SECOND RUGGLES LECTURE FOR THE INTERNATIONAL ASSOCIATION
FOR RESEARCH IN INCOME AND WEALTH

THE LONG RUN EARNINGS DISTRIBUTION IN FIVE COUNTRIES: "REMARKABLE STABILITY," U, V OR W?

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"Earnings inequalities are one of the most tangible subjects . . . with real implications for each and every individual." (European Commission, 2005, p. 164)

Introduction

The subject of this Ruggles Lecture is the distribution of earnings among individuals. It is concerned with how much different people earn, and how earnings differences have changed over time. I am sure that it will be agreed that this is a subject which should be central to economics. It is certainly of widespread interest among the general public, as recognized in the above quotation from *Employment in Europe 2005*. It is also a topic that has attracted a lot of attention from economists in recent years. A major reason for this interest was the realization in the United States that earnings dispersion had started to increase sharply around the end of the 1970s. Figure 1 shows the decile ratio for individual gross earnings in the U.S., which rose over this period from about 3.6 in 1980 to around 4.4 in the 1990s. (Here, as in the rest of the Lecture, I am concerned with the bulk of the distribution, from the 10th to the 90th percentile, not with the very top.)

Much of the considerable resulting literature has been concerned with explaining the rise in the decile ratio in the U.S., and the changes in other OECD countries, since the 1970s. To take two recent examples, the article by Gottschalk
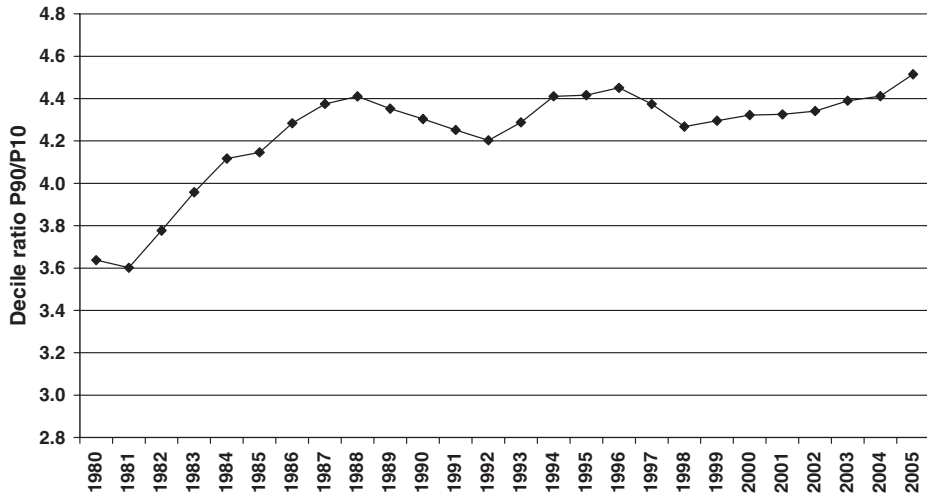
Figure 1. The Increasing Decile Ratio in the United States Since 1980
Source: Website of Economic Policy Institute, January 5, 2006 and October 10, 2006.

and Danziger (2005) is concerned with the period 1975–2002; the study by Lemieux (2006) covers the period 1973–2003. But I believe that it is important to set this experience in historical context, and this is the primary purpose of the present Lecture. Looking backward is important not only to understand our past but also as a basis for speculating how the future will evolve. Is the rise in earnings dispersion in the U.S. a step change that has been completed, as suggested by the lack of trend in the period in the 1990s (see Figure 1)? Or will earnings differences continue to widen, so that we are only observing a pause?

It has been suggested, for example, that the recent rise in dispersion is note-worthy because it comes after a long period of "remarkable stability" in the earnings distribution. Are we in this sense experiencing a "New Economy"? In the U.S., Jones and Weinberg noted that "the earnings distribution for men remained stable, with a few exceptions, between 1967 and 1980" (Jones and Weinberg, 2000, p. 3). Writing about the U.K., Machin says, "after showing relative stability for many decades (and a small compression in the 1970s) there has been [since the late 1970s] an inexorable upward trend in the gap between the highest and lowest earners in the labour market" (Machin, 1996, p. 62). Writing about the U.S., Morris and Western in their survey article for the *Annual Review of Sociology* state that "the postwar years of prosperity were marked by . . . relative stability in earnings inequality. The benefits of economic growth were large and widely dis-tributed. . . . These trends made a dramatic reversal in the early 1970s" (Morris and Western, 1999, p. 625). This characterization in terms of "relative stability" is in fact a long-standing one, at least in the U.K. Commenting on the data for 1886 and 1978, Phelps Brown notes how "the average wage in money . . . has been multiplied by a factor of 64. Differentials between occupations and grades and regions have changed—mostly they have contracted. The distribution of man-power between different jobs and different places has altered radically. Trade

unionism has greatly extended its power. . . . Yet, after 91 years of these changes . . . the dispersion of individual earnings remains very closely the same" (Phelps Brown, 1979, p. 4). Stability has been regarded as a long-standing feature of the British earnings distribution: "thus in a period [1886 to 1966] when the level of earnings of adult male manual workers increased by a factor of nearly 16, it appears that their dispersion (measured in percentage terms) changed very little" (Thatcher, 1968, p. 163).

Other researchers, particularly in the U.S., have emphasized the degree of change in earnings dispersion. "Great Compression" is the term used by Goldin and Margo to describe the narrowing in the U.S. wage structure in the 1940s: "when the United States emerged from war and depression, it had not only a considerably lower rate of unemployment, it also had a wage structure more egalitarian than at any time since. Further, the new wage structure remained somewhat intact for several decades" (Goldin and Margo, 1992, p. 2). They go on to say that "the movement toward equality in the 1940s was reversed in the post-1970 period" (p. 3). As put by Katz and Autor, we have returned to the degree of differentiation observed in 1939: "the entire compression of the wage structure in the 1940s is undone by 1990" (Katz and Autor, 1999, p. 1500). Such a view of changing earnings dispersion has been characterized as a "great U-turn" (Harrison and Bluestone, 1988). There are however different forms of "U." The quotation from Goldin and Margo (1992) suggests that the compression and the reversal were separated by two or more decades of relative stability: that the U had a flat floor during the 1950s and 1960s.[1] Equally, the earlier study by Lydall, after recording "the substantial fall in dispersion of employee earnings in the United States from 1939 to 1949" (Lydall, 1968, p. 177), went on to note that "when we turn to the period 1949 to 1959 we find a quite different picture. The general picture is one of stability, with a slight tendency to widening dispersion" (p. 178). On the other hand, Katz and Autor record that, after the 1940s, "wage inequality for men then rises in each subsequent decade with an acceleration of the pace of widening inequality in the 1980s" (Katz and Autor, 1999, p. 1500). This suggests more of a "V turn" than a "U turn."

The distinction between these two shapes is important since it affects how we view the "Golden Age" of the third quarter of the twentieth century. As described by Maddison, "the years 1950–73 were a golden age of unparalleled prosperity" (2005, p. 12). In France, the period 1946–75 was described by Fourastié (1979) as *Les Trentes Glorieuses*, 30 years of growth and redistribution. But did all share equally in the growth of that period, as suggested by the flat-bottomed U? Or was the Golden Age characterized by widening earnings dispersion as suggested by the V-shape? If the rising earnings dispersion started in 1950, rather than 1980, then we may have to consider other explanations than those currently in favor, which emphasize the advent of Information and Communication Technologies and the impact of globalization. Moreover, is it possible that there was a break in the 1960s, after which a combination of

[1]Goldin and Margo cite the finding of Thurow that "after the wage differentials of the Great Depression and World War II had become embodied in the labour market for a number of years, they became the new standard . . . and were regarded as 'just' even after the egalitarian pressures of World War II had disappeared" (Thurow, 1975, p. 111).

government wage policies and stagflation narrowed differentials? The War on Poverty in the U.S., and the aftermath of the events of May 1968 in Europe, may have left their trace on the distribution of wages. Was there an "egalitarian push"? If so, then the period from the mid-1960s to the late 1970s may have represented a reversal of the 1950s rise in dispersion. The time path may in fact look more like a "W" than a "V."

As the sub-title indicates, in this Lecture, I am seeking to cast some light on these empirical questions. What has happened in the long-run to the distribution of individual earnings? I draw a great deal on earlier research, notably of the authors already cited, and of the OECD, which has been a leader in the field of international comparisons of earnings dispersion.[2] Previous research does not however fill all of the gaps, and one of the main purposes of the present Lecture is to describe (in Sections 1 and 2) the construction of new data, or, more accurately, the assembly of already existing but unused data. Since one of the underlying messages is the need to take data seriously, Section 1 is concerned with the methodological issue of the criteria to be applied in data selection and use. Section 2 then describes the extent to which I have been able to augment the data on earnings dispersion going back before 1980. These data are employed in Section 3 to examine the historical experience of North America (Canada and the U.S.) and three European countries (France, Germany and the U.K.).[3]

It should be stressed at the outset that I am concerned in this Lecture with the earnings of individuals, and not with those of occupational groups or industrial groups (see, for example, Galbraith and Berner, 2001). Occupation and industrial distributions are important, but they are only part of the explanation of who earns how much. While the skill differential is of considerable interest, "at the best, the skill differential can help explain only a part of the over-all dispersion of earnings" (Lydall, 1968, p. 167). The overall distribution depends on the dispersion *within* skill categories and on the relative numbers in the different groups. The overall dispersion may therefore move differently over time from the skilled/unskilled wage differential.

1. Assembling Data on the Distribution of Earnings

One of my key concerns in this Lecture is with taking data seriously. Here I should like to begin by drawing a parallel between research on distributional issues and the development of national accounts. One of the great strengths of the International Association for Research in Income and Wealth is that it brings together people in both fields. Indeed, in the early days, researchers such as Simon Kuznets were interested in both national income and in its distribution. Since then, however, the two subjects have tended to grow apart. In my view, some rapprochement would be desirable. In particular, I believe that distributional research can learn from the development of national accounts, which is one of the great success

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[2]They have published two major articles on the subject in *Employment Outlook* (OECD, 1993, 1996). Today, the OECD provides on its website the valuable LMS database containing evidence for almost all OECD countries.

[3]The Lecture draws on a forthcoming more extensive study, covering some 20 OECD countries (Atkinson, forthcoming).

stories of social science in the 20th century. If one remembers that in the U.K. the first official national accounts were produced as a small number of tables in 1929 and not published as they were felt to be too politically sensitive (Stone, 1977), and draws the contrast with the present situation, one can see the enormous progress that has been made in terms of the production, acceptance and use of official national accounts statistics.

What have been the key ingredients in this success of national accounts? The development of national accounts was extensively discussed by Maddison (2005) in the first Ruggles Lecture. Here I want simply to highlight one aspect: the setting and application of data standards, where the United Nations *System of National Accounts* plays a central role, but it is only part of an extensive network of statistical consultation, comparison and validation. In many cases, this has led to explicit quality criteria. The Eurostat *Handbook on Price and Volume Measures in National Accounts* (Eurostat, 2001), for instance, adopts an A/B/C classification: A methods are the most appropriate, B methods may be applied *faute de mieux*, and C methods should not be used. A good example is provided by the measurement of the volume of output of the government sector, where, following the 1993 revision of the UN System of National Accounts, it has been decided to abandon the previous practice of measuring the growth of output of the government sector by the growth of the inputs (i.e. assuming constant productivity) (see Atkinson, 2005a). In order to achieve an A grading, countries have now to introduce direct measures of government output. It is recognized in the Eurostat *Handbook* that for collective services, such as defense, it may still be necessary to use input indicators, and if appropriately designed, they can qualify for a B classification, whereas for individual services, such as health, input methods are only classified as C.

In the field of distributional analysis, important steps have been taken by data compilers towards the setting of standards as a result of collaborative projects on income distribution, such as the Luxembourg Income Study and the Luxembourg Wealth Study, of databases such as the World Income Inequality Database (WIID) constructed by WIDER, and of the report of the Canberra Group (Expert Group on Household Income Statistics, 2001). The WIID, for example, attaches quality ratings from 1 (best) to 4 to income distribution data (World Income Inequality Database, 2005). But there is, in my view, inadequate follow-through in actual practice. Users of distributional data are insufficiently sensitive to issues of data quality. We have learned from the experience of national accounts that it is not just the *setting* but also the *application* of standards that is needed.

It is indeed *data users* who are the key. Data quality and suitability can only be assessed in relation to a particular application. For example, a data source may contain good information on earnings but lack credible information about capital incomes. For this reason it may be given a low grade by WIID, but the source may be perfectly acceptable for studying the dispersion of earnings. This means that it is the user who must make explicit the criteria employed and verify that the data meet the required standards. In so doing, the user should clearly attach considerable weight to the grading attached by the data suppliers, but he or she has to exercise independent judgment.

(i) *Criteria for Earnings Distribution Data*

How can we apply such an approach to the particular subject with which I am concerned here—the dispersion of individual earnings? Specifically, what criteria should be applied when selecting earnings data to measure changes over time in the top decile relative to the median and in the bottom decile (or lower quartile) relative to the median? To illustrate the approach, I follow the Eurostat *Handbook on Price and Volume Measures* in adopting a threefold A/B/C classification (rather than the fourfold WIID classification): A denotes data that are the most appropriate, B denotes acceptable, if not ideal, data that may be applied *faute de mieux*, and C denotes data that should not be used.

My approach is influenced by, but departs from, the "Standard Distribution" approach adopted by Lydall (1968). It departs in the specific criteria adopted (for example, his Standard Distribution relates to male workers, whereas I consider all workers wherever possible); it departs in allowing a variety of definitions (appropriately identified). The latter feature also distinguishes the approach adopted here from harmonization exercises such as those involved in the European Union Structure of Earnings Survey. What is possible in a forward-looking exercise is not possible when seeking to draw together past data drawn from disparate sources. Thus, the data presented below include distributions limited to full year workers and distributions also covering part-year workers. The differences in definition have to be clearly signaled, and taken into account in interpreting the findings, but both types of distribution can aid our understanding.

The first requirement for an A or B classification is that the data relate to *earnings from employment (not self-employment)*. Distributions of total income are definitely classified here as C. This applies even where restricted to those for whom wage or salary income was the primary source, since the membership of this category is likely to have changed considerably over time. The distributions of earnings and income may move quite differently over time (see Atkinson and Brandolini, 2005). It may be noted that in tables 5.1 to 5.3 in Lydall (1968), covering 25 countries, the data for six of the 25 countries relate to total income, and would be excluded here.

The second requirement for an A or B classification is that the data should relate to *individual* and not to total family earned income. Given the varying extent of female participation over time, changes in the distribution of joint incomes are difficult to interpret, and would require us to consider a further set of explanatory factors. This means that I do not consider distributions derived from the U.S. income tax data, based largely on joint incomes. (These data are used by Piketty and Saez, 2003, who make a number of corrections, to examine changes in top earnings shares.)

Thirdly, I am concerned with actual gross earnings, including overtime, bonus payments, commission, holiday or thirteenth month payments, etc. Information on wage rates, rather than earnings, would not warrant an A or B classification. This rules out a lot of historical material, and limits how far we can go back in time. Nevertheless, while information on wage rates can provide a valuable complement, it is no substitute for earnings data. Finally, although the require-

ment may appear otiose, an A or B classification requires that there *be* underlying data. In some cases, statistical offices have made informed estimates of the earnings distribution, or have made forecasts, based on data for other years. These are classified here as C.

How are the A and B classifications to be distinguished? One criterion might be the use of micro-data, rather than reliance on tabulations. However, I do not feel that we should regard tabulated data as necessarily of significantly lower quality. Where the tabulations were conducted according to the procedures that we would apply if we had the micro-data today, and we can interpolate with reasonable accuracy, then there is no reason for not giving an A classification. The error of interpolation depends on the number of ranges, their relation to the key percentiles (bottom 10th, 25th, 50th, and 90th), and on whether the information includes the interval mean as well as the interval frequency. Where the tabulations only permit an approximate interpolation, then a B classification is applied.

There is therefore no presumption that an A classification requires microdata. In the same way, I do not require that the data contain information on hours, and I do not limit attention to hourly earnings. Whereas hourly labor costs are the most relevant variable for the employer, my perspective here is that of the employee. For the employee, it is the combined hours/earnings package that is of concern. To be paid €100 for one hour is a very different proposition if only one hour of employment is offered from the situation where this hourly rate applies to a 35 hour week. Moreover, in a number of occupations, "hours paid for" and "hours worked" may differ considerably, as academics know all too well. In interpreting the evidence, one needs to take account of the difference between distributions of hourly earnings and distributions of weekly, monthly or annual earnings, but all of these are treated here as potentially qualifying for an A classification.

The third possible distinction between A and B classifications relates to the extent of coverage. Earnings data commonly exclude some sectors of employment. The exclusions may relate to agriculture or government service; they may exclude people employed in small enterprises; the data may be truncated at the top or the bottom of the distribution. Given that complete coverage is a counsel of perfection, rarely attained, it does not seem reasonable to relegate distributions from A to B solely on this account. Rather, I suggest that it should be a matter of judgment in each case whether the exclusions are sufficiently important to warrant a B, or indeed C, classification.

A particular example of incomplete coverage is provided by data drawn from tax records, such as those derived from the wage tax data in Germany. In past years, a significant proportion of wage earners has been below the tax threshold and is not covered. I suggest that, for present purposes, an A classification be limited to those cases where at least half the relevant population is covered, allowing the median to be calculated. Where the top decile is covered, but the median has to be calculated from other sources, a B classification seems appropriate. Where the data do not extend beyond the top 9.9 percent, a C classification is given.

To sum up, I have suggested a graded approach to the classification of earnings data. Some data do not meet the minimal standards (classification C);

TABLE 1

CLASSIFICATION OF EARNINGS DISTRIBUTION DATA

Method	Applied to Percentile Distribution of Individual Earnings
A = most appropriate	Micro-data or tabulations with sufficient ranges (or mean earnings) to allow accurate interpolation.
	Coverage not necessarily totally complete, but data cover the major sectors.
B = acceptable, faute de mieux	Tabulated data where significant interpolation error, or where earnings data on numbers and amounts, but tabulated by range of income.
	Data omitting certain significant sectors (e.g. agriculture), but still with wide coverage (e.g. more than manufacturing).
	Data covering between 9.9% and 49.9% of total earners, where alternative information available on median.
C = not acceptable	Data on income or wage rates (rather than earnings).
	Data relating to joint earnings of family units or couples.
	Data with too restricted coverage (e.g. covering only manual workers or only manufacturing).
	Data covering less than 9.9% of total earners.
	Informed estimates or forecasts, not based on underlying current data.

other data are more (classification A) or less (classification B) fit for purpose. The criteria applied here are summarized in Table 1.

(ii) *Variety of Sources*

Before starting to work on the distribution of earnings, I had not appreciated the wide variety of sources of earnings data. Coming from the field of income distribution, I tended to think of household surveys as the standard source. In the case of earnings, this is true for a number of countries. In the OECD Labour Market Statistics (LMS) database, my starting point below, the data are in a number of cases derived from household surveys, such as the U.S. Current Population Survey, the German Socio-Economic Panel, and the Canadian Survey of Consumer Finances (see Table 2). Representative national household surveys are however a relatively recent innovation, and in earlier years other sources were employed. These encompassed censuses of population, where a number of countries including Canada and the U.S., have collected information on income or earnings from a sample of the census respondents. The other main source of distributional data was administrative records. Early investigators relied heavily on income tax returns. For earnings, these had particular significance, since in a number of countries there was a separate wage tax, such as the *Lohnsteuer* in Germany, for which returns had to be made by employers, and in other countries employers had to provide returns of earnings for the purposes of social security legislation. In France, for example, the *Déclarations Annuelles des Données Sociales (DADS)* are the principal source of earnings data, and provide the basis for the single longest series in the OECD LMS database. There are also interesting hybrid cases shown in Table 2, such as the use of a household survey linked to administrative records on earnings, as in Canada.

TABLE 2

VARIETY OF SOURCES OF EARNINGS DATA

Type of Source	Sub-Category	Sources Used in this Paper
Household survey	Repeated cross-section	Survey of Consumer Finances in Canada
		Current Population Survey in U.S.
	Panel	German Socio-Economic Panel
	Linked to administrative data	Survey of Labour and Income Dynamics in Canada
Census of population		Census of Canada
		U.S. Census
Administrative data	Income tax returns filed by taxpayers	Taxation Statistics in Canada
	Returns of earnings by employers	*Déclarations Annuelles des Données Sociales* in France
		Schedule E earnings data in U.K.
	Wage tax returns by employers	*Lohnsteuer* data in Germany
Employer surveys	Sample of employers/sample of employees	*Gehalts- und Lohnstrukturerhebung* in Germany
	Sample of employees	New Earnings Survey in U.K.

But, in addition, in the case of earnings there are other sources, not applicable to the case of household incomes. An individual worker is engaged in a market transaction, and—just as in national accounting—one can make use of information from both sides of the market. One can interrogate the other side of the labor market by surveys or censuses of employers. In fact, of the data sources underlying the OECD LMS, employer surveys or censuses are represented at least as much as household surveys. We should also note that these may be micro-data at the level of the employer but not for the individual worker: that is, the employer may be asked how many workers are paid in different bands. From this information, we can construct a distribution even though there are no underlying micro-data on individual workers. It should also be emphasized that the responses by the employer may differ from those given by the employee. Hours of work are an example. The employer is likely to report contractual hours; the employee may report hours actually worked.

This account of different sources, summarized for the five countries covered here in Table 2, has been intended to convey the richness open to us, but it also highlights the problems of comparability. We cannot assume that earnings distributions obtained from household surveys are fully comparable with those obtained from employer surveys. Evidence from tax records may not be fully comparable with survey data. The differences in sources have to be taken into account in any use of the OECD LMS database or other data collections. Here, I abstain from any cross-country comparisons, but similar issues of comparability arise over time. The data series presented below are in fact a patchwork for each country of data from different sources. The data for Germany for example combine information from the wage tax for earlier years with more recent evidence from the German Socio-Economic Panel. We have to be careful about the joins.

2. We *Can* Go Back in Time

My starting point is the OECD LMS Database, which is the current version of the data published earlier in *Employment Outlook* that have been widely used by economists and other social scientists. My main concern is to augment this database, but I begin with some subtraction.

(i) *Data Examination*

It is tempting to download data from a database and proceed immediately to drawing conclusions about trends and to testing explanatory models. The first stage should however be a careful examination of the data and their origins. Consider, for example, the case of France, where the employer declarations of salaries provide the basis for the longest series in the OECD LMS database, a continuous annual series from 1950 to 1998. However, careful inspection reveals that the data for 1981, 1983 and 1990 that appear in the LMS database are estimates by INSEE, not based on the employer declarations for those years. These returns were not analyzed on account of the workload arising from the censuses of 1982 and 1990 (Piketty, 2001, p. 665). So, on the absolute criterion enunciated earlier, these numbers should be removed.

The second example concerns an evident break in comparability for the Netherlands. When one examines the Netherlands data in the OECD LMS database, one discovers that the series is dominated by a single large downward movement in the bottom decile (from 64.3 to 61.0 percent of the median) between 1994 to 1995, when the top decile similarly jumps upwards from 165.8 to 171.9 percent of the median. Investigation shows that 1995 was the year in which the new form of the Structure of Earnings Survey was introduced. There are good reasons to expect the new survey to cover more fully low paid workers, so that the apparent rise in earnings dispersion is probably a statistical artifact. The Netherlands figures do not form a continuous series. In fact such breaks in continuity in earlier years led Hartog *et al.* to state that "there is no good time-series information on earnings inequality among individuals in the Netherlands, due to the absence or incomparability of information about particular years" (Hartog *et al.*, 1993, p. 184). This seems too strong a conclusion, since for many countries we have a patchwork rather than a single continuous series, but it underlines the care that is needed in using apparently continuous series.[4] In fact I shall not here use data for the Netherlands, since I have not been able to locate data going back before 1970, whereas my intention in this Lecture is to back in time at least to the 1950s.

The key lesson is that we need to look at the data. In 1899, the *Journal of Political Economy* published a Note entitled "An Error in Austrian Wage Statistics" (Davis, 1899), referring to a recently published book. The point was not that the book's author had taken six years of his time series from the wrong

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[4]A further instance of a break in the LMS series is provided by the case of Hungary, where a personal income tax was introduced in 1988, and at the same time the gross pay was adjusted to compensate. The top decile jumped from 164 percent of the median to 183 percent, but this should not be taken as a measure of increased inequality.

column, which is easily done (indeed it was only in this one issue of the statistical source that the columns were given in a different order), but that the author had not noted "the sudden and enormous drop in wages about 1859 and 1860 and the correspondingly great rise between 1865 and 1866" (Davis, 1899, p. 104). As she comments, "an average fall of over 50 percent throughout the empire, a depression lasting five years, and as sudden a rise in wages at the end of that time would have indicated a great industrial crisis, nothing short of a cataclysm for the laboring classes, involving widespread misery, which would have left its impression on the economic literature of the time" (Davis, 1899, p. 104). This is a good, if extreme, example of the importance of simply looking at the data.

(ii) *Back to the 1950s or Before*

From this point, I shall concentrate on five large OECD countries: Canada, France, Germany, the U.S., and the U.K. Other countries could be added, but the five countries illustrate the potential. They also allow us to contrast experience on two sides of the Atlantic. We can compare the years of the German "economic miracle" with the Eisenhower years in the U.S.

To go back before 1975, we have to draw on a variety of sources. This is well illustrated by the case of Germany. The OECD series starts in 1984, which is the first year of the German Socio-Economic Panel. But, there are earnings data for Germany for years much before this date. Lydall (1968) gives eight tables of earnings distribution data for West Germany. They cover the years 1950, 1957 and 1961 from the *Lohnsteuer* (wage tax) statistics, and 1962 from the *Gehalts- und Lohnstrukturerhebung* (salary and wage survey). The latter survey has been conducted in West Germany for the years 1949, 1951, 1957, 1962, 1966, 1972, 1978, and 1990. These sources may not all be A graded (for example, the 1949 survey had only partial geographical coverage), but we can—as the title of this section suggests—go back in time.

In the case of the U.K., the major source of earnings data in recent decades has been the *New Earnings Survey*, an employer survey introduced experimentally in 1968, established on an annual basis in 1970, and which ran until 2003 when it was replaced by the *Annual Survey of Hours and Earnings*. Before 1968, we can however obtain evidence from income tax sources: the distributions of *principal source Schedule E income* of individuals that began to be published in the IR *Annual Reports* from 1954–55. The data are not the same: they refer to annual earnings, whereas the employer survey data relate to the current pay period of workers whose pay is not affected by absence. Where the person changes job, it is the sum of earnings from successive principal employments in the tax year, but there is no restriction to full-time or full-year workers. These differences in definition have to be taken into account in interpreting the series.

The extension of the period covered is illustrated in Figure 2 for the five countries. In three countries the period covered has been more than doubled; for the other two countries, the extension is 16 years and 31 years. This has been possible in the case of France and Germany by using the wage tax data (and the
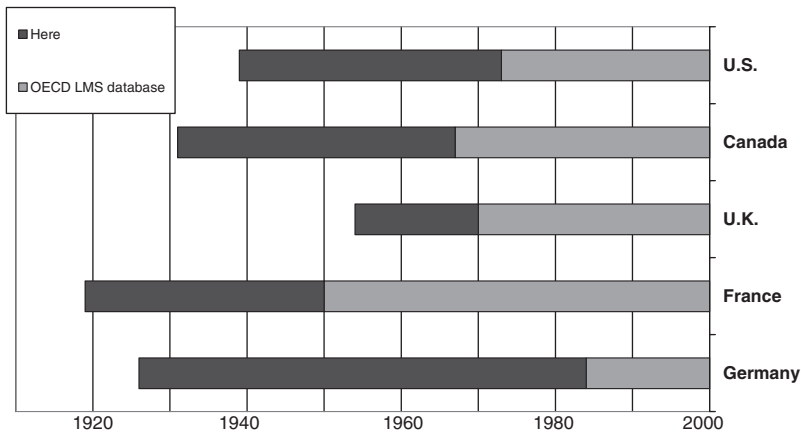
Figure 2. Coverage of Data Extended Back in Time: Five OECD Countries

Note: The series do not give data for all years, and there are breaks in comparability.

same applies to the U.K.). These data allow us to go back before 1939 in the case of France (following Piketty, 2001) and Germany (where I have also used insurance data, following Trivanovitch, 1937 and Sweezy, 1939). For Canada, I have made use of what Lydall described as "the rich material collected in the Canadian censuses" (Lydall, 1968, p. 181),[5] and of the income tax data published in *Taxation Statistics*. For the U.S., in their study of the great compression of the 1940s, Goldin and Margo (1992) make use of an impressive variety of sources, including the census of population, but they do not refer to the annual tables on the distribution of earnings published by the Census Bureau covering years since the 1940s.[6] If one is prepared to use grouped data, then, as pointed out by Burtless (1990), these tabulations provide an unbroken series of earnings data since the Second World War. He used them to calculate the Gini coefficient, which depends on the full distribution; here I have calculated deciles, which place less demanding requirements in terms of interpolation.[7]

As emphasized earlier, the data are a patchwork and not always fully comparable across time. For example, the 1971 Census of Canada refers to wage-earners aged 15 and over; the 1941 Census refers to wage-earners aged 14 and

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[5]The Canadian Census earnings data are discussed at length by Goldberg and Poduluk (1957), who draw attention to the fact that the earnings information related to the previous year, whereas the question was only asked of people classified as wage-earners at the time the census was taken, thus omitting people who had worked in the previous year but had ceased to be wage-earners.

[6]Data exist for years from 1944, but the earnings data for, for example, 1945 relate to civilian workers. As is noted by the Bureau of the Census, "the presence of large numbers of veterans in the sample, some of whom could have had no civilian employment and some of whom could have had civilian employment for only part of 1945, requires exercise of caution in interpreting the civilian earnings distributions" (Bureau of the Census, 1948, p. 8). I have used data from 1947.

[7]The number of published ranges is less than desirable, and interpolation has to be made in some cases over quite wide intervals. On the other hand, the median is published, which eliminates one source of interpolation error. I feel that the data merit at least a B classification.

over; and the 1931 Census to wage-earners aged 10 and over. The U.S. published CPS tabulations refer to all wage-earners, whereas the more recent data refer to full year full time workers. These breaks in comparability are signaled in the graphs.

In the same way, there are differences in the quality of the data. Following the classification suggested in the first section, I have not used any series that I would classify as C. I have however used series classified as B in addition to those classified as A. In the case of Germany, for example, I have classified the wage tax series prior to 1939 as B, on the grounds that the median has to be obtained from another source.

3. A Four Part History

In this section, I describe the evolution over time of the distribution of individual earnings in the five countries (U.S., Canada, U.K., France and Germany), focusing on the four periods identified at the outset: the "great compression" of the 1930s and 1940s, the Golden Age of the 1950s and 1960s, a possible change of direction in the 1960s, and the period since 1980. These are marked in the graphs by vertical lines at 1950, 1965 and 1980. The graphs show for each country the evolution of different percentiles: the upper (top decile), shown by hollow symbols, and lower (bottom decile or lower quartile), shown by solid symbols. Different sources are indicated by different symbols (squares, circles, diamonds, etc). Data classified as A are shown by solid lines; data classified as B are shown by dotted lines. Data limited to male workers are shown with smaller symbols.

In describing changes in the decile ratios over the four periods, I shall limit attention to those that are 5 percent or larger, describing as "significant" those that exceed 10 percent, and as "large" those that exceed 20 percent. So that, starting from a top decile of 200 percent of the median, a rise to 210 would qualify as a "rise," a rise to 220 would be "significant," and a rise to 240 would be "large." It should be noted that this metric is independent of the period of time: I am interested here in the extent of change, not in the speed of change.

(i) *United States*

In their analysis of the U.S. earnings distribution, Goldin and Margo suggest that "remarkable similarities exist between the narrowing wage structure of the 1940s and the widening wage structure after 1970" (Goldin and Margo, 1992, p. 3). The compression at both ends was replaced by widening at both top and bottom. Seen from 1992, that may have appeared to be the case, but from subsequent experience it is clear that we have to distinguish between the experience at the bottom of the distribution and that of the top decile. Over the 1990s, in the U.S., the bottom decile recovered ground, whereas the rise of the top decile continued (see, for example, Atkinson, 1999). For this reason, I show the top and bottom deciles separately.
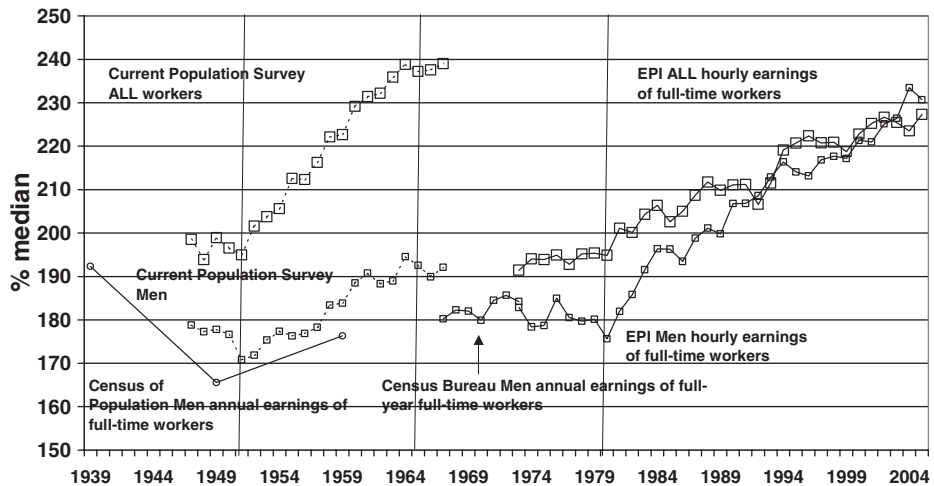
Figure 3. Top Decile Earnings in United States 1939–2005

Source: (A) Census of Population series from Goldin and Margo, 1992, Table 1 (the data refer to men working more than 39 weeks and earning more than half the minimum wage on a full-time basis); (B) Current Population Survey series from Current Population Reports *Income of Families and Persons in the United States* (1947, Table 21; 1948, Tables 18 and 20; 1949, Table 25; 1950, Table 23; 1951, Table 12; 1952, Table 11; 1953–55, Table 10; 1956 and 1957, Table 27; 1958, Table 39; 1959 and 1960, Table 36; 1961, Table 40; 1962, Table 28; 1963–66, Table 32; 1967, Table 16) (the lower quartile is obtained by linear interpolation of the cumulative distribution; the top decile is obtained by Pareto interpolation of the cumulative distribution); (A) Census Bureau series from Jones and Weinberg, 2000, Table 1; (A) EPI series from website of Economic Policy Institute January 5, 2006 and October 10, 2006.

The change in the top decile in the U.S. in Figure 3[8] exhibits a very clear pattern. Using the annual data provided by the Current Population Survey tabulations, we can see that there was a sharp turnaround at the beginning of the 1950s. The U initiated by the great compression (shown by the census of population data) was not a flat-bottomed U but a V. The top decile began to rise immediately in 1952 and the rise continued unchecked until 1964. The rise from 195 percent of the median in 1951 to 239 percent in 1964 certainly qualifies as large. The lower quartile, shown in Figure 4, fell steadily throughout the 1950s. Again the change can be described as large. The period I have described as the "Golden Age" was therefore in the U.S. a period of widening earnings dispersion on a large scale, contrary to what is commonly believed.

What happened after 1964? Although I have not here, or later, applied rigorous statistical tests, the period between 1965 and 1979 seems to represent a shift of regime. The top decile did not decline, but it stopped rising. The bottom decile in Figure 4 shows a significant (more than 10 percent) rise between 1967 and 1973. In this respect, the pre-1980 period was not one of stability, at least in the U.S. There then follows the significant fall in the bottom decile in the 1980s, and the large rise post-1980 in the top decile. Linking the series for men (Census of Population, Current Population Survey tabulations, and Current Population

[8]For Figures 3–8, source (A) denotes A classification; source (B) denotes B classification.
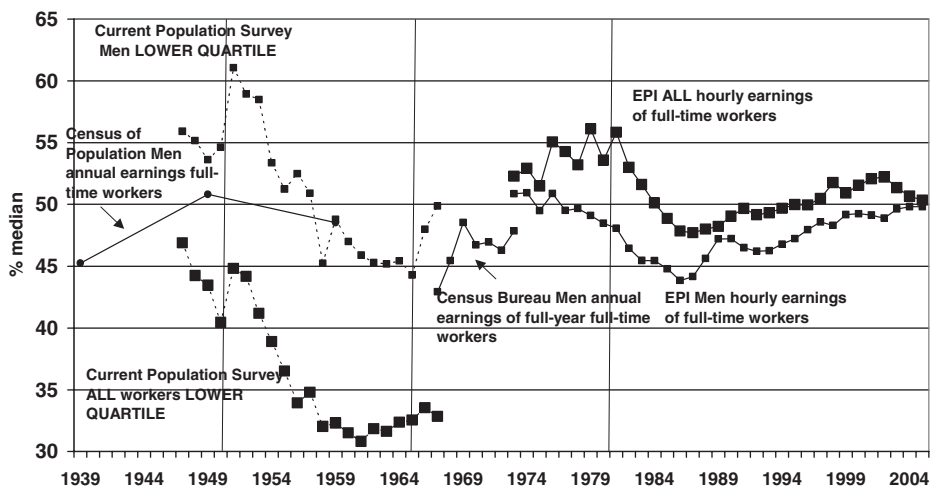
Figure 4. Bottom Decile Earnings in United States 1939–2005

Source: See Figure 3.

Survey results given by the Census Bureau and EPI), we find that the top decile fell from 210 percent of the median in 1939 to 160 percent in 1951 and then rose, with a pause from 1965 to 1979, to 233 percent in 2005.

(ii) *Canada*

There is a large literature on changes in earnings dispersion in Canada, but it is largely confined to the period since 1980, as illustrated by the titles of some of the key papers: "Changes in the Distribution of Wages in Canada, 1981–1992 (Richardson, 1997), "Canadian Wage Inequality over the Last Two Decades" (Burbidge *et al.*, 1997), and "Earnings Variability and Earnings Instability of Women and Men in Canada: How Do the 1990s Compare to the 1980s?" (Beach *et al.*, 2003). Here I take a longer term perspective.

First, was there a great compression north of the 49th parallel? The comparison of the U.S. and Canada is of interest if we are seeking to identify the contribution of specifically U.S. institutional factors, such as the National War Labor Board, and of the U.S. labor movement. The top and bottom deciles are shown for Canada in Figure 5. In reading it, one has to bear in mind that the Census data are not fully comparable with those for recent years, and the percentiles have had to be interpolated from broad ranges. There is a considerable margin of error, and the series is classified as B. But the overall picture for the first part of the period is clear. In Canada, as in the U.S., there was a large fall in the top decile; indeed the fall was larger in Canada, and is described as "dramatic" by Lydall (1968, p. 182). Moreover, it was reversed after 1951. There is only decennial data, but the rise in the top decile and fall in the lower quartile from 1951 to 1971 were both large. Changes over the period 1965 to 1979 are not easy to discern, since I have not been able to locate a consistent annual series. The differences in the partial series shown are not large enough to be regarded as "changes" according to the criteria adopted
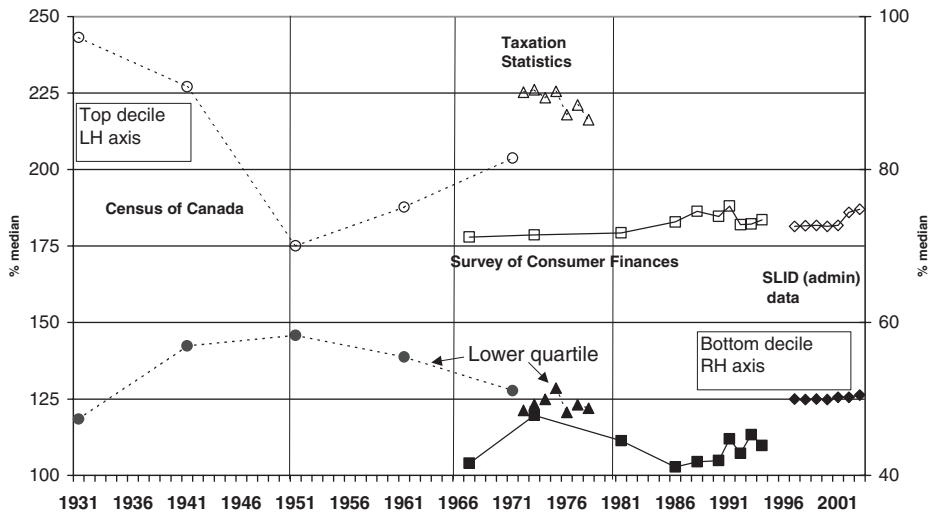
Figure 5. Top and Bottom Decile (Quartile) Earnings in Canada 1931–2003

Source: (B) Census of Canada data 1931 from Seventh Census of Canada, Volume V, Table 25; 1941 and 1951 from Ninth Census of Canada, Volume V, Table 14; 1961 from 1961 Census of Canada, Volume III, Part 3, Table 9; 1971 from 1971 Census of Canada, Volume III, Part 1, Table 39 (the lower quartile and median are obtained by linear interpolation of the cumulative distribution; the top decile is obtained by Pareto interpolation of the cumulative distribution); (B) *Taxation Statistics* data from that publication, data for 197x from the 197(x+2) edition, Table 15 (Table 14 in the case of 1978 data), the data are classified by total income, so that I have used the cumulative frequencies and cumulative amounts to interpolate the Lorenz curve to obtain the implied earnings intervals; the fact that the data are ranked by income and not by earnings means that they are given a B grade; (A) data from Survey of Consumer Finances for 1967 to 1994, with adjustments made by Statistics Canada to improve coverage and comparability between the years, from the OECD LMS website downloaded December 2005; (A) data for 1997 to 2003 from Survey of Labour and Income Dynamics, supplied by OECD.

here, apart from the rise in the bottom decile indicated by the Survey of Consumer Finances data.

(iii) *United Kingdom*

With the next graph, Figure 6, we cross the Atlantic to the U.K. Here, Routh (1965) has constructed an estimate of the individual distribution of earnings for 1911–12 that he has compared with the Schedule E income tax data for 1958–59, which shows for men a large rise in the bottom decile and a significant fall in the top decile. He also made use of the earnings inquiries carried out by the Ministry of Labour on three occasions (1906, 1938 and 1960). The latter information relates only to manual workers and excludes a number of sectors, including agriculture, mining, railways, and gas, electricity and water. For this reason, I do not regard them as meeting a B grading, but it is interesting nonetheless to note the conclusion of Routh: "the egalitarian process observed for men . . . must have been the net product of a move to greater equality followed by a less pronounced move away from it" (Routh, 1965, p. 57).

To draw firmer conclusions about the time pattern, more frequent data are needed. Annual data in the U.K. are available from 1954/55 from the Schedule
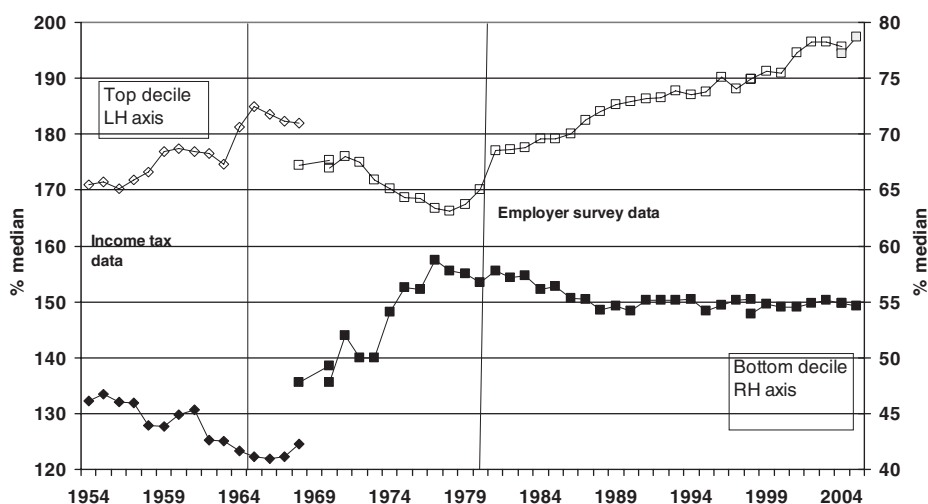
Figure 6. Top and Bottom Decile Earnings in United Kingdom 1954–2004

Source: (A) Income tax data from Schedule E principal employment income distributions in *Annual Report of the Commissioners of the Inland Revenue* (AR) or *Inland Revenue Statistics* (IRS) (1954 from AR 1957–8, p. 68; 1955 from AR 1958–9, p. 71; 1956 and 1957 from AR 1959–60, p. 73; 1958 to 1968 from IRS 1970, Table 21); for the source of control totals for total employment and total earnings, see Atkinson and Voitchovsky, 2003; the median, top and bottom deciles are obtained by mean-split interpolation (see Atkinson, 2005b); (A) employer survey data are from the New Earnings Survey 1968–2003 and the Annual Survey of Hours and Earnings from 2004 (data for 1968 and 1970 from Atkinson and Micklewright, 1992, Table BE1; data for 1970–98 from the OECD LMS website downloaded December 2005; data from 1998–2005 downloaded from Office for National Statistics website December 2005).

E tax returns.[9] For the Golden Age of the 1950s and early 1960s, they show (Figure 6) a significant fall in the bottom decile and a rise in the top decile (even if at the very top earnings shares were falling, see Atkinson and Voitchovsky, 2003). These changes need of course to be interpreted carefully, since the data relate to annual earnings of all workers. They may reflect the expansion of part-time work and increased labor force participation by women.[10] But there is evidence that widening of the earnings distribution did leave its impression on the literature of the time, to use the phrase of Davis (1899). In particular, it was in the mid-1960s that concern began to be expressed again about the extent of "working poor," notably following the publication of *The Poor and the Poorest* (Abel-Smith and Townsend, 1965).

The concerns of the 1960s with the persistence of poverty in the U.K. had indeed an impact on the policy of the Labour Government elected in 1964. There was a distinct change of direction: between 1965 and 1979, as may be seen from Figure 6, there was a large rise in the bottom decile and a fall in the top decile.

[9]Lydall (1968, p. 351) employed the same source for 1954–55, 1958–59, 1960–61, and 1961–62. Data for 1954–55, 1959–60 and 1964–65 were used by Thatcher (1968).

[10]It may be noted that the estimates of Hill (1959, table 1) from the Oxford national survey of incomes and savings show upper and lower deciles for men working full-time and full-year that are close (68.3 and 159.4 percent, respectively) to those from the Family Expenditure Survey for 1963 (Thatcher, 1968).

There was an "egalitarian push." Taken together with the post-1980 significant rise in the top decile and fall in the bottom decile, these generate a V form, but the data for the 1950s suggest that it is in fact best seen as part of a W.

(iv) *France*

What about Continental Europe? Piketty, whose research I have followed in using the wage tax and employer declaration data, stresses the stability of the top and bottom decile over the long-run: "the P10 threshold regains from the end of the 1970s its 'habitual' level (around 50 percent of mean earnings), just like the threshold P90 (around 160 percent of mean earnings)" (Piketty, 2001, p. 212; my translation). The percentiles in Figure 7 are expressed relative to the median, rather than the mean, but show the same findings regarding the beginning and end values. The top and bottom deciles in 1998 are virtually identical to their values in 1950. But, in between, earnings dispersion in France first widened and then narrowed. The top decile rose by nearly 10 percent from 1951 to 1965, and the bottom decile fell significantly. For at least this part of the Golden Age, there was distinct widening of the distribution of individual earnings. Piketty (2001, pp. 207–10) has explained clearly how earlier accounts of the *Les Trentes Glorieuses*, as years of equalization, had been misled by focusing on occupational differentials, and particularly on the salaries of top-ranking civil servants.
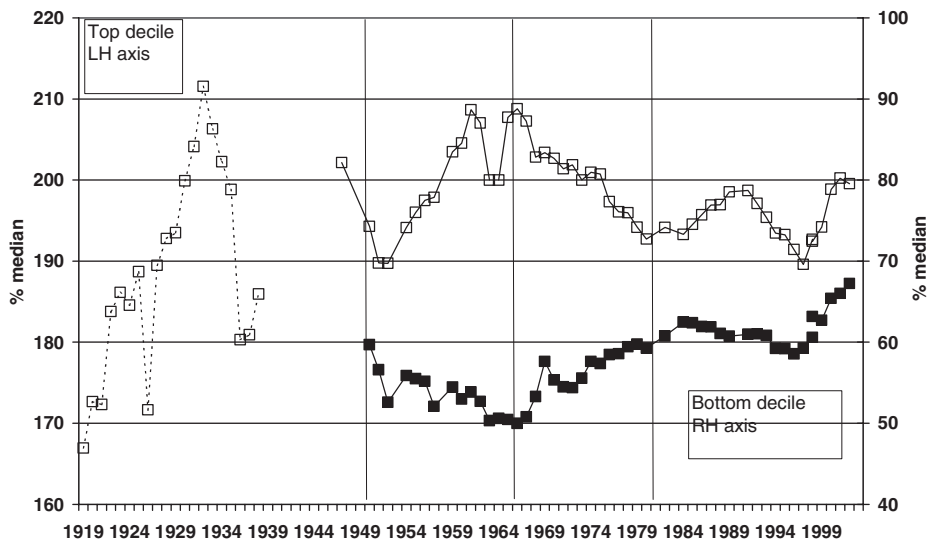

Figure 7. Top and Bottom Decile Earnings in France 1919–2002

Source: (B) Data for top decile for taxable wages from Piketty, 2001, Table D-5, assuming that the median is 80 percent of the mean (from Table E-3); the need to make this assumption leading me to classify the data as B for the period prior to 1947; (A) employer wage declaration data (DADS) for 1947 to 1998 from Piketty, 2001, Table D-12 columns 8, 9 and 10; data for 1953, 1958, 1981, 1983 and 1990 are not used as they are based on interpolation between adjacent years; (A) data for 1998 to 2002 from *Annuaire Statistique de la France*, 2003, Table C.03-4; 2004, Table C.03-4; 2005, Table D.01-4.

Then came 1968. According to Piketty, "the break point is clearly identifiable, because it arises from the 'events' of May 1968 and the resulting social measures" (2001, p. 165; my translation). He goes on to say that this break was "the result of breaks in the wages policy of the state, and notably in policy towards the minimum wage" (2001, p. 165; my translation). As may be seen from Figure 7, the bottom decile did indeed rise significantly from 1966 to 1979. The top decile fell by nearly 10 percent. There was an almost complete reversal of the increased dispersion of the 1950s. As was summarized in the report of CERC, "earnings dispersion widened between 1954 and 1963, the decile ratio increasing by 20 percent; it remained stable between 1963 and 1967, then closed abruptly in 1968" (CERC, 1976, p. 14).[11]

For France, we can go back to 1919 for the top decile (the wage tax data do not cover the lower part of the distribution). This shows a significant fall in the top decile in the 1930s, so that the great compression was not limited to North America. We should however note the turning point in 1936, and the fact that the fall in the top decile from 1932 was preceded by a large rise from 1926. Inevitably, in seeking a pattern, we are led to seek to go further back in time.

(v) *Germany*

For Germany, we can also go back to 1929, and the data, shown in Figure 8, also suggest that the top decile was rising in the late 1920s, to be followed by a reverse in the 1930s. It should be stressed however that the insurance estimates have been assembled from a combination of sources, and are only B graded (although the wage tax data corroborate the changes in the top decile). The continuing decline in the top decile after 1933 appears to run counter to the conclusion reached by Sweezy, who used the same data for earnings, that "the general picture of the distribution of individual income shows that inequality has increased during the Hitler regime" (Sweezy, 1939, p. 182). She was referring to total income as well as earnings, and part of the rise in inequality may have been associated with a general fall in the wage share. Moreover, we should note that our data in Figure 8 also show that the lower quartile was falling. The distribution was becoming more spread out at the bottom, which is consistent with the direction of change found by Petzina, who describes an unprecedented fall in the share in total income of the bottom 50 percent (1977, p. 147). This period clearly warrants closer examination, in particular if we wish to establish what would have happened in the counterfactual situation where Hitler had not come to power.[12]

Turning to the post-war period for Germany, we should note the obvious differences in territorial coverage (also that West Berlin and Saarland are missing from the earlier years). We can also note the contrast between Germany and the

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[11]The post-1968 period has been studied carefully in other European countries. To take just one example, the data assembled for Sweden by Gustavsson (2004) show the quintile ratio for men as falling from 1.86 in 1968 to 1.7 in 1976. This was preceded, and followed, by periods of relative stability in the ratio. As he notes, the period coincided with the heyday of the "solidarity wage policy" followed by the major trade union confederation, Landsorganisationen (LO) (see also Edin and Holmlund, 1995).

[12]The wage and labor market policies of the Nazi regime are described in Trivanovitch (1937) and Bry (1960, pp. 235–7).

Figure 8. Top and Bottom Decile Earnings in Germany 1951–2002

other four countries with respect to the 1950s and 1960s. During the Golden Age, the top decile is stable and the bottom decile rises significantly. There is no apparent break in the 1960s. From 1950 to the end of the 1970s, the change in the top decile was less than the threshold of 5 percent, and the bottom decile continued to rise. In the years following 1980, the top decile rose, and, splitting the period in two, the bottom decile first rose and then fell.

Summary

The main findings for the five countries are summarized in Table 3. As the case of Germany has just illustrated, generalizations about the time path of change do not necessarily hold universally, but between 1930 and 2005 there are four distinct periods, which exhibit common features in several of the five countries studied:

- Compression of the earnings distribution in the 1930s and 1940s (although we lack evidence for the U.K.).
- Widening of the earnings distribution during the Golden Age from 1950 to mid-1960s (except in Germany).

TABLE 3
SUMMARY OF FINDINGS

Period (approximate)		Canada	France	Germany	U.K.	U.S.
1930–50 "Great Compression"	Top decile	Large fall	Significant fall (preceded by significant rise in 1920s)	Significant fall		Significant fall
	Bottom decile	Large rise in lower quartile		Significant fall in lower quartile		Significant rise
1951–64 "Golden Age"	Top decile	Large rise	Rise	Stable	Rise	Large rise
	Bottom decile	Large fall	Significant fall	Significant rise	Significant fall	Large fall
1965–79 "Egalitarian push"	Top decile	Stable	Fall	Stable	Fall	Stable
	Bottom decile	Rise	Significant rise	Rise	Large rise	Significant rise
1980– "Recent decades"	Top decile	Stable	Stable	Rise	Significant rise	Significant rise
	Bottom decile	Stable	Rise	Stable	Fall	Significant fall

Note: A "change" is a change of 5 percent or more; a "significant change" is between 10 and 20 percent; a "large change" is 20 percent or larger; "stable" otherwise.

- Narrowing of the distribution in the late 1960s and 1970s (stability of top decile in U.S. and Germany).
- Post 1980 rise in dispersion in the U.S., the U.K. and Germany.

Conclusions

This Lecture has been concerned with both methodological and substantive issues. On the methodological side, I have suggested that there is a variety of types of evidence about the long-run evolution of the distribution of earnings among individuals. Going back in time typically involves drawing on sources other than household surveys, returning to sources used in the pioneering study of Lydall (1968), and making use of income tax records, as in the recent literature on top incomes stimulated by Piketty (2001, 2003). In using these different sources, I have tried to make explicit the criteria applied when judging the fitness of data for purpose, arguing that data assessment is a responsibility of data users, not just of data compilers. In some cases, data have been rejected (classification C). I have not made use of data on the joint earnings of couples. I have not made use of data on occupational differentials (although this may provide useful background information to the study of individual earnings). In other cases, data are classified as B (acceptable if not ideal), rather than A (most appropriate). Series classified as B include those where the coverage does not allow the whole distribution to be estimated, where interpolation has to be made over wide ranges, or where earnings are tabulated by income, not earnings. To sum up, I have suggested a graded approach to the classification of earnings data. Economists tend to swing between two extreme positions with regard to data quality. They either use any data that can be downloaded, without any consideration of their quality, or they reject any data that depart in any respect from their ideal (for example, considering only household survey micro-data). In my view, we need to adopt an intermediate position, classifying data according to their suitability for the purpose in hand.

Substantively, my interest in this Lecture has been with "what happened before 1980?" The answer is rather different from the one I expected. The period certainly cannot be characterized as one of "remarkable stability." The U.K. commentators cited at the outset were drawing on single isolated years, and it is clear how this can be misleading. One needs to look in much greater detail at the year-by-year changes. With the new data presented here, we can see that the Anglo-Saxon countries have all seen large rises and falls in the deciles; France and Germany have both seen significant rises and falls. If a single letter summary of the time path of dispersion is required, then a W seems more appropriate than a U or a V. The Great Compression was followed, in all countries apart from Germany, by a rise in dispersion in the Golden Age of the 1950s and early 1960s. There was then a change in direction, when dispersion fell in the late 1960s and 1970s.

This answer in turn poses new questions. First, as put to me by Edward Wolff, we have to relate the observed changes in the distribution of individual earnings to those in the distribution of the disposable income of households. In the U.S., Gottschalk and Danziger found that the distribution of hourly wages of men and the distribution of adjusted family incomes for the period 1975 to 2002 "follow remarkably similar patterns" (Gottschalk and Danziger, 2005, p. 232). But this

need not happen. There are several intervening mechanisms (see, for example, the discussion of the U.S. case by Karoly and Burtless, 1995). Household income depends on the joint distribution of the earnings of individual household members. There is capital income. Taxes and transfers influence the outcome. There have been significant changes in family size and composition. If the two move differently, as may have been the case during the Golden Age, then we need to examine these, and other, factors. Secondly, a major reason for extending the period of observation backwards is that it allows us to test the purchase of different explanations that have been advanced for the post-1980 period. If earnings dispersion started to rise in the U.S. in 1952, how far can this be explained by world trade or computers? If the time path is that of a W, are we observing the supply of trained labor first outrunning increased demand due to technical change, and then falling behind? Thirdly, I have referred in a number of places to the impact of government policy. Minimum wages, wage controls, income policies, and more general labor market interventions have all left their mark on the distribution, and we need to clarify their role. Finally, the observed time patterns lead us to speculate about the future. Are we observing fluctuations about a stationary distribution that tends to reassert its hold? Or is there a natural tendency for market economies to generate rising dispersion, only redressed (or held in check) during periods of active government intervention? To find out, we shall have to wait, but I have tried to argue in this Lecture that we can also learn by going back in time.

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