Measuring the Evolution of Inequality in the Global Economy

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Abstract:

This paper provides a summary of information in the UTIP data set on the evolution of industrial earnings inequality in the global economy. At present the data set covers 66 countries, with annual observations going back to 1972 in most cases and to 1963 in many. Our measure of changing inequality, based on the group-wise decomposition of the Theil statistic across industrial categories, appears to be a sensitive barometer of political and economic conditions in many countries, and the percentage change in this index appears to be meaningfully comparable across countries. We also measure and detect regional patterns of similarity in the movement of inequality through time. The paper may be read in conjunction with many illustrations available for downloading at the UTIP web-site: http://utip.gov.utexas.edu.

1. Measurement of Inequality around the World

The remarkable work of Deininger and Squire (1996) has greatly advanced our knowledge of income inequality around the world. By assembling an wide range of information from past research, Deininger and Squire have brought us as close as we are likely to get to having a comprehensive set of Gini and quintile estimates of the distribution of household or personal income across countries and through time. Unfortunately, it is not enough to permit authoritative examination of the effects of economic change on inequality. Specifically, the effects of growth and globalization on wage inequality cannot be resolved using these data.

There are three major difficulties with the available data. First, Gini coefficients typically are measures of household or personal income, and not of annual earnings or hourly wages. But it is wages and earnings that bear the direct effects of economic globalization, and therefore a measure of inequality restricted to these income sources would better suit this research problem. Second, Gini coefficients are highly sensitive to under-reporting of high incomes, and the degree of distortion differs to an unknown degree from one country to the next and even across surveys within individual countries. Third, analysis of economic change requires dense and consistent time-series. Data must be available almost every year if valid comparisons with time-series such as GDP growth or inflation are to be made. As the Deininger and Squire data set makes painfully clear, too many countries failed to take appropriate surveys of adequate quality on a consistent basis, so that annual changes in inequality can be computed from this data for only a handful of countries. Indeed, existing measurements of inequality often combine multiple estimates of Gini coefficients for particular years with spotty or non-existent coverage at other times. Restricting the data to series of acceptable quality, a major D&S contribution, reduces the first problem but worsens the second.

2. The Theil measure

Is there an alternative? Yes: a group-wise decomposition of Theil's T statistic (T_N hereafter) provides a useful alternative approach to measuring the *change* in earnings inequality within a single country, and to comparing degrees of change across countries. Of the three major problems noted above, a T_N based on industrial payrolls solves the first and third and it is unpretentious about the second. Usefully for a study of pay, T_N can be computed from aggregated payroll data, and since it does not require rank-ordered income bins, industrial groups are a perfectly adequate source of raw material. There may be problems of under-reporting as some establishments escape notice, but larger establishments and hence most of manufacturing are likely to be covered accurately, while those parts of income most likely to be under-reported, such as profits, interest and off-the-books earnings are not targets of the analysis. Most important, data for computing a reliable between-group component of the Theil statistic are widely available for long periods and in dense and consistent time-series; the exceptions are mainly in Africa and short periods of war or revolution in other countries. Indeed, for many countries one can obtain useful data on a monthly basis, as Calmon *et al.* (1998) have done for Mexico and Brazil.

3. Computing TN from industrial earnings data

Industrial earnings data are ubiquitous. Virtually every country performs an industrial classification on its manufacturing establishments, and most collect basic information on total employment and total payrolls on at least an annual basis, with exceptions only in the poorest nations and those afflicted by severe political instability or war. In the various phases of this work we have employed the following major data sources:

— the Annual Survey of Manufactures for the United States, which provides annual information on US industries by Standard Industrial Classification, 1958 - 1992. This data set is distinctive in that it permits us to calculate the inequality of hourly wage rates for production workers in manufacturing; full details of an analysis of this data are in Galbraith (1998a).

— the OECD Structural Analysis (STAN) database, which provides 3- and 4- digit ISIC data on annual earnings for about 40 industries in 22 countries, 1970 - 1992, with incomplete recent extensions up to 1995.   Galbraith (1998b) provides an analysis of these data and their relationship to unemployment rates in the OECD.

– the Economic Commission for Latin America and the Caribbean (ECLAC) data set on industrial structure, which provides 29 industrial (ISIC) categories for eight Latin American countries: Argentina, Brazil; Chile, Colombia, Jamaica, Mexico, Peru and Uruguay, 1970 - 1995.

– the United Nations International Development Organization (UNIDO) Industrial Statistics database, with up to 29 ISIC categories for 173 countries; annual coverage varies but begins for many countries as far back as 1963. The present paper provides the first results from this rich source of industrial earnings and employment data.

– Finally, Lu has computed inequality by region and by industry for 1985-1996 in the People's Republic of China from data in the 1997 China Statistical Yearbook; Lu's inter-industrial results are reported here.

The basic evolution-of-inequality calculations from the 3-digit STAN, ECLAC and UNIDO data sets are presented in Figures that may be found on the UTIP web-site at http://utip.gov.utexas.edu.   At present writing we include 21 countries from the OECD and from outside the OECD 17 countries in Asia, 14 South American and Caribbean nations, 6 countries in Europe and 9 countries in Africa.[1] Where countries are represented in more than one data set, we chose the series that appears to be of higher quality, which usually means STAN over the other two because of the finer industrial classification scheme. ECLAC and UNIDO appeared to be working from essentially the same numbers for Latin America; however data going back to 1963 are available in the UNIDO series for many countries and this is an obvious advantage. In all we presently have continuous inequality time-series for 66 countries, including many for whom previous inequality computations have been restricted to a bare handful of widely separated years.

The measurement of inequality that we present is, in effect, a chain-linked index of earnings dispersion, updated annually for changes in the structure of employment as well as changes in relative per-capita earnings. It reflects changes both in relative wage rates *per se* and changes in employment structures. In many cases, changes in employment structures have been dramatic, and they can either compound or offset the movement in inequality of relative wage rates. It is possible to distinguish between inequality caused by rising relative wage differentials and inequality caused by changing patterns of employment by computing an index whose employment weights are fixed to a base-year employment structure. Differences in the change between a variable and a fixed-weighted statistic can illustrate the comparative extent to which the two forces are at work in any particular nation.

In most cases, the variable-weighted measure is the more appropriate gauge of changing industrial earnings inequality overall, precisely because it accounts for changes both in average earnings and in the structure of employment. A limited exception occurs during periods of industrial job loss, because the coverage of these data sets is restricted to manufacturing. If job losses are concentrated among low-wage and/or part-time workers, while job gains occur among both low-paid ordinary services and relatively high-paid producers' services, then the change in a variable-weighted T_N may understate the rise in inequality overall, because as workers disappear into unemployment or services the relative weight of low-wage workers in manufacturing is declining along with their wages, thus imparting a bias in the measure toward less increase in inequality than is actually occurring overall. This problem seems to be serious only for a handful of high-income countries, though it appears to be significant for the UK. Our data show an apparently low rate of inequality increase for the UK as compared with the US, but this difference narrows when one compares fixed-weighted indices – even though the rise in earnings inequality in the U.S. remains larger. If this is correct, then the larger increase in *total income* inequality in the UK, revealed in a number of studies, is therefore apparently due to sharper increases in non-wage income among the wealthy and to sharper cutbacks in social welfare programs, than was the case in the United States.

Allowing for this difficulty, for occasional irregularities in the data[2] and for the facts that a Theil measure based on annual earnings in manufacturing will be related only loosely to the inequality of total incomes or wealth, it seems clear that the use of the change in T_N to estimate changes in the overall distribution of earnings in a country expands substantially the available measures of the evolution of inequality in pay. When compared to the difficulties involved in acquiring acceptable Gini coefficients, we believe these numbers are as plutonium to isotope separation: cheap, available, easily processed, effective. It is a bit surprising that these calculations have not already become a standard part of the inequality literature. Though the data need to be treated with caution, it seems clear that the added information is significant, and that availability of dense and reliable time-series coverage far outweighs the disadvantages of limited coverage of non-manufacturing sectors and other occasional problems.

4. Summary of main trends.

Industrial earnings inequality through most of this period rose comparatively little in Central and Northern Europe, and actually declined in a number of smaller, mostly social democratic countries as well as in Japan. In a subset of Southern and Atlantic countries in Europe, notably the UK, Italy and Portugal, inequality declined in the 1970s but then rose in the 1980s. In the United States, inequality rose from the early 1970s onward; the patterns in Mexico and Canada resemble those of the United States but with less upward movement in the 1970s and more in the 1980s. Inequality rose in most of Latin America and the Philippines, dramatically in some places and almost invariably following military coups (See Galbraith and Purcell, 1998, for detailed analysis). In just a few Asian countries inequality declined, and quite sharply, from the late 1980s onward -- often after having risen in the early part of the decade. In the People's Republic of China inequality fell during the first decade of reforms after 1978, but rose again from 1989 through 1994, with an especially sharp increase in 1993; this striking finding is paralleled in data for Hong Kong and Macau.

In the Soviet Union, earnings inequality seems to have declined in the 1960s and to have remained unchanged from that point until the country collapsed; the usual caveats about Soviet data naturally apply and we note that the story for other forms of income in the USSR may have been quite different. Following the collapse of the Soviet Union, inequality in Russia soared.[3] In Eastern (Central) Europe, inequality was held also constant through most of the period under study, but rose sharply when communism collapsed in the early 1990s. We have data for nine highly disparate countries in Africa: Nigeria and Algeria, where inequality seems to follow the oil price; Egypt, where earnings compression in the early 1970s is followed by rising inequality after the Camp David accords; South Africa, where inequality rises sharply in the early 1970s and again following the end of apartheid rule in the early 1990s; Ghana, which experienced drastic increases in inequality according to these measures; Zimbabwe, where inequality fell following liberation and has yet to return to colonial levels; and Madagascar, Kenya and Tanzania. In Iran, inequality fell sharply following the revolution, only to rise again in the early 1990s; in Iraq, a decline in inequality during the Iran-Iraq war was followed by a large increase in the wake of the Gulf War.

There are many stories in this data. Galbraith and Garza Cantu (in progress) have developed a detailed examination of the trends in inequality in Latin America from 1970 to 1995, linked to the patterns of political change. Inequality rose following military coups in Chile, Argentina and Uruguay, though in each of these cases military governments tended to reduce inequality by small amounts toward the end of their writs. But inequality also rose following the introduction of post-military "liberal" regimes in Argentina (Alfonsin) and Peru (Belaunde Terry), and in the course of austerity and liberalization in Mexico (Lopez-Portillo, de la Madrid). Stabilization plans tended to arrest the rise in inequality in Brazil (Sarney, Cardoso) and in Mexico (Salinas) but not to reverse past increases. In Peru, the extreme instability surrounding the failed stabilization efforts of Alan Garcia is evident, as the harsh consequences of the Fujimori regime. Colombia, Venezuela and Jamaica are also covered in this work.[4]

We have only preliminary results on the comparative role of employment and wage shifts

in the evolution of inequality in developing countries. But it seems that almost all countries that liberalized their trading regimes experienced significant increases in raw earnings inequalities. Of these, a small number -- Malaysia and Indonesia are the main ones in our measurements -- achieved sufficient increases in higher-wage employments, notably in export sectors and in construction -- so that overall inequality actually declined in the late 1980s and 1990s. In a few other cases -- for instance, Korea and the Philippines -- changes in the structure of employment partly offset rising inequality of pay; this is a sign of partly successful adaptation to a deteriorating global wage structure. In In many other countries – Egypt is an example – the rise in chain-linked inequality is a combination of rising earnings inequality and a worsening distribution of jobs. This appears to be a sign of declining relative employment in high-wage sectors as import-substituting regimes eroded, without replacement by high-wage exports. Within the OECD, both patterns are evident but overall fluctuations tend to be less. New Zealand is a leading OECD case of rising wage inequality that is not offset by favorable shifts in employment, whereas in Germany total inequality rose less than would have been the case without employment shifts toward the high-wage sectors.

5. Globalization, Growth and Inequality

We are not yet in a position to evaluate the causes of the movement of wage inequality in a comprehensive and systematic way. But the following generalizations suggest themselves.

a. Many countries compressed their wage structures in the 1970s but most saw rising inequality in the 1980s.[5] Of these, only a few have succeeded in reducing inequality in the 1990s. The United States has experienced consistently rising inequality in annual earnings through the entire period, though with hourly wage rates it appears that the rise in inequality peaked in the early 1980s (see Galbraith 1998 for details on this point).

b. Countries that are rich and strongly social democratic generally succeeded in controlling their wage structures through most of this period comparatively well, irrespective of their patterns of trade. This is also true of India after the shocks of the early 1970s; though poor, India remained aloof from global capital markets until comparatively late. Germany, the Scandinavian countries, Holland, Austria and Denmark are notable examples of stable or declining inequality, or of increases in inequality that remain modest by historical and international standards. In some of these cases favorable employment shifts offset rising wage differentials, but in others, such as Austria, overall inequality declined as inter-industry differentials were compressed.

c. Developing countries that liberalized and globalized were subjected to larger swings in inequality than countries that did not; one may contrast India, notably, with Argentina or the Philippines. In most cases, identifiable liberalizations are followed by rising inequality in wages.

d. Just a few liberalizing countries managed to compensate for an increase in raw wage differentials with large increases in relatively high-wage employment -- as noted Malaysia and

Indonesia seem the main cases.[6], as well as Korea in the mid- to late 1980s, though overall inequality increased in Korea in the early 1990s. Almost everywhere else, the effects of liberalization appear to be associated with rising inequality, and the issue is only whether the redeployment of jobs moderated or actually worsened this trend.

e. Given that earnings inequality was rising worldwide, this result is hardly surprising. But it leads to the profound conclusion that equalization-through-export-led modernization is inherently a zero-sum game for income distribution in developing countries. Improving employment distributions in one country leads to not-especially-creative destruction and worsening inequality in others through a redistribution of jobs. Only a general compression of earnings structures can create an environment where equalization prevails on the global development scene.

f. In Taiwan, falling inequality with liberalization along Indo-Malay lines was arrested abruptly in 1993. We think the explanation for this lies in the close relationship of Taiwan's economy to that of China, where economic growth slowed sharply in 1993 and inequality rose dramatically,[7] as it did in Hong Kong and Macau.

g. Irrespective of trading regime, it appears on a preliminary viewing that inequality has a negative association with the national rate of economic growth. In almost every country we observe that major slumps (reductions in output) increase inequality, while sustained booms improve the equality of the manufacturing wage structure. Whether this reasonably implies that most developing countries are on the downward-sloping portion of a Kuznets U-curve is a proposition we are not yet able to test in detail, though evidence in Calmon *et al.* (1998) makes the case very powerfully for Brazil and Mexico.   Galbraith and Garza-Cantu (1998) report that simple correlations between growth and changes inequality are negative for all countries in Latin America, but the bivariate coefficients are small and usually not statistically significant taken one by one.   For the main support of the present proposition, we merely observe the common knowledge that the early 1980s were a time of global recession; sharp increases in inequality are apparent especially in countries seized by the debt crisis: note the cases of Argentina, Bolivia, Brazil, Chile, Ecuador, Korea, the Philippines, and Nigeria.[8]

h. Wars, civil wars and dirty wars (Iraq, Argentina, Chile, Pakistan, Peru and Uruguay, notably) create disastrous increases in inequality as one might expect. Military coups are followed almost everywhere by detectable increases in the inequality of pay. In Latin America and the Philippines, as well as South Africa and (earlier) Greece and Spain, however, the (mostly negotiated) end of dictatorship did not mean a lessening of economic inequalities. Rather, it appears that whether by design, accident or the structured application of stabilization policies, the democratic governments that follow military regimes or dictatorships are often too weak or unwilling to tackle inequality and poverty.   This is in sharp contrast to the political platforms of the 1970s or to the continuing success of social welfare states and socialist governments in parts of Europe into the late 1980s, despite high unemployment in some places. Revolution, on the other hand, is a reliable way to reduce wage and earnings differentials, at least for a time, as the

experiences of Portugal, Iran, Nicaragua and Zimbabwe illustrate. But revolutions are rare.

6. A cluster-analytic approach to economic systems and performance.

As a final exercise, we present as Figure 1 a cluster analysis of the co-evolution of earnings inequality across 60 countries in our data set for which the time-series are adequately long. Details of the algorithm are presented in Galbraith (1998a) and Galbraith and Lu (1999). For present purposes we merely note that the figure aligns countries according to the similarity of the movement of wage inequality from year to year in percentage terms between 1970 and 1995.[9] Strong geographic and developmental patterns are evident in the diagram, including the clustering of the richest OECD countries on the center-left along with such cases of non-globalization as India and the old USSR, and with a striking clustering of the unstable cases on the right of the diagram. Smaller-scale geographic affinities in the evolution of inequality are apparent throughout the diagram. We note in passing the comparative relative wage stability of the enduring communist countries and their affinity to the developed capitalist ones in the evolution of inequality. We think this is real, but caution that our runs of data for China and Cuba are short, and unrecorded events earlier in the period could have upset our picture.

The figure shows a very striking divide between countries that maintained reasonable control of their wage structures and those that did not. It also illustrates just how extreme fluctuations and, for the most part, increases in inequality have been for some countries of the Third World. War and revolution obviously play a role in the extreme fluctuations on the right side of the diagram (viz., Israel, Iran, Iraq, Kuwait, Nicaragua, Poland, Peru), though we are struck by the possibility that the oil price (affecting Iran, Iraq, Nigeria and Kuwait) and the collapse of the competitive position of natural textile fibers (affecting Peru, Bolivia, Uruguay, New Zealand and Bangladesh, among others) may have played major roles in the havoc experienced by more than a few of these countries. Immigration is no doubt also a major consideration in such smaller countries as Israel and Kuwait.

7. Conclusions

The major conclusion of this paper is that industrial data sets can greatly enhance our knowledge of the evolution of earnings inequality in manufacturing worldwide, and are therefore a valuable resource in an effort to understand the effects of economic globalization. While it remains possible for wealthy and determined countries to keep control of their wage structures, our analysis shows that the predominant recent trend in inequality worldwide has been decisively upwards. Liberalizations have almost always made inequality worse; only a few developing countries escaped by upgrading their employment structures, and this is a feat that necessarily only a few can achieve. The experience of the 1960s and early 1970s was quite different; in those years many countries reduced inequality and many more held their wage structures stable.

Since our measures do not lend themselves to comparing levels of inequality across

countries, we are not able to answer that oft-asked question, is equality good for growth? However this evidence does points toward an answer to the inverse question. In most countries, growth is good for equality; indeed strong growth appears to be an indispensable prerequisite for equalization. Conversely, the weak growth in most developing countries in the 1980s was an inequality disaster.

It does not seem to matter greatly whether growth is achieved through import substitution or the rapid growth of high-wage exporting sectors. The problem is that the rapid growth of high-wage exports is a solution open to only a few countries at any one time. It follows that a reduction of inequality globally will require either a return to import-substitution and nationally-based wage structures, or else a substantially higher pace of world economic growth.

To be sure, higher growth globally can only be achieved if led by the comparatively successful, stable and wealthy nations of the global center. It cannot be achieved by liberalizing reform of small nations on the periphery.

We think that this policy conclusion, so contrary to the conventional view that each country is responsible for its own performance in the global economy, flows inevitably from a global look at the evolution of inequality. It is, indeed, remarkable and perplexing that in our age of global economic relations so little analysis has so far been devoted to the global determinants of national economic performance. We hope that our demonstration of the computability of statistics measuring the year-to-year evolution of inequality worldwide will contribute to an effective globalizaton of economic policy research, and so help to lay the groundwork for a global approach to the great policy problems of growth, employment and incomes equalization.

Appendix 1: The Theil Index and Convergence of dT'/dt to dT/dt [10]

Originally drawn from information theory, Theil's T has the following formula:

$$T = (1/n) \sum (Y_i / \mu) \log(Y_i / \mu)$$

(1)

Here, n is the number of individuals, Y_i is each person's income, and μ is average income for the whole population. "Log" is the natural logarithm.

Notice that, whenever a group population consists of equal individuals, the final terms in T all reduce to $\log(y_i / \mu) = \log(1)$, which is equal to zero. Thus T overall is zero for the case of perfect equality. And T increases, as deviations away from the average value increase. Since deviations of (y_i/μ) below the mean have values between zero and one, whereas deviations above the mean are unbounded, T increases as more of the observations move away from the average. Thus T is a reasonable way to measure the degree of dispersion about the average value for any group of observations.

The formula for computing T from grouped data is this:

$$T = \sum (p_i \, \mu_i / \mu) \log(\mu_i / \mu) + \sum (p_i \, \mu_i / \mu) T_i$$

(2)

where now p_i is the proportion of workers employed in the i-th group, μ_i represents the average income for the i-th group, μ represents average overall income, and T_i is the Theil T as measured strictly within the i-th group. Thus the grouped Theil statistic is the weighted sum of that part of inequality that occurs between groups and a part that occurs within groups.

The formula for T', the between-group-Theil statistic, is just the first element in the formula for computing the Theil T from grouped data:

$$T' = \sum (p_i \, \mu_i / \mu) \log(\mu_i / \mu)$$

(3)

Since the within-group element in variation is omitted, this is obviously a lower-bound estimate of dispersion. However, it is clear that as subdivisions increase, T' must converge to T. It therefore follows that the change in T' through time must converge to the change in T. We show in an appendix that this convergence depends on a set of conditions most of which can be checked quite easily. It follows that the movement of T' through time, which is basically the movement of the dispersion of the weighted means of a set of groups, is not merely some "inter-industrial" component of inequality changes, a very common misapprehension, but instead a robust approximation of the movement of the whole underlying distribution. For more details on this argument, see Conceição and Galbraith (1998).

Appendix 2: Notes on the US and UK cases.

We find that Theil series constructed from the either the Economic Census or the STAN for the United States is highly correlated with a measure of the Gini coefficient for variations in family income, based on the Current Population Survey, for the years 1970-1992. However, several cautions are in order.

First, our measure of TN for the US rises more rapidly than the CPS series in the 1970s, and less rapidly in the 1980s; indeed TN stabilizes in the mid-1980s. The divergence in the 1970s may be because wage incomes grew more unequal in that decade, while non-wage incomes actually contributed to a reduction in household income inequality through the expansion of social security and other entitlement programs in those years. In the 1980s, on the other hand, a huge rise in interest incomes flowed mainly to wealthier Americans, so that non-wage incomes would work to increase inequality.

Second, our TN series for the U.S. has about twice the standard deviation of the CPS Gini series. Our series increases much more sharply than the CPS series, and therefore projects back over twenty years to much lower estimated inequality values in the early 1970s than does the Census series. This turns the United States into a low-earnings-inequality country, relative to much of Europe, as recently as 25 years ago. We think this result is plausible in historical context. This was a time of full employment, strong labor unions, recently-installed trade protection in textiles, and a shooting war, all of which work to compress the distribution of earnings. Inequality in U.S. wage incomes in 1970 would have been much lower than inequality in overall family incomes, due to the highly skewed distribution of non-wage incomes in the United States, a country with a very weak social welfare system, a high concentration of private capital ownership and few nationalized industries when compared to Western Europe at that time.

In the case of the UK, several colleagues have noted that our measure of wage dispersion shows less increase since 1979 than other measures, notably the Gini coefficient for inequality of household incomes, and that the rise in inequality in the UK is more nearly comparable to that in the US than our data show. We believe there are two explanations for this. First, our variable-weighted TN deviates from the fixed-weighted measure in the UK case but not in the US case. When a fixed-weight TN is substituted, the measured rise in wage inequality in the UK approximately doubles, from 8.6 to 16.9 percent, compared to 26 percent for the U.S. series. Second, we believe that the dispersion of non-wage incomes probably grew much more in the UK than in the US after 1979: the Thatcher regime was much harsher on the welfare state than that of Ronald Reagan, partly because Reagan never controlled both houses of Congress. Thus a measure of inequality based on household income will grow more rapidly in this period in the UK, compared to a measure based on wages.

Acknowledgments

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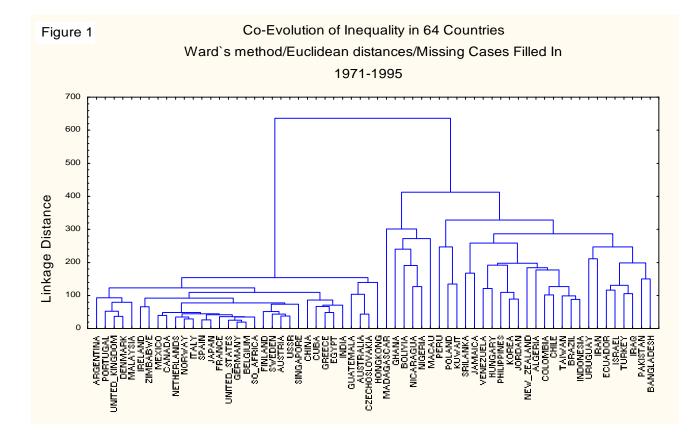
Figure 1.   A Cluster Analysis of Changing Inequality

Figure 1 — Co-Evolution of Inequality in 64 Countries
Ward`s method/Euclidean distances/Missing Cases Filled In
1971-1995

Endnotes

1. Korea, a late-joining OECD member, is presented with other Asian countries even though the Korean data do come from the STAN. Meanwhile Ireland, a founding OECD member, is listed with European outsiders because the data for Ireland come from UNIDO.

2. France and Belgium are the two identified problem cases, both in the early or mid 1970s. Galbraith (1998b) provides an explanation.

3. The proportionate increase in inter-industry earnings inequality in Russia as compared with the Soviet Union is by far the largest in the world, albeit from a very low base.

4. The Garza-Cantu analysis is visible on the UTIP site under the heading "Inequality and Regime Change in Latin America"

5. The UTIP web-site contains measurements of proportionate changes in the Theil statistic for all countries in the data set for three periods: 1972-1980, 1981- 1988, and 1989-1995. These are visible on global maps under the heading "Changes in Global Inequality." The scales of those maps represent the ratio of T values at the end each period to that at the beginning, and the colors from red to blue represent relative differences in these values.

6. This is evidently not the case of Singapore, which appears to have experienced persistent wage compression.

7. We underscore that Lu's evidence for the Chinese case is original: there are no up-to-date electronic sources of industrial wage data for China presently available, part due to a misprinting of the 1997 Statistical Yearbook on CD-ROM.

8. Galbraith (1998a and b) notes that for the most advanced countries, unemployment rather than the growth rate is the critical determinant of inequality. Controlling for unemployment, higher rates of economic growth actually appear to increase inequality in the short run in at least two countries: the US and the UK.   The reason for this would appear to be that the US and UK hold unique positions as suppliers of knowledge-intensive capital goods and high-wage producers' services, so that inequality in these countries moves heavily with the flow of profit-based incomes and thus with the investment cycle. In most other countries, capital goods are imported, and an increase in GDP growth reflects an increase in consumption, with rising real wages and relative equalization.

9. The distance matrix from this analysis yields a global map of the "average degree of similarity" of each country's evolution of inequality to that of all the others. This striking map can be found on the UTIP web-site.

10. This technical section is taken from Galbraith (1998b). For more detail, see Conceicao and Galbraith (1998).