Inequality under globalization: state of knowledge and implications for economics*

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Abstract
This paper considers the state of knowledge of economic inequalities, measured within countries over the past half-century, and presents a consistent, dense global data set which (a) permits the ranking of about 150 countries by their level of pay or income inequality, (b) permits the calculation of a global time trend for the evolution of inequalities from 1963 to 2014, and (c) demonstrates the close relationship between movements of exchange-rates and movement of pay and income inequality in a wide range of countries, excepting only the largest. The chief implication for economic science is that distribution should be considered part of a global macroeconomics driven largely by financial conditions, rather than as a microeconomic topic determined in labor and product markets.

1. A brief history of inequality in modern economics

In the years following World War II the division of labor between neoclassical micro-economics and pseudo-Keynesian macroeconomics was pioneered at MIT and disseminated worldwide from there. Macro held a narrow strip of economic territory: unemployment, inflation, interest rates and money supply, the business cycle, the rate of growth and their interrelations through the quantity theory, the Phillips Curve and Okun's Law. The personal distribution of income fell squarely into the microeconomics of labor markets, governed by supply and demand for various levels of skill, alongside such ad hoc matters as firm-size effects, industry-specific labor rents, imperfect competition and efficiency wages. A theory of changing inequality was offered for developing countries by Simon Kuznets in 1955, positing a rise in inequalities in the early stages of development but a decline later on. For the rich, the Kuznets evolution was supposedly complete, the Cobb-Douglas distribution theory with Hicks Neutral Technical change predicted stable functional shares, and national income accounts appeared to bear this out. So the functional distribution – the division between wages, profits and rent – was hardly spoken of.

Beginning in the late 1970s and early 1980s, circumstances began to force a change. An early hearing on rising inequalities at the Joint Economic Committee (1982)[1] pointed an accusing finger at right-wing policies, and this message was restated by Bluestone and Harrison (1988), who laid the blame on de-industrialization and the war on unions, conspicuous features of the Reagan and Thatcher years. The point seemed obvious enough, but there was a subtle difficulty. The severing of micro from macro made it conceptually difficult for many economists to tie the Reagan Recession of 1981-82 and its UK counterpart

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[1] The hearing was organized by the senior author here at the direction of the committee chair, Rep. Henry S. Reuss (D-Wis.) It was difficult to find academic witnesses as the subject was out of fashion and obscure.

– major drivers of deindustrialization – to a distributional outcome. Instead the emphasis fell on specific anti-worker political actions – in the US these included the firing of air traffic controllers, deregulation of trucking, a radical-right National Labor Relations Board. Still this was a minor muddle compared with what was to come.

It was only in the early 1990s that mainstream economics began a concerted search for a less-contentious explanation of rising inequality, rooted in the labor market analysis to which distribution issues had been consigned. Given the evolving preference of applied micro-economists for data based on surveys of household characteristics – however limited these may be by survey-takers' fixation on race, gender, age, education and a handful of similarly simple categories – the evidentiary basis for a labor market analysis of inequality was remarkably thin. It consisted of little more than widely-separated surveys of earnings, stratified by worker characteristics, and largely confined to a small handful of wealthy countries.

Bound and Johnson (1992) set the template for neoclassical investigation. Rising in- equality was a matter of changing relative demand for skills, a characteristic unobservable in practice but usually approximated by the number of years spent in school. Demand being driven by technology, the underlying cause had to be a "bias" in the character of technological change. The remedy to the resultant inequality could only be an increased supply of skill – more years in school. This remedy had the peculiar feature that if enough people pursued it, the advantage accruing to each would diminish until it disappeared. Education was economically worthwhile, but only if it is restricted – a truism that is nevertheless in its way subversive. The labor economists Goldin and Katz (2008) eventually produced a thick book on this theme, from which the ugly class politics of the 1980s had disappeared.

The discipline of economics is such that to have purchase with the profession, any argument counter to "skill biased technological change" had to adapt the same broad framework of labor market supply-and-demand. Such an alternative was presented by Wood (1994), who argued that North-South trade in manufactures would expand the effective supply of unskilled workers in the Global North, driving down their wages in rich countries but raising them among the poor (where Wood argued factory workers form an intermediate skill class) thus moving inequality in opposite directions in the two hemispheres. Wood's argument gained an audience briefly but was ultimately dismissed by the mainstream; among other things the encouragement it would have given to skeptics of free trade made it politically incorrect.

In the mid 1990s an analysis based loosely on the Kuznets hypothesis revived, thanks in part to efforts at the World Bank to begin to compile a comprehensive global data set of inequality measures, along with income measures prepared by the Penn World Tables and Purchasing Power Parity (PPP) estimates of the relative purchasing power of different national currencies. Fairly soon after the publication of the landmark Deininger and Squire (1996) data set there were multiple efforts to trace the growth (or decline) of inequality on the world scale, resolving roughly into three conceptual measures as described by Milanovic (2005): inequality between countries pure and simple (Concept I), inequality between countries weighted by population (Concept II), and inequality across individuals or households irrespective of nationality (Concept III). The diversity of concepts brought with it new sources of uncertainty in the result and indeed inconsistent – on more precisely, divergent – conclusions depending on the concept deployed. Thus, while inequality between countries (Concept I) tended to rise, inequality between countries (Concept II) fell. The difference was largely due to the rise in average Chinese incomes. Meanwhile Concept III inequality could be calculated only by merging data sets from different countries, a task of heroic proportions; the

extensive data requirements meant that only few years (initially just three) could be brought to fruition. Changes in Concept III inequality from one period to the next generated the famous "elephant curve" showing sharp gains for those at the very top of the global income scale, substantial gains for the lower middle (mostly Chinese and Indian) masses, and stagnation for the incomes of the middle classes in the already-wealthy countries. These numbers too were driven largely by national-average movements (mainly the rise of average incomes in China) rather than by measures of inequality per se.

At the other end of the measurement-method scale, the Luxembourg Income Study set out to blend and homogenize household and personal income surveys so as to permit detailed and accurate welfare comparisons – but with the limitation that such surveys are sparse, restricted mainly to the wealthy countries and for the most part to recent years. What one gains in fine detail on household characteristics one loses on the capacity for extensive international and historical comparison. In these matters, there are different ways to process a finite body of data but, methodologically speaking, there is no free lunch.

In this cacophony of facts and semi facts, Kuznets' straightforward and intuitive hypothesis did not fare well. Indeed, most researchers citing Kuznets were not much interested in his narrative of intersectoral shifts; rather they sought inverted–U curves anywhere they might find them and made that the test of Kuznets' thesis, irrespective of whether there existed an underlying framework of early-to-late transition from agriculture to industry and from rural to urban life.

For many researchers by then, the relation of inequality to income level was no longer of prime interest. Debates over development, education, industrial policy (the East Asian Miracle) and economic growth directed attention toward the link between initial levels of inequality and later growth rates. Two competing strands emerged. One held that low levels of inequality were good for growth (Birdsall et al., 1995) – citing Korea, Taiwan, Post-Mao China but largely ignoring East Germany and the USSR – while the other advanced the opposite thought, that income and savings must first be concentrated before investment and growth will follow (Forbes 2000). A fair summary of these debates is that by choosing periods, countries, data sources and econometric techniques with sufficient care, either argument can be made. But whatever the result, this literature bore only a slight resemblance or relation to Kuznets. An exception is the work of Deaton (2015), who argues that improvements in human welfare must start by increasing inequalities along the relevant dimension, whether life expectancy, infant mortality, years of education or any other index. Only after an improvement has taken root somewhere first, will it be adopted broadly and so eventually inequalities along that dimension will decline.

2. Some policy-relevant themes

Against this counterpoint of alarm and apology, a few lines of reasoning stand out as having a pragmatic bent and drive toward policy relevance. Of these, perhaps the most significant is the Meidner/Rehn (see Martin, 1981) model of wage compression as a path toward productivity gain in an open economy. Their insight was that the composition and technological level of industry in a small economy such as Sweden is endogenous. Floors on wages drive out weak players and place pressure on stronger ones to modernize. The result over time is a superior industrial mix and a higher standard of life both in absolute and relative terms. Moreover, an advanced industrial base can support a large and well-paid service

sector; the downside is that high tax rates may encourage the expatriation of high-income persons, but this is a minor price. The Meidner/Rehn approach is highly validated by the Sweden experience over 70 years, but of less relevance to large economies that cannot export the full spectrum of backward technologies and cheap services.

A second framing of the issue of inequality in policy term builds on the model of Harris and Todaro (1970), who studied urbanization, minimum wages and unemployment in East Africa in the 1960s. Their insight was that an unequal wage structure (say, across an urban/rural divide) generates migration and competition for the better jobs. If these are few and the pay gap is large, then job-seekers must necessarily outnumber jobs and unemployment results. This hypothesis can be extended to migrations in Europe, North America and China, among other cases, and provides a testable hypothesis in contrast to the skill bias model. The latter predicts that more flexible-meaning unequal-labor markets will have less unemployment, since employers will be able to match pay to skills and requirements; they will choose to hire more unskilled workers if the latter are cheaper. The Harris-Todaro model predicts the opposite, namely that societies with compressed and regulated wage structures will (within-limits) tend to enjoy lower unemployment, and also, per Meidner/Rehn, higher rates of productivity growth and larger manufacturing sectors than those who maintain their allegiance to "free and flexible" labor markets. This proves to be one of the rare points on which evidence is spectacularly clear, as reflection on the centralized wage bargains of Scandinavia, Austria and Ireland will attest (Galbraith and Garcilazo, 2004). The preference of employers for flexibility has everything to do with power, and nothing at all to do with combating unemployment.

A third pro-equality argument was offered a few years back by Galbraith et al. (2007, reprised in Galbraith 2016); it is that when countries fight wars, the more equal of two combatants generally wins. This generalization appears to hold going back to classical times. Republics fight their way to independence, become Empires by conquest, fall into decay and disunion, and recede. Communist countries, particularly, did not lose wars unless they fought with each other, at least not until the very last stages of the USSR. And when theocracies collide, the advantage lies not with the richer but with the more compact and coherent, which is to say, usually, with the Islamic.

3. The Piketty phenomenon

None of these arguments are referenced in the 700-page tome of Thomas Piketty (2014) which set out to provide an empirical account of the evolution of inequality worldwide. Piketty's book also sought to embed that record in a theoretical framework capable of bearing the weight of comprehensive explanation. For this, a "new" theory is evidently required, and while Piketty is at pains not to disparage the mainstream labor market education/technology theory, he is not prepared to accept it either. His grand scheme requires a framework capable of operating over a long span of history and pre-history – thousands of years – and for this the concept of skill-biased technology is too specifically modern, too tightly linked to the digital age.

Piketty's proposed solution is superficially macroeconomic; it is to base a theory of inequality on the relationship between r and g where r is the rate of profit and g is the rate of economic growth. Where the former exceeds the latter inequality must rise, since capital (and land) are

owned by the upper classes. So, it remains for Piketty to establish that $r > g$ is both normal historically and plausible as a matter of theory.

For theory, Piketty however reverts to the neoclassical standard, the marginal productivity of capital,[2] and so muddles the question of whether the key forces are macro- or microeconomic. Piketty argues that a profit/interest rate drive by the marginal productivity of capital typically exceeds overall growth rates, without recourse to the culpable (but correct) proposition that short-term interest rates are set by and for the benefit of the state. Instead, for reasons not entirely clear, technology must keep raising the real rate of return on capital, through the traditional neoclassical mechanics of supply-and-demand.

For Piketty, episodes of income leveling are therefore restricted to short periods of capital destruction in wartime, which actually did not happen in Germany in World War I or in the US or UK in either war, nor to any dramatic degree in World War II in France. Piketty also implicitly assumes that fortunes largely pass unbroken from one generation to the next. Thus he builds his hypothesis that the inequalities of the 19th century were natural and the mitigations of the 20th an aberration, now (however regrettably) receding.

Piketty's celebrated empirical work rests partly on archival research on patrimony in the Paris archives – a narrow foundation – but more on a compilation of income tax records, now presented as the World Inequality Database. There is no doubt value in this collection, but recognizing that value and its limitations requires acknowledging that (a) not every country has income tax and those that do not may not resemble those that do; (b) among countries that do have income tax, tax laws defining taxable income vary, as does the effectiveness of enforcement and degree of evasion, and (c) even in countries with good reporting and enforcement, tax law changes can alter the reported distribution without effect on the underlying reality. Galbraith (2019) provides a thorough survey of this database.

To illustrate point (c), in 1986 in the US tax reform was designed to alter the reported distribution without altering the distribution of the tax burden. The reform required high-income individuals to report more of their income while taxing the whole at a lower rate. The resulting bulge in Piketty's top income share for the US in 1987 et seq. provides a substantial part of his case that rising inequality in America outstrips that in Europe. But it is fictitious. Thus statements attributing US inequality to (for example) allegedly exceptional inequalities in American education lack foundation in fact; compared to Canada or the UK, even by Piketty's own data (with this one correction) the US experience is not exceptional.[3] And as Noah Wright (2015) has shown, even those parts which have an arguable basis in fact do not support his central claim that the rate of profit is again coming to exceed the rate of growth.

4. The data on inequalities so far

In order to be able to make reliable comparisons, the research community needs a reliable fact-base of information on the evolution of inequality over time and across countries, using a single consistent concept of inequality measured across the full spectrum of nation states and

[2] This choice requires him to attack the Cambridge Capital Theory, which since the 1960s established that smaller "quantities" of capital do not produce higher rates of return.
[3] Further, some of Piketty's longer run data are simply imaginary; there are figures in his book that report values for 2100 and 2200 AD, not even labeled as "projections."

with sufficient density over time to establish trends and turning points reliably. To summarize the state-of-play:

- The World Institute of Development Economics Research (WIDER) has produced a comprehensive bibliographic compilation of inequality surveys. For researchers seeking global coverage from survey data, this remains probably the most thorough source. But any conceptually consistent panel will necessarily be a relatively sparse subset of the full data-base.
- The Luxembourg Income Study has produced a fully-consistent micro data collection but for only a relatively few, mostly high-income, countries and years. The LIS data are of highest quality and the source data have many uses beyond the computation of inequality indices. But limitations of underlying source material restrict the coverage.
- The World Bank has reverted to a data set of inequality numbers, published as the World Development Indicators (WDI), provided by member states with no attempt to assure consistency of concept. Consumption inequality numbers for (say) India are intermingled with income-based numbers for Western countries. The WDI inequality measures are only weakly consistent with the larger literature and are not a respectable source for comparative inequality measures.
- Piketty and his collaborators, through the World Inequality Database, rely on tax rather than survey data, with advantages in covering top incomes but weak comparability across countries, sparse overall coverage biased toward the rich countries and former UK colonies, and with problems of continuity within countries as tax laws change. Of the major datasets, the WID is the least consistent with all the others (Galbraith, Choi, Halbach, Malinowska and Zhang 2016)
- Milanovic (2005, 2016) has built a unified world inequality measure, condensing all households to a common metric. But this work is based on a melding of within-country inequality measures and between-country comparisons based on PPP estimates. It is largely driven by the latter and subject to their weaknesses; that is, the major forces shaping the "elephant curve" are estimated differences of country-average household income, not the inequalities measured within countries.
- Solt has produced a synthetic data set (the SWIID) covering a very wide range of countries and years, but with a great deal of interpolation and imputation across countries and years. The approach is largely benign where survey data are dense, but unreliable in many cases where they are sparse. (See the comparisons in Galbraith, Halbach, Malinowska, Shams and Zhang 2016.) Solt's data are based in part on the EHII data, discussed below.

These approaches appear to exhaust what can profitably be done from a record of survey and tax data assembled from diverse, incomplete, independent and conceptu- ally autonomous sources. Further progress requires extracting, if possible, reliable information from alternative records. But to undertake this task requires a different method, indeed a different measure of inequality, altogether. As the work of the University of Texas Inequality Project has shown, suitable inequality measures exist – and have existed for decades – and suitable source data are ubiquitous and easy to handle.

5. Measuring inequality from grouped data

The insight behind the UTIP measures touches on several distinct issues, especially the nature of category structures – of taxonomies – and the fractal character of economic distributions, which bears on the relationship between an observable portion of a distribution and the whole thing.

Categories are groups of individuals. The characteristics of a category are the statistical summary of the characteristics of the individuals covered by the category. Changes in the income (say) of individuals within a group change the average income of the group. One can therefore use a change in group average income as a proxy measure of changes affecting the underlying individuals. As group structures become more detailed and refined, the correspondence between group and individual necessarily becomes closer, until the two ways of looking at the data converge with each individual her own group.

This is true irrespective of the overlying character of the group – whether individuals are classed by location, industry, age, gender, body weight, religion, language or any combination of these or other characteristics so long as the groups are "MECE" – mutually exclusive, collectively exhaustive – that is to say, non-overlapping and covering the entirety of that part of the population being observed. At all points, dividing groups into subgroups increases between group inequality. And after a certain point, the movement of a distribution consistently measured across groups must reflect the movement of the same distribution measured across individuals. There is no need for a "random sample" to establish what the ebb and flow of the distribution is. Moreover, if the prime forces driving change in a distribution of incomes or earnings are differences across substantial geographic regions or between different industrial or economic sectors, then a fairly rough group structure will capture the important movements over time – so long as the structure is measured consistently. Administrative data sets, collecting income and population by region and employment and payrolls by sector and industry in hierarchical structures that remain reasonably stable over time, therefore turn out to be highly useful to a project of filling in the historical record of inequality statistics.

A limitation of categorical data in practice is that the group and underlying individuals covered may be a systematic (and therefore biased) subset of the population of interest. Thus, in a survey of manufacturing establishments, workers in units below a certain size may be excluded, while those in agriculture, services and the informal economy are not covered at all. But the fractal character of distributions implies that so long as the broad social relations of a society endure – so long as bankers make more than factory workers who make more than peasants – an increase in the inequality within a given observational frame – say, the manufacturing sector – is far more likely than not to mirror a change in the distribution writ large. By the same token, one can tell the weather – usually though not always – through a window at a glance.

The specific methodological contribution of the UTIP effort was to marry the above insights about categorical data sources – which are cheap and abundant in the real world – to Henri Theil's proposed general entropy measures of between-group inequality, specifically the between-groups component of Theil's T statistic, a simple and flexible formula that requires just two morsels of information on any group structure, namely the total population (or employment) and total income (or payroll) of each group. From this an inequality measure can be computed which is unaffected by sampling error, nor by inflation or by differences/changes

in the currency unit over time. Moreover, the measure can be added-up at will across sectors or regions, or divided between them. The statistic is thus well-suited to the construction of dense and consistent time series, on an annual or even monthly basis where sources permit. The production *en masse* of such series from diverse national and regional data sources was an early UTIP contribution (Galbraith, Conceição and Bradford, 2001).

The formula for the between-groups component of Theil's T-statistic across G groups is:

$$T = \sum_{i=1}^{G} p_i R_i ln(R_i) \text{ for } 1 \leq i \leq G$$

where p_i is the population (or employment) share of group *i*, and R_i is the ratio of average income (or pay) in group *i* to the average income of the population (or pay of the employed population) as a whole. Thus groups with an above (below) average income (or pay) make a positive (negative) contribution to total inequality, and each group's contribution is weighted by its population (employment) share. The expression to the right of the summation is referred to as the "Theil element" for each of *G* groups. T is the sum of the "Theil elements" and is always a positive number. Replicating this calculation across adjacent time periods using a stable group structure generates a very sensitive measure of the evolution of inequality, from widely-available source data.

But there was more. For reasons that remain mathematically obscure, in data sets that measure employment and payrolls across consistently-categorized industries or economic sectors - examples include the Industrial Statistics of the United Nations Industrial Development Organization (UNIDO) and Eurostat's REGIO – the between- groups component of Theil's T statistic is effectively normalized, so that measures compared between countries – and not merely through time within a country – tend to correspond closely to the available survey-based measures (especially from harmonized data sets such as LIS) and to evolve smoothly across international frontiers (rising from North to South in Europe, for instance) in ways that strongly suggest that international comparisons with these measures correspond to underlying economic realities. The same cannot be said for at least some of the survey-based data sets, which in some cases show sharp inconsistencies in inequality between neighboring countries (such as France and Germany, for example) with similar average income levels and open borders. But if France were radically more unequal than Germany as some data sets appear to show, then low wage workers would migrate to Germany from France. This does not appear to be a common case.

The discovery that between-groups Theil statistics could accurately depict both the evolution of inequalities over time and comparative levels of inequality between countries (or other geographic entities, such as sub-national regions in Europe, or US states) opened up the prospect of a search for international, inter-continental and global patterns in the evolution of inequality through time, hence the possibility of identifying forces driving a continental or even global macroeconomics of inequality, as well as decompositions of each inequality measure into the specific contributions of each region or sector, enabling a descriptive history of inequality going far beyond, in detail and accuracy the limited information reported on households or persons in surveys. It also became possible to seek the institutional and political correlates of changing inequality within countries, as the measures prove to be

sensitive reflections of revolutions, *coups d'état* and regime change. Sometimes even the mundane consequences of ordinary elections can be detected.

6. Quality of the UTIP measures

How do measures of inequality computed in this way – from a limited and systematically–biased underlying data set, such as UNIDO's Industrial Statistics – correspond to measures taken by other researchers over time in the customary ways? To assess this question, UTIP conducted two research exercises.

The first was a comparison by linear regression of the UTIP Theil measures to an early collection of Gini measures from diverse surveys – the Deininger/Squire data set of the World Bank, first published in the mid 1990s, was chosen for this purpose because it has a manageable number of distinct conceptual categories (six) and also because it was the dominant international comparative data set on inequality at the time. The comparison showed that after controlling for concept – whether an inequality measure was gross or net of tax, of income or of expenditure, whether the observational unit was the person or the household – considerable variance in the DS set could be accounted for by just two variables, the share of manufacturing employment in total population and pay inequality measured across industries within the manufacturing sector. Coefficients on both variables were stable and precisely estimated. This permitted the construction of extensive estimated measures of gross household income inequality in Gini format, and so the construction of an dense and consistent inequality data set, covering almost 150 countries from 1963 forward, more than available from any other source not using interpolation across countries or years (Galbraith and Kum 2005).

The second verification exercise compared the UTIP estimates to inequality measures in the published record, a painstaking exercise carried over a period of years (Galbraith, Halbach, et al., 2016). There is no easy way to summarize this evidence; it has to be examined and evaluated visually. However, a fair summary is that for wealthy and transition economies, the Estimated Household Income Inequality (EHII) series track available survey evidence on the same concept well, and generally fall – as predicted – between measures of "market inequality" and measures of "disposable" (or net) income inequality – the former high and the latter low. Further, the EHII data set corresponds well to narrower data sets that use consistent concepts, such as those from the OECD, ECLAC and the European Union (Galbraith, Choi et al., 2016).

For developing countries, a similar story holds, except that in some larger countries such as Mexico, Brazil, South Africa, the EHII estimates tend to fall below those found by surveys. The relatively small weight of manufacturing in these economies may be partly responsible, but there is also the fact that in some large, poor countries a significant share of households reports no income at all – about a third, in South African data. This calls into question whether the meanings of "income" and "house- hold" are comparable as between wealthy countries and those with a substantial share of deeply impoverished people.

In South Africa, the EHII estimates run continuously from the 1960s into the early 2000s, thus spanning the liberation in 1994, which is not the case for any survey evidence on inequalities in South Africa. The inequality estimates are tolerably close to survey-based Gini coefficients in the apartheid period, but far below those of more recent years. We suggest two reasons,

based on discussions at the Southern Center for Inequality Studies in 2018. First, that in the earlier period, a significant share of the South African population was simply uncounted, because it was officially considered not-South African, but rather citizens of the various apartheid-era homelands. Second, that in the post-liberation years, a great many households have formed that subsist on casual labor and the basic grant, but consider that they have no regular "job'" and report zero income to surveys. If this number indeed approaches thirty percent of all households in South Africa, that would by itself add 30 points to the Gini even if all reported incomes were equal, which is of course not the case. Thirty Gini points is about the difference between the EHII estimate and measures from modern South African surveys.

With respect to the United States, as well, after the early 1990s the EHII estimates fall below survey and tax estimates of inequality, because the wealthiest US households have in these years substantial and rapidly growing income from capital, which they report. This adds an almost unique dimension to measured income inequalities in the US, closely tracking capital asset prices. It is not clear that this indicates actually- greater inequality in the United States as compared to other wealthy countries, but may instead be a consequence of the relative thoroughness and effectiveness of US income tax reporting. So far as it applies to those with high incomes, the US tax system is considerably more rigorous than, say, the Italian.

There are multiple ways in which measurement and recording issues work to show higher inequalities in the United States as opposed to European and other countries. In tax records, a culture of compliance with tax laws – in part because these tend to be lenient toward capital incomes – is one such way. In the survey record, a large jump in the reported inequality in household incomes in the early 1990s was due partly to improved survey methods – use of computers by survey-takers – and in part to an increase in the threshold for top-coding of income responses. A greater proportion of capital assets in publicly-registered and traded companies means greater transparency in capital gains. Less access to and use of tax havens by the broad population of capital asset owners is another factor. And there is the mathematical fact that when distributions have "fat tails," more intensive surveys in the top brackets will reveal more high-income households and therefore yield higher inequality measures. And finally, adding-in the commonly-ignored between-countries component of inequality across Europe reverses the usual notion that pay scales in Europe are more egalitarian than in the United States (Galbraith, Conceição and Ferreira, 1999).

Even after noting the exceptions, the simple UTIP EHII model produces sensible estimates of gross household income inequalities over time, and the EHII data set is the largest available consisting solely of independently measured, consistent inequality concepts.[4]

The creation of conceptually consistent, dense panel data sets on inter-industry pay inequality and its derivative data set on estimated household gross income inequality, each with about 150 countries and about 4000 independent country – year observations beginning in 1963, opens the door to a new kind of global economics. Such an economics integrates distribution – the central preoccupation of microeconomics in mainstream classical and neo-classical theory – with the presence of macroeconomic forces and influences on an international and even planetary basis. It is an economics without *a priori* national or regional boundaries, an economics *sans frontières*, an empirical economics for an age of globalization, an economics which treats interdependence as a foundational fact whose properties are to be analyzed,

[4] Solt's SWIID is larger, but it is reliant on interpolations across countries and through time to fill in many gaps. And SWIID draws on EHII as one of its source data sets.

rather than as an add-on to a prefabricated national model – as in Keynesian macro-economics – or as a mere incantation in a world of insular, supply-and-demand driven labor markets, each with its boundaries fixed, in practice, by the happenstance and whim of national or regional statistical agencies. The work also transcends the conventional distinction between advanced and developing countries, blending the two into a portrait of the world economy as a unified whole.

7. What the EHII data reveal

We turn finally to what the analysis shows. Research possibilities are boundless, since inequality measures can be compared not only to each other but also to other socioeconomic variables: income, life, health, violence, happiness, and more.[5]

Basic facts are among the most useful. A glance at a map tells that there is a gradient of inequality measures that runs roughly from North to South, from wealthier countries to poorer ones, and also (to a degree) from East to West, in the sense that socialist or formerly socialist economies (until they collapsed) had egalitarian qualities which their capitalist adversaries did not. This gradient plainly reflects the strength of an industrial and urban middle class in the wealthy countries; without such a class, a country is necessarily both poor and unequal, an amalgam of landlords (and resource barons) and peasants, peons, serfs. Especially high inequality readings turn up – no surprise – in the oil kingdoms and in the mining fiefs of the Third World. Table 1 presents the country fixed-effects from a two-way fixed-effects regression on the measures of inter-industrial pay inequalities, 1963 to 2014. While the coefficients have no intuitive interpretation, they provide a rank-ordering and relative size-effect of the inequalities. The table is a rough cut, and we have not edited out some implausible values, but it represents so far as we know the only effort to achieve this result consistently, so far available.

The two-way fixed-effects model is designed to yield a summary description of the patterns in the data – not to test hypotheses per se but to motivate informed explanation of suitable causal factors. The model equation is:

$$\mathrm{T}_{it} = \beta_i X_i + \gamma_t Y_t + \epsilon_{it}$$

where the X and Y are vectors of dummy variables representing countries and years respectively, and T_{it} are the elements of a matrix of inequality measures indexed by country and year. Thus the β_i yield coefficients of country fixed-effects and the γ_t yield a time trend common to the inequality measures in the data set, but relatively insulated from the presence or absence of particular measures for any particular country in any particular year.

[5] The UTIP team has largely steered clear of these comparisons, in part because the limited span of other data sets means that many comparisons entail many lost observations.

Table 1 Country Effects on a Two-Way Fixed-effects Regression Using UTIP-UNIDO Measures of Industrial Pay Inequality

Qatar	0.374	Zambia	0.032	Bulgaria	0.001
Kuwait	0.290	Mauritius	0.031	Nicaragua	0.001
Kyrgyzstan	0.227	Ethiopia	0.030	Hungary	0.000
Peru	0.207	South Africa	0.030	Republic of Korea	-0.001
Trinidad & Tobago	0.114	El Salvador	0.030	Yugoslavia	-0.001
Cameroon	0.087	Pakistan	0.029	Belgium	-0.002
Swaziland	0.085	Macedonia	0.028	Russian Federation	-0.003
Lesotho	0.083	Philippines	0.027	Cyprus	-0.003
Malawi	0.080	Suriname	0.026	Croatia	-0.004
Burundi	0.076	Argentina	0.026	Seychelles	-0.004
Togo	0.074	Egypt	0.025	Germany, Fed.Rep	-0.005
Mozambique	0.074	Sudan	0.024	Romania	-0.005
Papua New Guinea	0.073	Singapore	0.024	Algeria	-0.006
Puerto Rico	0.071	Turkey	0.024	Occupied Palestinian Territory	-0.006
Azerbaijan	0.069	Somalia	0.024	Afghanistan	-0.006
Oman	0.067	Israel	0.023	Canada	-0.007
Yemen	0.066	Burkina Faso	0.021	Iceland	-0.007
Rwanda	0.065	Tonga	0.019	New Zealand	-0.008
Jamaica	0.062	Sri Lanka	0.019	Cuba	-0.009
Morocco	0.061	Georgia	0.018	Germany	-0.009
Kenya	0.060	Fiji	0.017	Czechoslovakia	-0.009
Tunisia	0.060	Panama	0.017	Italy	-0.009
Mongolia	0.060	Kazakhstan	0.017	Austria	-0.009
India	0.052	Libyan Arab Jamahiriya	0.016	Australia	-0.010
Brazil	0.050	Madagascar	0.016	Ireland	-0.010
Indonesia	0.050	Ecuador	0.016	Malta	-0.010
Dominican Republic	0.049	Taiwan	0.015	Poland	-0.010
Ghana	0.048	Japan	0.015	Republic of Moldova	-0.011
United Rep. of Tanzania	0.048	Senegal	0.014	Germany, Dem. Rep	-0.011
Congo	0.045	Nigeria	0.014	United Kingdom	-0.011
Guatemala	0.045	Portugal	0.014	Latvia	-0.013
Honduras	0.042	Myanmar (Burma)	0.013	Slovenia	-0.013
Nepal	0.041	Iran	0.012	China	-0.013
Syrian Arab Republic	0.039	Venezuela	0.012	Macao	-0.014
Uganda	0.037	Albania	0.012	Finland	-0.014
Jordan	0.037	Bangladesh	0.011	Luxembourg	-0.014
Thailand	0.037	Mexico	0.011	France	-0.014
Barbados	0.037	Uruguay	0.010	Slovakia	-0.015
Central African Republic	0.036	Colombia	0.007	Netherlands	-0.015
Ivory Coast	0.035	Estonia	0.006	Norway	-0.016
Eritrea	0.035	Iraq	0.006	Hong Kong	-0.017
Chile	0.035	Costa Rica	0.005	Denmark	-0.018
Botswana	0.034	Malaysia	0.004	Sweden	-0.020
Bolivia	0.034	Ukraine	0.004	Vietnam	-0.021
Zimbabwe	0.033	Greece	0.003	Switzerland	-0.024
Zambia	0.032	Spain	0.003	Czech Republic	-0.026
Mauritius	0.031	Lithuania	0.002		

Note: Countries ranked by size of effect. The United States serves as the baseline and thus these values capture the average distance from the baseline after controlling for year effects. These rankings do not reflect any particular moment in time, and in certain cases the inequality measures have changed dramatically over the life of the panel, 1963-2014. The 15 countries with less than 10 observations were removed. Fixed-effects may also be influenced by the years for which data are available.

The table suggests that Kuznets was right – up to a point. There is an organic relation between income and inequality. In general, for most countries in a cross section, inequality declines as income rises. The intuition behind this regularity is plain: in order to be a high-income country on average, a nation must have a strong and prosperous middle class, and therefore relatively low inequalities. As Adam Smith observed, it is not possible for a nation to be prosperous while the large mass of its people remain poor. The main exceptions are a handful of very-high-income resource fiefs – notably the oil kingdoms of the Persian Gulf – whose inequality is an artifact of having imported their manual labor force from other countries, most notably Pakistan, India, Sri Lanka.

Kuznets' view of an initial period of egalitarian peasant agriculture applies only to a handful of cases – such as North America north of the Mason Dixon Line in the 18th and 19th centuries – and in the wider world only if one excludes – as he did – landlords and rental income. In the modern world, the cases of post-revolutionary China and of post-1992 India fit under the rising pattern of Kuznets' inverted U. But a large number of developing countries, notably in Latin America, are squarely on the downward-sloping part of the Kuznets curve; when growth is strong inequalities decline and when it is weak, they rise. In the industrial and semi-industrial world, a relatively egalitarian society with a prosperous middle class is the constructed artifact of industrialization, urbanization and social policies. Countries which have a small urban-rural divide generally achieve this by supporting agriculture from the surplus of the cities.

Meanwhile close examination of a handful of the richest countries – the US, UK, Japan – exposes that in these cases, inequality rises as the economy grows. This is the evident consequence of a structural concentration on technology and finance in a global setting (for an early discussion, see Galbraith, 1989). Countries that export financial services and advanced capital equipment to the world experience rising inequality in investment booms, and falling inequality in a slump. The "Augmented Kuznets Curve" (Conceição and Galbraith 2001) captures these stylized facts. In short, Kuznets correctly captured the critical role played by intersectoral structural change in inequality. However his historical experience precluded him having applied that correct insight to the peculiar facts of globalization.

A second observation emerges from a glance at maps: that countries of the core of the world economy – call them the OECD – resemble each other, and resemble their close neighbors more closely than their distant ones. Thus, the Scandinavian countries form a low-inequality unit, so do Germany and its neighbors, while the Mediterranean countries are more unequal. These are signs of economic integration; large differences occur only across substantial boundaries and distances. Further, large continental regions – the United States – are necessarily more unequal than small European states taken individually – although, as noted above, the picture changes if one takes Europe as a single integrated continental economy, adding the between-countries element of pay inequality to the within-country components. (A further difficulty of exact comparison of upper-income inequality lies in the superior tax reporting of the United States compared to the tax-haven-rich European Union.) Examining national patterns over time, it is clear that measures of inequality – particularly those of pay inequality in manufacturing, but also many geographic and intersectoral

measures drawn from national data sources, are sensitive mirrors of underlying political events. Thus, the coup in Chile in 1973; in Argentina in 1976, the 1992 liberalizations in India, the reforms after 1993 in China, and above all the collapse of the USSR and of socialism in Eastern Europe show as moments of rising inequality. In some cases, these are dramatic. Meanwhile the Iranian revolution, the Iran-Iraq war and the period of post neo-liberal recovery (and higher commodity prices) in South America and Russia in the 2000s are among the limited instances of declining inequalities. The social implications of declining inequality are not always unambiguous. For example, data for the German Democratic Republic show declining inequality on a steady path until the country disappeared. As a general rule, though, low and stable inequality is associated with strong institutions and wealth; high and fluctuating inequality is the lot of poorer open economies adrift on a sea of debts, unstable commodity prices and fluctuating interest rates, as well as military conflict and political upheaval.

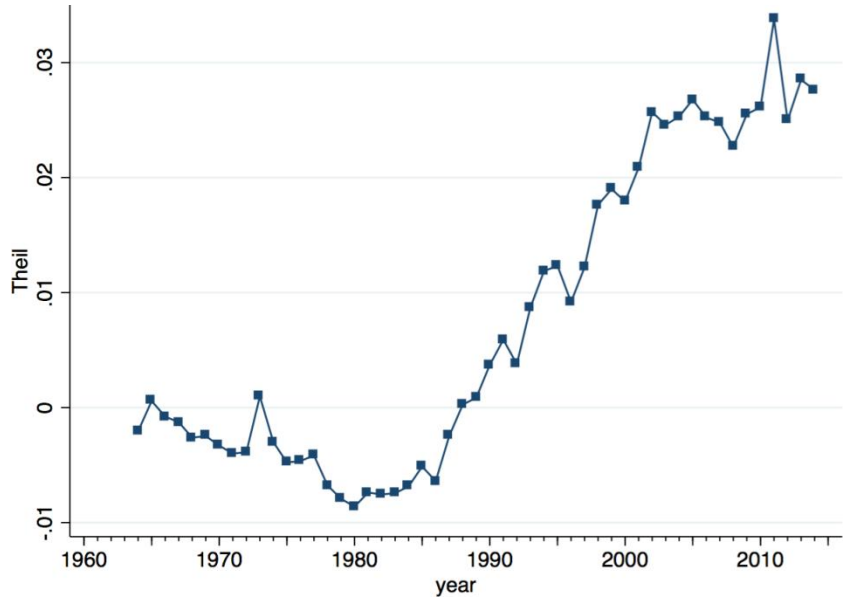
Patterns of geographic contiguity establish the existence of interdependence and of global hierarchies. They validate the center-periphery view of economic relations under global capitalism and put paid to the practice of national economic modeling except for the largest, most autonomous economies of the global center; most countries are not autonomous and their conditions are dominated by global forces and trends. They also establish the transnational scale of distributive relations, calling into question the notion of "microfoundations." Instead of building a consolidated picture from individual or household data, a practice that assumes the autonomy of those units, the world appears to be structured from the top down. And so the question becomes, by what major force or forces?

An answer can be sought in a search in the data for global patterns – trends and turning points through time. The existence of a *common pattern of movement* is evidence *prima facie* of a common underlying force, with broad global effect on national distributions of pay or income. It is also per contra proof that purely national or local analyses of 'market forces' – the stuff and substance of neoclassical microeconomic and labor market analysis – cannot be sufficient to explain the phenomenon under review.

8. Global macroeconomics and inequality

Inspection of trends and changes in inequality gives a strong clue to the sweep of events. There are four trends and three distinct turning points. From 1963-1971, no trend appears, and changes in individual countries are for the most part small. After 1971, while inequality increases in some of the wealthy countries, in much of the world it is declining. After 1980, there is a radical change, and the world enters on a period of large inequality increases, sweeping across regions beginning in Latin America and Africa, hitting Eastern Europe and the (former) USSR after 1989, and moving on to Asia in the 1990s. In 2000 there is a further turning point, after which stabilization and even modest declines in inequality are found in Russia, China, Latin America, parts of Africa and elsewhere. Figure 1 provides this time trend as estimated above, over the entire global data set. The key turning points in the early 1970s, in 1981, and 2000 emerge very clearly.

Figure 1 The Time Trend of Global Inequality



Note: The trend measured from pay across industrial sectors, and calculated as the time coefficient of a two-way fixed-effects model using the UTIP-UNIDO data set. The reference year is 1963, and thus each coefficient refers to the differences from that year.

The meaning of these patterns seems accessible from elementary knowledge of key economic developments at global scale. In 1971 the stabilizing exchange rate framework of the Bretton Woods institutions collapsed – or more precisely was torpedoed by the anchor country, the United States. There followed a nine-year boom in commodity prices, led by oil and fueled by the recycling of petrodollars into commercial bank loans to the Third World. Inequality fell in the (numerous, relatively poor) commodity-producing and debt-increasing countries, which grew rapidly: it rose in the fewer (relatively rich) industrialized consumers, especially in the crisis year, 1973. Two simple parameters, debt flow and oil prices, dominated the global pattern, while national institutions and politics affected the timing of effect in particular cases, such as the coups in Chile (1973) or Argentina (1976) on the side of rising inequality as compared with (say) the revolution in Iran (1979).

These patterns are consistent with the central thesis of the original Kuznets hypothesis, in a world where most countries are to be found on the downward-sloping surface of the inverted-U. In most such cases, stronger growth – whether fueled by commodity exports or debt – absorbs surplus labor into formal and informal activities, raising wages more rapidly at the bottom of the pay scale than toward the top. The two great exceptions in those years were China and India, clearly still on the upward-sloping Kuznets surface, but which had not then begun to enjoy their long growth-and-development phases.

In 1981 the global crisis ended the commodities-debt-and-development boom. The crisis hit first in the most exposed indebted countries, provoking a collapse of investment, de-industrialization, a collapse of public revenues and public services, and in certain cases – Chile 1982 – a banking crisis. Inequalities rose as the middle classes were destroyed. Ultimately better-protected countries – the East bloc – also fell before the pressure, along with the internal political strains it had generated and their own structural weaknesses. Financial

liberalization and its discontents then spread to the most successful of the developing nations, the East Asian Tigers, who entered crisis in 1997. China experienced rising inequality as reforms and urbanization accelerated in the early 1990s, but having maintained capital controls throughout – and resisted the temptation to lift them[6] – China remained untouched by this final act. That China was therefore poised to reap the spoils in the following decade is therefore not perhaps a surprise.

In the 2000s, following the NASDAQ collapse of April 2000 and the 2001 9-11 attacks, global interest rates fell and with China's growth, commodity prices recovered, giving space for left-wing governments to come to power in South America and in parts of Africa, enabling broad-based growth and poverty reductions. Meanwhile growth in China spread past its initial geographic concentration on Guangdong, Shanghai and Beijing, so that China too moved toward a downward-sloping Kuznets surface (Zhang 2016). In Russia a new government took partial control of the national resource base, stabilized living conditions and arrested the free-fall of life expectancy, fertility, emigration, and violence that had followed the dissolution of the USSR in the early 1990s. So, in Russia too inequality declined after the late 1990s. In the US a saw tooth pattern emerged, of underlying stagnation capped by income gains to property speculators and mortgage fraud, the signature elements of the ages of Bush and Obama. In Europe, the consolidation of the Eurozone replayed the global boom of the 1970s on a regional scale, as capital flowing to Portugal, Ireland, Greece and Spain set the stage for the subsequent collapse.

Curiously the Great Financial Crisis was in the first instance a debacle of the rich countries, reducing measured inequalities for the very richest countries along the augmented, or secondary, upward-sloping surface of the Kuznets Curve. One can see this in national data for the United States, and in Europe-wide data showing the relative losses in London and Paris, the great financial centers. The effects on the wider world ran through other channels: declining commodity prices, the return of reactionary governments (throughout Latin America, also in India) and especially above all, the ironical flight to the US dollar, capital markets and Treasury bonds. A final discovery underscores the point: the relationship of pay inequality to exchange rates, measured against the dollar.

To see the effect of exchange rates on inequality, consider that a manufacturer has only two possible markets – those inside the country and those outside. Typically a country exports its best products, and the pay scales of the exporting sectors exceed those who sell only or largely at home. From this it follows that a depreciation of the national currency raises inequality: the peso or real or rupee income of the exporter rises, while that of the non-exporter stays the same. Inequality rises as a matter of accounting-and all the more so, if the increased local currency flows are concentrated *within* the exporting sector, flowing to upper-income echelons in the sector. No behavioral response or effect on trade flows is required. Devaluations raise inequality. *Overvaluations* therefore create the conditions under which vulnerability to increased inequality grows. These findings thus reinforce the arguments of Bresser Pereira's (2010) new developmentalism. Since we know that variations in pay inequality drive household income inequality, the line of causality is unambiguous; it must run from the exchange rate to the inequality measure.

[6] The senior author served as Chief Technical Adviser for macroeconomic reform to the State Planning Commission at this time, and in 1995 organized discussions of capital control for the Chinese economic policy leadership. Robert Eisner and Jane D'Arista spoke at these meetings on the wisdom of maintaining controls.

Systematic comparison of inequality and exchange rates is complicated by – among other things – changes in the currency unit in certain countries. However Table 2 gives correlation coefficients for selected countries. In an examination of data from over 30 countries, Rossi found that while the slope of the relationship varies, depending on proximity to the United States, the relationship is often both strong and inverse (Galbraith and Rossi, 2016). More extensive work on the data is underway, and it suggests broadly that the effect is present in up to two-thirds of countries, strong in a third of them, with the strongest effects found in countries with open capital markets and supplier relationships with the Global North. Large industrial economies and those insulated from global capital are less affected, or not affected at all.

Table 2 Correlations of Exchange Rates and Theil Index for Selected Countries

Mexico	0.98	India	0.48
Egypt	0.97	South Africa	0.46
Hungary	0.92	Zimbabwe	0.44
Poland	0.91	Malaysia	0.39
Pakistan	0.84	Algeria	0.36
Canada	0.82	Sweden	0.36
Guatemala	0.81	United Republic of Tanzania	0.26
Bangladesh	0.81	Philippines	0.21
Nigeria	0.80	Costa Rica	0.05
Israel	0.77	Norway	-0.08
Cameroon	0.75	Greece	-0.22
Uruguay	0.74	Ireland	-0.27
Jordan	0.71	Denmark	-0.36
Bolivia	0.66	Ethiopia	-0.50
Singapore	0.65	Republic of Korea	-0.52
Senegal	0.63	Austria	-0.63
Czech Republic	0.59	Japan	-0.67
New Zealand	0.58	Iraq	-0.73
Brazil	0.58	Cyprus	-0.77
United Kingdom	0.56	Germany	-0.79
Turkey	0.50		

The statistical chase comes to an end: that global financial capital has been driving the movement of inequality, measured within countries, around the world for the years since 1971 seems established. And this, in a nutshell, is what we know about the relationship between globalization and inequality.

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