

Technology, Institutions, and the Great Compression:
The Dynamics of Income Distribution in Liberal Market Economies

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Abstract:

Comparative studies of capitalism tend to treat the US as a free-market base case, and to assume that the relative inequality of the US income distribution, in comparison with coordinated or neo-corporatist market economies, is stable. Studies of changes in the US income distribution cast doubt on both of these assumptions, but often fail to exploit the comparativists' insights into the interaction of technology, production systems, and the politics of distribution. This paper puts brings insights from the comparative capitalism literature to explanations for the coming and going, between the 1940s and 1980s, of the "great compression" in the US income distribution.

The current interest in income distribution arises from the considerable growth of within-country inequality in much of the world over the past three decades. While growth in inequality has been seen in many places, among rich industrial countries the increase has been particularly sharp increase in the English-speaking countries; the growth of inequality in those countries was most pronounced in the 1980s.

The higher levels of inequality in the Anglophone world have led both to efforts to explain the abrupt shifts in distribution within those countries, and to efforts to explain why income distribution in certain other industrial countries has not become so unequal. To a significant degree, these efforts have remained separate. An influential line of analysis of the relative equality in much of continental Europe and industrial East Asia focuses on complementarities between product specialization in international trade, systems of production, skill acquisition, social welfare, corporate governance, and electoral systems (Hall and Soskice 2001; Estevez-Abe, Iversen, and Soskice 2001; Iversen 2005; Cusack, Iversen, and Soskice 2007; Gourevitch and Shinn 2005). While it is comparative in ambition, however, much of this literature focuses on these coordinated market economies (CMEs), and without a great deal of investigation treats the liberal market

economies (LMEs) of the English speaking world as a free-market base case - the sort of outcomes that you presumably get in the absence of effective coordination (Howell 2003).

In the case of the CMEs, however, the discourse of comparative capitalism has combined analytical political economy with older traditions of regulation theory and comparative industrial relations, and in so doing has shed light on the relationships between technology, the organization of production, the power of different actors, and the distribution of income. This dimension has been sadly underdeveloped in most of the literature on the growth of inequality within the US and other LMEs. Among economists, explanations for the growth of inequality have, until recently, focused on skill-biased technological change (SBTC): production technologies play a central role here, but it is an abstract one, affecting distribution only through changes in the demand for skill. The leading rival explanation has been the reduction in barriers to trade, as a consequence both of political choices and of improvements in transport and communications technologies. Here, again, the labor market changes are not institutional, but simply shifts in the effective supply (through international competition) of various types of labor.

Gradually, these hypotheses have yielded ground to explanations focused on institutional change, largely because the pattern of the shifts in distribution - in particular, the abrupt 'great compression' at the start of the 1940s, the similarly abrupt great dispersion forty years later, and the continued rise of the top-level income share after the 1980s - cannot be plausibly explained in terms of simple supply of and demand for human capital, whether domestic, foreign, or the two combined. Atkinson (1999; 2000) offered a systematic critique of what he called the 'Atlantic consensus'. Di Nardo et al (1996) showed that much of the increased wage dispersion in the US in the late 1970s and 1980s could be explained by institutional factors, including de-regulation of industries, weakened unions, changed tax rates and, in particular, the declining real value of the minimum wage. More recently, Philippon and Reshef (2008) have shown that changes in earnings in the US finance industry over the past century have closely followed on changes in financial (de-) regulation, even after the inclusion of very fine human capital controls. Levy and Temin (2007) provide a concise survey of the institutional changes associated with both the great compression and the great dispersion in the US; they argue that institutional changes shape the effects, on distribution, of technological change, and also make a case for the importance of social norms.

But big clusters of institutional changes - in such diverse areas as the tax code, the legal status of unions, the social welfare system, the minimum wage, the prudential regulation of financial services, state-sponsored cartelization in transport industries, and price- and rate-of-return regulation in public utilities - themselves require explanation. It is here that analytical political economy, together with an understanding of changes in the organization of production, become useful. These tools are useful not only for explaining the path that income distribution has taken in the LMEs, but in assessing under what conditions income inequality might be substantially reduced within those economies.

The approach taken in this paper is to begin by identifying functional complementarities between economic institutions and systems of production (that is not to imply that institutional variation is explained in a functionalist way: various actors have an interest in the existence of functional complementarities, and strive to see their interests reflected in institutions). I begin with a discussion of the way in which the determination of income distribution is treated in the literature on comparative capitalism. Next, I outline three different theories that have been advanced for the relationship between changing production technology and organization and the distribution of income

within the LMEs. The first of these works through simple markets for human capital (skill biased technological change plus Heckscher-Ohlin factor price effects in international trade, as noted above). The second works through a functional need of a closed mass production economy for a large middle class, and the lack of such a need in an open economy with flexible production; this is a simple version of *regulation* theory. The third works through changes in agency relationships within firms as a result of changes in economies of scale and scope, and in technologies of coordination and control; this is what Peter Skott and I have called power-biased technological change (PBTC).

Each of these theories offers an explanation for why the distribution of income in the US was more compressed between 1942 and 1978 than it was either before or after that. The *regulation* theory and PBTC both endogenize institutions, and it is possible (though not so plausible) to do so with the SBTC / trade hypotheses. What none of the theories does, however, is to explain the abruptness with which institutional change occurred, around 1940 and again around 1980. Explaining institutional discontinuities is deep water, and I can't say I have navigated it far: more like dipping a toe at the edge. Even so, we get far enough that we can say

something about the prospects for re-distribution within liberal market economies in the future.

1. US inequality in comparative perspective

Supporters of the proposition that increased inequality in the US and other LMEs has been a necessary consequence of technological change, increased trade, or both, have had to face the fact that in many industrial economies the increases in inequality came later and were much more modest, if they came at all. For some time, the answer to this challenge was the argument that CMEs had contained earnings inequality only at the cost of high unemployment (Wood 1994). Much of the unemployment in that story, however, was the consequence either of German unification, or the slump that followed the collapse of Japan's asset bubble and banking system. While it is clear that the countries of southern Europe have had difficulty creating jobs, especially for their more educated workers, the idea that high skills and a relatively equitable distribution of income come at such a cost has been belied by the resurgence - up until the current slump - of the Netherlands, Denmark, Sweden, and Germany; the continued growth of the East Asian Tiger economies; and of course by evidence that income polarization has

continued to grow in the US (Autor, Katz, and Kearney 2006), together with current doubts as to whether any of the growth seen in LMEs in the past decade has been more than a financial fiction.

In the 1980s, many saw CME institutions as both competitively and socially superior to the LMEs (see, for instance, Lazonick 1991; Piore and Sabel 1984; Porter 1990). As regards international product market competition, at least, this view is no longer influential. What has taken its place is an analysis that sees the CMEs and LMEs as having comparative advantages in different kinds of product or production process. Young people outside of the LMEs are far likelier to partake in vocational training and education (I say outside of the LMEs because this generalization holds not only in CMEs but in several countries that are difficult to classify), and so to acquire industry- or firm-specific skills.

Estevez-Abe et al. (2001) argue that this is due to the fact that non-LMEs in the industrial world have institutions establishing either job security, or generous unemployment benefits together with state-assisted retraining, or both. Within CMEs, at least, these institutions are regarded as credible guarantees over an individual's lifetime, because these countries have political systems that are consensual - mostly, proportional representation systems - making it easier to

block changes in the systems of job security and social welfare (Iversen 2005). For similar reasons, the promise of a state-mandated pay-as-you-go pension system is credible within CMEs, and funded pensions invested in the stock market are unimportant in these countries. This eliminates an important political constituency for minority shareholder rights, and leaves corporate governance in the hands of insiders - managers, bankers, or equity investors who hold large blocs of shares (Gourevitch and Shinn 2005). Because these insiders are not threatened by a market for corporate control or other institutions of shareholder governance, they are able to make credible long-range commitments to their employees. The combination of long-range commitment by management and a workforce with high levels of specific skills lends itself to specialization in complex products that benefit from incremental improvement: automobiles, capital equipment, and luxury goods are common examples (Hall and Soskice 2001).

LMEs are what CMEs are not: low levels of vocational training for production and service workers; minimal social insurance; training concentrated in the general skills of the managerial, financial, and scientific workforce; funded pensions invested in the stock market; and priority, in the governance of corporations, to shareholder value generally and the rights of minority

shareholders in particular. The electoral systems in LMEs are majoritarian, rather than proportional. This reduces the size of the coalition needed to make changes in the social contract, and so renders inter-generational bargains on social insurance and pensions non-credible. These economies specialize in products that benefit from the ability to rapidly mobilize, and demobilize, human and financial resources: the search for the next blockbuster drug, or movie, or killer application in the realm of general purpose software.

In this analysis, income distribution in CMEs is less equal than in LMEs for several reasons: motivation for investment in skills establishes a high marginal product of labor; insider control of companies and relatively small securities markets remove a sector in which high incomes have been concentrated in the LMEs; and, most fundamentally, the political settlement on which the production system is based is one of cooperation and consensus, a settlement which is sustained by, and which looks favorably on, relatively egalitarian outcomes.

From this work, two very different pictures emerge of the political dynamics of national business systems, and consequently of income distribution. One is a picture of post-second world war CME exceptionalism, in which proportional representation combined with win-win solutions promised by the rapidly

expanding pie of post-war reconstruction, to create anomalous systems of highly skilled, highly paid labor in production, and high marginal tax rates on high incomes. With reconstruction long since complete and international competition intense, easy mutual gains are no longer available, and the future of the CMEs is in doubt (Eichengreen 2007; Eichengreen and Iversen 1999); in this reading, crisis tends to nudge their political systems away from PR, as in reforms in the 1990s in Japan (Estevez-Abe 2008). The other picture is one of relatively durable traditions of consensual politics and high skill levels, with constitutional arrangements dating from the early 20th century and traditions of cooperation and training reaching much further back in history (Cusack, Iversen, and Soskice 2007). But, whether the CME is viewed as a stable system or a passing fluke, the implicit question is how such a system exists in a world where the logic of the market takes one in the direction of liberal market economies (LMEs), such as the United States. The relatively in-egalitarian distribution of income in the LMEs is regarded as stable over time (Iversen and Soskice 2006).

It is not at all clear, however, that income inequality in the US was, over the 20th century, consistently greater than those of today's CMEs. Piketty and Saez (2006) compare the shares going to the top 0.1%, over time, in Britain, Canada,

France, Japan and the USA. Before 1980, any differences in level are swamped by similarities: an abrupt reduction in the top share in the early years of the second world war, with relative stability at similar levels across countries both before and after. The big differences, for this elite demographic, come after 1980, when the share taken by the highest incomes in all English-speaking countries suddenly takes off. Piketty and Saez (2003) document similar, if slightly less extreme, paths for the income shares of various larger slices of the top 10% in the US. Goldin and Katz (1999) show a particular sharp compression of incomes among manual workers during the 1940s, with a gradual de-compression from the early 1950s into the 1970s. In light of this, it is perhaps not surprising that Mann and Riley (2007) find the average of income GINIs in the 1950s is lower for Anglo-Saxon economies than for their groups of Nordic, Continental, and industrial East Asia; these relationships are reversed by the 1970s, and in the 1980s the differences became extreme.

This history of changes in the relative levels of inequality are less surprising when we note that the production systems of the LMEs and CMEs have themselves become more differentiated since the 1970s. With the completion of postwar reconstruction and the reduction of trade barriers, international

competition increased and this spurred specialization (Eichengreen 2007; Eichengreen and Iversen 1999). The CME institutions described above had been present within mass production economies in the 1950s and 1960s, and gave those countries a comparative advantage in successor systems such as flexible mass production (Japan) and diversified quality production (Europe) (Hollingsworth 1997). The decline of mass production in the Anglophone economies, with less skilled production workers and growing external financial control of companies, took a different path.

2. Technology, the organization of production, and the great compression in the US: three theories

We turn now to the question of how it is that LMEs achieved relatively egalitarian distributions of income during the decades from 1940 to 1980 - a period which includes the Second World War, the Golden Age of Mass Production (1948-1968), and the Crisis of Mass Production (the decade of slow productivity growth, high unemployment and high inflation in the 1970s). That this was achieved within majoritarian political systems and with the heavy use of semi-skilled production labor will tell us something about the limits of the

foregoing analysis.

The default assumption for many economists has been that changes in the distribution of income reflect changes in the marginal productivity of different types or levels of human capital. The great decompression is understood to result from skill biased technological change (SBTC): the application of new technologies in the workplace in the last decades of the 20th century reduced demand for low skilled labor, and increased demand for certain skills that were already well rewarded (Machin and Van Reenen 1998). Early versions of this hypothesis focused on the decline of mass production, together with a rise in skills presumed necessary to use computers (Autor, Katz, and Krueger 1998). This approach, however, does not appear to explain much (DiNardo and Pischke 1997). More recent accounts stress the role of computers in the displacement of routine mental and manual tasks, and their replacement by jobs requiring judgment (Entorf and Kramarz 1997; Levy and Murnane 2004), or social and teamwork skills (Bresnahan 1999).

The SBTC hypothesis requires not only a change in the demand for skills, but a failure of supply to keep pace. The case for this is made by Goldin and Katz (2008). For a skeptical assessment of this argument, see Handel (2003).

The same theory, applied not to the great dispersion but to the great compression, sees mass production increasing the demand for semi-skilled labor, and the expansion of high school and college education increasing the supply of skilled labor (Goldin and Katz 1998, 2008).

SBTC is not really plausible as an explanation for changes in the upper tail of the income distribution. Piketty and Saez (2003) have documented changes in the extreme tip of that tail, and they are like a grossly exaggerated version of the rest of the upper tail. Philippon and Reshef (2008) examine earnings in finance, a particular industry that is heavily represented across the entire upper tail. Much of their data runs from 1909 to 2006. They attempt to explain changes in the earnings in this industry relative to others in terms of human capital theory: education, and also the skill demands of particular occupations as reported in the Dictionary of Occupational Titles (DOT). Their conclusion is that human capital doesn't do the job: in periods when financial earnings are high, they can only describe them as rents. And high relative earnings in finance track quite closely the share Piketty and Saez show going to the top 1%.

SBTC is more plausible as an explanation for changes in the middle and the lower tail of the distribution, but here it is difficult to reconcile with the long

periods in which inequality remains at particular levels: decades before, during, and after the great compression. A big change in the return to education should affect people's education choices, so that extreme swings in inequality don't last so long. The human capital argument can be saved, here, either by arguing that education is as much an institutional choice as an individual one, and that educational institutions may struggle for decades to catch up with changing demands for skill (Goldin and Katz 2008). Or, one might put earnings differences down to innate ability rather than acquired skill.

The human capital explanation also has an international dimension: lower trade barriers lead rich countries to specialize in [human] capital intensive goods, to the detriment of the relative position of low-skilled workers in rich countries (Leamer 1996; Wood 1994). Although it follows from exactly the same logic as SBTC, together with a standard Heckscher - Ohlin trade framework, it has proved more controversial among economists - a fact that only makes sense in light of economists' professional aversion to countenancing any analysis that might encourage protectionist politicians.

The *regulation* school sees the institutions affecting income distribution in the US - and, to varying degrees, in other capitalist countries - in the thirty years

following World War II as part of a system sometimes called “Fordism” (Aglietta 2001; for a range of related arguments, see Marglin and Schor 1990; Piore and Sabel 1984; Weisskopf, Bowles, and Gordon 1983). The role in Fordism of a relatively egalitarian distribution of income is simply that, in a relatively closed mass production economy, the sale of the marginal mass-produced car or washing machine depended on the income of the less (if not of the Rawlsian least) well off. Toward the end of the Fordist period, more flexible production methods and increased international economic integration both reduce the importance of a broad domestic consumer market - the former because short production runs and greater product variety are no longer prohibitively expensive, and one might as well make luxury goods for the few as generic ones for the many; the latter, because when production and consumption occur in different countries, the owners of businesses making tradable goods and services will place less importance on the spending power of domestic consumers. Hence, mass producers in relatively closed economies required an egalitarian distribution for profitability, while flexible producers in relatively open economies do not.

Stated in this way, the regulation explanation is crudely functionalist. Functionalist arguments in social science are suspect, but some are less suspect

than others. As collective action problems go, uniting the owners of heavy industry behind a set of institutions which maintain demand for their products does not seem the most exacting; uniting them behind a program of dismantling those institutions when demand could be found elsewhere seems even more straightforward.

And, yet, there are problems. First, while many critical parts of the Fordist framework of re-distribution in the US were enacted in law - and, later, removed - by the Congress, a great deal of the wage determination process remained at the level of the company or, in certain cases, the industry. A critical pillar of the system of earnings distribution was, thus, in the hands of actors whose private interests could reliably be expected to trump any common interests of their respective classes - manufacturers of air conditioners see the wages they negotiate with their workers principally as costs, and only trivially as a source of product demand. After the passage of the Taft-Hartley act in 1948, private sector union organizing became progressively more difficult, and union coverage in the private sector declined. Income inequality crept upward - slowly, and at this point without any benefit to the top 0.1%, but upward nonetheless - from the early 1950s until the late 1970s. The institutions and the timing of events in the UK

were different, but that country shared with the US an absence of centralized wage negotiation or guidance, a weak legal status for unions, weak job security provisions for individual employees, and minimalist social safety nets.

Skott and I propose a theory of power-biased technological change (PBTC) (Skott and Guy 2007; Guy and Skott 2008a, 2008b). This is an agency-theoretic argument (in formal terms, we use a labor discipline efficiency wage model). It could be seen as providing a micro-foundation for the *regulation* story. Our starting point is that a worker's wages are positively related to the potential consequences a worker's choices have for the employer. Choices here may be concerning investment, effort level, cooperation with fellow workers, simple sabotage ... anything that affects outcomes for employers. Potential consequences depend on information asymmetries and on the extent of operations or assets over which the employee has influence. We argue that in mass production companies, and more generally in the paper-based systems of bureaucratic management that reached their peak in the post-war decades, the choices made by production and lower-level administrative workers had greater consequences, and those of top managers and professionals had smaller ones, compared with production systems before or after. These large companies had grown to take advantage of economies

of scale, scope, and speed - motivations thoroughly elucidated by Chandler (1977; 1990; 1962). Technologies of coordination and control were crude, however (Beniger 1986; Jonscher 1994; Yates 1989). This enhanced the relative discretion of lower-level employees (or reduced that of the top executives) in two distinct ways. One was a simple problem of both monitoring the employee's behavior and understanding the state of nature in which the employee was acting: failures in both of these dimensions increased the discretion available to employees; put a premium on fair process for employees threatened by sanctions for violating what were often inappropriate (but, due to failures in the feedback and adjustment systems, unchanging) rules; and rendered the entire organization and its various operations inflexible. The other was that the single-path flow both of mass production supply chains and of paper-based information created numerous opportunities for hold-up.

All of the factors noted enhanced the discretion of the typical lower- or mid-level corporate employee, while reducing that of top managers. Moreover, between opportunities for hold-up and the importance of employee voice to ensure fair process, large mid-century organizations created opportunities for unions. The collective organization of employees not only further improved their

bargaining position with the employer, but enhanced their political power as well.

The micro-processor revolution has led to sharp improvements in coordination and control. This reduces the discretion of lower-level employees; by enhancing the flexibility of the organization, it increases the discretion of top executives. It has also facilitated the movement of both intermediate goods and information down multi-path networks, reducing opportunities for hold-up. Together with improvements in transportation and communications, it has made possible the geographical dispersion of these production networks; with the ability to move parts of any network into poor countries or other low-wage jurisdictions (such as right-to-work states in the US), this further erodes the bargaining power of workers at any particular location. The growth of network organization meant the modularization of production processes, including the provision of numerous ancillary services. This encouraged the treatment of companies as portfolios of assets rather than ongoing integrated operations, and contributed to the market for corporate control - or, if you will, to a market for corporate parts. That, in turn, contributed to the growth of agency rents in investment banking and corporate law.

All three of these stories - SBTC, regulation, and PBTC - give accounts of how the technologies of mass production employed in relatively closed economies encouraged a compression of the income distribution, while flexible technologies employed in open economies encouraged dispersion. At best, this can only be part of the story, since we know that institutional change played an important role. And, in fact, the larger test of the value of any of these theories will be whether it can help us understand the institutional changes that did occur.

Both the regulation and the PBTC stories give us some help in understanding why coalitions in favor of redistribution would have prevailed during the mass production period, when they did not do so either before or after: mass production-based unions were a political force in favor of redistribution, and the dependence of mass production companies on broad consumer markets mitigated their opposition to it.

Yet, there remains much that none of them can explain. The *abruptness* of the big changes in income distribution can be explained to a large extent by the clustering of institutional changes, but it seems far fetched to treat the clustering of institutional changes and the consequent step-changes in distribution as direct outcomes of changes in production systems. Levy and Temin (2007) argue that a

change in social norms is crucial, but this just pushes the question back one more step: what brings about such a big change in social norms? We can fill this gap with a Marxian forces-and-relations-of-production story, in which institutions (relations of production) are inflexible (subject to hysteresis); for some time they are functional and then, as the forces of production (technologies and production organization) develop, the old institutions become fetters on production. This leads to crisis, and a discontinuous change in institutions. (Today, this explanatory scheme is as likely to be called 'new institutional' as 'Marxian'. See, for instance, North and Thomas 1973.) The great depression and the Second World War were one such crisis, the productivity slowdown of the 1970s and the intense competition from those countries that would come to be regarded as CMEs was another.

The more pressing question, today, is what range of institutional choice is effectively open at the time of crisis. Atkinson, and Levy and Temin, among others, have argued that the neo-liberal direction taken by the LMEs around 1980, was not pre-ordained. They point to the different route taken by the CMEs. Eichengreen, Estevez-Abe, Iversen, and Soskice (EEIS), among others, see a more mechanical logic in the divergence between CMEs and LMEs, based in part on

deeper (constitutional) institutions within the two sets of countries.

Comparativists have a professional predisposition for seeing lasting differences between their objects of study, so it is worth noting here that while EEIS offer a powerful explanation for the divergence of CMEs and LMEs, it is hard to find room in their scheme for the fact that the great compression occurred in the LMEs in the first place, or that it lasted there for several decades. Moreover, in the US, the New Deal institutions included a not-inconsiderable pay-as-you-go pension scheme, namely Social Security; this was joined nearly thirty years later by Medicare. While parts of the neo-liberal coalition have striven to dismantle or diminish these inter-generational bargains, they have failed to do so; it seems more likely, in today's climate, that they will instead be strengthened.

Certain critical parts of the clusters of institutional change seem, in retrospect, like windfalls or monumental blunders. A critical factor in weakening external financial control of large US corporations in the late 1930s was a law pushed through by William O. Douglas - later a long-serving justice on the Supreme Court - intended to protect small creditors in bankruptcy proceedings (Frankel and Montgomery 1991). The cutbacks of prudential regulation of financial markets in the 1980s and 1990s have made a tremendous contribution to increased

income inequality, but within the larger package of neo-liberal reforms it seems gratuitous and, in hindsight, a huge mistake.

3. Further institutional change

We should bear these considerations in mind as we go forward in the present crisis. That crisis has three elements. The first is that the collapse of the world banking systems have revealed the financial services path to post-industrial prosperity to be a big ponzi scheme; that is what is getting our attention today, and it may lead to a strong new wave of financial regulation at the national, regional, and global levels. Second, it has become increasingly clear that for all the talk - both anxious and enthusiastic - about 'globalization', the world's international *production* systems are largely regional (Guy 2007): East Asia, North America, Europe. Intra-regional trade has expanded far faster than inter-regional trade, especially (but not only) when facilitated by regional trade agreements (Mansfield and Milner 1999). For the future of income distribution, this means that there is the potential to replicate national institutions of distribution at the regional level, both because that is the level at which production networks operate and because it is a level at which political institutions are developing.

That is not necessarily a good thing: the outcome of the last big round of regionalization (expanding nation-states and global empires in the late 19th century) ended badly. It is simply a factor to take into account. Third, climate change and policy responses to climate change will bring new roles for the state - again, at the national, regional, and global levels - together with some big changes in relative prices and demands that we make sacrifices for the common good. This prospect is the reason that political assessments of scientific work on climate change so often divides along left-right lines, especially within the LMEs. The scientific prognosis on climate keeps getting worse, even as the policy action on it moves like a snail; the longer this continues, the more disruptive the actions (and the consequences of inaction) will be when they come.

Taken together, these three factors are easily as consequential as the Great Depression and the Second World War. In such circumstances, we should not imagine that the institutions which emerged in the LMEs from the neo-liberal settlement of the 1980s are in any way fixed.

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