ABSTRACT

Inequality has become perhaps the foremost preoccupation of modern empirical economics. Yet the conventional theoretical explanations of changing inequality rest on premises long ago demolished on logical grounds. This paper summarizes a Keynesian theory of income distribution. The theory integrates macroeconomic and distributive phenomena and so accounts for the empirical relationship between the changing shape of the distribution and major macroeconomic events.
Michael Lind has called income inequality the prevailing social issue of our time. These days, the designation meets little argument.¹ But the development is recent. The rise in income inequality in postwar America dates only to 1970, and the re-emergence of inequality as a social issue only to the late 1980s. It took the spur of Reaganism, with its celebration of conspicuous differentiation, to reawaken class consciousness in American political life. Before that, attention had been on other issues for nearly sixty years.

The original submergence of class was a liberal achievement. It was perhaps John Maynard Keynes greatest service to capitalism that he focussed attention on jobs, that unemployment and not equality was the great issue of the Great Depression. And in the Keynesian period from 1945 to 1970 income inequalities received scant scholarly attention. The great leveling achieved during World War Two seemed to have become a fact of nature, and attention shifted to poverty as the organizing principle for social action.²


² As early as 1957, John Kenneth Galbraith observed that a few things are more evident in modern social history than the decline of interest in inequality as an economic issue. Michael Harrington The Other America is widely credited with mobilizing opinion on poverty. In a world that saw itself as prosperous, egalitarian and fully employed, the poor were other. Poverty became defined as separation from the capitalist system rather than as an extension of it.
And so the theory of income distribution passed into the domain of microeconomics. Textbooks taught neoclassical marginal productivity theory, loosely rooted in two-factor production functions, according to which profits are the just reward of capital and wages are proportional to personal productivities, as duly adjusted by stocks of human capital. The theory nicely explained the stability of income shares -- as between profits and wages -- as reflecting the slow unfolding and neutral character of technological change. The theory also predicted a smooth relationship between the rate of interest and the capital-intensity of technique. If and as interest rates declined, profit-maximization would dictate an evolution toward greater capital intensity and a correspondingly lower marginal productivity of the capital stock.

This is the context of the uprising that became known as the Cambridge capital critique, which began in the 1950s with the observation, by Joan Robinson, that there were difficulties in assuming a unit of measure for the capital stock. Under simple alternative specifications that admitted the heterogeneity of capital goods, the smooth inverse relationship between interest rates and capital intensity would not hold. This was *reswitching*.

Brief statement of the Starting Position

Jan Kregel’s essay on *Income Distribution* in the 1978 *Guide to Post Keynesian Economics* remains a classic introduction to the work of Kalecki, Robinson, Kaldor, Sraffa,

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3 And it provided a universal, irrefutable, empty rationalization for existing wage differentials, since human capital cannot, by its nature, be observed or measured to any useful degree of precision.
Pasinetti, Harcourt and others in the tradition of Keynes on this issue. Since my own education on these questions occurred at Cambridge in 1974 and therefore pre-dates Kregel’s essay, I can scarcely improve now on that work. This chapter will therefore focus mainly on developments since 1978 and on what I believe to be the most promising way forward for future research. Still, it is useful to begin with a brief review of the original controversy, and what it means for the micro-theoretic view of the distribution of income.

Already by 1960 Joan Robinson and Piero Sraffa had raised lethal objections to the neoclassical proposition that the distribution of factor income could logically be interpreted as a set of factor returns related to marginal productivities under constant returns to scale. Robinson had presented the special theory of this critique, namely that the concept of aggregate capital as a physical quantity was incoherent. Capital goods cannot be aggregated into a common measure of the capital stock without first assigning a value to each physical capital item. But on the other hand, treatment of the capital stock as a value aggregate requires prior knowledge of the rate of interest. The value of a particular capital good depends on the future net revenue stream attributable to the acquisition of that good, discounted at a rate of interest; capital goods will be acquired up to the point where their internal rate of return (marginal efficiency) just equals that rate of interest. How then can the neoclassical rate of interest be, itself, precisely the marginal productivity of capital that the theory was supposed to determine? Robinson had identified an indeterminacy at the heart of the neoclassical distributional paradigm.

Sraffa’s contribution was to generalize Robinson’s position and to render the concept of marginal productivity redundant. In Production of Commodities by Means of Commodities, Sraffa showed that short-period production prices can be derived purely from dated physical quantities
of embodied labor input (and an exogenous discount or interest rate), as indeed Marx had postulated long before, but without satisfactory proof. Relative prices, and for that matter relative wages, therefore do not depend on marginal productivities. Meanwhile, Keynes supplied a theory of the interest rate built on liquidity preference, and so eliminated the need for a marginal physical productivity of the aggregate capital stock to underpin the theory of the rate of interest.

It followed that aggregate income distribution, the division of national product between wages and profits, has to be determined by some mechanism other than the marginal rate of return on an alleged capital stock. But what mechanism?

Keynes, Kalecki and Kaldor presented a Keynesian position on this question: A capitalists get what they spend. Aggregate profits are determined by the spending decisions of the capitalist class. Businesspeople, motivated by animal spirits, receive back as profit income what they lay out as capital investment and luxury consumption. Aggregate wages, on the other hand, are determined merely by the aggregate stock of consumption goods produced, they are a function of effective demand for output; average wages are this value divided by the total number of workers.

Where workers save, as Pasinetti showed, the flow of profit income runs partly to workers. But, other things equal, the aggregate volume of profit income is unaffected. In other words, total profits depend entirely on business and government spending decisions, and not on the distribution of claims to profit income nor on the quality or type of spending. Finally, the internal or personal distribution of wage income is so far left entirely up in the air, to be settled by further assumptions or by political, institutional and historical forces.
The ratio between aggregate wages and gross profits is the national distribution of income. After a slump, exhilaration takes over and investment soars. An investment-and-profits boom leads back to full employment. In times of full employment, with consumption and wages high, there is a profits squeeze and business gets boom-tired. Artificial booms are possible, for the government can provide a stimulus to spending if private businesses are unwilling to do so; but these are met with ambivalence by business leaders since they deprive them of their controlling position in the political economy.

The Argument since 1978

We are now nearly forty years after Sraffa. Yet for reasons psychological and political rather than logical and mathematical, the capital critique has not penetrated mainstream economics and it never will. Today, only a handful of economists seem even aware of it. Applications of aggregate production-function methodology run rampant in studies of economic growth (new growth theory), of development and convergence, and of international trade (e.g., factor-price equalization and other applications of Heckscher-Ohlin). Ostensible liberals are not exempt: arguments for higher public infrastructure investment based on its alleged marginal productivity are of precisely this type, as are arguments for increased investment in education based on the higher marginal productivity of human skill. To mainstream economics,

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4 Aggregation of human capital -- heterogeneous education acquired at different moments in past time -- faces exactly the same problems as aggregation of physical capital. The (needless to say, ludicrous) response of the literature is to treat all moments in school as identical and timeless, so that they can be added and compared, once for all, for each worker.
Keynesianism has been reduced to a narrow doctrine relating sticky wages, public spending and employment. The fact that there exists a Keynesian distribution theory, still less the reasons for it, has been mostly forgotten.

Thus when inequality resurfaced as a social, political economic issue in the 1980s, economists responded with a flood of new studies founded in microeconomics. It is perhaps a mark of the capital controversies that these rarely, if ever, baldly refer to non-labor income, nor attempt to rationalize the vast rise of profits in the early 1990s as a respond to a rising marginal productivity of capital. But otherwise the debate over increasing inequality has been conducted almost exclusively in pre-Sraffian, anti-Keynesian terms, that is in terms of the pricing of underlying factors of production, of their marginal productivities; the idiom is of competitive supply-and-demand models operating under conditions of diminishing marginal returns.

The fault line in these inequality debates has thus been over the timeless issue of demand or supply. Is rising inequality due to an increase in the relative demand for (read: a rise in the marginal physical productivity of) highly skilled workers (Bound and Johnson)? Or is it due to an increase in the effective supply of low-skilled workers, through immigration (Borjas and Ramey) or trade (Wood), driving down the marginal wage (e.g., along a fixed marginal productivity schedule)? Either way, the arguments entirely respect the marginal productivity paradigm and the market mechanism.

The empirical literature is interesting. Juhn, Murphy and Pierce show, for example, how rising inequality in the United States in the 1970s was mainly due to the falling position of the
bottom half of the wage distribution; it is only in the 1980s that the top half also spreads out, with a corresponding increase in the estimated value of years of schooling. Krueger has shown how higher wage differentials are associated with the use of computers at the workplace, though as Lawrence, Krueger and others in this area now acknowledge, the direction of causation in this relationship is far from certain. Carnoy, Howell and Gittleman, and others have noted that skill differentials and wage differentials do not always move together: for African-Americans, the former have narrowed but the latter have increased. In a new paper Thurow, citing a study by Houseman, points out that while the wage gap between high school and college grads increased, real wages in both groups declined; what sort of technological progress is this?

In practice, the mainstream analysts downplay supply factors, leaving a plurality for the hypothesis of skill-bias in technological change. Yet the impression left by surveys (Danziger and Gottschalk, Lawrence) is that of evidentiary impasse, with the final result dominated by the power of conventional thinking. It may be that the core empirical issues will never be resolved to the entire satisfaction of the contestants. It is even more unlikely that this work will evolve into a satisfactory examination of the underlying theoretical questions.

At the same time, the literature is vulnerable to a Keynesian critique. But to make such a critique persuasive, it needs a clear theoretical restatement, going beyond the usual appeal to institutions, politics and history. But it also needs a persuasive empirical substantiation, capable of accounting in detail for the movement of inequality through time and in different national settings. Keynesians need to show that the personal distribution of income is linked to the flow of economic profits as a share of national income, and therefore to the spending decisions of
capitalists and their macroeconomic ramifications. They need to show this, not only for the United States, but for a wide range of countries. The Keynesian theory of income distribution is not specific to the United States.

For this, we need more and better data, particularly a substantial expansion in the volume and improvement in the quality of measures of the movement of economic inequality through time, so that the relationship between such movements and measured macroeconomic phenomena can be tracked. A macroeconomic theory of distribution requires macroeconomic measures of distribution. Fortunately, this condition can be met. The requisite information is available on the historical record, for long timespans and in many countries, though their potential for this particular purpose has rarely been recognized and almost never exploited.

Toward a Macroeconomic Theory of Personal Income Distribution

Consider a simple setting: an economy with one production factor, labor, firms with identical rising marginal production costs, but distinct markets. One firm faces a competitive, perfectly-elastic demand curve, and therefore prices at marginal cost. Another faces a downward-sloping demand curve, and therefore sets output so that marginal revenue equals marginal cost, with a price taken from the corresponding point on the demand function -- as first stipulated by Joan Robinson. The second firm thus enjoys a degree of monopoly equal to the inverse of the elasticity of the demand function, per Abba Lerner, and a monopoly return per unit equal to the difference between price and marginal cost. However, since in this model there is no capital, there is no profit either, and the monopoly return must be distributed to the sole factor of
production, namely labor: it is a firm-specific labor rent. The distribution of income therefore
depends entirely on the relative degree of monopoly power.

This is the simple theory of personal income distribution that best corresponds to the Post
Keynesian view of pricing. Sraffa’s pricing scheme, though worked out for the competitive
setting, does not exclude monopoly power. Rather, it rules out the notion of a separate return to
capital, and therefore a coherent idea of profit as a factor return. Rent and quasi-rent, on the
other hand, remain viable. And there is no reason why certain classes of labor cannot earn
scarcity premia, just as much as can certain grades of land. The premium commanded by the
purveyor of a new machine, so often referred to as a return to capital or to technological
innovation, is simply the scarcity rent commanded by the labor that produced it. Remove the
patent protection or veil of secrecy surrounding the technique embodied in the machine, and the
return will collapse even though marginal productivity in a technical sense is unaffected.

Now, consider the effect of an equal proportionate upward shift in the demand function
facing the two firms. In the competitive case, prices (and wage rates, which by assumption make
up marginal cost) rise along the marginal cost function. But in the monopolistic case, the slope of
the marginal revenue function assures that the rise in price will not be to the full extent of the shift
in demand. Furthermore, since the wage rate in the monopolistic case already includes a
substantial element of quasi-rent, the proportionate shift in the wage must be lower, for the
identical shift in the demand function. For these reasons, an outward shift in demand will raise the
wage of the competitive sector relatively to that of the monopolistic sector, reducing the
difference between the two and therefore the degree of inequality in the system as a whole. An
inward shift will have the opposite effect.

From this simple argument two hypotheses emerge. First, because of rent-sharing, firms facing less elastic demand functions should pay higher wages than firms facing more elastic demand functions. Second, the degree of dispersion in the wage structure should vary with macroeconomic conditions: falling in booms and rising in slumps. In other words, most countries should be found on the downward-sloping portion of an inverted Kuznets U-curve, such that economic growth is equalizing and recession is not. These predictions differ from the neoclassical view, according to which monopoly rents flow to capitalists rather than to workers, and according to which there should be no connection between the microeconomically-determined interpersonal distribution of wages and the business cycle.

This is a good beginning, but it is not quite enough. One needs a rationale for the existence of monopoly power, of downward-sloping demand curves. This is to be found in the existence of machines, which are the embodiment of past labor frozen for current and future use. It is the machinery used in production, and nothing else, that permits one final product to be distinguished from another, which makes possible the differentiation of individual firm demand curves. Once title to machinery is vested in the capitalist, some of the monopoly rent (as well as the transferable title to the firm itself) may be paid to that person. But this does not undermine our conclusion, since the salary paid to an owner-executive is not distinguishable from employee wages in accounting terms. And a larger portion of the monopoly rent also flows downward, through the salary and wage structure, reaching managers and even production workers in the form of efficiency wages. Everyone connected with machinery enjoys some leverage as a result,
and a corresponding advantage over those not so connected.

Our two firms can be re-interpreted as representing two sectors in the economy. One of them works entirely with current labor, supplied competitively, and prices output at a conventional but small mark-up over a socially-determined minimum wage. We might call this the S-sector; it resembles the largest parts of the services sector in real life. The other sector -- we may call it the C-sector -- produces ordinary machinery and consumption goods from current labor and existing machines, which is to say from current labor plus a pot-pourri of embodied past labor over which the firm holds ownership rights. Since each such pot-pourri is in some respects unique, the essence of monopoly power is right there; it lies in the particularity of manufactured output and the corresponding differentiation of consumer demand.\textsuperscript{5}

The still-missing element is a central one in capitalist economic life, the defining characteristic of advanced industrial countries as opposed to developing ones. This is the creation and production of new products, machinery and means of production. This is, in large part, the function of a separate, specialized sector which we may call the K-sector: the producers of knowledge goods.

From the standpoint of distribution theory, the income of the K-sector corresponds to the Keynes-Kalecki-Kaldor flow of profits. It is determined by capitalists\textsuperscript{spending}. Since capitalists\textsuperscript{spending}.

\textsuperscript{5} There is, of course, a certain amount of monopoly rent in human talent, the A\textsuperscript{winner-take-all} phenomenon of sports stars and divas admirably dealt with by Cook and Frank. But in comparison with product differentiation this phenomenon is minor.
spend on investment goods, a swing in the flow of gross investment corresponds to a swing in the income of the K-sector. The Keynes-Kalecki (widow crisis) proposition that capitalist consumption -- expenditure on non-wage goods -- also enhances the flow of profits has its material counterpart in the observation that non-wage goods, or luxury consumption, are merely advanced-technology investment goods adapted for personal enjoyment. In a cyclical economy, the K-sector will be a strongly cyclical performer. The cycle itself is above all a cycle of capitalist spending.

Production in the K-sector is not based primarily on an accumulation of past labor inputs, organized as a specific stock of machines, but rather on the an accumulation of people and their skills. Like the C-sector the K-sector is monopolistic, but in an unstable way. Monopoly power in this sector is inherently transient, and depends on the fabrication of new markets and the extraction of maximal revenue from them while they last. The K-sector is Schumpeterian. It is the sphere of creative destruction, a winner-take-all proposition, a lottery, in which the game of competition is beat the competition with new products and better processes. Wages in the K-sector are necessarily high, both because the prizes are great, and because there is nothing to be gained from second-rate talent.

But on the other hand employment in the K-sector is radically dependent on the flow of investment demand. The K-sector is the central producer of new capital equipment. It therefore depends entirely for its prosperity on a high rate of acquisition of such equipment. Correspondingly, it also depends on a periodically high rate of destruction of old capital equipment. The K-sector therefore benefits, as the C-sector does not, from a strong cycle in investment spending, both from the downturn that wipes out the old and obsolescent, and again
from the upturn when new plants and processes move into the vacuum left by the old.

In the advanced industrial countries a rise in business investment, such as occurs with the burst of growth at the start of expansion, increases employment among high wage groups, such as construction and technology workers, and especially among their non-production workers -- the designers, marketers, managers and so on. At first, high rates of growth will increase both inequality and the average real wage on that account. It is only as the expansion proceeds, as higher incomes are paid to production workers and as demand shifts to consumer products and services, that the normal income-compressing effects of prosperity will be felt. In short: 

*investment demand is unequalizing, while consumption demand is equalizing.*

Extension to the foreign sector is simple. In an advanced economy, such as the United States, K-sector goods dominate exports and C-sector goods dominate the competition with imports. Since the K-sector is hyper-monopolistic, it has few developing-country competitors. Changes in the (North-South) exchange rate do not greatly affect it. But such changes do undercut the relative wage position of C-sector workers by adjusting, in effect, the relative wages of their direct competition. Since K-sector workers sit at the top of the wage structure, currency appreciations therefore tend to increase inequality in advanced countries, and currency depreciations to decrease it. Also, export booms in an advanced country tend to raise inequality in the wage structure, as do the corresponding increases in imports. In countries lacking a K-sector, investment demand leaks to imports and economic growth is equalizing insofar as the domestic economy is concerned.
Thus we derive a macroeconomic theory of the evolution of the personal income distribution, according to which inequality varies with the movements of aggregate demand, differentiated by sector. In advanced countries, investment booms increase inequality, consumption booms decrease it, and the exchange rate alongside patterns of foreign demand govern the patterns of effect from the foreign sector.\textsuperscript{6}


To evaluate a macroeconomic theory of personal income distribution one needs dense time series information on the evolution of inequality in many countries. This requirement has been a major limitation. Very few nations have consistent annual household surveys from which inequality measures can be computed over long time horizons. The measures that do exist for the countries that have conducted such surveys tend to focus on income by family or household, measures which can be quite far removed from the structure of hourly wage rates by industry and occupation. Industrial data in household surveys can be sketchy and, in contrast to information on age or gender or ethnicity, such data are subject to high rates of error in reporting.

But there is an alternative approach to the measurement of the changing dispersion of hourly wage rates, particularly if one is principally interested in the manufacturing sector. This is the generalized entropy approach of Theil, based on information theory. Theil’s measure has the virtue that changes in inequality can be estimated from very crude data on wages or earnings and

\textsuperscript{6} To this, one might add a fourth source of differentiated aggregate demand, namely that from the military sector, whose effect will depend specifically on the composition of military spending. Typically, the military sector combines an emphasis on advanced technologies with high wage rates among production workers.
employment grouped by industrial sector. Industrial data sets, organized into standard
classification schemes are available on a consistent annual basis for most countries in the world.
They provide a rich and so far largely unexplored source of data from which estimates of the
movement of industrial wage inequality through time can be computed.

Our empirical work in this area (see references) suggests that in virtually every
industrializing country there is a negative association between growth and inequality. Rapid
growth is equalizing; most countries are on the downward-sloping portion of the Kuznets inverted
U-curve. Among significant exceptions, we find the United States and the United Kingdom. In
these cases, we find a strong positive association between unemployment and inequality. But
after controlling for the effects of unemployment, inflation and the exchange rate (all of which
have signs predicted by the macroeconomic theory), growth per se increases inequality to modest
degree. This would appear to reflect the influence of the cycle of profit spending on employment
and incomes in the K-sector -- just as predicted.

Further research on the United States economy has decomposed the sources of between
group-variations in industrial performance, after establishing a strong relationship between the
performance of industries and their wage rates. The four major lineally independent components
of between-industry variations correspond well to the sectoral predictions. The most important is
the flux of investment spending, which differentiates the K- from the C-sectors. Second is the flux
of consumption spending, which operates mainly within the C-sector. Third are the fluctuations
of the exchange rate, and fourth are those of the military budget. In this way, a second type of
analysis tends to confirm that the major components of flux in the industrial structure are linked in

Summary and conclusions

The Keynesians long ago challenged marginal productivity distribution theory. They have also presented the outlines of an alternative theory, whose major elements are the distribution of labor rents, affected by differing degrees of monopoly power, and the flow of profit spending and therefore of investment, which corresponds to the income of the sector producing investment- and especially technology-goods. But they did not succeed. What they lacked was a demonstration of the superiority of this theory as the foundation-stone for empirical research into the functional and personal distributions of income. In consequence, neoclassical theory has continued to shape the literature.

Today, advances in the measurement of the evolution of inequality, coupled with careful attention to issues of taxonomy in the industrial structure, permit one to demonstrate that in fact the major movements in the inequality of wage structures are traceable to macroeconomic events. They appear to correspond closely to the patterns of performance of the major Keynesian sectors: investment, consumption, foreign trade, and government spending as represented by that quintessentially governmental activity, the military. One may hope that the combination of theory and evidence can, perhaps, change some minds about which theory of income distribution is appropriate to the modern world. Perhaps this approach may enjoy more success than the purely logical critiques of thirty years ago.
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Original draft: June, 1998
This draft: November 28, 1998