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Labor heterogeneity, inequality and institutional change

Peter Skott
University of Massachusetts Amherst, pskott@econs.umass.edu

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By

Peter Skott

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Peter Skott†

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Abstract

US earnings inequality has increased dramatically since the 1970s, and the prospect of a reversal depends on what caused the trend. The standard explanation emphasizes skill-biased technical change. This paper briefly considers some aggregation issues and then proceeds to outline two alternative perspectives – power biased technical change and the effects of induced mismatch in the labor market – and their implications.

JEL classification: J31, J41, O33

Key words: inequality, power-biased technological change, minimum wages, overeducation, mismatch, efficiency wage, aggregation.

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†Department of Economics, University of Massachusetts Amherst, MA 01003; pskott@econs.umass.edu.

1 Introduction

Distribution has been central to classical economic theory as well as to the various strands of Post-Keynesian and structuralist macroeconomics. As a simplifying assumption, however, labor is typically taken as homogeneous, and the main focus has been on the functional distribution of income between wages and profits (with rents as an additional category in some versions). Kurz and Salvadori (1995, ch. 11) is a prominent exception but their treatment of labor heterogeneity stays at a high level of abstraction, and a large part of their analysis serves to clarify the conditions that would allow a reduction of heterogeneous to homogenous labor. This paper, by contrast, has heterogeneity as its focal point: simplifying assumptions of homogeneity may be justified for many purposes, but labor disaggregation is essential if one wants to address some of the most striking changes in inequality over the last 100 years.

As shown in figure 1, the long-term variations in the profit share are relatively mild. It drops about 4 percentage points between 1950 and 1980 and then recovers, rising about 2 percentage points during the neoliberal era. The calculation of the profit share raises many issues and the figure may give a misleading impression of the recent trend. CEO pay has increased dramatically, and at least a part of this increase should be included with profits. Adjustments along these lines have been made by Krueger (1999), but even with these adjustments, the functional distribution fails to tell the main story.

Figure 2 shows a different measure of inequality for the period since 1917. The fluctuations in income share have been particularly strong at the top end, but significant changes have occurred throughout the distribution, and wage movements are central to these changes.[1] What is remarkable in figure 2 is not just the increase in the share of the top decile that took place since 1980 but also the 'Great Compression' in the early 1940s, when inequality dropped dramatically in just a few years. This development raises the intriguing possibility of a parallel between the 1940s and the present. The neoliberal era from the 1980s, the financial bubbles, and the crisis have similarities with the runup to the great depression, and one might wonder whether the scene has been set for a new compression.

Figures 1-2 about here

The great compression of the 1940s was supported by institutional changes.[2] Federal

[1] This is the case even at the top end. According to Piketty and Saez (2003, p. 3)

> the increase in top income shares in the last three decades is the direct consequence of the surge in top wages. As a result, the composition of income in the top income groups has shifted dramatically over the century: the working rich have now replaced the coupon-clipping rentiers.

[2] The war played a part in the timing and pace of the compression. But compressions occurred in countries like Sweden and Spain that stayed out of the second world war, and it would be hard to explain the durability of the compression on the basis of the war.

legislation in the late 1930s strengthened labor unions, extensions of social insurance improved workers' bargaining position, and there were important changes with respect to workplace health and safety, minimum wages, and statutory overtime pay. Institutional changes also accompanied the increasing inequality in the de-compression period – federal labor relations law weakened, unions declined, industries were deregulated, and the minimum wage was allowed to fall – and studies by DiNardo et al. (1996) and Lee (1999) find that de-unionization and the falling minimum wage can account for a substantial share of the rise in wage inequality between 1970 and 1988.

The argument for institutional determinants of the observed movements in inequality has obvious appeal. It is easy to see how changes in policies and institutions since the late 1970s may have put downward pressure on low-skill wages, and there is no doubt that neoliberal ideas have taken a blow and that new openings have been created by the economic crisis. There is a real potential for a break with neoliberal policies. But this does not guarantee that a break will happen, and the prospects of a successful break depends in part on the employment effects of a reduction in inequality.

A decrease in the relative wage of low-skill workers leads to a rise in the demand for low-skill workers in a standard model of the labor market. Contrary to this prediction, low-skill workers have lost ground in terms of both wages and employment since the 1970s. Relative wages and relative employment have moved in the same direction, and this has been interpreted as evidence of skill-biased technical change (SBTC): firms have chosen to employ an increasing proportion of those workers who have become relatively expensive, and profit maximizing firms will not do that without shifts in marginal products (e.g. Acemoglu 2002 and Autor et al. 2008).

This TINA argument for SBTC ("There Is No Alternative", as Margaret Thatcher used to tell her critics) has implications for an assessment of both past trends and future prospects. Institutional changes cannot be blamed for increasing inequality if skill biases lie behind the observed trends in employment and inequality since attempts to prevent the increase – by maintaining or raising the real value of minimum wage – would have resulted in unemployment for low-skill workers.[3] Looking ahead, the SBTC hypothesis suggests that only changes in the skill composition of the labor force – education and training programs – can ensure a lasting reduction of inequality without causing unemployment.

Undoubtedly, improvements in education are desirable but the story of SBTC has many weaknesses,[4] and the TINA argument is false. The SBTC argument is usually cast in the context of a one-sector model, and this paper first considers aggregation problems that could invalidate the conclusions. The empirical relevance of these aggregation issues is unclear, but two other mechanisms may account for the observed co-variation of wages and employment. The two mechanisms are distinct, but not mutually exclusive.

Like the SBTC story, the first alternative focuses on technology. Skill biases in tech-

[3] This was a standard argument for high unemployment in Europe in the 1980 and 1990s, but see Howell et al. (2007) for a critical examination of the evidence.

[4] E.g. Howell (1999) and Card and Dinardo (2002).

nological change clearly could affect distribution, but other biases may have been more important. The great compression of incomes in the early 1940s can be seen as a response to the limitations of the available information and communications technologies (ICT) for the coordination and control of the new, large enterprises that had been created in the preceding decades. The burdens of coordinating large, complex, and geographically dispersed companies enhanced the bargaining power of those lower in the hierarchy and reduced that of top managers. The abruptness of the compression clearly has to be explained by institutional changes (and the war), but the underlying problems of coordination and control facilitated these changes. From the 1970s onwards, advances in ICT led to improvements in coordination and control, and these improvements reduced the agency rents accruing to those lower in the corporate hierarchies. In short, technological changes may have been important for the movements in inequality, not because of skill bias but because of their *power bias*: the changes have affected the ability of different groups to extract rents (Skott and Guy 2007; Guy and Skott 2008)).

The second alternative is based on the observation that many workers fail to get jobs that make use of their qualifications. This mismatch in the labor market – and the degree of mismatch – can be determined endogenously using an efficiency wage model (Skott 2005, 2006), and Slonimczyk and Skott (2010) use this setting to examine the effects of changes in minimum wages. We show that a rise in the minimum wage can have monopsonistic effects: low-wage workers gain from this rise both in terms of wages and employment, and aggregate unemployment may fall. Thus, in the US, the decline in the minimum wage since the late 1970s is consistent with the observed patterns in inequality and relative employment, and there may be no need to invoke biases in technological change. According to the mismatch argument, moreover, policy initiatives that help to reverse the increase in inequality need not have adverse effects on employment; they may even be beneficial, also in terms of employment.

Section 2 presents a simple example of paradoxical aggregation effects, section 3 discusses the PBTC argument in greater detail, and section 4 takes up the question of endogenous mismatch and its implications. A final section offers a few concluding comments on policy implications and the links between inequality and the financial crisis.

2 Aggregation

The one-sector argument for SBTC is simple. Assuming a well-behaved aggregate production function with constant returns to scale and only two inputs, high- and low-skill labor, we have

$$Y = F(N_H, N_L, t) \tag{1}$$

where N_H and N_L denote the input of high- and low-skill labor, respectively, and the time parameter (t) is included to allow for technical change.

The first-order conditions for profit maximization imply that

$$\frac{w_H}{w_L} = \frac{F_{N_H}}{F_{N_L}} = f(\frac{N_H}{N_L}, t) \quad \text{with} \quad f_{N_H/N_L} < 0 \tag{2}$$

where subscripts are used to denote partial derivatives. This equation implies that if relative employment and relative wages move in the same direction, it must be because of shifts in the production function. The one-sector assumption excludes changes in relative prices and the composition of output, and the production function defines an inverse relation between relative wages and (the profit maximizing) employment ratio.

The factor substitution in this case is not between capital and labor, but between two different kinds of labor, each of which is taken as homogenous and measurable in well-defined units, and the supply of which may be taken as exogenous (for simplicity). The well-known problems of re-switching and capital reversal can not arise in this case, but the one-sector assumption is restrictive and the inverse relation need not hold in a multisector setting.

As a simple example, assume that there are two consumption goods and that each of them is produced using a fixed coefficient production function,

$$C_1 = \min\{N_{H1}, \beta N_{L1}\} \tag{3}$$
$$C_2 = \min\{\beta N_{H2}, N_{L2}\} \tag{4}$$

where C_i and N_{ki} are the output of good i and the input of N_k in its production, respectively, and β is a positive constant. Using low-skill wages as the numeraire, letting ω denote the high-skill wage, and assuming that wages are paid at the end of production, the price equations are given by

$$p_1 = \omega + \beta \tag{5}$$
$$p_2 = \beta\omega + 1 \tag{6}$$

The composition of output is determined by demand, and it is assumed that high-skill workers spend all their income on good 1 while low-skill workers consume only good 2,

$$p_1 C_1 = \omega N_H = \omega(N_{H1} + N_{H2}) \tag{7}$$
$$p_2 C_2 = N_L = N_{L1} + N_{L2} \tag{8}$$

Equations (3)-(8) can be used to find the employment ratio N_H/N_L as a function of the relative wage ω:

$$\frac{N_H}{N_L} = \frac{\omega + \beta}{\omega\beta + 1} \tag{9}$$

Hence

$$\frac{\partial \frac{N_H}{N_L}}{\partial \omega} > 0 \quad \text{if} \quad \beta < 1 \tag{10}$$

In this example, a positive covariance between relative employment and relative wages is obtained if the high-skill intensity of production in sector one – whose output is consumed by high-skill workers – exceeds that of sector 2. The intuition is straightforward. The simplifying production and consumption assumptions exclude substitution both in production and in the consumption pattern of each type of worker. The aggregate effects on employment come from sectoral shifts associated with distributional change: as the relative wage increases, consumption shifts towards the good that is produced intensively by high-skill workers. The extreme assumptions in this example can be relaxed: a sufficiently strong distributional effect can dominate the substitution effects (which for simplicity were set to zero in the example).

The empirical relevance of these aggregation/distribution effects is questionable. The analysis has taken ω as exogenous, while a neoclassical approach would endogenize the relative wage: for a given relative supply of labor, equation (9) can be solved for the market clearing relative wage. A positive correlation between employment and relative wages, however, would imply that standard tatonnement mechanisms became unstable. Relative wages above the market clearing solution would produce an excess demand for high-skill workers and a tendency for the relative wage to rise further. Putting it differently, if one believes that market induced changes in relative wages tend to produce (near-) full employment, cases which produce the positive correlation in (9) must be excluded.

This stability argument may not carry much weight, but empirical evidence points towards the same conclusion. The shift towards increased skill intensity can be found across all industries, and it follows that the observed aggregate increase in high-skill employment cannot be explained as a compositional effect.[5]

The rest of this paper considers explanations that do not depend on shifts in the sectoral composition of output. Output will be taken as homogeneous, and non-Walrasian labor markets, instead, will play the key role.

3 Power-Biased Technological Change

An advertisement from the "Parts Bin" in the Daily Hampshire Gazette (my local newspaper in Amherst, MA), can be used as a simple illustration of the main point. The ad shows a picture of a "Fleet Black Box" and explains how this device gives the owner of a truck the ability to

> monitor driver performance as it pertains to obeying the law, safety and keeping operating costs in check (fuel economy, etc.) simply by plugging the Road Safety RS-2000 Fleet Black Box into the OBD II port of any 1996 and newer vehicle. You set the guidelines for high-speed driving, hard cornering, hard

[5] The issue has received a lot of attention since explanations of the wage-employment patterns that based on foreign trade effects come up against similar problems (e.g. Autor et al. 1998).

> breaking/acceleration and other aggressive behaviors. According to the manufacturer, the RS-2000 is tamper-proof and offers second-by-second reporting of vehicle speed, G-Force, throttle position and even interior sound level.

As it says on the manufacturer's webpage, "it is like being able to sit next to every one of your drivers every second they drive" (http://www.roadsafety.com/fleet.php).

This technology marks a shift in the relationship between truck drivers and owners. It used to be difficult for the owner of a truck to keep track of its progress. The owner had no way to monitor continuously what happened en route, and a late arrival at the destination could be blamed on mechanical problems, bad weather or heavy traffic. The information problem also meant that if the truck were to break down, it was difficult for the owner to tell whether the breakdown had been caused by driver negligence. With the new technology, this has all changed.

Truck drivers are not unique. As another example, consider the case of retail clerks. In a special report about new technology, Business Week described one of the uses of information technology:

> No part of a store churns up more data than cash registers. This is also where employee theft is most likely to pop up. ... With the press of a button, managers can highlight irregular register transactions on their computers and pull up corresponding video. This could enable them to catch cashiers who cut deals for their friends or pocket cash refunds themselves. (Business Week, 11 September 2006, pp. 48-50).

The traditional cash register provided a way of ensuring that the money collected from customers matched the money a clerk handed over to her or his employer. But it could not prevent collusion between clerks and customers (i.e., deliberate undercharging), and it was a crude instrument for measuring the work pace or productivity of the clerk. Cash registers have proliferated and improved since their introduction in the 1870s but not until the late 1970s, with bar codes and networked computing, was there a fundamental change in what the cash register *did*. With those changes, the cash register now creates a substantial barrier to clerk-customer collusion and, as in the case of trucks, the new technology gives managers the ability to monitor each individual clerk's productivity, second by second.

Trucks and cash registers show how changes in technology can affect the relative power of workers and their employers, where power, as we use the term, means one party's ability to affect outcomes that matter for another. The power of a worker depends on both the sensitivity of employer outcomes to the worker's actions - is the worker able to affect a large operation or a costly piece of equipment, or is her work independent and without much capital? - and on the employer's ability to constrain the worker's actions through monitoring and intervention. High costs of monitoring individual workers, or the employer's ignorance of the state of nature in which they operate, leads, *ceteris paribus*, to greater worker power and, as a result, to higher wages. Indeed, this is a standard

result of efficiency wage models. Poor information systems reduce the match between contractible proxies for a worker's effort or output, and the effort or output itself; the power of workers is enhanced and the level of efficiency wages tends to increase. This holds whether the latter is understood as taking place in a gift exchange (Akerlof 1982) or in an adversarial relationship in which performance is enforced through a combination of employment rents, and a threat of dismissal following the principal's subjective evaluation of the agent's performance (e.g. Shapiro and Stiglitz 1984 and Bowles 1985).

There is substantial evidence of widening power differences following the adoption of ICTs, not least in growing industries such as retailing, banking and telecommunications (e.g. Grimshaw et al. 2002; Miozzo and Ramirez 2003; Hunter and Lafkas 2003). Large groups of low-paid workers face increased monitoring and more precise task specification, and these changes can be analyzed formally in an efficiency-wage model: increased monitoring implies that the worker's risk of sanctions (firing) becomes more sensitive to variations in the worker's 'effort'.

Using this framework, Skott and Guy (2007) show that PBTC can account for a simultaneous rise in the relative wage and the relative employment of high-skill workers. In other words, PBTC can explain the particular employment-inequality pattern that has been regarded as a key piece of evidence for the SBTC hypothesis. Unlike the SBTC hypothesis, moreover, PBTC explains an increased intensity of work effort, evidence for which is reviewed by Green (2004).

PBTC sheds light on the great compression too. In the early twentieth century, economies of scale, scope, and speed offered substantial productivity benefits to large managerial firms. These productivity gains were contingent on solving problems of coordination and control, and the limitations of the information systems necessitated a relatively rigid, single-path flow of materials and information. As result, in 1937 workers at General Motors were able to bring a large part of the operations of the company and many of its suppliers to a halt by sitting down in a few factories. The rigidity of the production system gave small groups of workers the ability to disrupt production and strengthened their bargaining power, and the flip side of organizational inflexibility was a reduction in top managers' scope for action which limited their agency rents. These factors tend to reduce inequality in a decentralized system of wage determination. Moreover, they provide a setting for industrial conflict which threaten the productivity gains of large-scale production and, in some cases, the larger social order. Labor unions and government regulation can be viewed as a way to alleviate these threats and promote orderly industrial relations. Thus, the limitations of ICT facilitated the institutional changes that contributed to the great compression.[6]

[6] Freeman and Medoff (1984) suggest another role for labor unions. If limited coordination technology forces a firm to rely on relatively inflexible rules, the firm can be brought to a standstill by its employees 'working to rule'. In this situation, doing a good job will sometimes require working beyond - and perhaps even in violation of - the rules, and employees therefore expose themselves to arbitrary retaliation from supervisors simply by doing a good job. In these cases unions may help ensure fair treatment, and as a result, unionized companies may gain productivity benefits.

The explosive growth of new ICTs that started in the 1970s reversed these trends by enhancing the flexibility of firms and their ability to coordinate complex production networks. This increased flexibility reduced the ability of low-level employees to disrupt production, and improvements in the monitoring technology led to further reductions in the power of low-level workers. The new technology, however, can do little to monitor the more complex actions and options of executives, and there has been a growth in performance contingent pay - where performance is an outcome, not an action (Lemieux et al. 2007). From this perspective, the very large changes in the top end of the earnings distribution are not surprising.

To conclude, there is substantial direct evidence of power-biased technical changes, and an efficiency wage model shows that PBTC can potentially explain the observed patterns of employment and inequality. Moreover, PBTC can contribute to an understanding of the institutional changes that played a part in the great compression and its reversal.

4 Mismatch

High-skill workers are sometimes unable to find jobs that matches their skills, and in many cases they will then broaden their search, rather than go unemployed. A recent article by Michael Luo in the New York Times described how the recession has produced

> a new cadre of underemployed workers dotting American companies, occupying slots several rungs below where they are accustomed to working. These are not the more drastic examples of former professionals toiling away at "survival jobs" at Home Depot or Starbucks. They are the former chief financial officer working as comptroller, the onetime marketing director who is back to being an analyst, the former manager who is once again an "individual contributor" ("Overqualified? Yes, but Happy to Have a Job", New York Times, 28 March 2010)

The measurement of mismatch is notoriously difficult but studies suggest that 'overeducation' is widespread in all OECD countries. Estimates of the proportion of overeducated workers range between 10 and 40% (Groot and Maassen van den Brink, 2000), and the results in Slonimczyk and Skott (2010) fall in this range too. Combining data from the Dictionary of Occupational Titles and the Current Population Survey we found over-education rates of about 15-25% in the US.[7]

[7] The DOT reports expert assessment of more than 12,000 job titles, and we take the General Education Development (GED) index as our measure of skill requirements. The very detailed job classification of the DOT is not available in any representative survey of earnings, but proxy measures forr 3-digit occupations can be obtained by averaging the GED scores. The skill requirements data were merged with the Current Population Survey earnings files. We use the education item to identify low- (high school or less) and high-skill workers (at least some college).

As shown in Figure 3, the share of employed workers with at least some college increased from around 33% in 1973 to over 58% in 2002. This feature of the data will not be surprising, but less well known is the substantial rise in the share of high skill workers whose jobs have requirements below their skill level, at least according to the DOT experts. At the beginning of the period only 14.7% of workers were in this category; toward the end of the period the percentage of over-educated workers had increased by 10 percentage points.

Figure 3 about here

The existence and persistence of significant mismatch in the form of overeducation may be surprising from a traditional Walrasian perspective but poses no problems in an efficiency wage setting.[8] Drawing on Skott (2006), Slonimczyk and Skott set up a formal model with two job categories and two types of workers. We assume that high-skill workers can get two types of jobs ('good' high-tech jobs and 'bad' low-tech jobs), whereas (for simplicity) low-skill workers have only one type of employment opportunity (low-tech). Monitoring of workers' effort is imperfect, contracts are incomplete, and workers cannot convincingly pre-commit to not shirking. One solution is for firms to use the threat of dismissal as a way to elicit effort, but for this threat to work, both good and bad jobs must be rationed to ensure that employed workers receive a rent over and above their best alternative. Good jobs pay more than bad jobs, which in turn must pay more than unemployment. In equilibrium there will be both un- and under-employment (some high-skill workers have bad jobs that do not utilize their skills), and inequality between groups will depend not only on the wage gap between good and bad jobs, but also on the degree of mismatch. The model, in other words, determines unemployment rates for both high- and low-skill workers as well as a rate of underemployment (the proportion of workers with jobs for which they are overeducated).

Now introduce a minimum wage and assume that it is binding in low-tech jobs but not in high-tech jobs. When the minimum wage is binding then, by definition, it forces firms to pay more than would be required to fill the low-tech jobs with non-shirking workers. It follows that the no-shirking condition cannot be binding for both high- and low-skill workers in low-tech jobs. There is now an extra degree of freedom in the determination of who gets the low-tech jobs, but Bewley (1999) has provided empirical evidence on how the model should be closed. In his study of wage setting behavior, Bewley found that overqualified job applicants were common, but that many employers were reluctant to hire them. Indeed, this "shunning of overqualified job applicants" is highlighted as one of two novel findings of the study (p.18). Attitudes to overqualified applicants differed somewhat between primary and secondary sector jobs, where secondary sector jobs are defined as short-term positions that are often part time. Both sectors received applications from

[8] Assignment or matching models can also explain mismatch (e.g. Sattinger 2006, Albrecht and Vroman (2002).

overqualified workers, but for primary sector jobs 70 percent of firms expressed a "total unwillingness" to hire them, 10 percent were "partially unwilling" and only 19 percent were "ready to hire" overqualified applicants (pp. 282–83). Secondary sector employers had fewer reservations, but only a minority (47 percent) "were ready to hire them" with 30 percent being "totally unwilling" and 23 percent "partially unwilling" (p. 324).

Bewley's evidence suggests that firms prefer low-skill workers in low-tech jobs, as long as the no-shirking condition is satisfied. This result can be included in the formal model, thereby removing the extra degree of freedom, and the effects of a change in the level of the minimum wage can be derived. The results are striking: an increase in the minimum wage unambiguously raises the employment of low-skill workers and reduces the rate of underemployment of high-skill workers, and it may – but need not – generate a reduction in average unemployment. What happens is that low-skill workers get pulled into low-tech jobs when the minimum wage is increased and high-skill workers get thrown out. The fallback position of high-skill workers in high-tech jobs now deteriorates, and this relaxes the no-shirking condition in high-tech jobs and stimulates employment. The monopsonistic effects arise as a result of these spillover effects from induced changes in the degree of mismatch.[9]

We test the predictions of the model in time series regressions for the US as a whole and panel regressions using state level data. This empirical approach is unlike most recent work on the employment effects of the minimum wage, which looks at specific groups or industries that are likely to be strongly affected, such as teenagers and restaurants (see Card and Krueger 1995 and Dube et al. 2007). Our theoretical argument, however, concerns macro effects on the entire labor market that cannot be captured by a study of a small subset of workers or industries.

The regression results are consistent with monopsonistic effects of changes in the minimum wage. The coefficient on minimum wages is negative in all time series and panel regressions for low-skill unemployment, high-skill unemployment and the degree of over-education. The regressions also give the expected negative effect of the minimum wage on the wage premium in high-skill jobs.

One should be cautious about causal attribution, of course. The minimum wage could be endogenous and its decline could reflect the decrease in the demand for low-skill workers. This endogeneity argument would be particularly forceful if a decline were necessary to prevent rising low-skill unemployment. Our model questions this premise, however, showing to the contrary that low-skill employment may suffer as a result of a falling minimum wage. It is probably true that the regression results for the minimum wage may capture other influences. Changes in the minimum wage are related to political pressures and general ideological trends, and these trends have generated a range of non-market changes, from labor market legislation and declining unionization to the deregulation of

[9] The monopsony model, literally interpreted to apply to single buyer markets, may have little relevance but as argued by Manning (2003), labor markets can be monopsonistic, even if there is a multiplicity of buyers of labor.

the financial industry. The estimated effect of the minimum wage may capture some of these other non-market factors. This potential problem of interpretation, however, does not imply that non-market changes merely reflect market fundamentals.

5 Conclusion

One-sector macro models with 'capital' and 'labor' as inputs to production have come in for heavy criticism. In my view, models of this kind can be very useful, but clearly they have limitations. Sraffian critiques have focused on aggregate capital, but the neglect of labor heterogeneity (and its interaction with non-Walrasian features of the labor market) may be the more important shortcoming if one wants to understand the trends in US income inequality.

The mainstream position on increasing earnings inequality emphasizes SBTC. This leaves education as the main solution if one wants to reduce inequality and avoid unemployment. This long-term remedy can be supplemented with employment subsidies or changes in tax structures (earned income credits, for instance), but any attempt to improve wages at the lower end of the distribution by raising the minimum wage or strengthening labor unions will have significant adverse effects for employment, according to the SBTC hypothesis.

This paper has examined two alternative explanations of increasing inequality, both of which can be formalized using efficiency wage theory.[10] The distributional effects of technological change, first, may derive primarily from a power bias, rather than a skill bias. An explanation of rising inequality based on power bias implies that institutional changes may be hard to implement. The changes associated with the great compression in the 1940s were – at least partly – consonant with the needs of business, and this facilitated the changes. The improvements in ICT since the 1970s have given firms much greater flexibility as well as an ability to monitor and control low-level employees. As a result, policies and institutional changes that strengthen workers and reduce economic inequality are likely to be meet with much fiercer opposition from business than during the great compression.

Unlike the PBTC explanation, the other (non-exclusive) perspective gives grounds for optimism. Business opposition may be fierce but the crisis does offer opportunities for social mobilization and policy initiatives that would have seemed unthinkable just a few years ago, and induced mismatch implies that the observed patterns of inequality and employment cannot be taken as evidence of a trade-off between equality and employment. In other words, it may be difficult to implement changes, but reforms that reduce inequality need not founder on inevitable employment losses.

The movements in inequality are of great importance in their own right. Most economists – in particular macroeconomists with their representative-agent models of inter-

[10] The basic argument behind efficiency wage theory was recognized by the classical economists, see Kurz and Salvadori (1995, pp. 332).

temporal optimization – may have a blind spot when it comes to income distribution, but the welfare implications of the observed shifts are clearly momentous, and they also have macroeconomic effects. An increase in inequality – whether caused by SBTC, PBTC or changes in policies and institutions – will tend to reduce aggregate demand, and in the absence of other compensating effects, rising inequality would have led to severe recessions in the US a long time ago. The compensating effects are not hard to find, however. Public sector deficits have been expansionary although this has been partly offset by a drain from the trade balance. More importantly, the stock market bubble in the 1990s provided a stimulus to both consumption and investment, and when that bubble collapsed, the housing boom and creative mortgages allowed saving rates out of distributed incomes to fall even further. A need for bubbles to maintain aggregate demand does not, of course, explain how the bubbles were created. But it does suggest that absent the adverse trends in distribution, bubbles would have led to overheating and therefore would have been quenched much earlier by an aggressive monetary policy. In this sense, it is not unreasonable to view the long-term changes in the distribution of income as a central part of any story about the financial crisis.

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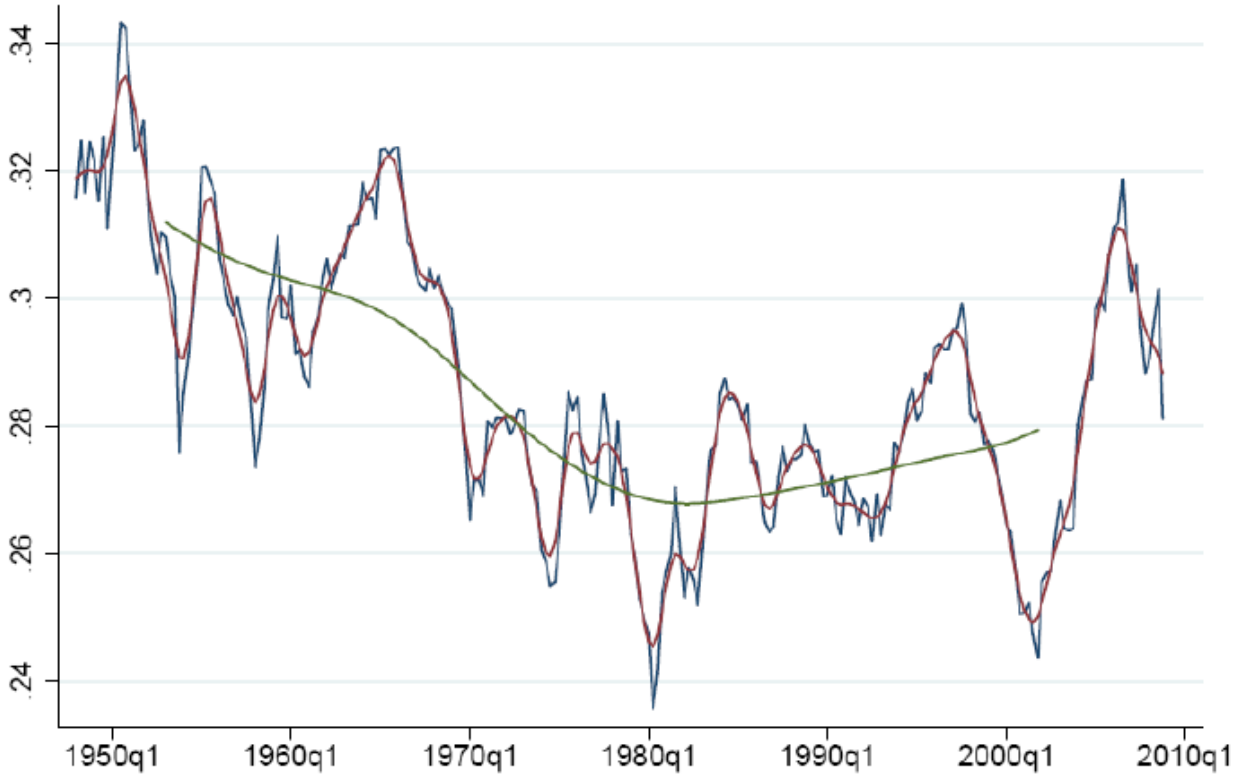

Figure 1: Profit share; US corporate business (Source: Zipperer and Skott 2010).

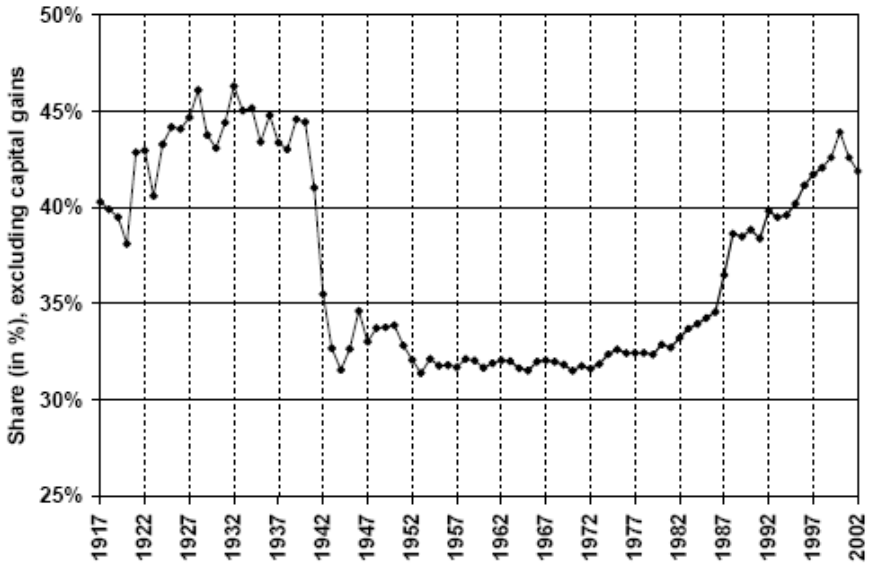

Figure 2: The Top Decile Income Share, 1917-2002. Source: Piketty and Saez (2007, Figure 1).

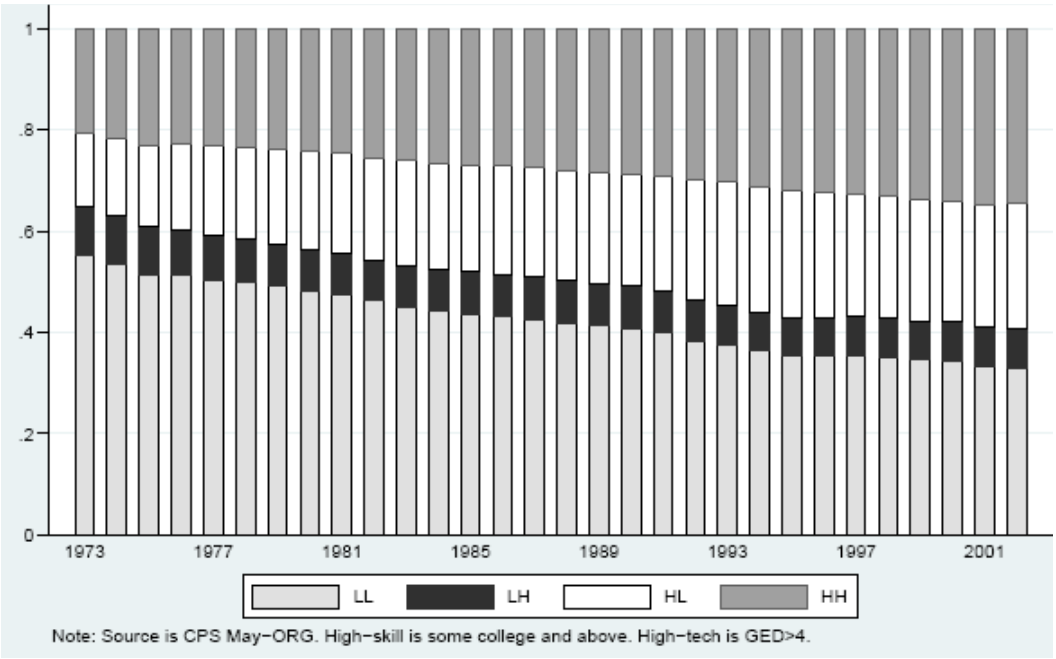

Figure 3: Distribution of the employed labor force (source: Slonimczyk and Skott (2010); LL=low-skill workers in low-tech jobs, LH=low-skill workers in high-tech jobs, HL=high-skill workers in low-tech jobs, HH=high-skill workers in high-tech jobs)