Review of Income and Wealth
Series 40, Number 3, September 1994

GROWTH AND WELL-BEING: INTRODUCING DISTRIBUTION-WEIGHTED GROWTH RATES TO REEVALUATE U.S. POST-WAR ECONOMIC PERFORMANCE

BY STEPHAN KLASEN

Harvard University

In order to improve on the income growth rate as an indicator of changes in well-being, four composite indices of growth and income distribution are introduced and compared. When applied to the United States post-war economic performance, these indicators significantly revise upward the welfare improvements during the 1960s, while for the 1980s they show little expansion and, for some measures, even reductions of well-being. The revisions implied by these conceptually different measures are very similar indicating that the results presented are considerably robust.

1. INTRODUCTION

Economists widely agree that the standard growth rate is an incomplete measure of welfare. Apart from the problems of measurement, the welfare interpretation of changes in income is far from obvious. While many of these issues have no easy solution, there appears to be a possibility of improving upon one particularly problematic aspect of the income growth rate, which is its neglect of distributional issues.

In this paper I present four measures that explicitly incorporate a distributional component in the analysis of changes in well-being. Two of the measures I argue for, called equal weights and poverty weights indices were first introduced by Ahluwalia and Chenery (1974) in their work on redistribution and growth in developing nations. The present analysis, however, expands considerably on the justifications provided by the original authors and argues that these new measures could yield very useful results if applied to industrialized nations. Two other distribution-weighted measures, based on work by Sen (1976) and Dagum (1990), make use of the Gini-coefficient of income dispersion.

The advantage of these four distribution-weighted measures is that they more accurately reflect changes in welfare than the standard income growth rate and, at the same time, can easily be measured with data currently available in many countries.

These measures are then applied to the post-war economic experience of the U.S. to get a better understanding of improvements in welfare over the past four

Acknowledgements: I would like to thank Amartya Sen for invaluable comments and criticisms at various stages of this project. In addition, I want to thank Stephen Marglin, Boaz Moselle, Jack McNeil from the U.S. Census Bureau, Ben Polak, Juliet Schor, Jeffrey Williamson, members of the Political Economy Seminar at Harvard, and two anonymous referees for helpful comments and assistance. As usual, I take responsibility for all remaining errors.

decades.[1] Using U.S. Census Bureau data on family income before taxes (U.S. Census, 1988, 1992a), the new measures significantly revise downward the growth performance during the 1980s while showing that improvements in well-being in the 1960s were considerably larger than previously thought. When applied to recently published data by the Committee on Ways and Means (CWM, 1991a) and U.S. Census Bureau estimates of after-tax income (U.S. Census Bureau, 1992b), some of the distribution-weighted rates show negative welfare growth for the 1980s.

The revisions implied by the various measures are very similar so that the results presented are considerably robust to a variety of ways to conceptualize the role of income distribution in changes in well-being.

2. Income Growth, Income Distribution, and Well-Being

Changes in GNP over time can be interpreted as improvements in well-being of a society only in conjunction with a number of relatively stringent assumptions. One of the most problematic is the necessity to assume that either all consumers are identical and consuming the identical commodity bundle (Sen, 1984) or that the distribution of income is either optimal (Samuelson, 1947; Graaff, 1957; Sen, 1976) or constant (Sen, 1982).[2]

None of these three assumptions is particularly useful. The assumption of identical consumers abstracts from crucial welfare-relevant differences between people. Assuming optimal distribution in order to "keep the ethical worth of each person's marginal dollar equal" (Samuelson, quoted in Sen, 1984:426) appears to be a highly arbitrary and, as I will argue below, an empirically and ethically very dubious assumption. Assuming constant distribution is not very helpful either since the interest here is to assess changes in well-being in a country where income distribution changed considerably in the past four decades.

The only way out of these problematic distributional assumptions is to directly address income distribution rather than treating growth and distribution as essentially two separable issues (Graaff, 1957). Most theoretical and empirical considerations, to be discussed presently, would suggest that the inclusion of a distributional component that rewards shrinking and penalizes rising income inequality is an important element in any index of welfare changes over time.

From a utilitarian point of view, assuming concave individual welfare functions only dependent on individual income, a redistribution from rich to poor (without reversing their position) will increase the sum-total of utility in the society

[1]Contingent on the availability of the U.S. Census Bureau data on money income by quintiles, the starting-point of this analysis is 1947. For information regarding income distribution during earlier decades, see Goldin and Margo (1992) and Lindert and Williamson (1980).

[2]Other assumptions that are needed to establish a close link between income growth and welfare changes included exogenous and constant tastes, the disregard of savings and investments, some form of monotonicity with respect to preferences for income, and the neglect of public goods and externalities (Graaff, 1957; Hirsch, 1976; Tobin and Nordhaus, 1972; Sen, 1992; Fisher and Shell, 1972).

(Sen 1982, ch. 10).[3] The assumptions for this statement to hold do not appear to be particularly demanding. Concavity of individual welfare functions is tantamount to stating that individuals experience a declining marginal utility of income, a commonly used assumption (Krugman, 1990).[4]

Non-utility based welfare assessments would lead to a similar conclusion. For example, Sen argues that welfare assessments should be based on functionings (such as "being healthy and well-fed") and capabilities (such as the "ability to be healthy and well-fed") rather than incomes which are just a means to achieve some of these desirable functionings and capabilities (Sen, 1985, 1987, 1992).[5]

A population with a more equal distribution in income is, *ceteris paribus*, also very likely to have a higher sum-total of functionings and capabilities than a population with a large income inequality given that personal investments in health, nutrition, education, and other basic functionings have declining marginal returns (World Bank, 1993; Streeten, 1982; Stewart, 1985; Drèze and Sen, 1989).[6]

A third argument that would reward lower income inequality in a welfare assessment is based on Hirsch's work on the social limits to growth (Hirsch, 1976). Based on the claim that, particularly in advanced industrial economies, much effort and income is expended to acquire scarce positional goods whose welfare-value is dependent on the number and the social standing of other people aspiring to or holding this good, high income inequality increases the amount of resources diverted to investments in positional competition which have no effect on overall social welfare.[7] Moreover, high inequality in a population engaged in positional competition will increase the dissatisfaction and thereby directly reduce the well-being of those who are lower down the income ladder (Hirsch, 1976; Dagum, 1990).

These arguments have so far centered on the idea that lower income inequality would increase the sum-total of the maximands relevant for welfare considerations, be they utilities, functionings, or other indicators of well-being. A second group of arguments for an inclusion of income distribution in welfare assessments centers around notions of equity and distributional justice.

[3]This is equivalent to a version of Dalton's principle of transfers (Jorgenson, 1990; Dagum, 1990). For such a judgement to be possible, cardinal unit-comparability or cardinal full comparability of individual utilities must be possible in order to avoid Arrowian impossibility results (Arrow, 1951; Sen, 1982). In addition, it must be assumed that there is an equal probability of all individual types to be in any position in the income distribution (i.e. barring that, for example, rich people are systematically more efficient in translating income into utility).

[4]For further discussion, see Friedman (1947), Sen (1982).

[5]For further discussion regarding the concept and measurement of functionings and capabilities, see UNDP (1991), Morris (1979), and Sen (1985, 1987, 1992).

[6]For example, the ability of rich people who already enjoy high life expectancy, good health, and high education to improve these functionings is extremely expensive (e.g. expensive cancer treatment, dietary and fitness programs) in comparison to poor people who could buy the same absolute achievements at much lower cost (e.g. basic vaccinations, adequate nutrition, primary schooling, etc.). Given that the differences in basic functionings and capabilities between rich and poor people are very large even in a country such as the U.S. (Otten *et al.* 1990; McCord and Freeman, 1990; Mare, 1990), a redistribution of income could have a substantial effect on the sum-total of functionings and capabilities.

[7]For example, if top jobs in business not only generate higher social standing but also much higher incomes, then more resources will be invested to gain access to these leadership jobs without their supply being increased by one bit (Hirsch, 1976). Thus higher income inequality will reduce the amount of funds available for goods that have direct well-being effects while in a situation with low inequality the misallocation of resources invested in positional competition is smaller.

TABLE 1

DISTRIBUTION OF MONEY INCOME IN THE UNITED STATES, 1990

Quintiles	1	2	3	4	5	Income-Weighted Growth Rate
Shares in Income	44.2	24.1	16.6	10.7	4.5	
Growth Scenario 1	5	5	0	0	0	3.4
Growth Scenario 2	0	0	5	5	5	1.6

Note: Shares in income taken from U.S. Census Bureau (1992a).

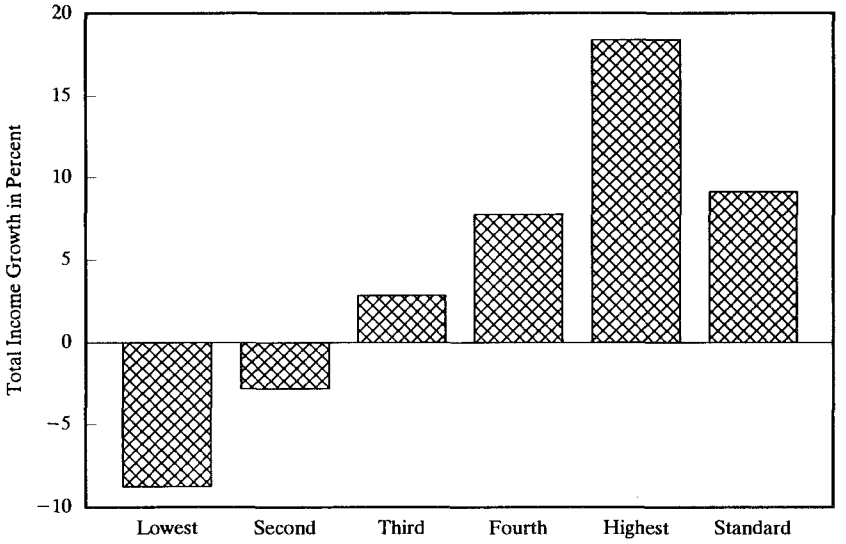
One equity argument calls for equal consideration of everyone's improvement in well-being in an overall welfare assessment. The standard income growth rate, however, focuses only on the overall dollar increment in income rather than improvements for any particular person. In fact, the growth rate weighs percentage changes in the incomes of the already wealthy much more heavily than changes in the incomes of the poor (Ahluwalia and Chenery, 1974; see also Sawers, 1988). The numerical example in Table 1, using the distribution of money income in the United States in 1990, illustrates the point.

In growth scenario 1 where only the top 40 percent benefitted and the rest stagnated, the overall income-weighted growth rate will be 3.4 percent, while in the reverse scenario 2 the overall growth rate will be less than half that, a mere 1.6 percent. In fact, the growth of the richest quintile is valued proportional to their share in income, in this case 9.8 times the growth of the poorest quintile.

High growth may mean nothing more than large improvements for the currently wealthy, with no charge or even deterioration for the poor. This is not just a theoretical possibility, but a reality in many countries. Chenery *et al.* show that the impressive income growth performance of many developing countries in the 1950s and 1960s did little to improve the lot of the poorest segments in many of those countries (Chenery *et al.*, 1974). Similarly, in the United States the income-weighted growth rate posted a 9.1 percent increase in real family money income between 1973 and 1989 while the poorest two quintiles of families suffered a 8.8 and 2.8 percent decline, respectively, over the same time period. The 9.1 percent increase in the income-weighted growth rate thus masks a deterioration for the bottom two quintiles and is mainly based on the 17.3 percent gain made by the richest quintile (U.S. Census Bureau, 1992a, see Figure 1).

Other equity arguments include Sen's call for "basic capability equality" to ensure that all citizens are entitled to a certain minimum set of capabilties (Sen, 1982) as well as Rawls' demand for the preferential treatment of the least advantaged in society (Rawls, 1971). Translating these arguments from the spaces of capabilities (Sen) and primary goods (Rawls) into the space of incomes would clearly amount to a call for low income inequality on equity grounds.[8]

[8]It is important to point out that the proponents of these equity arguments, if translated into the space of incomes, are not only interested in raising the absolute income levels of the most disadvantaged, but also the relative standing of these individuals in society since both "primary goods" as well as capabilities may be socially determined (Sen, 1984). In order to track improvement towards meeting these concerns, the overall shape of the income distribution will have to be considered in any welfare assessment. Three of the four measures to be introduced later exhibit this feature.



Source: U.S. Census Bureau (1992*a*).

Figure 1. The Bias in the Income-Weighted Growth Rate: Income Growth by Quintiles and Income-Weighted (Standard) Growth Rate 1974–89

Taken together, these arguments all point to an inclusion of a distributional measure in the standard income growth rate to better track changes in welfare over time. Moreover, such a measure clearly should penalize rising and reward falling inequality.

3. Growth and Distribution: Timing and Trade-off Issues

Before the measures are introduced, two important objections to the inclusion of a distribution element in the growth rate need to be addressed.

One objection is that, while intertwined at the welfare-theoretic level, income growth and income distribution should be treated separately from a policy point of view. In particular, the best economic policy should attempt to maximize growth regardless of distribution in order to increase the overall pie as much as possible and then address distributional issues separately.

While this separation is appealing in theory, it is not a realistic policy stance. In particular, significant redistributions of incomes or assets are unlikely without major social upheaval. Evidence of successful large-scale asset and income redistributions in this century support this claim. The biggest redistributions of assets happened during wartimes when assets were destroyed as in the case with Germany, Japan, and Korea (Mason *et al.*, 1989), when redistributions were imposed by occupying powers as in Taiwan, Korea, and Japan (Mason *et al.*, 1989; Fei *et al.*, 1979; Morishima 1982), or when assets were confiscated in a post-revolutionary shake-up as in China post-1949 (Perkins, 1984).

Ahluwalia and Chenery noticed the same problem in the context of developing countries:

> "As long as economists were willing to assume the possibility of unrestricted transfer among income groups, they found no conflict between the objectives of distribution and growth. Once it is recognized that large-scale transfers of income are politically unlikely in developing countries, however, it becomes necessary to evaluate the results of any development policy in terms of the benefits it produces for different socioeconomic groups." (Ahluwalia and Chenery, 1974:39).

Their argument clearly applies to industrialized countries as well. Redistribution of the gains from growth appears to be the only option to improve the welfare of lower income groups.

While "grow now, redistribute later" does not appear to be a viable option, the question arises as to whether redistribution now will reduce growth later. This is the second major objection to incorporating a distributional element in a welfare assessment. If that were the case, the "gains" from low inequality today would be paid for by losses of growth in the future so that redistribution only achieves short-lived welfare gains now and welfare losses later. Given the size of the literature on this topic, it is impossible to deal with this issue adequately, but a few comments are in order.

First, it is important to point out the theoretical reasons why one might believe that lower inequality might retard growth. Two distinct possibilities come to mind. One is that the mere *existence* of lower income inequality might lead to a slow-down in growth, primarily via a reduction in the domestic savings rate. The other possibility is that the *cause* of lower inequality, such as a redistributive policy by a government, reduces growth, mainly by reducing the labor supply. I will address the two issues in turn.

The crucial question for addressing the first issue is whether rich people have a higher marginal propensity to save than poor people. For proponents of a life-cycle or permanent-income hypothesis, there is no *a priori* reason to believe that this is the case. Only when such a model is combined with a pay-as-you-go social security system that has an income cut-off above which no social security payroll tax must be paid (as existing in the U.S. and some other industrialized nations), can it predict that rich people, in order to augment their social security checks, engage in higher levels of private savings to smooth their life-time consumption stream (Feldstein, 1974). Most Keynesian and Marxian models also assume that rich people have higher savings rates (Marglin, 1984).

As far as the link between savings and income growth is concerned, neo-classical growth models predict that a higher savings rate leads to higher growth in the short-run after which growth reaches a new steady-state growth rate which is unrelated to the savings rate (Blanchard and Fischer, 1989). In addition, some Keynesian and Marxian models predict a positive link between the savings rate and growth (Marglin, 1984).

Empirically, it appears to be the case that personal savings rates among rich people are higher than among poor people in the same country (Poterba, forthcoming). There is, however, no discernible link between income distribution

and savings in a cross-country comparison of savings behavior (Poterba, forthcoming). The U.S. which has the highest inequality in the industrialized world, also has by far the lowest private savings rate (Smeeding *et al.*, 1990; Carroll and Summers, 1987). Nor do time-series data suggest that there is a quantitatively important link between savings and income distribution. The experience of the U.S. in the 1980s where a falling private savings rate accompanied rising inequality suggests that other factors that depressed national savings easily dwarfed the expected boost on savings due to higher inequality (Carroll and Summers, 1987; Attanasio, forthcoming).

Turning to the second possibility, the process or policy that leads to reduced inequality may also influence future growth rates. In fact, some causes of reduced inequality can actually increase growth. In particular, increases in the educational achievements of the population can lower inequality and increase the growth performance at the same time. The low inequality and high growth rates of Japan and the Newly Industrializing Countries (NIC) have been partially attributed to large state investments in mass education (Mason *et al.*, 1989; Morishima, 1982; Fei *et al.*, 1979). Similarly, the rise in the quantity and quality of mass education in the U.S. has contributed to higher growth and lower inequality, particularly in the 1960s and 1970s (Denison, 1985; Freeman, 1976).

Another potential cause for reduced income inequality may be asset redistributions. Asset redistributions fall into the category of lump-sum transfers which are held to have no effect on labor supply or productive incentives and should thus have no impact on economic growth.[9] In fact, the record growth rates of East Asian economies which followed massive asset redistributions in the form of war-time destruction and land reforms points to the possibility that asset redistributions might actually spur economic growth (Morishima, 1982; Mason *et al.*, 1989; Fei *et al.*, 1979).

Finally, marginal taxation, both at the personal as well as at the corporate level, might be the cause for reduced inequality. Economic theory would suggest that this would reduce labor supply and investment, thereby reducing output growth. The experience of the U.S. in the 1980s, where marginal taxes were reduced considerably provides, once again, an interesting test case. The evidence suggests that labor supply effects of the large changes in income taxation were small and mainly due to different reasons and that investment and private savings continued to fall in spite of improved incentives (Bosworth and Burtless, 1992).

Looking directly at the empirical link between growth and inequality does not yield any firm conclusions either. High growth has been achieved by countries with high income inequality (such as Brazil in the 1950s and 1960s), low income inequality (such as South Korea), and high marginal income taxation (such as Sweden) so that most economists who have investigated the link have been unable to locate statistically significant relations between growth and redistribution (Drèze and Sen, 1989; Streeten *et al.*, 1981; Stewart, 1985; Chenery *et al.*, 1974; Williamson, 1991). Thus it appears that there is little direct relation between income inequality and future growth so that this objection to a distributional

[9]This may not be the case if repeated asset transfers change expectations concerning the security and value of property rights.

element in a welfare assessment does not appear to be of overwhelming importance.

4. Four Measures of Distribution-Weighted Growth

There are a number of ways to incorporate a distributional element in a welfare assessment in income changes.[10] I will focus on four indicators that combine income growth and income distribution. The first, proposed by Ahluwalia and Chenery, is the equal weights index (Ahluwalia and Chenery, 1974). Instead of assuming that a *one dollar* increase in income carries the same weight regardless of its recipient, a *one percent* increase in income will be weighed the same for all people. Consequently, a dollar increase in income for the poorest will be valued much more than a dollar increase to the richest.

The equal-weights growth rate (EW) is calculated as follows:

$$\mathrm{EW} = \sum_{i=1}^{n} w g_i$$

where $w = 1/n$. w: welfare weight of a person (or quintile)[11]; n: number of people (or quintiles); g_i: percentage income growth of the i-th person (or quintile).

This way each individual's percentage improvements in well-being has an equal part in the evaluation of growth. Chenery *et al.* refer to this as the "one man-one vote" principle (Chenery *et al.*, 1974: XVI).

While this rate is mainly based on the equal treatment argument presented in Section 2, it is also well-suited to accommodate the efficiency arguments. In a utilitarian framework, this equal-weights rate is equivalent to assuming that individual welfare is a function of the log individual income (i.e. a concave function of individual income) and exhibits the commonly used Constant Relative Risk Aversion properties.[12]

Given that it weighs the dollar increases in income of poorer people more than those of richer people, it also accommodates the other efficiency arguments advanced by Sen and Hirsch. At the same time, this measure implies that individuals only care about their own absolute level of income rather than the shape of the income distribution as such. Moreover, if one is particularly concerned with Rawls' or Sen's equity arguments, equal treatment of percentage increases may not be the preferred indicator.

Instead, one may wish to give more than equal weight to the most disadvantaged or incorporate the overall shape of the income distribution more forcefully in a welfare assessment. The poverty weights (PW) growth rate does precisely that by weighing the percentage increase in income of the poorest more heavily than the percentage increase to the richest. The PW index is calculated as follows:

$$\mathrm{PW} = \sum_{i=1}^{n} w_i g_i$$

[10]For a different approach, see Jorgenson (1990), Jorgenson and Slesnick (1990), and Fisher (1987).

[11]Ideally, one would take the average of percentage increases for all persons, but due to data availability, the empirical analysis in this paper will be restricted to quintiles.

[12]See also Ahluwalia and Chenery for ways to derive the equal and poverty weights indices from specific utility functions.

where

$$\sum_{i=1}^{n} w_i = 1.$$

Here, w_i also refers to the welfare weight of a person or quintile which, in this case, is a declining function of the rank in the income distribution.[13]

This rate is particularly suited for Sen's and Rawls' equity arguments. Rawls' notion of justice interpreted in the space of incomes would assign all weight to the lowest income group (as a proxy for the least favored in society).[14]

The two remaining indices make use of the Gini coefficient. The first measure is derived from Sen (1976) and will henceforth be referred to as Gini 1. Sen derives this index by replacing the dubious optimal distribution assumption mentioned earlier with an axiom he called "rank-order weighting" where the weight of an individual's income in a social welfare assessment is proportional to the rank of that individual in the income distribution (Sen, 1976).[15]

Given this assumption, the Gini 1 growth index is calculated as follows:

$$\text{Gini 1} = \frac{\mu_{t+1}(1 - G_{t+1})}{\mu_t(1 - G_t)}$$

μ_t: mean income at time t; G_t: Gini coefficient at time t.

Dagum (1990) derives the identical index from an interpersonal utility function. In addition, he derives a second index, which I call Gini 2, from a function where the utility of a person depends not only on her own income and the overall shape of the income distribution (as in Gini 1), but additionally on the number and the incomes of people ahead of her in the income distribution. This measure, which he claims to be supported by psychological and sociological literature, appears to be particularly suited to Hirsch's analysis where the number of people

[13]In the empirical section, I will use quintiles instead of persons. A particular problem with both measures is that they disregard the income distribution *within* the various quintiles and, due to this aggregation, the percentage increase of income of the richest person within a given quintile carries more weight than the percentage increase of the poorest in that quintile. Moreover, the richest person in the poorest quintile carries more weight in the welfare weights rate than the poorest person in the next quintile although their incomes may not differ by much. Further disaggregation into deciles or percentiles (for which there is currently no data for the U.S.) combined with smoother weights could diminish these two shortcomings.

[14]The problem with such extreme weighting is that one could achieve large welfare gains by just taking away money from the rich and giving it to the poor even if the economy did not grow at all (although if this were to retard income growth, the poorest segments would be penalized eventually). Thus a static redistribution would look just as good or even better than a dynamic poverty-oriented distribution of the gains from growth. This could lead one to treat distribution as a static zero-sum game rather than a dynamic process where everyone gains and the poorest gain more.

In the empirical section of this paper, I use a more moderate and gradual weighting for the five quintiles (w_1 (lowest) $= 0.4$, $w_2 = 0.3$, $w_3 = 0.2$, $w_4 = 0.075$, w_5(highest) $= 0.025$). This reflects the notion that the growth rate of the poorest matters most, but not exclusively. This is to ensure that the welfare measure shows high rates only for poverty-oriented distribution of growth rather than for static redistribution of income.

Since these weights are assumed to be fixed regardless of the actual levels of incomes for the various quintiles, this measure is also particularly suited to analyze relative deficiency in capabilities and primary goods.

[15]Additional assumptions are that market prices reflect true scarcities ("efficient exchange") and that price structure and preferences do not change over time. Moreover, Sen's ordinal index is interpreted here in a cardinal fashion (see Sen, 1976).

ahead of an individual in the income distribution detract from one's own well-being.

It is calculated as follows:

$$\text{Gini } 2 = \frac{\mu_{t+1}(1 - G_{t+1})/(1 + G_{t+1})}{\mu_t(1 - G_t)/(1 + G_t)}$$

It may be useful at this stage to point out the major differences among these four measures. A major difference between the equal and poverty weights measures on the one hand and the Gini measures on the other is that the weighting in the former is based on people's actual incomes while the latter weight individual incomes by their rank in the income distribution, i.e. making the weights equidistant regardless of the distance in income between two adjacent people in the income rank scale (see Sen, 1976).

As mentioned earlier, the equal weights measure is based on an individualistic view of individual welfare, while the two Gini measures incorporate the income distribution as a whole into a welfare assessment. The poverty weights index is an intermediate case since it can be derived from an individual utility function only dependent on one's own income, while at the same time, the social welfare contribution of an individual's income growth depends on their rank in the income distribution.

Finally, it may be useful to see how the four measures react to a change in income of one person with everybody else's income held constant. It is clear that it will increase welfare as measured by the equal and poverty weights rates. It is different with the Gini measures. If the increment of income accrues to the richest person, Dagum has shown examples where Gini 1 shows no change and Gini 2 shows a decline (Dagum, 1990).[16]

What appears to be clear, however, is that all four measures are to be preferred to the standard income-weighted growth rate since the combination of income growth and changes in the income distribution give a better approximation of changes in well-being. Moreover, a comparison between these measures and the standard growth rate will enable one to make statements about changes in the income distribution and the beneficiaries of economic growth.

Before proceeding to a recalculation, it may be useful to address the issue of the "arbitrariness" of these measures. For example, the equal weights index arbitrarily assumes that percentage increases in income are worth the same to all people. Similarly, the other three measures also assign "arbitrary" importance to income distribution in welfare-assessments. Thus one may prefer the income-weighted growth measure as a more "value-neutral" indicator.

On the other hand, the income-weighted growth rate is not a "value-neutral" indicator itself. When used in welfare assessments it relies on the arbitrary and very dubious assumptions of identical people, optimal or constant distribution.

[16]This is not equivalent to stating that the population and welfare weights measures obey the Pareto Principle while the Gini measures do not. For the Pareto Principle to apply, the change in income by one person must be accompanied by no change in anyone else's position. If however everyone's evaluation of two states depends on the shape of the income distribution and the shape of the distribution is altered by changing one person's income, as it does with the two Gini measures, the *ceteris paribus condition* for the Pareto Principle does not apply.

Clearly, the case for the alternative measures is not based on the certainty of the particular weights attached to distributional concerns but the claim that an incorporation of distributional concerns may approximate changes in welfare better than a total neglect of them.

5. Data

For most of the analysis, I will rely on Current Population Reports provided by the U.S. Census Bureau (U.S. Census Bureau, 1988, 1992a). The income data refer to money income for families which includes all forms of factor income (with the exception of capital gains) plus cash transfer payments from all levels of government.

There are a number of problems associated with these figures. First, there is a serious problem of underreporting. The U.S. Census Bureau estimates that the CPS data only reports about 57 percent of interest, dividend, and rental income, while 89 percent of wages and salaries are captured (U.S. Census Bureau, 1992a). Since higher income brackets rely much more on property and capital income than lower income brackets (Smeeding, 1990), underreporting of capital income leads to a serious underestimation of high incomes and thus a downward bias in the inequality estimates. These relationships also change over time. Cutler and Katz show that in the 1960s the ratio of labor income to capital income was rising while in the 1980s it was shrinking, further reducing income inequality in the 1960s and increasing it in the 1980s. (Cutler and Katz, 1991).

A second problem is the omission of capital gains in the money income data. Capital gains accrue predominantly to very high income brackets leading to a further downward bias in the inequality measure. Data from the Congressional Budget Office show that, in 1990, realized capital gains represented 6 percent of income for the top quintile, more than 17 percent for the top 1 percent, and less than 0.1 percent for the bottom two quintiles (CWM, 1993). Once again, this bias is likely to have increased in the 1980s when a long stock market, real estate and art market boom led to a surge in a capital gains.

An opposite problem is the omission of near-cash and non-cash transfer payments such as food stamps, reduced-price school lunches, Medicaid, Medicare, housing vouchers and the like. This could underestimate the consumption of poorer households since they are the main recipients of such transfers. Cutler and Katz show that this omission indeed leads to an overestimate of inequality, but they also claim that in the past 30 years, there has been no significiant change in the relation between Census-defined income and consumption, so that this shortcoming does not affect changes in inequality, which is the focus of this study (Cutler and Katz 1991).[17]

Finally, some of the changes in inequality reported in the CPS data may be due to changing family compositions. Since families are treated as one unit regardless of size, it may be the case that family size varies between income quintiles. In order to examine this issue, Cutler and Katz change the income definition to

[17]The third data set, discussed below, specifically includes the effects of non-cash and near-cash benefits in an assessment of changes in well-being in the 1980s and finds that it does not significantly alter the results.

account for family size. The resulting distribution of income among "equivalent persons" is virtually identical to the income distribution of families indicating that family size and changing family composition has had a negligible effect on inequality measures (Cutler and Katz, 1991).

The last problem associated with the money income definition is the omission of taxes and general government expenditure. The second data set to be introduced presently will allow an evaluation of the impact of federal taxation.

The second set of data used is drawn from a study by the Congressional Budget office (CBO) which covers five benchmark years between 1977 to 1989. The data are partially based on the same U.S. Census Bureau studies, but are adjusted by numbers from the annual sample of tax returns called the Statistics of Income (CWM, 1991b). The tax return data give a better indication of developments of incomes of the rich since it avoids the problem of underreporting of capital income and it includes realized capital gains, thereby addressing two of the major shortcomings of the pure Census Bureau data.

A second advantage of that data set is that it includes calculations of income after federal (income, corporate, and payroll) taxes. It thus gives a better impression of the actual disposable income available to households which is neglected in the U.S. Census Bureau statistics since all taxes are excluded from the analysis.

A drawback of the CBO data is that the mixing of two sets of conceptually different data sets (household surveys and tax returns) may generate biases which are hard to quantify. Moreover, tax return data may understate the income of the rich as well given the incentive to evade taxes and hide incomes. Such distortions are unlikely to remain constant over time since they depend on current tax legislation.

The third data set also measures pre- and post-tax income in the 1980s. It is based on simulations done by the U.S. Census Bureau to account for all income sources and taxes. A particular advantage of this data set is that in addition to simulating the effect of all forms of direct taxation it also imputes a value for non-cash benefits such as food stamps, housing subsidies, Medicare, and Medicaid, thereby addressing one major shortcoming of the income definitions discussed above.

Unfortunately, the report only contains data for all households which include families but also unrelated individuals so that the results are not entirely comparable to the results from the other two data sets.[18] However, since all three sources

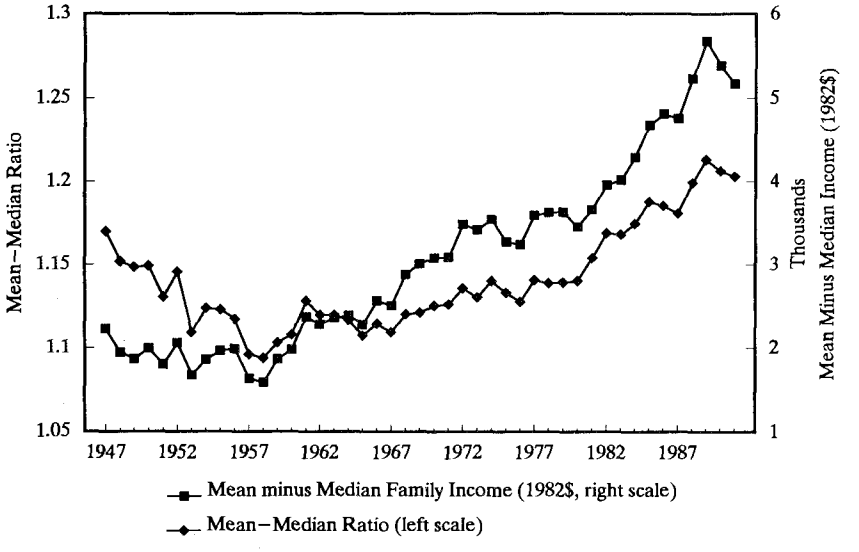
[18]There are a number of definitional differences in pre- and aftertax income between the CBO and the U.S. Census Bureau data set. Pre-tax income using CBO data includes money income, realized capital gains and employer contribution to social insurance and federal corporate profit taxes, while the U.S. Census Bureau definition used here (definition 4 in U.S. Census Bureau, 1992b) includes money income minus cash government transfers, plus capital gains plus health insurance supplements to wage and salary income. Aftertax income using CBO data subtracts only federal taxes, assuming that individual income taxes fall entirely on those who paid it with no shifting among families. Payroll taxes are assumed to be shifted to labor income, excise taxes to consumers, and corporate income taxes to fall equally on capital and labor income (CWM, 1991a; see also Reynolds and Smolensky, 1977; Pechman, 1986). Aftertax income using the U.S. Census Bureau definition adjusts for federal and state income taxes, all federal and state transfers including non-cash benefits such as the "fungible" value of Medicaid, Medicare, the value of school lunches, and an imputed return on equity in own home. For more details, see U.S. Census Bureau (1992b) and CWM (1991b, 1993).

of data indicate similar changes in the income distribution, the main conclusions presented in this paper are largely unaffected by the choice of data.

6. Growth and Inequality in the Post-War U.S.

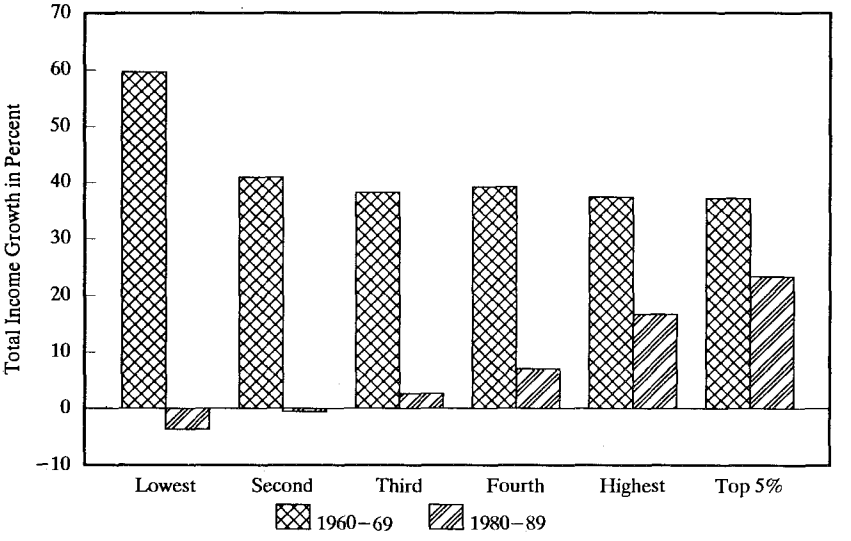
That growth has not been balanced in the past 40 years can already be seen from a comparison of much cruder statistics, mean and median family income. If the gap between mean and median income is rising quickly, this indicates a widening gap between upper income strata and the average citizen (the mean is sensitive to outliners, the median is not). While in the 1950s and 1960s the absolute gap between mean and median income did not change much, the gap rose dramatically in the 1980s. In fact, while mean income increased by 16.7 percent between 1980 and 1989, median income rose by a mere 9.7 percent (see Figure 2). Not only did the absolute gap increase, but the relative gap, i.e. the mean–median ratio, also increased drastically in the 1980s reaching new post-war highs (Figure 2).

Examining the income development of the various quintiles confirms these trends. In the 1960s, big strides were made to reduce income inequality. The incomes of the lowest quintile rose by 60 percent between 1960 and 1969, while the incomes of the richer quintiles rose "only" by about 37 to 40 percent each. In the 1980s, the trend is reversed. Between 1980 and 1989, the real income of the poorest quintile dropped by nearly 4 percent, the middle quintiles' income virtually stagnated, while the richest 5 percent gained about 23 percent (see Figure 3).



Source: U.S. Census Bureau (1992).

Figure 2. Mean-Median Income Gap: Difference and Ratio, 1947-91



Source: U.S. Census Bureau (1992*a*).

Figure 3. Real Family Income Growth by Quintiles: 1960s versus 1980s

Thus in the 1960s, there was high growth and reduced inequality, while in the 1980s there was only moderate growth and sharply rising inequality so that only a fraction of the population benefitted from the much-praised longest growth boom in post-war history.

The calculations of the new growth rates are shown in Table 3. They are based on the level of real family income by quintile reported in Table 2.[19]

A comparison of the four new measures shows that the poverty weights measure is more volatile than the equal weights index suggesting that the income of the poorest undergoes more drastic swings than those of other income groups. The Gini 1 rate is only slightly different from the equal weights index, while Gini 2 appears to hover mostly between the equal and poverty weights rates. However, all four measures which are based on conceptually different ways to incorporate income distribution in welfare assessments closely track each other so that the results to be shown presently are not dependent on a particular index.

A comparison between the standard (income-weighted) and the four distribution-weighted rates shows that the relation between income growth and income distribution changed considerably throughout the post-war period.[20] Between

[19]To convert current income into constant income, the CPI-U index was used up until 1983, after which the U.S. Census Bureau switched to the CPI-Ux1 index. The choice of index does not alter the results by much with the exception of the late 1970s, where the use of the CPI-Ux1 index shows considerably smaller income contractions in 1979 and 1980. For a discussion regarding these two indices, see Pollin and Stone (1991) and U.S. Census Bureau (1992a).

[20]Of particular interest may be that during recessions, the distribution-weighted growth rates decline much more than the income-weighted rate indicating that the poor are generally hurt more by economic downturns. In recoveries, the reverse generally holds with the important exception of the 1980s, where during the 1983–89 recovery the distribution-weighted rates show smaller growth than the income-weighted rate each year.

TABLE 2

MEAN FAMILY INCOME BY QUINTILES IN CONSTANT 1982 DOLLARS

	Lowest	Second	Third	Fourth	Highest	Top 5%
1947	3,838	9,134	13,048	17,730	33,004	53,727
1948	3,612	8,919	12,753	17,102	31,255	50,421
1949	3,251	8,597	12,499	16,978	30,849	48,839
1950	3,447	9,193	13,330	17,926	32,711	53,012
1951	3,898	9,666	13,720	18,242	32,429	52,386
1952	3,971	9,967	14,100	18,963	33,954	56,401
1953	3,992	10,618	15,290	20,302	34,743	53,346
1954	3,791	10,194	14,911	20,134	35,214	54,927
1955	4,299	11,017	15,943	21,227	36,991	58,756
1956	4,735	11,837	16,951	22,444	38,826	60,986
1957	4,753	11,837	16,870	22,182	37,654	58,158
1958	4,638	11,594	16,695	22,167	37,657	57,134
1959	4,880	12,251	17,828	23,705	40,936	63,346
1960	4,868	12,373	18,052	24,340	41,885	64,501
1961	4,905	12,420	18,265	24,840	44,045	69,302
1962	5,327	12,892	18,753	25,572	44,005	66,913
1963	5,519	13,356	19,537	26,491	45,476	69,759
1964	5,828	13,712	20,225	27,424	47,078	72,674
1965	6,126	14,371	20,968	28,154	48,179	73,035
1966	6,996	15,491	22,237	29,732	50,595	77,954
1967	6,995	15,771	22,766	30,397	51,382	77,327
1968	7,521	16,654	23,772	31,830	54,394	83,807
1969	7,794	17,257	24,633	32,984	56,225	86,843
1970	7,459	16,852	24,312	32,876	56,083	86,196
1971	7,584	16,547	24,269	32,819	56,398	86,597
1972	7,872	17,348	25,512	34,843	59,918	92,719
1973	8,144	17,620	25,911	35,536	60,855	91,800
1974	7,917	17,273	25,190	34,546	59,017	89,245
1975	7,522	16,438	24,517	33,572	57,253	86,367
1976	7,720	16,870	25,162	34,455	58,759	89,211
1977	7,562	16,868	25,447	35,190	60,347	91,320
1978	7,727	17,238	26,005	35,813	61,967	92,728
1979	7,716	17,212	25,966	35,759	61,725	93,775
1980	7,159	16,282	24,564	34,108	58,812	85,902
1981	6,857	15,497	23,863	33,463	58,561	84,481
1982	6,437	15,339	23,419	33,280	58,617	87,651
1983	6,563	15,499	23,877	33,931	59,902	88,806
1984	6,782	15,872	24,530	35,208	61,758	92,348
1985	6,802	16,117	24,989	35,783	64,321	98,773
1986	7,071	16,601	25,824	36,892	67,173	104,526
1987	7,146	16,777	26,098	37,283	68,041	106,877
1988	7,245	16,852	26,302	37,799	69,298	108,356
1989	7,431	17,123	26,653	38,284	72,044	115,658
1990	7,244	17,008	26,142	37,481	69,765	109,609
1991	6,894	16,392	25,431	36,920	67,713	104,787

Source: U.S. Census Bureau (1992a).

1947 and 1960, there is no clear trend in the relation between the three measures, indicating that growth was, in general, altering inequality by very little. This changes dramatically in the 1960s. Between 1961 and 1969, the poverty weights index exceeds the income measure six times; in 1962 and 1966 the excess of the poverty weights rate is 3.2 and 3.7 percent, respectively, indicating that income growth was combined with significant redistribution in favor of the poor. Both Gini measures show similar trends as the equal and poverty weights measures.

TABLE 3

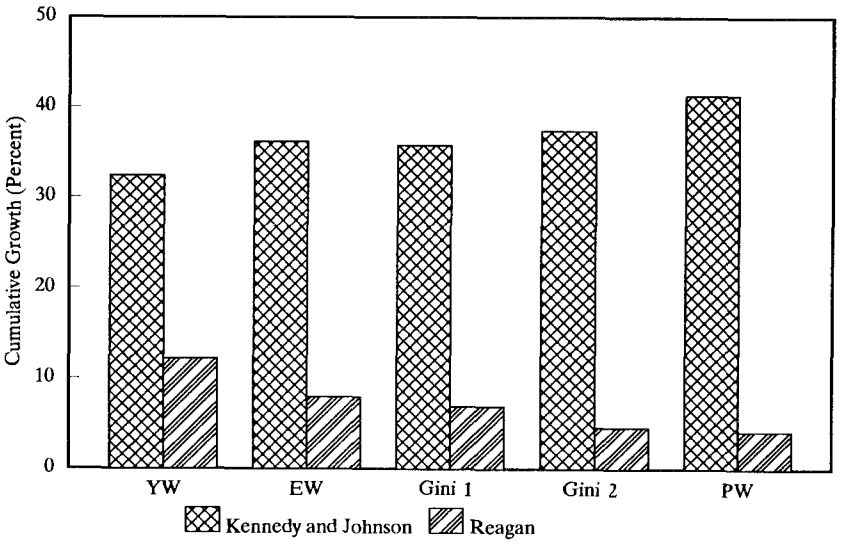
INCOME AND DISTRIBUTION-WEIGHTED GROWTH RATES
(in percents)

	Income Weights	Equal Weights	Poverty Weights	Gini 1	Gini 2
1948	−4.0	−3.9	−3.9	−3.2	−2.8
1949	−2.0	−3.5	−5.6	−3.1	−3.6
1950	6.0	6.2	6.4	5.9	5.8
1951	1.8	4.4	7.5	4.4	5.6
1952	4.0	3.3	2.7	3.1	2.8
1953	4.8	5.0	4.5	6.3	7.0
1954	−0.8	−2.2	−3.7	−2.7	−3.5
1955	6.3	7.8	9.7	7.7	8.3
1956	5.7	6.9	8.1	6.6	7.0
1957	−1.6	−0.9	−0.1	−0.5	0.0
1958	−0.5	−1.1	−1.8	−0.9	−1.2
1959	7.4	6.7	5.9	6.2	5.7
1960	1.8	1.4	0.7	1.3	1.1
1961	2.9	1.9	0.9	1.3	0.6
1962	2.1	3.6	5.3	4.0	5.0
1963	3.6	3.7	3.7	3.6	3.6
1964	3.5	3.8	4.1	3.7	3.8
1965	3.1	3.7	4.5	3.9	4.3
1966	6.1	7.7	9.8	7.2	7.8
1967	1.8	1.6	1.2	2.0	2.0
1968	5.6	5.6	6.1	5.6	5.6
1969	3.6	3.6	3.6	3.5	3.4
1970	−0.7	−1.7	−2.7	−1.5	−1.9
1971	−0.2	0.0	0.1	−0.5	−0.6
1972	5.7	5.2	4.6	5.2	5.0
1973	1.6	2.0	2.3	2.0	2.3
1974	−2.8	−2.7	−2.5	−2.6	−2.6
1975	−3.2	−3.7	−4.3	−3.5	−3.7
1976	2.6	2.6	2.6	2.5	2.4
1977	1.7	0.8	−0.4	0.9	0.5
1978	2.2	2.2	2.2	2.2	2.2
1979	−0.2	−0.2	−0.2	−0.5	−0.6
1980	−5.4	−5.5	−6.1	−5.4	−5.4
1981	−2.3	−2.8	−3.9	−2.9	−3.2
1982	−0.1	−1.9	−3.2	−1.9	−2.7
1983	2.0	1.8	1.7	1.6	1.5
1984	3.3	3.1	3.0	3.2	3.1
1985	2.5	1.9	1.2	1.5	1.0
1986	4.0	3.6	3.5	3.4	3.2
1987	1.1	1.1	1.1	0.9	0.8
1988	1.4	1.2	1.0	1.1	0.9
1989	2.6	2.2	2.0	1.5	1.1
1990	−2.5	−2.1	−1.8	−1.7	−1.3
1991	−2.7	−3.1	−3.8	−2.9	−3.0

Source: Calculations based on U.S. Census Bureau (1992a).

The 1970s do not show a strong trend as far as redistribution is concerned. If anything, it appears that the economic crises of the 1970s bore more heavily on the poorer income groups, with the poverty-weighted index being below the income measure in five out of nine years (see also Cutler and Katz, 1991).

In the 1980s, the trend is very clear again. Between 1980 and 1990, the income measure surpasses the equal weights and both Gini measures nine times, while



Source: Calculations based on Table 3.

Figure 4. Well-Being Growth, Kennedy–Johnson vs. Reagan: Cumulative Growth of Well-Being Indices 1961–68 vs. 1981–88

the reverse is true only once, in 1990. This confirms the analysis presented above that the gap between the rich and the rest widened tremendously in the 1980s.

Looking at the poverty weights measure reinforces this trend. Of particular significance is a comparison of the income-weighted and the poverty weights indices during the 1980–82 recession. While the income-weighted measure shows a cumulative loss of 7.8, the poverty weights measure shows a decline of 13.2 percent indicating a heavy redistributive impact of that recession.

Clearly, the use of distribution-weighted rates gives a very different impression of changes in well-being in the past 45 year. A comparison of well-being improvements during the Kennedy and Johnson administrations (1961–68) with improvements during Reagan's tenure (1981–88) highlight the results of this reassessment most dramatically (see Figure 4).

Under Kennedy and Johnson, the distribution-weighted rates outperform the already very high income-weighted rate (YW) by a total of 4–9 percent (depending on the index chosen) indicating that booming economic conditions as well as the War on Poverty were much more successful in raising the well-being of Americans than previously thought. In fact, the poverty weights rate indicates that well-being growth in those eight years was larger than in all other 34 years combined.

In contrast, during the Reagan years already modest increases in the income-weighted rate drastically overstate well-being improvements as measured by the disstribution-weighted rates, suggesting hardly any improvements in well-being throughout this period.

The contrast in well-being performance under these two administrations is startling (Figure 4). Even using income weights (YW), Kennedy/Johnson cumulatively outgrew Reagan by nearly 20 percent. In equal weights terms, well-being

TABLE 4

WELL-BEING GROWTH USING PRETAX FAMILY INCOME

	Income Weights	Equal Weights	Poverty Weights
1977–80	−1.6	−3.6	−5.3
1980–85	4.9	−0.8	−4.4
1985–88	6.0	2.6	1.0
1988–89	−0.8	0.3	0.9
1977–89	8.6	−1.6	−7.7
1980–89	10.3	2.1	−2.5

WELL-BEING GROWTH USING AFTERTAX FAMILY INCOME

	Income Weights	Equal Weights	Poverty Weights
1977–80	−2.2	−3.9	−5.0
1980–85	6.9	0.0	−5.0
1985–88	4.5	2.0	1.2
1988–89	−0.5	0.6	1.1
1977–89	8.8	−1.4	−7.7
1980–89	11.2	2.7	−2.8

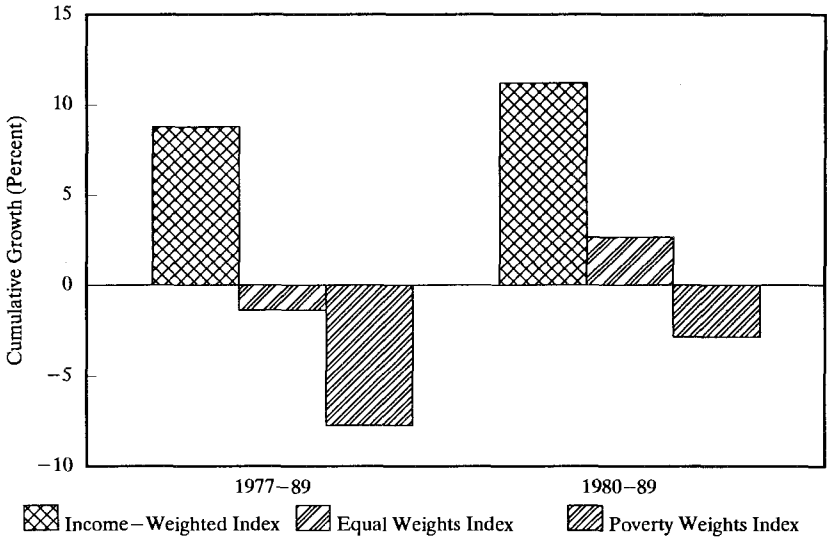
Source: Calculations based on CWM (1991a).

grew by 28 percent more, Gini 1 shows 29, Gini 2 32 percent larger improvements in the 1960s. In poverty weights terms, the difference is the highest, more than 37 percent.

The CBO shows an even more dramatic picture for the 1980s. Income before taxes is reported to have risen by about 10 percent from 1980 to 1989 using the income-weighted measure. When this increase in income is disaggregated, it becomes clear that improvements were concentrated among very few people. While the bottom three quintiles were actually worse off, the top quintile made income gains of 23 percent with the top one percent gaining an astounding 63 percent. The income increases for the top income brackets are higher than the ones based on the U.S. Census Beureau data since a major source of the increases in income in the 1980s, capital gains, is excluded from U.S. Census Bureau studies.

The equal weights rate reflects the fact that growth was highly iniquitous as it revises down improvements in well-being to a meager 2.1 percent, or less than 0.3 percent per year (Table 4). The poverty weights rate, which places more importance on the heavy income losses of the poorer quintiles, shows that well-being actually declined between 1980 and 1989.

These data still underestimate the actual deterioration in economic well-being of the country since 1980 was a recession year while 1989 was on the height of a recovery. To adjust for these cyclical effects, we may want to use 1977 as the benchmark and compare it to 1989 given that both years represent a similar stage in the business cycle. This comparison leads to 1.6 percent decline in the equal weights and a 7.7 percent decline in the poverty weights measure, indicating that welfare actually fell during the 1980s (see Figure 5).



Source: Calculations based on CWM (1991a).

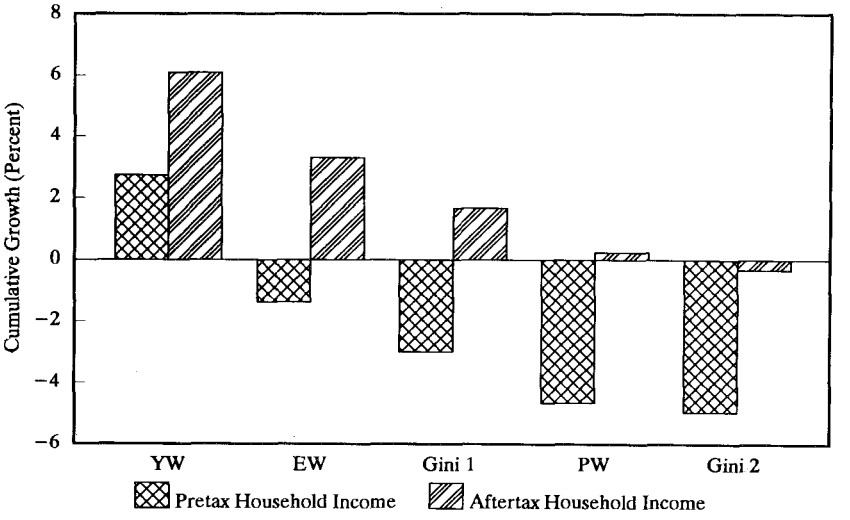
Figure 5. Welfare Growth in the 1980s: Income, Population and Welfare-Weighted Growth Rates of Pretax Income

This all refers to income before taxes. According to the CBO data, federal taxation slightly increased inequality, and thereby further reduced well-being growth in the 1980s. The federal effective tax rate for the top one percent declined from 31.7 to 26.7 percent while it rose for the poorest quintile from 8.1 to 9.3 percent. (CWM, 1991a). The bottom panel of Table 4 shows that changes in federal taxation did make a small but significant contribution to widening inequality in the 1980s. The difference between the income-weighted and the poverty weights rates is even bigger when applied to aftertax income, particularly between 1980 and 1989.[21]

The third data set, the U.S. Census Bureau study on pre- and aftertax income between 1979 and 1991 supports the findings above. Figure 6 shows the various indices applied to pretax and aftertax income from 1980 to 1991, two comparable recession years. For pretax income, a 2.7 percent increase in the income-weighted rate turns into a 1.4 percent decline in the equal weights index and a 5 percent decline using the Gini 2 measure. Aftertax income data show a slightly more favorable picture with a 6.1 percent rise using income weights and a 0.3 percent decline in Gini 2 terms.[22] Also this data set, which gives the most comprehensive

[21]Since the CBO data only commence in 1977, one may wonder that the impact of federal taxation was prior to that. Reynolds and Smolensky (1977) and Pechman (1986) present calculations showing that the redistributive impact of federal taxation changed very little from 1950 to the mid-70s, so that the U.S. Census Bureau data presented above give a relatively accurate picture of changes in disposable income during that time.

[22]The data on aftertax income should be treated with caution. They are based on simulations that make use of a number of debatable assumptions and, furthermore, are very volatile (U.S. Census Bureau, 1992b). It is important to note, however, that they do show rapidly rising inequality in the 1980s, even if all non-cash government transfers, all taxation and returns to home equity are included.



Source: U.S. Census Bureau (1992b).
Note: Pretax income refers to definition 4, aftertax income to definition 15 (U.S. Census Bureau 1992*b*).

Figure 6. Welfare Growth 1980–91: Income and Distribution-Weighted Indices Applied to Census Bureau Data

account of all cash and non-cash income sources, supports the impression that reliance on the standard income-weighted growth rate vastly overstates welfare improvements in the 1980s regardless of the income definition used.

Conclusion

Moving from income-weighted to distribution-weighted growth rates is an illuminating exercise for a number of reasons. First, it changes our view of post-war U.S. economic history. In the last few years, it has become fashionable to decry the failure of the welfare policies of the 1960s (Harrington, 1986; Hirschman, 1991). A reexamination of the record in light of the performance indicators presented here radically alters this assessment. Particularly, the new measures shed a much more favorable light on improvements in well-being during the 1960s, particularly compared to the 1980s. Using the poverty weights index, well-being improved at more than 10 times the rate under Kennedy/Johnson than under Reagan. Similarly, a reassessment of well-being growth during the 1980s changes drastically to the negative indicating that the country may actually be worse off at the end of the 1980s that it was in the 1970s.

Moreover, considering distribution-weighted growth rates may lead to a re-evaluation of economic policies. Since a description of economic performance often carries an implicit prescription, the move from the income-weighted to a distribution-weighted rate may alter economic policy priorities. In particular, the use of distribution-weighted indices would raise the appeal of policies aimed to increase the incomes of the poor since such policies would not merely represent good social policy but also yield higher overall welfare growth.

Finally, this exercise might demonstrate that small improvements towards a better understanding and measurement of well-being are possible, feasible, and relevant for policy. While this analysis does not contribute to a resolution of the complex issues surrounding welfare measurement, it may serve as an intermediary step between the focus on income growth and the ultimate question of welfare improvement.

BIBLIOGRAPHY

Ahluwalia, M. S. and Chenery, H., The Economic Framework, in Chenery, H. *et al.* (ed.), *Redistribution with Growth*, Oxford University Press, London, 1974.

Arrow, K. J., *Social Choice and Individual Values*, Wiley, New York, 1951.

Attanasio, O. P., Personal Saving in the US, in Poterba, J. M. (ed.), *International Comparison of Household Saving*, forthcoming.

Blanchard, O. J. and Fischer, S., *Lectures on Macroeconomics*, MIT Press, Cambridge, 1989.

Bosworth, B. and Burtless, G., Effects of Tax Reform on Labor Supply, Investment, and Saving, *Journal of Economic Perspectives*, 6, 3–25 1992.

Carroll, C. and Summers, L., Why is National Savings so Low? *Brookings Papers on Economic Activity*, 2, 607–35, 1987.

Chenery, H. *et al.*, *Redistriubution with Growth*, Oxford University Press, London, 1974.

Committee on Ways and Means (CWM), *Background Material on Family Income and Benefit Changes*, Government Printing Office, Washington DC, 1991a.

———, *1991 Green Book*, Government Printing Office, Washington DC, 1991b.

———, *1993 Green Book*, Government Printing Office, Washington DC, 1993.

Cutler, D. M. and Katz, L. F., Macroeconomic Performance and the Disadvantaged, *Brookings Papers on Economic Activity*, 6, 1–68, 1991.

Dagum, C., The Relationship between Income Inequality Measures and Social Welfare Functions, *Journal of Econometrics*, 43, 912–102, 1990.

Denison, E. F., *Trends in American Economic Growth 1929–82*, Brookings Institution, Washington DC, 1985.

Drèze, J. and Sen, A., *Hunger and Public Action*, Clarendon Press, Oxford, 1989.

Fei, J. C. *et al.*, *Growth and Equity: The Taiwanese Case*, Oxford University Press, London, 1979.

Feldstein, M. S., Social Security, Induced Retirements, and Aggregate Capital Formation, *Journal of Political Economy*, 82, 905–26, 1974.

Fisher, F. M., Household Equivalence Scales and Interpersonal Comparisons, *Review of Economics and Statistics*, 54, 519–24, 1987.

Freeman, R. B., *The Overeducated American*, Academic Press, New York, 1976.

Friedman, M., Lerner on the Economics of Control, *Journal Of Political Economy*, 55, 405–416, 1947.

Goldin, C. and Margo, R. A., The Great Compression: The Wage Structure in the United States at Mid-Century, *Quarterly Journal of Economics*, 107, 1–34.

Graaf, J. de V., *Theoretical Welfare Economics*, Cambridge University Press, London, 1957.

Harrington, M., *The Other America*, Macmillan, New York, 1962.

———, *The New American Poverty*, Macmillan, New York, 1984.

Hirsch, F., *The Social Limits to Growth*, Harvard University Press, Cambridge, 1976.

Hirschman, A. O., *The Rhetoric of Reaction*, Basic Books, New York, 1991.

Jorgenson, D. W., Aggregate Consumer Behavior and the Measurement of Social Welfare, *Econometrica*, 58, 1007–40, 1990.

Jorgenson D. W. and Daniel Slesnick, Inequality and the Standard of Living, *Journal of Econometrics*, 43, 103–20, 1990.

Krugman, P. R., *The Age of Diminished Expectations*, Washington Post Company, Washington DC, 1990.

Lindert, P. H. and Williamson, J. G., *American Inequality: A Macroeconomic History*, Academic Press, New York, 1980.

Mare, R., Socioeconomic Careers and Differential Mortality among Older Men in the United States, in D'Souza, S. *et al.* (eds.), *Measurement and Analysis of Mortality*, Clarendon Press, Oxford 1990.

McChord, C. and Freeman, H., Excess Mortality in Harlem, *New England Journal of Medicine*, 322, 173–77, 1990.

Marglin, S. A., *Growth, Distribution, and Prices*, Harvard University Press, Cambridge, 1984.
Mason, E. *et al.*, *The Economic and Social Modernization of the Republich of Korea*, Harvard University Press, Cambridge, 1989.
Morishima, M., *Why has Japan Succeeded?*, Cambridge University Press, Cambridge, 1982.
Morris, M. D., *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*, Pergamon, New York, 1979.
Nordhaus, W. D. and Tobin, J., Is Growth Obsolete? in *Economic Growth: Fiftieth Anniversary Colloquium V*, NBER, New York, 1972.
Osberg, L., *Economic Inequality in the United States*, Sharpe, New York, 1984.
Otten, M. *et al.*, The Effects of Known Risk Factors on the Excess Mortality of Black Adults in the United States, *Journal of the Americal Medical Association*, 263, No. 6, 845–50, 1990.
Pechman, J. A., *The Rich, the Poor, and the Taxes they Pay*, Harvester Press, Sussex, 1986.
Perkins, D. H., *Rural Development in China*, Harvard University Press, Cambridge, 1984.
Pollin, R. and Stone, M., The Illusion of an Improved CPI, Challenge 34, No. 1, 53–57, 1991.
Poterba, J. M. (ed.), *International Comparison of Household Saving*, forthcoming.
Rawls, J., *A Theory of Justice*, Harvard University Press, Cambridge 1971.
Reynolds, M. and Smolensky, E., *Public Expenditure, Taxes, and the Distribution of Income*, Academic Press, New York, 1977.
Samuelson, P. A., *Foundations of Economic Analysis*, Harvard University Press, Cambridge, 1947.
Sawers, L., Poverty Weighted Measures of Social Welfare Change, *World Development*, 16, No. 8, 899–901, 1988.
Sen, A. K., Real National Income, *Review of Economic Studies* 43, 19–36, 1976.
———, *Welfare, Choice, Measurement*, Basil Blackwell, Oxford, 1982.
———, *Resources, Values, and Development*, Harvard University Press, Cambridge, 1984.
———, *Commodities and Capabilities*, North-Holland, Amsterdam, 1985.
———, *The Standard of Living*, Cambrdige University Press, Cambridge, 1987.
———, *Inequality Reexamined*, Oxford University Press, New York, 1992.
Smeeding, T. M. *et al.*, Poverty, Inequality, and Income Distribution in Comparative Perspective, Harvester, New York, 1990.
Stewart, F., *Planning to Meet Basic Needs* Macmillan, London, 1985.
Streeten, P. *et al.*, *First Things First: Meeting Basic Needs in Developing Countries*, Oxford University Press, New York, 1982.
United Nations Development Program, *Human Development Report*, Oxford University Press, New York, 1991.
U.S. Census Bureau, Current Population Reports, Series P–60, No. 162, *Money Income of Households, Families, and Persons in the United States: 1987*, Government Printing Office, Washington DC, 1988.
———, No. 180, *Money Income of Households, Families, and Persons in the United States: 1991* Government Printing Office, Washington DC 1992a.
———, No. 182–RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1979 to 1991*, Government Printing Office, Washington DC 1992b.
Williamson, J. G., *Inequality, Poverty, and History*, Oxford University Press, New York, 1991.
World Bank, *World Development Report 1993*, Oxford University Press, New York, 1991.