

AN EXTENSIVE REVIEW OF EQUALITY AND THE DISTRIBUTION OF INCOME FOR THE SOCIAL ACTIVITIES

Mongsathoy Marma¹, Samsul Alam²

School of Economics, Jilin University, Changchun, China¹

Department of Sociology, University of Dhaka, Bangladesh²

ABSTRACT: *The three topics put together in the title of this paper are not appropriate and can be compared with elements of the classic Russian definition of Winston Churchill. Mystery, mystery in mystery. Make no mistake. This is a complex field. The purpose of this paper is to add some wrinkles to the Byzantine subject area. The ultimate goal is to introduce a new way to measure income distribution. An approach that can provide the basis for actually moving the public policy needle on the issue of income redistribution. The paper begins with a broad overview of "equality and income sharing" as the topic develops from the past. Plus year, the main measure of income distribution is used by economists to assess equality and social status, focusing on the Lorenz curve / Gini ratio analysis. Furthermore, the argument "income distribution and distribution" continues. This is a match for the previous discussion on equality, the preface to the topic "equity and income distribution", and this paper details a new approach to assessing the equity of income distribution. . This paper concludes with a series of policy implications on income redistribution, as implied by the measurement of income distribution described in the previous section of this paper.*

KEYWORDS: equality, equity, distribution of income, Lorenz curve.

INTRODUCTION

As one might expect among philosophers, especially those who consider themselves in egalitarians [1], equality is a thorny concept that has occupied the discipline since ancient times. Origins of the contemporary philosophical debate are often traced to Jean-Jacques Rousseau's essay *Discourse of the Origin of Inequality* published in 1754 [2]. Today, the debate continues unabated among philosophers whose discussion usually centers on the differences and similarities concerning two types of equality, deontic and telic [3], a distinction that the uninitiated may find difficult to grasp [4]. In economics, the difference between equality and inequality is more linear and usually focuses on how wealth or income or both are distributed. Economic concerns about equality/inequality predated modern economics which arguably began in the second half of the eighteenth century with the rise of Physiocracy in France and the publication of Adam Smith's *The Wealth of Nations* (1776). From 1645 to 1649, for example, the English Levellers, apolitical group who ,received their name as a term of disapprobation from their opponents who were often prone to accuse them of favoring the equalization of wealth,' espoused a number of 'radical' ideas including the levelling of men's estates [5]. In America, interest in the distribution of wealth has been on-going for over a hundred years as evident in the publication of Spahr's book on the topic as it related to the United States [6]. In 1905, Max O. Lorenz, then a graduate student in economics at the University of Wisconsin (Madison), developed a graph to represent the distribution of income or wealth [7]. Lorenz's approach is illustrated in Figure 1, a 1x1 square where the horizontal axis shows the cumulative percentage of income earners or wealth holders, be they individuals or households, ordered from lowest to highest, and the vertical axis shows the cumulative percentage of income or wealth received by those persons or units. In the field of statistics, a

curve showing the cumulative frequency or cumulative relative frequency of a variable is called an ogive, (pronounced oh-jive [8]). As a point of reference, a typical Lorenz-curve diagram has a forty-five degree line which represents the Line of Perfect Equality in the distribution of income or wealth, that is, all units receive an identical amount so that ten percent of the units (individuals or households) receive ten percent of the income or wealth, twenty percent of the units receive twenty percent, and so on, until all the units combined (one hundred percent) receive all the income or wealth [8].

The Lorenz ogive shows the *actual* cumulative percentage of all income (or wealth) accruing to individuals or households when arranged in ascending order from poorest to richest. The closer the Lorenz ogive is to the ogive of perfect equality, the greater the degree of equality in the distribution of income (wealth); conversely, the greater the gap between the two ogives, the more unequal the distribution. In 1912, the Italian economist Corrado Gini derived the Gini ratio as a way to quantify the degree of inequality for a given distribution of income or wealth. When compared to itself overtime, the Gini ratio indicates if that distribution is becoming more equal, more unequal, or staying the same. In terms of Figure 1, the Gini ratio is equal to the ratio of A, the area between the 45-degree ogive and the Lorenz ogive, and the total area under the 45-degree line, that is, A plus B[9]. The Gini ratio has a value range of zero to one, with the former value representing perfect equality in the distribution (i.e., the 45 degree line and the Lorenz give are one and the same), and the later value perfect inequality with the richest unit, be it a person or a household, receiving all the income or wealth, and everyone else receiving nothing. In 1980, the Gini ratio for the distribution of income in the United States was .4; twenty-three years later it was .48, indicating an increasing degree of inequality of the distribution of income in the USA, a process that has been on-going for at least forty years [10].

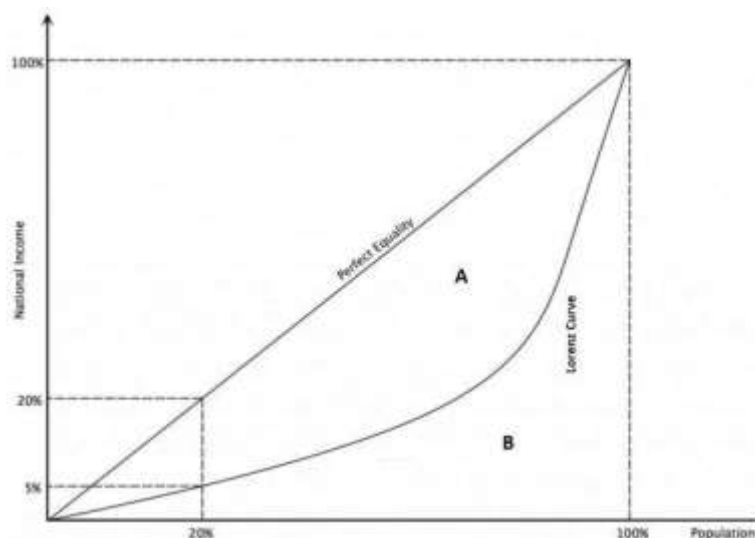


Figure 1. A Typical Lorenz Curve

Equality as a concept, and the most commonly used empirical method for quantifying it -the Lorenz-curve/Gini-ratio analysis- have several attributes that recommend this approach for measuring income distribution, namely familiarity, ease of computation, and readily available data for calculation [11]. There are, however, some inherent shortcomings, both technical and conceptual, with this methodology. Technically, Lorenz ogives can intersect, a rare occurrence, but when they do, the Gini ratio becomes ambiguous regarding the state of inequality and whether it has increased, decreased or remained the same[12]. Another source of ambiguity

regarding the topic of inequality is what is being measured—income or wealth. A thesaurus might consider the words income and wealth synonymous, and some of the great minds who have authored important works on the subject of economic distribution [13] used the terms interchangeable. In the fields of economics and finance, however, the two are distinct concepts and treating them as the same, even for the purpose of literary variety, can be confusing. Income is a flow and includes household earnings from labour as well as other payments such as interest and dividends [14]; it is usually measured per unit of time such as wage-per-hour, salary-per-week, or total annual compensation. Wealth is a stock and is equal to the net value of one's assets (what a person owns such as an automobile or a home) minus one's liabilities, e.g., outstanding car payments or a mortgage. It is measure at a point of time, say the last day of a calendar year [15]. The distinction between income and wealth has significantly different policy implications that are discussed in the final (policy) section of this paper.

The use of household incomes as the primary source of data for constructing a Lorenz ogive is another technical flaw embedded in conventional income-distribution analysis as such data imply that all households are identical, which is decidedly not the case, especially when households, as measured by income, are clustered together in ,fifths,' ,tenths,' or the ,top one percent.'

...there are far more people and workers in the top income brackets than in the lower ones. Indeed, there are 82 percent more people in the top fifth of households than in the bottom fifth. In 2006, 81 percent of households in the top quintile had two or more workers; but only 13 percent of the household in the bottom fifth had two or more workers. In nearly 40 percent of these households, no one was working' [16].

There is a reasonable likelihood that the recent steady increase in the Gini ratio for the distribution of income in the USA is due, in part, to the aging of the baby boomers and the corresponding rise of single-person households. Other things being equal, we would expect a household with four potential income earners, say two adults and two teenaged children, to generate more total income than a household consisting of a single potential income earner.

At the conceptual, or more correctly, philosophical level, much of the work on income distribution, especially that coming from economists [17], often equates equality and equity, a practice that is at best puzzling if not misleading [18]. Equality is a mathematical division that results in the same absolute share of the total being given to each recipient in the distribution process, whether it's dividing income among households, or a candy bar between two recalcitrant children. Equity is subjective, and the relative shares awarded are based on personal values reflecting some principle of justice as defined by one's sense of fairness [19]. In certain situations, equal and equitable can be equivalent, e.g., a teachers' union negotiating for an across-the-board salary increase in an educational environment where it is impossible to tease out the contributions of each individual teacher to the intellectual development of a specific student. In general, however, an equal distribution and an equitable are not necessarily the same [20] as will become evident in the next section of this paper.

A final, indeed almost fatal flaw of Lorenz-curve/Gini-ratio analysis is that the logic embedded in this approach comes to a dead end, at least with respect to policy recommendations. The foundation of the Lorenz-curve/Gini-ratio analysis is based on the implicit assumption that more equality is preferred to less. By the process of induction, this premise leads to the inescapable conclusion that perfect equality -when the 45 degree ogive and the Lorenz ogive are one and the same- is preferred to any degree of inequality. In the United States, this conclusion is a non-starter when it comes to policy recommendations concerning redistribution.

There are two interrelated reasons for this, one political, the other economic. Politically, European institutions favor workers, which partially explains the more even distribution of income throughout Europe when compared to America, where the political bias is slanted toward consumers whose wellbeing is usually tied to economic growth [21]. With respect to economics, or more specifically the economics of growth, American economists almost universally subscribe to the notion that there is a trade-off between equality and efficiency -a major source of growth-such that gains in the former may come at the expense of the latter [22].

It is necessary to know not simply whether a society is rich in economic terms, but also how its resources are distributed. Thus a problem with gross domestic product, as a measure of social well-being, is its obliviousness to distributional concerns. Free markets can help fuel economic growth, and economic growth can improve people's lives. But many citizens are not benefited by growth... [23]

The precise point at which greater equality may adversely impact efficiency, thereby inhibiting long-term growth and lowering the level of national output, leaving everyone, even those at the bottom rungs of the income distribution worse off, is unspecified and maybe undefinable[24]. 'Equality in an absolute sense would be advocated by nobody' [25]. Still, the prospect of a trade-off makes the politics of increasing distributional equality through income redistribution a tough if not impossible sell [25].

When combined, the philosophical, technical, and political drawbacks cited above have the cumulative effect of turning the discussion of income distribution, or more accurately redistribution, into an intellectual cul-de-sac for economists who, after wandering around the neighborhood of equality for over one hundred years, usually emerge to find they are essentially in the same place they started, that is, unhappy with the status quo, yet unable to recommend a plausible way to make the situation better. The next three sections of this paper are meant to break the cycle of inertia in the field of income distribution and discuss, in order, equity and income distribution, the creation of an empirical-based measure of equity regarding the distribution of income, and the creation of income redistribution policies that make economic sense and have realistic political possibilities.

Equity and the distribution of income

When it comes to the distribution of income, equality as a concept is easily understood and fairly straight forward in terms of measurement; not so is equity [26]. For some philosophers, distribution is about the just division of desserts among those responsible for their creation, a concept that dates to Aristotle [27] and finds its most well-known contemporary expression in John Rawl's *Justice As Fairness*. This is not the justice that is the 'characteristic value produced by legal systems, but rather 'an independent, ever-changing ideal, the perfect solution to disputes which judges and law makers quest after but never find. By this definition, or lack of definition, justice is never fully achieved[28]. Indeed, 'justice as fairness' is a philosophical doctrine that maybe incompatible with a political sensitive policy agenda [29]; it is also a concept 'with which economics has always had an ambivalent relation [30]. Indeed, linking philosophical argument with economic analysis 'runs the risk of creating a product that satisfies neither camp [31], as 'philosophers do not take kindly to the suggestion that they should tailor their conclusions to what other people happen to be willing to vote for [32]. For their part, economists, as noted above, are prone to equate equity and equality, with some going so far as to frame the quest for equity as a by-product of envy which folklore considers one of the seven capital vices [33]. Arguably, the most approachable perspectives on the concept of

equity, especially among those interested in generating meaningful policy recommendations that would promote it, are found among social psychologists.

Unlike philosophers or economists who tend to rely on deductive reasoning -going from the general to the particular- when exploring the topic of distribution within the context of social justice, social psychologists are more apt to use an inductive approach when considering the same topic. This tact usually involves studying regular people to see how they view justice with respect to the three transcendental realms of life, namely the social, the political, and the economic. The use of this particular-to-general methodology leads social psychologists to conclude that

...individuals begin from an assumption that they are equal to all others in their home life, school, community, political rights, and policy interests; however, they begin from an assumption that they are either better or worse than -at any rate, not necessarily equal to all others in their economic and social worth. Justice, then, requires differentiation in economic matters but equality in personal and political matters; justice is not a matter of finding the right rule for all occasions. [34].

This perspective becomes the prism through which social psychologists examine the three basic approaches to distributive justice—need, equality, and equity [35]. Distribution according to need requires an allocator to decide who gets what, and while not feasible at a societal level, this method for achieving distributive justice is deemed eminently fair in certain instances such as an emergence requiring medical triage and the immediate prioritization and distribution of available skills and/or medicines [36]. With regard to the other methods of achieving distributive justice, surveys of regular people indicate that equality or horizontal equity is the pertinent norm for evaluation -all persons are inherently equal in the social arena; one person, one vote, in the political world- whereas in economic life, equality in terms of vertical equity is the relevant Standard -to each according to his/her contribution [37]. In its weak form, economic equity implies a direct relationship between effort and rewards (desserts as philosophers like to call them); in the strong form, the relationship is direct and proportional [38]. Either way, equity is the means to achieve the objective of equality as it relates to social justice in the realm of economic life, a line of reasoning that has been articulated for more than a century [39]. Economists hypothesize an equality/productivity trade-off, that is, attempts to equalize incomes may discourage effort, thereby diminishing the overall level of production, and adversely impacting everyone in the system. For their part, social psychologists have documented an equity/productivity trade-off which is embodied in the word ‘shrinkage,’ a business euphuism that refers to production losses due to theft, sabotage, and other forms of purposeful inefficiencies [40-41] initiated by those who believe that they are being treated unfairly. As a corollary to Lorenz-curve/Gini-ratio analysis, efforts have been made to quantify equity theory as it relates to distributive justice in the economic sphere [42], but the resulting ‘indexes of inequity’ focus on microeconomic issues of justice, often involve the judgement of a ‘scrutinizer’ [43], and thus are not directly pertinent to the larger and more comprehensive issue of societal justice and the distribution of income [44]. Given that equity is a more challenging concept than equality when it comes to income distribution [45], can we develop a generally acceptable ideal for the equitable distribution of income, then compare it to the actual distribution so we can (a) see where we are relative to a desirable social norm, and (b) determine the extent of redistribution we would need to close the gap between where we are and what would be considered ideal? The ideal of equity as the basis of distributive justice is large and complex [46], and making it accessible is the focus of the next two sections of this paper.

A sense of fairness and the distribution of income

Despite the view that the concept of equity ,is so hopelessly subjective that it cannot be analyzed scientifically'[47], the search for a macro-measure of equity as a prerequisite for income redistribution has had a long history. Early in the twentieth century some economists concluded that since the distribution of personal attributes is almost certainly normal, statistically speaking, the distribution of income would follow suit [48]. Observation, then indicates otherwise, as income distribution is skewed to the right, with the mean exceeding the medium because of a relatively small number of extremely high incomes at top end of the distribution, and consequences of illegal bias at the other end [49]. In the United States, for example, race and gender play significant roles among those clustered in the low end of the income distribution, and though we like to think of our country as one that cherishes the wine and not the bottle it comes in, the reality is otherwise. During much of the nineteenth century, biological determinism and the related 'science' of craniometry (measurement of the skull) were the foundation of a theory ,that social and economic roles accurately reflect the innate construction of people[50]. In the later portion of the nineteenth century and through the 1920's, an alternative but related explanation of the disconnect between the distributions of abilities and income came into vogue, as some scholars reasoned that because the distribution of abilities, especially intelligence and other supposedly inherited traits [51], are not normally distributed, neither is income [52]. This line of thinking, now discredited, was the bedrock of the eugenics movement, a school of thought popular among academics, including some American economists. For example, Irving Fisher, one of the foremost American economists of the first half of the twentieth century, was instrumental in the formation of the American Eugenics Society and served as its first president from 1922-1926 [53].

Today we recognize that finding an empirically robust connection between the distribution of abilities and income is virtually impossible for several reasons. First, a consensus on the seemingly mundane process of identifying and defining abilities is highly unlikely. Second, measuring abilities in a complete and consistent manner is probably impossible. Finally, the trade-offs among attributes is so complex and involved, for some, the connection(s) between the distribution of abilities and income may just boil down to being a matter of chance [54]. Luck, however, has a way of averaging out [55]; an extremely bright person may have difficulties getting along with others, while a highly creative individual may have little or no resilience. Accepting that the distribution of personal assets involves ,large random elements [56] that may or may not be normally distributed [57], maybe the way to proceed is to assume that under ideal conditions the distribution of income would be normal, and deviations from that ideal would largely be the consequences of biases associated with factors (biases) having nothing to do with effort per se. The normal distribution and its associated give are shown in Figure 2. The dotted line in the figure represents the Line of Perfect Equality, which has three points in common with the Line of Perfect Equity: 0/0, where zero percent of the households receive zero percent of the income; 50/50, where 50 percent of the households receive 50 percent of the income; and 100/100, where all the households collectively receive 100 percent of the income.

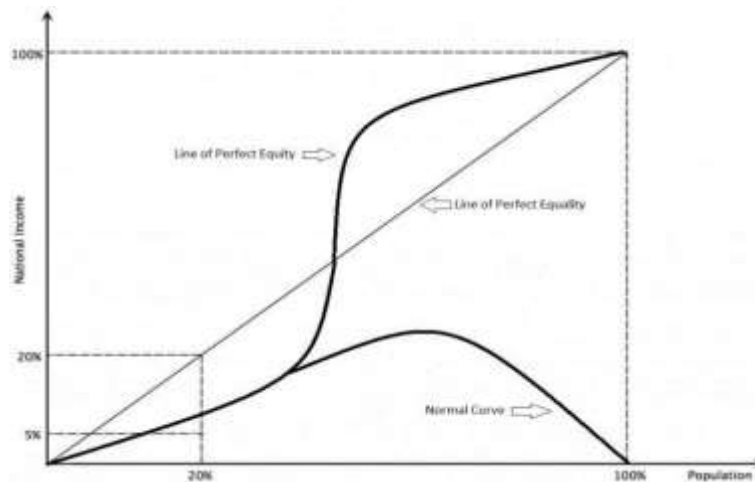


Figure 2. Line of Perfect Equity

The notion that under ideal conditions the distribution of income would be normally distributed has some empirical support, albeit oblique. In 2013, John E. Roemer and Alain Transom [59] published an involved and rather dense study of the distribution of income of male workers in Denmark and Hungary, showing the accumulated frequency distribution of earning as related to a measure of 'accountable effort' for workers clustered into three different categories according to the educational backgrounds of the workers' parents (p.232 in the *Handbook* version of the study). Under conditions of equal opportunity where income depends on effort, a choice variable, each of the three cumulative frequency distribution curves shown in two different diagrams (one for each country) has the characteristic S-shaped cumulative frequency distribution associated with a standard normal curve as usually defined in terms of its symmetry, and measures of central location and classic dispersion [60]. This conclusion was not the explicit purpose of the study, but the empirical results support the idea that under 'ideal' conditions, income is normally distributed, a hypothesis that American economists advanced more than one hundred years earlier [61]

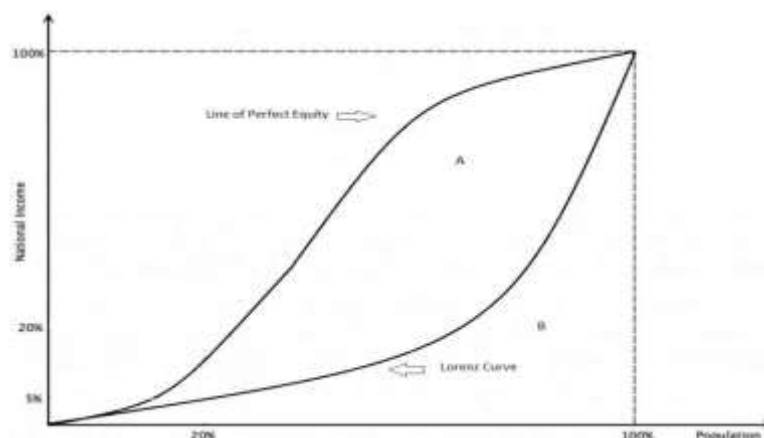


Figure 3. Index of Equity

Figure 3 is comparable to Figure 1, save that the Line of Perfect Equity (45 degree line) has been replaced by the Line of Perfect Equity, which represents the ideal distribution of income when there is genuine equality of opportunity, leaving effort, however defined, as the 'sole' determinate of actual income earned. Similar to the Gini ratio, the Index of Inequity can be computed as the ratio of two areas, A to A+B. As with the Gini ratio, the Index of Inequity would range from a value of zero when the Line of Perfect Equity and the Lorenz Curve are

identical, to a value of one (Perfect Inequity) when area A is equal to zero. Comparisons of the Index of Inequity to itself over time would indicate if the degree of inequity in the distribution of income is increasing, decreasing, or remaining the same. At any point in time, the state of income distribution as shown by the Line of Perfect Inequity could be used (a) to calculate exactly the aggregate amount of income that would have to be redistributed to move the actual distribution of income (the Lorenz curve) to the Line of Perfect Equity, and (b) the approximate gain or loss of each income unit, be it a person or household. Research fails to uncover any estimates of the aggregate income transfer that perfect *equality* would require, nor the associated per units gains or losses, probably because scholars are reluctant to spend the time calculating such numbers given that the probability of moving to an equal distribution of income is zero. An educated guess is that amount of transfers to achieve perfect equity in the distribution of income would be less than that required to achieve perfect equality. Using a log-normal transformation of 2010 Census data, my mathematically astute colleague Mr. Andy Kubis calculated both the Gini ratio and the Index of Inequity, whose values are respectfully, .43 and .54, suggesting that the degree of inequity is not as acute as the degree of inequality for the data set involved.

A cursory examination of Figure 3 indicates several points worthy of note. First, since the Line of Perfect Equity and the Lorenz curve are nearly synonymous for the bottom twenty percent of income recipients, any income redistribution designed to improve equity would flow primarily from the top fifth of income recipients to the middle sixty-percent of recipients; in short, very little of the redistributed income would make its way to the bottom fifth. This sort of overall income transfer might effectively eliminate the so-called 'hollowing-out of the middle-class' [83], a phenomena of growing concern over the past thirty years, but have little real impact on the bottom twenty percent of income recipients whose economic status is not so much about inequity as it is about a lack of occupational equality [62] usually associated with personal characteristics that have nothing to do with ability or effort [63]. The bow is oblivious to the gender or race of the person moving it across the strings of a violin, just as the computer is indifferent to the age or sexual orientation of the individual entering code. Vigorous and unrelenting enforcement of existing anti-bias laws are more likely to enhance the equality of opportunity and improve the intergenerational mobility and earning's potential [64] of the bottom twenty percent of income recipients than income redistribution alone [65]. Equality of opportunity is a necessary condition for equity, but it may not be sufficient [66]. That being the case, what are the policy implications of an equity-driven redistribution of income designed to promote distributive justice throughout society as a whole, an issue that America has grappled with for over a century [67]? That is the topic of the final section of this paper.

Thoughts on the policy implications of an equity approach to income redistribution

Philosophers split on the concept of income redistribution, with some arguing that it is an infringement on the liberty of those whose just desserts are diverted to others in the name of equity [68], while others believe that it is a legitimate method of promoting justice as fairness [69]. Politicians, being practitioners of the art of the possible, are open to the concept if it is politically viable. What are the policy options available for those willing to entertain the notion of promoting greater equity in the distribution of income given a surprising level of consensus among voters for such action [70]? An obvious one is the recalibration of the income tax schedule, which currently has a negligible impact on redistribution [71], so that the middle sixty percent pay less while the top twenty percent pay more, essentially leaving the total taxes collected about the same. The arithmetic may be relatively straight forward, but the politics would be complicated on at least three levels. First, the magnitude of the redistribution could

create so many unknowns regarding potential ‘winners,’ ‘losers,’ and ‘costs’ and ‘benefits’ that the whole process of redistribution might be viewed as a third rail that no politician, regardless of stripe, would be willing to touch [72]. Second, even if the idea of using the federal tax system as a vehicle for income redistribution in the name of equity became politically acceptable, pursuit of that goal could conceivably conflict with the federal government’s frequent use of the income tax as a tool for achieving the macroeconomic goals of steady growth, stable prices, and full employment [73]. Finally, tinkering with the federal income tax might incentivize the 43 states with state income taxes (and even the seven without) to revisit their income-tax systems in ways that neutralizes or at least diminishes the effectiveness of the federal system as a vehicle for income redistribution.

As part of a ‘synthetic approach’ to income redistribution [74], inherited wealth, which has become especially pronounced over the last 50 years [75], and its taxation certainly have to be considered. The idea of taxing inherited wealth in the name of social justice is hardly new [76,77]. Those that inherit significant wealth can be likened to lottery winners who are entitled to their prizes but cannot be said to deserve them [78]. Such a tax would also have to be applied to transfers between living persons, known as *gifts inter vivos* so as to discourage avoidance tactics [79]. A tax on wealth inheritance, which is especially pronounced among the mega rich [80], would also diminish intergenerational inequity and occupational inequality [80]. In the journey of life, an inheritance tax would be the equivalent of ‘the staggered start’ frequently used in selected Olympic track events in which racers run in assigned lanes around an oval track. The idea behind the staggered start is to eliminate or at least minimize the impact that the starting positions have on the outcome of the race. In the United States, the inherent fairness of a ‘staggered start’ in life may not translate into a significant redistribution of income due to the relatively anemic size of the intergenerational transfer of wealth [81]. It would, however, be an important endorsement of the principle of equity and readily perceived as such, for a sense of fairness is just as important as fairness itself [82,83].

References

- [1] Allison, P.D. (1978). Measures of inequality. *American Sociological Review*. 43(6), 865-880. doi. 10.2307/2094626
- [2] Arrow, K.J. (1983). *The Trade-off Between Growth and Equity*. Collected Papers of Kenneth J.
- [3] Arrow: *Social Choice and Justice*. Cambridge, MA: Harvard University Press.
- [4] Atkinson, A.B. (1983). *The Economics of Inequality (Second Edition)*. Oxford, UK; Clarendon Press.
- [5] Atkinson, A.B. (2015). *Inequality: What Can Be Done?* Cambridge, MA: Harvard University Press.
- [6] Becker, G. (1964). *Human Capital: A theoretical and Empirical Analysis, with Special Reference to Education*. New York, NY; National Bureau of Economic Research.
- [7] Boulding, K.E. (1978). *Stable Peace*. Austin, TX: University of Texas Press.
- [8] Boulding, K.E. (2008). *The Changing Distribution of Earnings in OECD Countries*. Oxford, UK:
- [9] Oxford University Press.
- [10] Bowles, S., Gintis, H., & Groves, M.O. (2005). Intergenerational inequality matters. In *Unequal Chances: Family Background and Economic Success*. S. Bowles, H. Gintis., & M.O. Groves, (Ed), pp.1-22, Princeton, NJ; Princeton University Press.
- [11] Carver, T.N. (1915). *Essays in Social Justice*. Cambridge, MA; Harvard University Press.

-
- [12] Champernowne, D. (1974). A comparison of measures of inequality of income distribution.
- [13] *The Economic Journal*. 84(336), 787-816. doi. 10.2307/2230566
- [14] Champernowne, D., & Cowell, F.A. (1998). *Economic Inequality and Income Distribution*.
- [15] London, UK: Cambridge University Press.
- [16] Corak, M. (2004). Generational income mobility in North America and Europe: an introduction. In *Generational Income Mobility in North America and Europe*: M. Corak, (Edt), pp.1-37. Cambridge, UK; Cambridge University Press.
- [17] Corning, P. (2011). *The Fair Society*. Chicago, IL: University of Chicago Press.
- [18] Corning, P. (2015). *Equality, Equity, and Reciprocity: The Three Pillars of Social Justice*: May 31; Institute for the Study of Complex Systems [Retrieved from].
- [19] Coulter, P.B. (1989). *Measuring Inequality: A Methodological Handbook*. Boulder, CO: Westview Press.
- [20] Culyer, A.J. (2001). Equity - some theory and its implications. *Journal of Medical Ethics*. 27(4), 275-283. doi. 10.1136/jme.27.4.275
- [21] DeCarlo, L.T. (1997). On the meaning and use of Kurtosis. *Psychological Methods*. 2(3), 292-307. doi. 10.1037/1082-989X.2.3.292
- [22] Deutsch, M. (1975). Equality, equity, and need: What determines which value will be used as the basis of social justice. *Journal of Social Issues*. 31(4), 137-150. doi. 10.1111/j.1540-4560.1975.tb01000.x
- [23] Deutsch, M. (1985). *Distributive Justice: A Social -Psychological Perspective*. New Haven, CT:
- [24] Yale University Press.
- [25] Diesing, P. (1976). *Reason in Society: Five types of Decisions and Their Social Conditions*.
- [26] Westport, CT: Greenwood Press.
- [27] Dolan, E.G. (2013). *Introduction to Microeconomics(Fifth Edition)*; Redding, CA: BVT Publishing.
- [28] Ely, R.T., Adams, T.S., Lorenz, M.O., & Young, A.A. (1910). *Outlines of Economics (Revised Edition)*. New York, NY; MacMillan.
- [29] Engs, R.C. (2005). *The Eugenics Movement: An Encyclopedia*. Westport, CT: Greenwood Press.
- [30] Feinberg, J. (1970). Justice and Personal Desert. In *Doing and Deserving: Essays in the Theory of*
- [31] *Responsibility*. Princeton, NJ: Princeton University Press.
- [32] Forgang, W.G. (1977). Inequality and equity in the distribution of income and wealth. *Forum for Social Economics*. 7(2), 13-30. doi. 10.1007/BF02761600
- [33] Galbraith, J.K. (1998). *Created Unequal: The Crisis in American Pay*. Chicago, IL: University of Chicago Press.
- [34] Galbraith, J.K. (2012). *Inequality and Instability: A Study of the World Economy Just Before the*
- [35] *Great Crisis*. Oxford, UK: Oxford University Press.
- [36] Gans, H.J. (2016). Reducing economic inequality: A bottom-up approach. *Challenge*. 59(2), 148-152. doi. 10.1080/05775132.2015.1137718
- [37] Gordon, R.J. (2004). Two centuries of economic growth: Europe chasing the American frontier. NBER Working Paper, No.10662. doi. 10.3386/w10662
- [38] Gould, S.J. (1981). *The Mismeasure of Man*. New York, NY; W.W. Norton.
- [39] Harding, D.J., Jencks, C., Lopoo, L.M., & Mayer, S.E. (2005). The changing effect of family background on the incomes of American adults. In *Unequal Chances: Family*

Background and Economic Success: S. Bowles, H Gintis, & M.O. Groves (Eds), pp.100-149. Princeton University Press; Princeton, NJ.

[40] Heilbroner, R.L. (1975). *An Inquiry into the Human Prospect*. New York, NY; W. W. Norton. Heilbroner, R.L. (1988). *Behind the Veil of Economics: Essays in the Worldly Philosophy*. New

[41] York NY; Norton.

[42] Heller, A. (1987). *Beyond Justice*. Oxford, UK; Blackwell.

[43] Herrnstein, R.J., & Murray, C. (1994). *The Bell Curve: Intelligence and Class Structure in American Life*. New York, NY; The Free Press.

[44] Hirose, I. (2013). *Egalitarianism*. New York, NY: Routledge.

[45] Hochschild, J.L. (1981). *What's Fair? American Beliefs about Distributive Justice*. Cambridge, MA: Harvard University Press.

[46] Jencks, C., Smaith, M., Acland, H., Bane, M-J., Cohen, D., Gintis, H., Heyns, B., & Michelson, S. (1972). *Inequality: A Reassessment of the Effects of Family and Schooling*. New York, NY: Basic Books.

[47] Keeton, G.W. (1956). *An Introduction to Equity*. (Fourth Edition). London, UK; Sir Isaac Pitman & Sons.

[48] Komlos, J. (2016). Growth of income and welfare in the US, 1979-2011. NBER Working Paper, No.22211. doi. 10.3386/w22211

[49] Le Grand, J. (1991). *Equity and Choice: An Essay in Economics and Applied Philosophy*. New York, NY; Harper Collins Academic.

[50] Leventhal, G.S. (1976). The distribution of rewards and resources in groups and organizations. *Equity Theory: Toward a General Theory of Social Interaction*. *Advances in Experimental Social Psychology*. 9, 91-131. doi. 10.1016/S0065-2601(08)60059-3

[51] Mayer, T. (1960). The distribution of ability and earnings. *Review of Economics and Statistics*. 42(2), 185-195. doi. 10.2307/1926538

[52] McClosky, H., & Zaller, J. (1984). *The American Ethos: Public Attitudes toward Capitalism and Democracy*. Cambridge, MA; Harvard University Press.

[53] Miller, D. (1999). *Principles of Social Justice*. Cambridge, MA; Harvard University Press.

[54] Norton, M.I., & Ariely, D. (2011). *Building a better America - One wealth quintile at a time*.

[55] *Perspectives on Psychological Science*. 6(1), 9-12. doi. 10.1177/1745691610393524

Nozick, R. (1974). *Anarchy, State, and Utopia*. New York, NY; Basic Books.

[56] Okun, A.M. (1975). *Equality and Efficiency: The Big Tradeoff*. Washington, DC: The Brookings Institution.

[57] Olsaretti, S. (2003). Introduction: Debating desert and justice. In *Desert and Justice*, S.

[58] Olsaretti, (Edt), pp.1-24. Oxford, UK; Clarendon Press.

[59] Palley, T.I. (2003). Income distribution; In *The Elgar Companion to Post Keynesian Economics*, J.

[60] E. King, (Edt), pp.181-186. Cheltenham, UK; Edward Elgar.

[61] Parker, R. (2017). The natural rights we must protect. *Challenge*. 60(3), 279-286. doi. 10.1080/05775132.2017.1308766

[62] Payne, K. (2017). *The Broken Ladder: How Inequality Affects the Way We Think, Live, and Die*.

[63] New York, NY: Viking Press.

[64] Pigou, A.C. (1920). *The Economics of Welfare*. London, UK; Macmillan.

[65] Piketty, T. (2014). *Capital in the Twenty-first Century*. Cambridge, MA; Belknap Press of Harvard University Press.

- [66] Piketty, T. & Zucman, G. (2015). Wealth and inheritance in the long run. In *Handbook of Income Distribution: Vol 2B; First Edition*, A.B. Atkinson & F. Bourguignon, (Edt), pp.1303-1368. Elsevier, Amsterdam.
- [67] Rawls, J. (1958). Justice as Fairness. *The Philosophical Review*, 67(2), 164-194. doi. 10.2307/2182612
- [68] Rawls, J. (1971). *A Theory of Justice*. Cambridge, MA: Belknap Press of Harvard University Press.
- [69] Rawls, J. (2001). *Justice as Fairness: A Restatement*. E. Kelly (Edt), Cambridge, MA; Belknap Press of Harvard University.
- [70] *Guide for Students and Politicians* (Third Edition). Cambridge, UK; Policy Press.
- [71] Amam Hossain Bagdadee. Power Quality Analysis by the Ripple Technique *Journal of Applied and Advanced Research* 2017, 2(4): 227–234
<http://dx.doi.org/10.21839/jaar.2017.v2i4.74>
<http://www.phoenixpub.org/journals/index.php/jaar> ISSN 2519-9412 / © 2017 United Arab Emirates.
- [72] Amam Hossain Bagdadee, “Imitation intellect Techniques Implement for Improving Power Quality in Supply Network Accepted in (Paper Code:IEEE-SCOPES-CUTM-03-16-OR0342)IEEE International conference on Signal Processing, Communication, Power and Embedded System (SCOPES)-2016
- [73] Amam Hossain Bagdadee “To reduce impact of the variation of power from renewable energy by using super capacitor in Smart grid” Published by World Scientific and Engineering Academy and Society in WSEAS TRANSACTIONS on POWER SYSTEMS Vol.11 2016,USA.
- [74] Amam Hossain Bagdadee, 'Rural Electrification Through Micro-grid in Bangladesh' (Paper ID: UCU77-J1) published by Oxford Academic Studies Press (OASP) in *Engineering Sciences and Technology Journal (ESTJ)*. Vol. 10 Issue 5. ISSN: 1465-2382, 2015.UK
- [75] Amam Hossain Bagdadee , Md. Bayezid Islam “TO IMPROVE POWER FAILURE ANDPROTECT SUSTAINABILITY OF THE ENVIRONMENT IN BANGLADESH BY THERENEWABLE ENERGY” Published by European Centre for Research Training andDevelopment UK in *International Journal of Energy and Environmental Research* Vol.3, No.1, pp.29-42, ISSN: 2055-0200, March 2015.UK
- [76] AmamHossainBagdadee ,Nazib Sobhan “Developing model of control stratagem with variable speed drive by synchronous speed in micro-Hydro plant” Published in *International Journal of Power and Renewable Energy Systems (IJPRES)*Vol.2,2015PP.88-100 ISSN 2374-376X.USA
- [77] Amam Hossain Bagdadee,“ ASSESSMENT OF PV OPERATION IN BANGLADESH Published by European Centre for Research Training andDevelopment UK in *International Journal of Energy and Environmental Research* Vol.2, No.1, ISSN: 2055-0200, March 2014.UK
- [78] Amam Hossain Bagdadee, “Status and Reform towards Development Energy Sector of Bangladesh”Published in *European Journal of Advances in Engineering and Technology*, Vol. 2(2): 24-28 ISSN: 2394 - 658X,2015.India
- [79] AmamHossainBagdadee,Abu Salman ShaikatPROPERTY OF ANCILLARY SERVICE MARKETS ON FREQUENCY CONTROL PERFORMANCE OF POWER SYSTEMSPublished by European Centre for Research Training and Development UK in *International Journal of Engineering and Advance Technology Studies* Vol.2, No.3, ISSN: 2053-5791,2014.UK
- [80] AmamBagdadee,Rural Electrification with Renewable Energy Based Village Grids in Bangladesh .Published in *International Journal of Scientific & Engineering Research*, Volume 5, Issue 10, 1080ISSN 2229-5518,2014,India

[81] AmamHossainBagdadee,'Using A Battery Storage Wind / PV Hybrid Power Supply System Based Stand-Alone PSO To Determine The Most Appropriate "Published in American Journal of Engineering Research (AJER)e-ISSN : 2320-0847 p-ISSN : 2320-0936Volume-03, Issue-08,2014,USA

[82] AmamBagdadee, "POWER SYSTEM ANALYSIS OF LOAD FLOW IN RADIAL DISTRIBUTION NETWORK" Published in International Journal of Scientific & Engineering Research, Volume 5, Issue 10, 1080ISSN 2229-5518,2014.India

[83] AmamHossainBagdadee, "Soft Power Factor Modification Using Static VAR Compensator on Dynamic Load" Published in International Journal of Novel Research in Electrical and Mechanical Engineering Vol. 1, Issue 1, ISSN:2394-9678,2014,India