until 1950, increases until 1970, than decreases in 70s and sharply decreases in 80s; the ratio continues to rise in 90s and in the beginning of 21st century, but at a slower rate. The trend of the high school wage premium is similar, with the exception of the period 1950-1980, when it remains almost constant, and the last years, when this rate, opposite to the college premium, is decreasing.

This last observation is a part of a new history, which attracted the attention of the scholars: the decreasing rate of growth of inequalities, in last years, between high and low incomes appears as the sum of two different effects: the inequalities between high and middle incomes, after the 80s continued to increase at an high rate, while the inequality between middle and low income remained more or less constant or decreased. Figure 2, reported from Autor, Katz and Kerney (2006) (pag.18), 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 80s, then the 90/50 percentile, after one year (1990) of sharp

decrease, begun to rise again, while the 50/10 percentile had a decrease in the second half of 80s, then it presented an erratic trend. According to OECD data, in the United States the value of the 90/50 percentile ratio of gross male earnings increased from 2.09 in 1991 to 2.24 in 2001; in the same interval the 50/10 percentile ratio was respectively 2.14 and 2.15; this phenomenon substantially continued in the following decade; in 2011 the 90/50 percentile ratio was 2.39 (+0.15 from 2001) the 50/10 percentile ratio was 2.20 (+0.05 from 2001). The similar divergent trends between the two levels of inequality happened in other two countries where there was a strong increase in the overall inequalities in 90s and in the first decade of 21th century: United Kingdom and New Zealand; among the countries where the overall inequalities increased sharply in the 90s, this phenomenon was particularly evident in Sweden.¹

Even in this case the trends of global income inequality led scholars to investigate the wage differentials by skills. Figure 3 and Figure 4, taken from Autor (2010) (pag.9) synthesize 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 70s and the end of 80s the trend is clear and simple, 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 80s 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 polarization: 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 90s (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. The same paper underlines that such trends are not unique to the United States but they are widespread across industrialised economies: he takes 16

¹ In the UK the 90/50 percentile ratio was 1.82 in 1991, 1.93 in 2001 and 2.03 in 2011; in the same years the 50/10 percentile ratio was 1.81, 1.83 and 1.83.

In New Zealand the 90/50 percentile ratio was 1.82 in 1992, 1.93 in 2002 and 2.03 in 2012; in the same years the 50/10 percentile ratio was 1.60, 1.56 and 1.58.

In Sweden the 90/50 percentile ratio was 1.60 in 1991 and 1.74 in 2001; in the same years the 50/10 percentile ratio was 1.36 and 1.40.

European Union countries into consideration, from 1993 to 2006, and he finds an increase of the share of employment for low-wage occupations in 11 of 16 countries and for high-wage occupations in 13 of 16 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 polarization.

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 80s to nowadays, while in Europe and Japan this ratio had a much smaller increase: in the 70s 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.

As it is well known, in 2007 a severe economic crisis began in the United States, then in Europe. In many countries, like United States, Italy, Great Britain and Ireland, it was the most severe crisis in the postwar period; the co-presence of increasing levels of inequalities has made many scholars think that there was a link between two phenomena.

3. The beginning of the story: explaining the increased wage differentials by education

The increase in wage differentials in 80s and 90s, particularly between skilled and unskilled workers, stimulated an abundant literature, on the quantification of the phenomenon and on its causes.

Changes in relative wages obviously imply changes in relative demand and supply. An abundant literature tried to examine this relationship, on a theoretical and empirical point of view. A milestone in this literature is the paper by Katz and Murphy (1993), who analyze the changes in relative wage in the United States from 1963 to 1987. They explicitly

refer to a scheme of relative demand and supply and conclude that fluctuations in the college/high school differentials over the period they considered may be largely explained by fluctuations in the rate of growth of the relative supply of college graduated and by a growth demand trend in favour of more educated workers. On a theoretical point of view they introduce a simple model with two skill groups of workers that do different and imperfectly substitutable jobs. 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 the empirical model the D in 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 wage premium: in particular, the increase of wage premium from the end of 70s is consistent with the deceleration in the growth of college relative supply. The explanatory power of this simple model gave great credit to the canonical model.

Anyway, the fluctuations in wage differentials must be explained not only by the fluctuations of relative supply but also by an increasing trend of demand (even at a not uniform rate, the supply of college-educated workers is always increasing: in absence of a positive demand trend, such permanent increase should imply a permanent decrease in college wage premium: the evidence in the 80s is the opposite). 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 stage of the debate (see Katz and Murphy, 1992), three main causes were identified: the skill-biased technical change, the globalization (increase in foreign

trade) and the role of labour market institutions, particularly trade unions. According to the first hypothesis, the new technologies widely introduced in the 80s, particularly ICT, are complements with skilled workers and substitutes of unskilled ones, therefore increasing the relative demand and wage of skilled workers; according to the second hypothesis, the globalization intensified the international specialization of production, with the western countries producing goods with higher technological content, requiring therefore an higher content of skills in the workforce (Murphy and Welch, 1991). According to the third hypothesis, the 80s were characterized by a significant reduction of the strength of trade unions and of their capacity to impose levelling of wages (Freeman, 1991); changes in pay norm must also be kept into consideration (Mitchell, 1989).

The hypothesis of the skill biased technical change appeared as the more convincing: 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 labor (Davis and Haltiwanger, 1991; Krueger, 1993²; Mincer, 1991); then various papers (Berman, Bound and Griliches., 1994; Autor, Katz and Krueger, 1998) showed the correlation between skill upgrading and various measures of technological change, like computerization and R&D expenditures. Given such convincing results, this theory was largely discussed and progressively refined, on a theoretical and empirical point of view, coming to a “unified theory” (Howell, 2002). In this view the increasing earnings inequality in the United States was driven by an imbalance in relative demand and supply of skills in the labour market: on the supply side, there was the decreasing growth of the college graduates; on the demand side the computerization in the workplace drove the strong increase in the demand for skilled workers. Indeed, such demand and supply forces are common to both United States and Europe: the flexibility of the U.S. labour market let such forces to cause an increase in wage differentials; in Europe the grater rigidity of the labour market channelled these trends to an higher unemployment for unskilled workers; the United Kingdom acts substantially like the United States because of the similar, little regulated, labour market. Divergent trends in flexible United States and inflexible Europe are interpreted in this way, among others, by Krugman (1994) and OECD (1994). Machin

² Even though the paper by Krueger was published in *The Quarterly Journal of Economics* in 1993 (and we report this version in our Bibliography), Katz and Murphy (1992) cite a previous version of this paper: a mimeo of Princeton University of August 1991. A further version of the paper was published as a NBER working paper, in October 1991.

(2008) states that unemployment in Europe and inequality in the United States are two sides of the same coin.

As mentioned above, an alternative explanation of the increasing wage differentials is a trade-based approach, which may be called the “globalization theory”, interpreting the globalization mainly as an increase in global trade. According to Gaston and Rajagur (2009), the natural framework for thinking about the effect of trade on labor markets, maintaining the assumption of competitive markets, is the Stolper-Samuelson theorem and its various generalizations. 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. Therefore the increased trade with China and India should have worsened, for Western countries, the distribution of earnings. Indeed, the same paper underlines that the appropriate implementation of this framework and the interpretation of the empirical analysis are controversial and, anyway, the conclusion that may be drawn from the studies is that trade has a relative small effect on the skill premium and that, among other factors, technological change is the more important.

Some contributions found that the globalization theory increases its explanatory power if connected to other explanations: Leamer (1998) and Feenstra and Hanson (1999) extend the Stolper-Samuleson framework to explicitly incorporate technological change. Leamer (1998) concludes that trade was the main cause of price changes in 70s, while technological change dominated price changes in the 80s. Feenstra and Hanson (1999) consider the effect of outsourcing too, a rather little considered topic; they decompose their measure of technological change into components due to high-technology equipment and outsourcing. They find that outsourcing plays a large (though not precisely estimated) role in generating wage inequality, but technological change dominates other effects.

Another limit of the Stolper-Samuelson framework is its relying on perfect competition hypothesis. 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.

Treating the connections between the globalization theory and other explanations of the wage differentials, it must be mentioned that the globalization theory may be connected to the explanation based on the role of labour market institutions, as globalization itself may have reduced the union density and the bargaining power of three unions (OECD, 1997).

A contribute useful to systematize the role of globalization is written by Smeeding (2002).

4. A more nuanced view of the wage differentials by education: the "job polarization" theory

The wide debate on skill-biased technical change (SBTC) theory led to identify some inconsistency of this theory. According to Card and Di Nardo (2002) the main problem for the SBTC theory is that wage inequality stabilized in the 1990s despite continuing advances in computer technology. In fact, the "canonical model" generates an overprediction of the rise in wage inequality. As Acemoglu and Autor (2012) report in their paper, Autor, Katz and Kearney (2008) plots the Katz and Murphy's model for the years 1987-2008. The fit of the model remains quite good through the year 1992, then the model systematically deviates from the data, predicting a sharper rise in the college premium than actually occurs. Without further refinements to the model, the discrepancy between the observed and predicted growth of the college premium suggests that the trend in relative demand decelerated in 90s, but this does not accord with common intuitions regarding the nature or pace of technological changes occurring in this era. The solution of this puzzle was found in a more articulated view of the wage differentials: in the 90s the trend for wage differentials become more nuanced than an increasing premium for high-skilled workers. Data for employment and wage by skills in the United States and in Europe, as reported by Autor (2010) and by Goos, Manning and Salomons (2014), synthesized in the second paragraph, are clearly consistent with a "job polarization" framework, whose premises may be found in Autor, Levy and Murnane (2003). They overcome the rough distinction between skilled and unskilled workers, substituting it with the difference between routine and non routine and between manual and non-manual jobs: crossing these categories, four typologies of jobs are generated, whose relationship of substitutability or complementarity with Information and Communication Technology (ICT) is analysed. Routine jobs are considered direct substitutes of ICT, therefore they are properly penalised by a "skill-biased technological

change”, while the “winning” category in the job market of 80s and 90s are the non-routine non-manual jobs, which are strongly complimentary to ICT; the manual non-routines jobs are broadly neutral to ICT.

The job polarization or job-tasks approach properly started with Autor, Katz and Kerney (2006), then it appeared in a relatively popularized version in Autor (2010) and in most elaborated treatment in Acemoglu and Autor (2011 and 2012). The paper by Autor (2010) is useful not only to report the data of the job polarization phenomenon, as seen above, but also to describe its characteristics and to identify its causes.

According to Autor (2010) the ongoing automation and the 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 process raises relative demand for nonroutine 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, therefore they require little formal education.

Therefore technology, trade and offshoring are the more accredited explanation for the job polarization phenomenon, while the shift in labour market institutions (declining labour union penetration and minimum wage) do not seem to have a great role. The role of technology remains paramount but turning from the SBTC, which explained the change in wage differentials until the 90s, to a routine-biased technological change (RBTC), more adapt to explain the wage differentials of the 90s and of the beginning of 21st century. Among the several formalization of such RBTC, a special mention is deserved by the model by Goos, Manning and Salomons (2014).

Autor also 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).

5. Criticism to market-based explanation of wage differentials: the impact of labour market institutions

It is easy to see that the job polarization theory was born in the hearth of the “unified theory”, the mainstream explanation for the increasing wage differentials in the 80s using the same demand-supply framework, even if with a more subtle and articulated view of their movement. Indeed, some papers more radically criticise the “unified theory”. It is worth considering the paper by Howell (2002). Firstly, 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 United States did not show lower unemployment until the late 1980’s and lately European unemployment rates converged to U.S 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, as Nickell and Bell (1996) had already stated in their influential paper. Indeed, several contributions explicitly deny the relation between employment inequalities and wage inflexibility, as Glyn (2000) reports in his 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 liberalization 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.

Notwithstanding the large consensus for the job polarization approach and the RBTC explanation of the wage differentials in the 90s, such theories have their critics too: Mishel, Schmitt and Shierholz (2013) agree that technological change generated change in the job structure and need for greater skills and education, 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 80s, even in their opinion the more complex inequality of 90s 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 polarization trends is not statistically robust and that the job polarization view may barely explain wage trends in 90s, 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 polarization 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 financialization, to those affecting institutions and particular sectors (unionization, minimum wage, deregulation, etc.).

Both Howell’s and Mishel, Schmitt and Shierholz’s papers, therefore, starting from a criticism of the usual interpretation of the data, underline the relevance of institutions and politic decisions in explaining wage differentials. As seen in the previous section, the importance of labour market institutions in explaining wage differentials was underlined 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. Koniger, Leonardi and Nunziata (2007), 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 labor 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 unions 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.

In the “institutional” view, therefore, it is not denied the importance of demand and supply movements, but their outcome in terms of inequalities depends on labour market institutions; the main difference from the “unified theory” consists in the different weight attributed to different explanations: according to the “institutional view” differences across countries in wage inequalities depend much more on differences in labour market institutions than on different intensities of technological change or different supplies of skilled/unskilled workers. The “unified theory” recognizes to demand and supply movements the main role in change of inequalities; however, labour market institutions have a role in determining if the increase (or decrease) in inequality is manifested in wages or in unemployment; hence the wage/unemployment trade-off: 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 Europe. Many papers confirm the existence of this trade-off: for instance Burneux, Padrini and Brandt (2006) conclude that in 90s the increase in wage inequality has been compensated, in OECD countries, by a decrease in unemployment. Nevertheless, 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 market. Angelini and Farina (2005), analysing the 80s and 90s, underline the differences inside Europe, with many exceptions to a trade-off view: in United Kingdom and Ireland the wage dispersion was not accompanied by an increase in employment; in Mediterranean countries (Italian, France, Spain) and continental countries (Germany, Belgium, Netherland, 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.

Several other aspects of labour market which may influence wage inequality, beyond demand-supply mechanisms, have recently attracted the attention of the scholars. Some papers focus on the non competitive labour markets, where wages do not depend at all or only in part by labour productivity. In such contexts wage bargaining determines the division of earnings; therefore the level of wage bargaining and the power of unions have a strong effect on wage level and inequality: according by Gürtzgen (2009), who studies the German case, powerful unions and a decentralized 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 Salvanés (2001) for France, Martins (2009) for Norway, Rusinek and Rycz (2009) for Belgium; Card, Devicienti and Maida (2009) studied this issue in an Italian region (Veneto) and Pistoiresi and Strozzi (2001) in an Italian industrial sector (heavy metals).

The level of wage bargaining and its impact on wage inequality has been widely studied: Koeniger, Leonardi and Nunziata (2007) and Card, Lemieux and Riddell (2004) find a correlation between the centralization of wage bargaining and a low wage dispersion.

Jirjan (2011) finds that the presence of work councils reduce the wage dispersion, likely to increase cohesion and solidarity among workers.

6. From wage inequality to other aspects of inequality: wage share and household income inequality; the importance of policy changes

The literature review so far made regards wage differentials, which are the aspect of inequality that most concerns labour economists. According to Checchi and Garcia-Peñalosa (2008), beyond inequality in earnings, the other relevant aspects of inequality are the wage share on total income, mainly analysed by macroeconomists, and the household income inequality, mainly focused by policy-makers. They develop a unifying theoretical framework to explain the relationship between the three concepts of inequality and their

correlation with labour market institutions, testing their model using a data set which covers 17 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).

As Checchi and Garcia-Peñalosa (2008) report in their paper, changes in wage share received less attention than changes in wage and unemployment inequality: they analyze the trend of the wage share on households income (microdata, from Luxembourg Income Study) and of the share of wage in corporate value added (or aggregate wage share: macrodata, from OECD). (Table 5, taken from their paper, reports both measures of wage share); it is possible to see that levels and trends differ substantially across countries, anyway, 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. In the United Kingdom the wage share on household income sharply declines from the middle of the 70s to the beginning of 90s, the aggregate wage share slowly but constantly declines from the middle of 70s to the middle of 90s; in the United States the trend is almost constant. Notwithstanding such different trends, overall in Europe the wage share declined: 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 liberalization of capital movements and the increase in financial activities (Glyn, 2006); the technological change, which favored profits more than wages, so that wages increased only in research intensive sectors (Pianta and Tancioni, 2008); the delocalization, which reduced internal occupation, depressing the salaries (Feenstra and Hanson, 2003) ; the deregulation of labour market, 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.

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

7. 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 bibliographic references in the context of the debate on income inequalities are Saez (2004) and Atkinson, Piketty and Saez (2011): this last paper analyses 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”.

8. Income inequality and crisis and other issues

As we reported in the beginning, 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.

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); among the recent papers, Jenkins et al. (2012) analyse the impact of what they called 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.

The impact of the inequalities 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). The impact of inequality on long run growth has been analyzed 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.

Other papers, in studying the relationship between inequality and growth, adopt a shorter period horizon mainly focusing on the impact of the recent recession. The paper by Kumhof, Rancière and Winant (2015) studies how high leverages and crises may arise as a results of changes in income distribution. An interesting literature review about the effect of inequality on growth can be found in Ehrart (2009). Morelli and Atkinson (2015) 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, Hoelscher 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. 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.

In the same papers the authors 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 households indebtedness, therefore to a financial crisis. More subtly, the authors underline the impact both of an 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 do 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.

Castells-Quintana, Ramos and Royuela (2015) study the link between the Great Recession and inequality 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 specialization, openness and technological change) are also associated with increasing inequalities.

In this overview of the literature, we cannot forget the contributions on the methodological problems arising from the analysis and interpretation of data: see Destefanis and Mastromatteo (2006, 2008) and Glyn (2000) about the wage differentials and Atkinson and Brandolini (2009) on the income inequality across time and countries on inequalities.

9. Concluding remarks

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 80s 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 90s 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 polarization of the labour market which is explained, according the job polarization or job-tasks approach, by the nature of the tasks required: middle-skilled routine jobs, whose demand is decreasing because of their easy substitutability by computers or machines, or non routine jobs, which may be unlikely replaced by machines or outsourced, whose demand is therefore increasing.

Notwithstanding the broad consensus about such explanations of the wage differentials trends, completely based on supply and moreover on demand shift, they 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 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 hypothesized 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.

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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

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

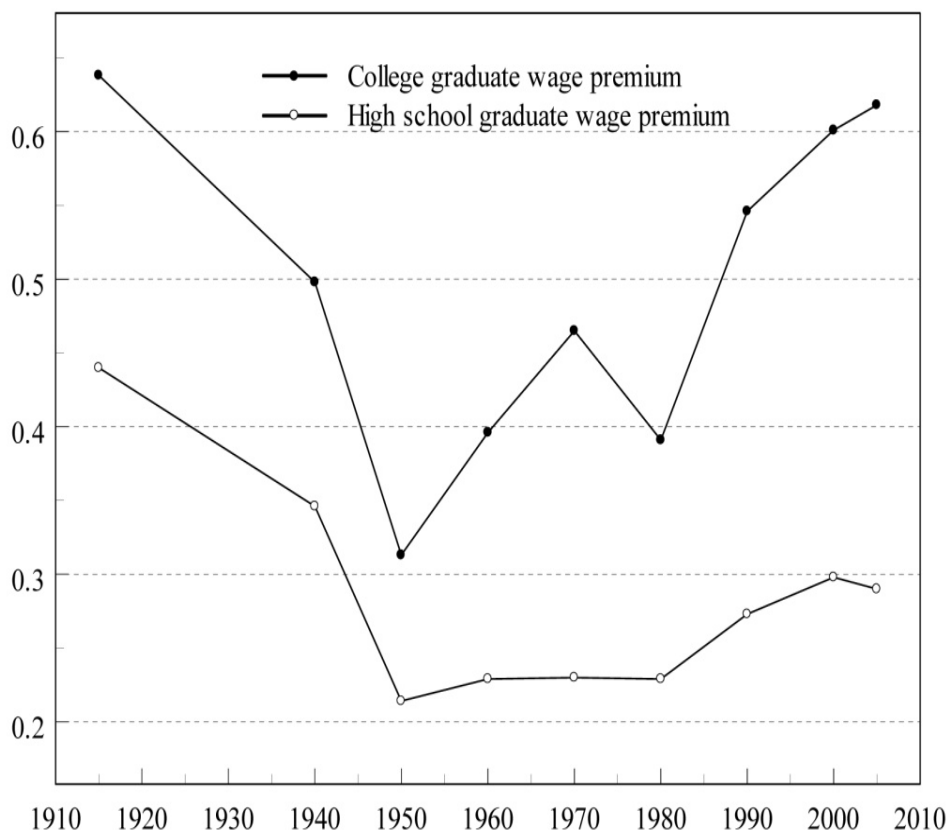
| | 1991 | 1996 | 2001 | 2006 | 2011 |
|----------------|--|--|--|--------------|--|
| United States | 2.09 2.14 | 2.12 2.21 | 2.24 2.15 | 2.36 2.17 | 2.31 2.20 |
| Italy | 1.50 1.43 | 1.62 ^a 1.50 ^a | 1.67 ^b 1.50 ^b | 1.61 1.34 | 1.56 ^c 1.49 ^c |
| Sweden | 1.60 1.36 | 1.68 1.40 | 1.72 1.40 | 1.71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

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

Source: OECD data

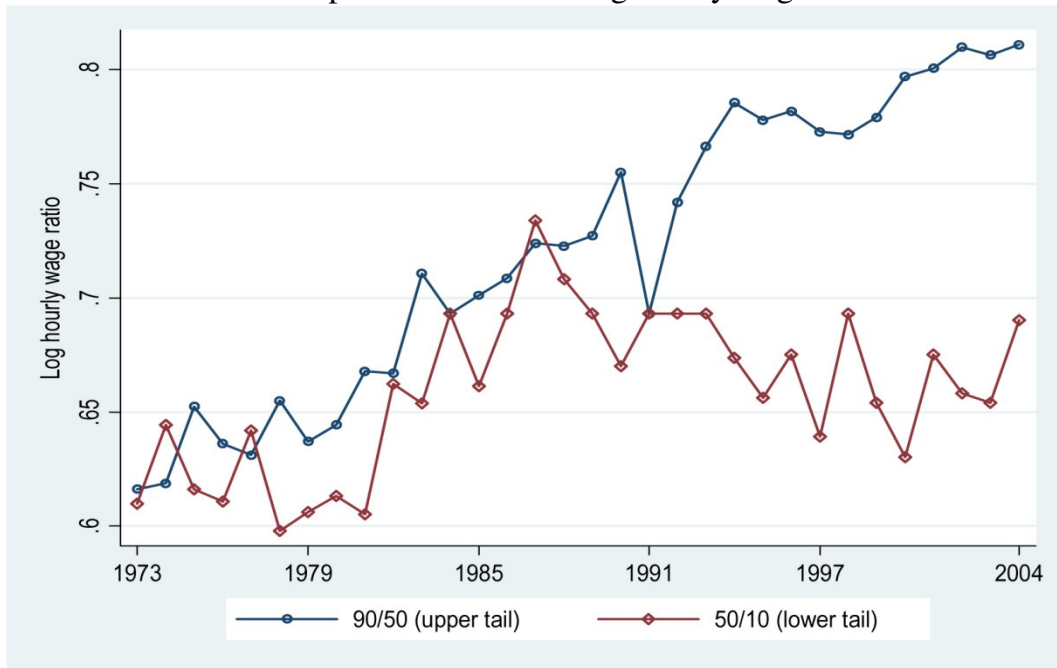
Figure 1

College and high school graduate wage premium in USA from 1910 to 2010



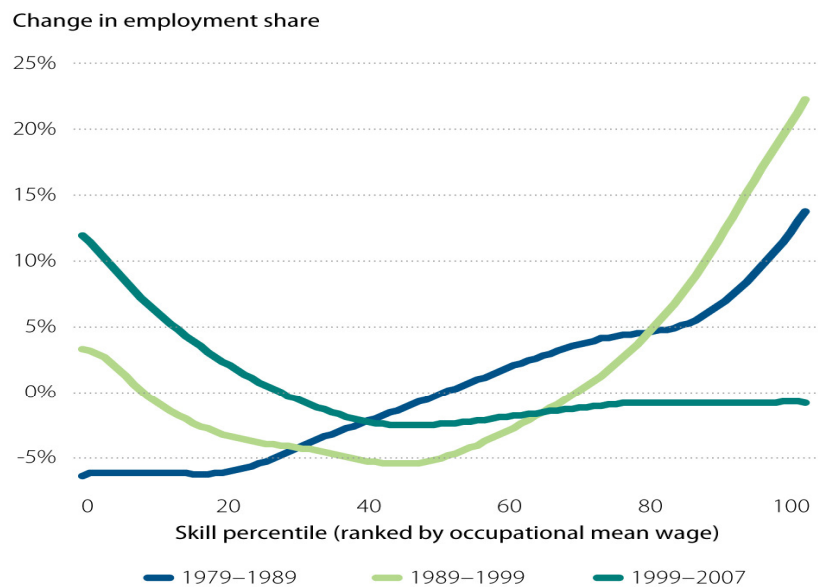
From Goldin and Katz (2010), pag.36.

Figure 2
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.

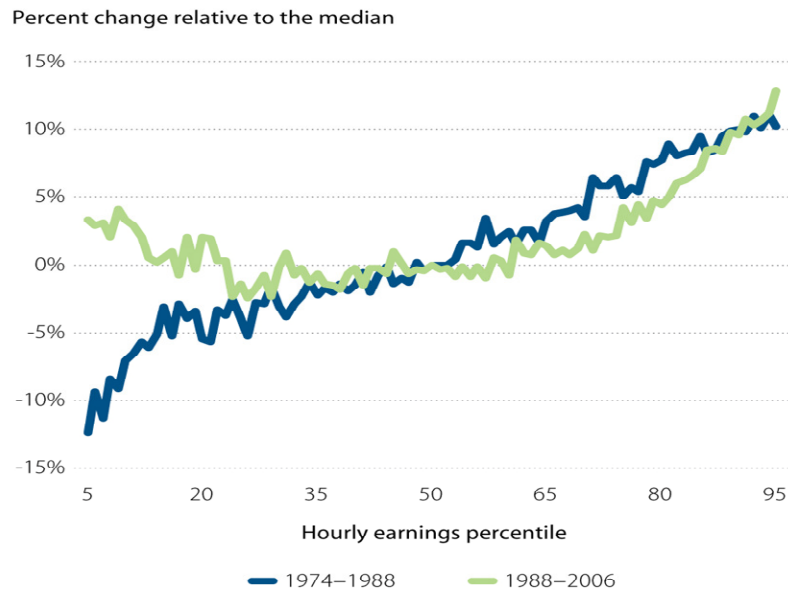
Figure 3



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 4



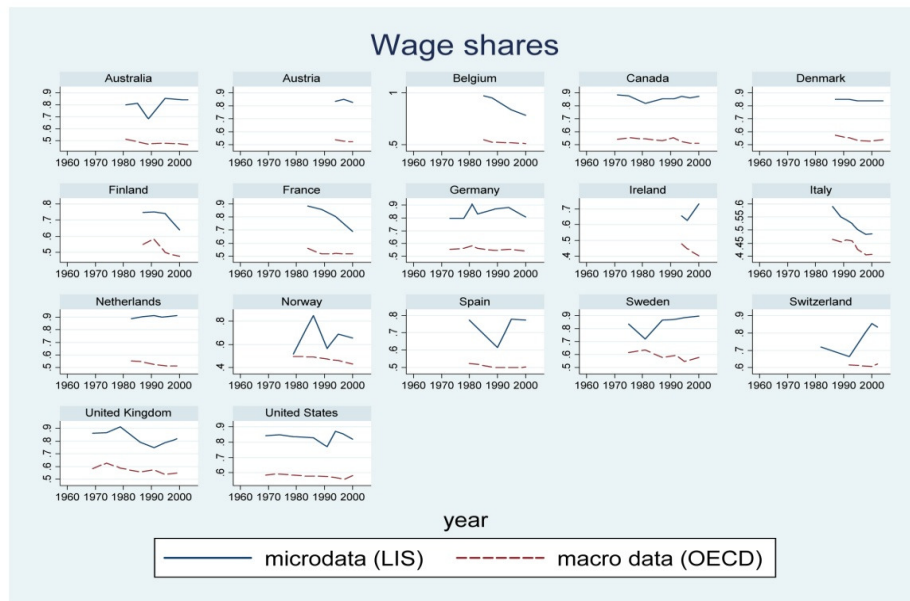
Source: May/ORG CPS data for earnings years 1973–2009. Each year comprises a three-year moving average (e.g. 1974 contains May/ORG data from 1973, 1974, and 1975), with years equally weighted. The real log hourly wage is computed by year for each percentile between the 5th and 95th percentiles. In every 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 5

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



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