



Groundings Undergraduate Academic Journal  
University of Glasgow | Glasgow University Union

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## **Mythical Measures: The Problem of Objective Inequality Measurement in Economics and the Social Sciences**

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**Source:** Groundings Undergraduate, April 2015, Vol. 8, pp. 129-144

**Published by:** Glasgow University Dialectic Society, University of Glasgow

**ISSNs:** 1754-7474 (Print) | 1755-2702 (Online)

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# Mythical Measures: The Problem of Objective Inequality Measurement in Economics and the Social Sciences

Max Schröder

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The Gini coefficient, one of the most widely used inequality measures in economics, is thought to report income disparity with a reliable degree of objectivity. However, a critical assessment of the Gini's implicit normative assumptions reveals that this objectivity is overstated. Moreover, this critique can be extended to other indices as well, uncovering a more general worry that the perception of distributive justice, which determines the ideal level of inequality underlying such indices, is necessarily subjective. As a result, the prospect of a mutually intelligible and transparent discussion on inequality suffers – both at the scientific and policy level. The implication of this finding is that more work needs to be done in specifying the normative foundations of inequality measures.

The distribution of income has long been a focal point for economics. Divergences in income are seen as the basis of a meritocratic, capitalist society. High incomes are supposed to inspire hard work and reward personal achievement. Those that contribute most to society — it is generally accepted — should also benefit the most. The downside of this incentive structure is quite apparent, and has been at the heart of political and social discussion since the onset of capitalism. Where inequality means wealth for some, it brings poverty for others, and societies divide themselves, most notoriously, along the lines of economic standing.<sup>1</sup>

The following pages will firstly introduce the most widely used measure of inequality, the Gini coefficient, and uncover its hidden moral foundations. This process will expose this particular construct of social aggregation as the imposter that it is and debunk the myth that objectivity is possible when it comes to such a complicated normative issue as the distribution of wealth and income.

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MAX SCHRÖDER is a final year student, pursuing a joint degree in Philosophy and Economics. He is interested in issues that lie at the intersection of both fields, such as the methodology of Social Sciences and the use of normative concepts in Economics. Further interests include issues of Inequality and Development. His undergraduate dissertation investigates the properties of alternative measures of inequality. After graduation, Max intends to pursue postgraduate studies in Economics, in order to embark on a research-focussed career.

<sup>1</sup> What sociologists might call 'social class'.

The first section of this article will present a short introduction to the contemporary debate on inequality, and outline why the study and measurement of inequality is of importance today. The second section will introduce the Gini measure of inequality and investigate it with respect to its underlying normative assumptions. The third section will draw on this analysis and highlight its implications for the measurement of inequality. Finally, the article will conclude by outlining potential solutions to the problem at hand.

## **SECTION 1: ECONOMISTS AND INEQUALITY**

In recent years, income disparities between the very poor and the very rich have increased both between and within countries. This has led to political turmoil in the developed world, manifesting itself in the ‘Occupy’ and ‘99%’ movements, which demand a higher level of redistribution and a more equitable economic system, in particular after the financial crisis of 2007-08.

The economic literature on inequality has two main pillars of investigation in older tradition that investigates the causes of inequality, the factors that influence it, and whether there is a ‘natural progression of inequality’ that different nations experience while they develop. The more recent strand of analysis deals with the potential effects of inequality on the performance of the economy. It tries to establish mechanisms by which inequality affects other economic variables (for better or worse), and tries to calculate the ‘socially optimal’ level of inequality.

The results of those works, however, remain controversial. No real consensus has been established on what the ‘right’ level of inequality is and what the economic causes and consequences of ‘too much’ or ‘too little’ inequality might be. What all economists can agree upon, however, is that inequality — if it is to be theorised about — needs to be measured, and this will be the topic of this article.

Economists have devised numerous measures of inequality to use as tools in their empirical and theoretical work on the subject matter. They have constructed mathematical formulas that try to capture the diverse phenomenon of inequality in a single summary statistic. Such measures have gained enormous popularity and are used widely outside the field of economics. Social scientists of all disciplines use inequality measures to illustrate their hypotheses, and politicians and policy-makers refer to them to justify their arguments.

It is, however, a dangerous leap to jump from the notion of mathematical scrutiny to the realm of neutral objectivity, and many users of inequality measurements fall prey to the myth of their scientific nature. The myth that economic measures of inequality are without bias is painfully prevalent in our time. To destroy it, one has to tear down the mathematical flesh from these constructs and look at their bare bones, wherein their normative axioms are hidden.

The theoretical and, even more so, the political and practical work that deals with inequality has a lot to gain from the realisation that inequality measures are not inherently objective, but rather vague, for they make their judgements in accordance with principles and preconceptions of how the ideal distribution should look like.

## **SECTION 2: THE GINI AND ITS SECRETS**

### 2.1: THE GINI MEASURE OF INEQUALITY

The Gini coefficient is the most widely used measure of income inequality. It can be defined as the relative mean difference between all possible pairs of incomes within a given distribution<sup>2</sup>, and it is usually interpreted as the ratio of the area between the Lorenz curve<sup>3</sup> and the line of perfect equality and the total area under the line of perfect equality (Figure 1).<sup>4</sup>

The Gini can take values ranging from 0 (perfect equality) to 1 (perfect inequality), and is sometimes expressed in percentage terms. It can be used to characterise distributions of income, wealth, land or just about anything that is quantifiable as well as distributable. For simplicity, this article will be concerned with distributions of income, but analogous results can be drawn for other kinds of distributions.

Those who use the Gini coefficient trust it to give an objective account of the level of inequality that is present in the distribution that is described by it. They believe that by ranking distributions according to their Gini values, one can get a perfectly

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<sup>2</sup> Cf. A. Sen, 'On economic inequality' (Oxford, 1973).

<sup>3</sup> The Lorenz curve is the cumulative density function over a population, whose members are ordered according to a certain characteristic (e.g. income) from lowest to highest.

<sup>4</sup> Source: J. A. Charles-Coll, 'Understanding Income Inequality: Concept, Causes and Measurement' (2011) 1:3 *International Journal of Economics and Management Sciences* 17–28.

adequate understanding of which distribution is more equal than another. However, things are not that simple, as the following example will show:

## 2.2 THE PROBLEM OF CROSSING LORENZ CURVES

A criticism that is often levelled at the Gini is the problem of crossing Lorenz curves.<sup>5</sup> The problem refers to the fact that different distributions can yield the same Gini value as long as the ratio of the area above the Lorenz curve to the total area under the line of perfect equality remains the same.<sup>6</sup> This failure of the Gini to pick out a specific distribution can lead to problems when comparing distributions whose Lorenz curves cross. In these cases, simple Gini coefficients can fail to give an unambiguous ranking of the distributions.

Atkinson<sup>7</sup> points to the case of Great Britain and West Germany whose Lorenz curves cross around the 50% population mark. Whilst the Gini ranking favours the British distribution, the German Lorenz curve is closer to the line of perfect equality than the British for the first half of the population (Figure 2). This leads him to doubt whether the Gini is an objective measure of inequality that is independent of any value considerations:

[T]he degree of inequality cannot, in general, be compared without introducing values about the distribution.<sup>8</sup>

Atkinson's disagreement with the Gini is in no way due to his inability to grasp the 'objective truth' about the distributions of income in Britain and West Germany, but it results from the fact that the Gini favours certain types of equality over others. This bias is, however, well hidden behind the Gini's apparent objectivity — after all, how could a mathematical formula be biased?

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<sup>5</sup> Cf. A. Cobham & A. Sumner, 'Is It All about the Tails? The Palma Measure of Income Inequality' (2013) *Center for Global Development, Working Paper* 343.

<sup>6</sup> Cf. Charles-Coll, *Understanding Income Inequality: Concept, Causes and Measurement*, 17–28.

<sup>7</sup> A. B. Atkinson, 'On the Measurement of Inequality' in A. B. Atkinson. (ed.), *Wealth, income and inequality: selected readings* (Harmondsworth, 1973).

<sup>8</sup> *Ibid.*, 66.

## 2.3 AXIOMATIC APPROACHES TO INEQUALITY MEASUREMENT

To illustrate this point, the following paragraphs will outline two popular technical Axioms of inequality measurement used by those that theorise about such measures. Those axioms are not exhaustive or crucially necessary — many commonly used measures of inequality do not conform to all of them — but are widely believed to be a good yardstick for judging the suitability of a measure. For a detailed discussion, see, for example, Dalton<sup>9</sup>, Sen,<sup>10</sup> or Cowell.<sup>11</sup>

Before moving on, some things have to be said about the following analysis. As mentioned before, those axioms are neither exhaustive nor uncontroversial, but their mere existence can provide a good understanding of where the problem with inequality measurements lies: in the complications that arise when one tries to capture normative ideas in mathematical formulas. A mathematical-axiomatic approach might be elegant and rather satisfactorily on a theoretical level, but can nonetheless not guarantee a ‘perfect measure’. Axiomatic approaches rely on two caveats for their validity: that their axioms are true and that the deductive system employed is applicable to the subject that is studied. However, neither of those can be said with certainty to apply to the axiomatic measurement of inequality.

## 2.4 THE PRINCIPLE OF TRANSFERS

The axiom to be considered first is the so-called Pigou-Dalton Transfer Principle.<sup>12</sup> The principle states that a transfer of income from a given individual *A* to a poorer individual *B* should, *ceteris paribus*, always increase equality<sup>13</sup> and thus decrease any measure of inequality.<sup>14</sup> This principle seems intuitively reasonable and remains fairly undisputed. The Gini conforms to this principle, but this hardly settles the issue.

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<sup>9</sup> H. Dalton, ‘The measurement of the inequality of incomes’ (1920) 30:119 *The Economic Journal* 348-361.

<sup>10</sup> Sen, ‘On economic inequality’.

<sup>11</sup> F. Cowell, *Inequality: Measurement* (2006).

<sup>12</sup> Cf. Dalton, ‘The measurement of the inequality of incomes’, 348-361.

<sup>13</sup> Given that the transfer is not large enough to make *B* richer than *A* was before the transfer.

<sup>14</sup> The reverse, that transfers from a poorer individual to a richer one should increase inequality, follows.

Some authors<sup>15</sup> criticise the Pigou-Dalton principle on the basis that it does not give any weight to where transfers take place. Atkinson<sup>16</sup> argues that transfers that affect the lower end of the distribution should have a greater effect on equality than those at the top. Sen<sup>17</sup> remarks:

After all, why should a transfer between two millionaires have the same (or a greater) effect than the same transfer at the lower end of the distribution?<sup>18</sup>

It seems reasonable to amend the principle of transfers with a sensitivity requirement.<sup>19</sup>

It can already be seen that the judgement that any measure of inequality makes about any number of distributions will crucially depend on the weights that it attaches to different parts of the distribution. The 'preferences' of the Gini will be investigated, but before this another issue should be considered:

## 2.5 THE PRINCIPLE OF PROPORTIONATE CHANGES

The second axiom to consider is the 'Principle of Proportionate Changes in Income'.<sup>20</sup> The principle considers the notion that measures of inequality should be 'scale independent' — that is, not to respond to equal proportionate changes in everyone's income.<sup>21</sup> This seems reasonable at first, but the principle has not been as unanimously accepted as the Transfer Principle. Dalton<sup>22</sup> argues that if the underlying social welfare function<sup>23</sup> exhibits decreasing marginal returns to additional income, then a

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<sup>15</sup> E.g. Sen, On economic inequality.

<sup>16</sup> A. B. Atkinson, 'On the measurement of inequality.' (1970) 2:3 *Journal of economic theory* 244-263.

<sup>17</sup> Sen, On economic inequality.

<sup>18</sup> *Ibid.*, 145.

<sup>19</sup> Some authors (Cf. J. Davies & M. Hoy, 'Making inequality comparisons when Lorenz curves intersect' (1995) 85:4 *The American Economic Review* 980-986) have formalised this approach under the name 'ADI' (aversion to downside inequality).

<sup>20</sup> Cf. Dalton, 'The measurement of the inequality of incomes'.

<sup>21</sup> The principle refers to 'real increases in income'— not just a change of the scale of measuring incomes (Cf. Dalton, 'The measurement of the inequality of incomes').

<sup>22</sup> Dalton, 'The measurement of the inequality of incomes'.

<sup>23</sup> A social welfare function describes the distribution of welfare, or utility over the individuals of a population, given a certain distribution of other economic and noneconomic variables.

proportional increase in all incomes will make poorer individuals better off in terms of welfare, relative to richer individuals. A similar discussion is given by Sen<sup>24</sup>, when he considers whether inequality should matter more at high levels of income — because richer populations can ‘afford’ more redistribution, or at low levels of income — because inequality has worse effects in those settings. In this light, there might be two populations (one rich, one poor) with identical Lorenz Curves<sup>25</sup> that differ with regards to their underlying distribution of welfare. Those arguments highlight the problem outlined by Dalton<sup>26</sup>, that we are trying to measure intangible welfare by using (measurable) incomes. The problem of the need to specify underlying welfare functions will be touched upon in section 3.1.<sup>27</sup>

A related principle outlined by Dalton<sup>28</sup> refers to equal absolute additions to income instead of proportionate ones. This ‘Principle of Absolute Additions to Income’ states that inequality should decrease with equal, absolute additions to every individual’s income. The reasoning seems sound enough: equal additions to incomes will erode inequality in terms of relative income and thus — given there are no increasing marginal returns to income — welfare would converge for all individuals.

The Gini behaves according to the principles of proportionate and absolute changes in incomes, but it is not free from Sen’s critique. By using the Gini, one (often unknowingly) agrees that inequality can be characterised in the same way in different distributions, regardless of how poor or rich the underlying population might be — a tenable, yet not entirely uncontroversial position.

## 2.6 THE SENSITIVITY OF THE GINI

To return to the discussion about the sensitivity of the Gini to changes within the distribution, many authors are in agreement that inequality measurements should have different sensitivity to changes in different parts of the distribution. Atkinson<sup>29</sup> investigates the Gini accordingly.<sup>30</sup> He finds that the Gini puts more weight on

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<sup>24</sup> Sen, ‘On economic inequality’.

<sup>25</sup> Which in turn implies equivalent values of scale-independent measures of income inequality.

<sup>26</sup> Dalton, ‘The measurement of the inequality of incomes’.

<sup>27</sup> Cf. Atkinson, ‘On the measurement of inequality’.

<sup>28</sup> Dalton, ‘The measurement of the inequality of incomes’.

<sup>29</sup> Atkinson, ‘On the measurement of inequality’.

<sup>30</sup> The mathematical proof is nonessential for the argument.



equality around the centre of the distribution than its tails. In other words, the Gini is less sensitive to the disparities between the poorest and the second poorest individual than it is to the differences in income between two individuals in the middle of the distribution. If the notion of downwards inequality aversion is to have any relevance, his conclusion is rather unfavourable:

This suggests that for the typical distribution more weight would be attached to transfers at the centre of the distribution than at the tails [...]. It is not clear that such a weighting would necessarily accord with social values.<sup>31</sup>

Applied to Atkinson's example, this result implies that the Gini ranking favoured Britain, at least partially, because of its more coherent middle class, while it disregarded West Germany's success in raising the relative incomes of the economically disadvantaged parts of its population. This shows that the Gini's measurement relies on moral preconceptions about the 'right' distribution rather than any purely objective criteria. It is simple to see how this reasoning applies to almost all inequality measures:

Summary measures such as the Gini coefficient are often presented as purely 'scientific', but in fact they implicitly embody values about a desirable distribution of income. Moreover, when one examines the values implicit in such measures [...], there are no grounds for supposing that the values are likely to be widely acceptable.<sup>32</sup>

## 2.7 THE PROBLEM OF EXTREME VALUES

The Gini's insensitivity to the tails of the distribution is demonstrated by the issue of extreme values: income distributions are aggregated from limited amounts of information<sup>33</sup> and are thus prone to outliers. The sensitivity of an inequality measure to the omission or inclusion of a couple of extreme observations might be a highly relevant property of such a measure. There are generally two types of outliers: those

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<sup>31</sup> Atkinson, 'On the measurement of inequality', 256.

<sup>32</sup> *ibid*, 42.

<sup>33</sup> These might be caused by accidental oversights, as well as deliberate attempts of individuals to hide the scope of their income.

on the lower and those on the upper end of the distribution. As a general rule, it can be said that the bottom outliers are less disturbing, since their potential value is usually limited by a certain lower bound.<sup>34</sup>

Cowell and Flachaire<sup>35</sup> investigate the effect of outliers on several types of inequality measures, and find that the Gini is less sensitive to the influence of large outliers than other measures.

The importance of this result and its implications might be illustrated by a thought experiment: consider a medieval society in which a few hundred peasants are ruled by a feudal overlord. Concerned about the state of equality in his realm, the lord sends one of his magistrates to measure the level of inequality in the country. The magistrate goes and does his duty, carefully measuring the output of all the small wheat and cattle farms, and finally concludes that all of the lord's subjects have very similar incomes. One could say that inequality is very low in this country. However, upon returning to the castle, he realises that he forgot to account for the income and wealth of his master, who, being the lord of the land, has a wealth many hundred times that of the ordinary inhabitant. If the magistrate was trained in the methods of the social sciences and decided to use the Gini coefficient, then the addition of this unaccounted wealth would increase measured inequality by less, than if he used another measure.

The question to be answered here is whether the disproportionate wealth of the lord should make us think about the country as being 'a little' more unequal, or if the magistrate has to fear for his head for presenting his master with a conclusion that is a better representation of what we think about inequality. In the light of recent revelations at the 2015 Davos Economic Forum<sup>36</sup>, this question seems as relevant as ever.

With the rise of extremely high incomes, as the Great Recession continues to undermine the financial situation of the lower strata of society, one might deem it

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<sup>34</sup> In terms of incomes, the lower bound tends to be zero.

<sup>35</sup> F. A. Cowell & E. Flachaire, 'Income Distribution and Inequality Measurement: The Problem of Extreme Values' (2007) 141:2 *Journal of Econometrics* 1044–72.

<sup>36</sup> This refers to the announcement that the world's richest 1% own about and over 50% of the world's wealth.

important that a measure of inequality accounts for these ‘centrifugal forces’<sup>37</sup> that cause distributions to move to extremes. One might also think that the rapidly increasing levels of inequality in developing economies, such as China and Brazil, should be a cause for concern — even more so than in the developed world. It is not unreasonable to expect a measure of inequality to account for this intuition (or at least be explicit about the absence of this feature).

These considerations aside, it seems likely that the problem of extreme values is going to haunt the inequality discussion, until the super-rich have no more incentives (and avenues) to understate their incomes. Until then, caution is advised – every indicator that relies on empirical data is likely to understate the ‘real’ level of inequality.

### **SECTION 3: WHAT THE GINI CAN TEACH US**

#### **3.1: BIASED MEASURES**

The discussion above leads us to a rather unsurprising conclusion: inequality is a complex social and economic phenomenon and is not easily measured. Inequality measures contain (implicitly or explicitly) moral judgements about the ‘right’ distribution in a given society. Atkinson and Sen are rather explicit about this failure of inequality indices to provide ‘objective’ measures of the degree of inequality:

The conventional approach in nearly all empirical work [to compare distributions ] is to adopt some summary statistic of inequality such as... the Gini coefficient – with no very explicit reason being given for preferring one measure rather than another... [W]ithout introducing [judgements about the level of inequality considered ‘fair’] it is impossible to measure the degree of inequality. That no such decision has to be made with the conventional measures simply obscures the fact that they embody quite arbitrary values about the distribution of income.<sup>38</sup>

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<sup>37</sup> The term is borrowed from Gabriel Palma’s work on the homogenous middle (Cf. J.G. Palma, ‘Globalizing Inequality: “centrifugal” and “centripetal” forces at Work’ (2006) 186 *Revue Tiers Monde*).

<sup>38</sup> Atkinson, ‘On the Measurement of Inequality’, 46 and 67-68.

This shows that inequality measures are by no means free from bias. Yet many economists use different measures to talk about issues of inequality, just like they use feet or metres to talk about the size of their living rooms — as if they were different ways of measuring the same objective thing. Different measures of inequality are not readily translatable. One cannot take a Gini value and transform it, by some easy formula, into the value that another measure would have obtained, had it been applied to the same population. This failure to take objective measurements makes it even more crucial to develop an understanding of the character of different measures of inequality.

The issue of distributional differences is a highly complex social, political, and philosophical matter that will not be easily resolved. However, economists cannot remove themselves from the debate and declare their measures scientific and objective, because they satisfy some postulated axioms.

### 3.2: THE GINI REVISITED

The discussion highlights some of the issues that arise with the use of the Gini, mainly its inability to be explicit in its underlying moral framework. The analysis has exposed some of the implicit normative assumptions on which the Gini stands. Anyone using it to measure and make statements about inequality tacitly (and mostly unknowingly) agrees with the moral assumptions embedded in it. To name the three that have been highlighted in the preceding analysis:

- i) Changes in inequality should matter most when they occur in the middle of the distribution. Inequality that involves the tails is of lesser importance.
- ii) Inequality should be thought of as being independent of the level of wealth of a given society. Rich and poor populations should be judged by the same standards.
- iii) Extreme incomes should not matter much. The existence of a few extremely rich individuals should not determine the level of inequality of an entire population.

It can hardly be claimed that these essential traits can be disregarded as mere ‘quirks’ of the Gini. They influence inequality rankings made by Gini coefficients and thus fundamentally determine the normative judgements made about various types of distributions.

### 3.3 HIDDEN AND EXPLICIT PREFERENCES

It is now rather obvious that inequality indices have to conform to the conceptions of those that use them, rather than the other way around. If inequality is to be measured, it must be assessed by the normative standards and principles of moral agents, not mathematical formulas. Once this is accepted, practitioners and theorists alike might come to prefer those measures of inequality that are explicit about the value judgments they embody. This would serve to counter the current climate of ignorance: in which most measures hide their normative foundations so well that many believe they are judgement free. It is, however, impractical to construct new measures of inequality by the dozen, to accommodate each and every definition of inequality; and even if it were, it would not serve the desired purpose of encouraging transferability and comparability of results across different authors and disciplines. What might be done, however, is putting a larger emphasis on uncovering these 'hidden' properties. To make implicit value judgements explicit in order to allow users to make better informed choices, rather than just adopting a certain measure for convenience.

The Gini has little to speak for it when it comes to openness about its preferences, and it is this issue that has to be addressed if a meaningful dialogue about inequality is supposed to take place. Such a dialogue is instrumental in aligning the theoretical and empirical work on inequality with political and practical decision-making. Absence of such dialogue can only serve to cause confusion and the misalignment of goals and judgements.

### 3.4: INTELLIGIBILITY, THE LAYMAN AND PROBLEMS FOR POLITICAL PRACTICE

Judgements motivate actions, and it is hard to talk about inequality in any meaningful way without taking the policy dimension into account. Inequality of incomes is not just a topic of interest for experts and economic researchers; it is a matter of concern for most people in society and thus an important part of political decision-making. This consideration leads to the issue of intelligibility.

There are few non-specialists who could understand many of the measures of inequality or the propositions that are made using them. For example, the statement 'between the years 2000 and 2010, income inequality in the United Kingdom increased from 51.2 to 52.3 Gini points' does not help a lay person to understand the scope of inequality in the UK, nor is the increase of 1.1 Gini points open to any intelligible

interpretation. The Gini only allows vague interpretations and is not open to any intuitive understanding of inequality. This adds to the general problem of unfamiliarity of the general public with the measure. Even if every citizen knew about the Gini and its common value ranges, a certain level of inaccessibility would remain as a result, removing it further from public scrutiny and discourse.

Intelligibility for a large non-technical audience is crucial for any relevant policy variable.<sup>39</sup> Unless the public can understand what is meant by the figures, the democratic legitimacy of the political processes surrounding inequality is severely undermined. The same goes for the monitoring of the efforts made by political, their goals, promises, and achievements — without an intuitive understanding of what measures of inequality represent, accountability is forfeited.

The habit of the Gini to express its judgements in a rather cryptic language might provide the last reason (if any more were needed) to reject it, and along with it, a number of other equally opaque measures. Inequality is, at its heart, a social and political issue, and any variable that is not suited for public dialogue is therefore without much relevance. In this light, preference should be given to those measures that are simple to understand and explicit on their moral foundations.<sup>40</sup>

## CONCLUSION

The analysis in this article has shown that the conception that economic measures of inequality are objective and without bias is a myth that is accepted without much reflection, and works to the detriment of the discussion on inequality. What has been shown in detail for the Gini can be expanded to most other indices. It has been highlighted that inequality measures are mathematical constructs that essentially include normative judgements about the distributions they describe. Unless the perception of distributional justice ceases to be a subjective issue this means that there is no ideal measure of inequality.

The fact that inequality rankings might disagree with the principles and ideals of those who use them has been largely ignored. As a result of this ignorance, many actors on

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<sup>39</sup> Cf. Cobham & Sumner, 'Is It All about the Tails? The Palma Measure of Income Inequality'.

<sup>40</sup> Such as the Palma measure proposed by A. Cobham and A Sumner, Is It All about the Tails? The Palma Measure of Income Inequality.

the stage of the inequality discussion continue to believe theories and pursue goals that are at odds with their own convictions on the subject matter. To rectify this situation, a new consciousness is needed. Economists will have to stop focusing on devising ever more mathematically elegant measures, and start to uncover the normative foundations of the existing ones. On the other end, political and social scientists and practitioners must cease to accept economic measures without question, and educate themselves about the implicit assumptions that underlie them.

The measurement of an abstract, social, and normative concept is riddled with complications, and one cannot expect to grasp it without using moral principles in turn. Ultimately the choice of these principles should lie with the human observer, not with the tool he uses, and the discussion of the issues of equality and justice should not be limited by the availability of measures, nor influenced by their hidden preferences.

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Appendix - Tables and Figures:

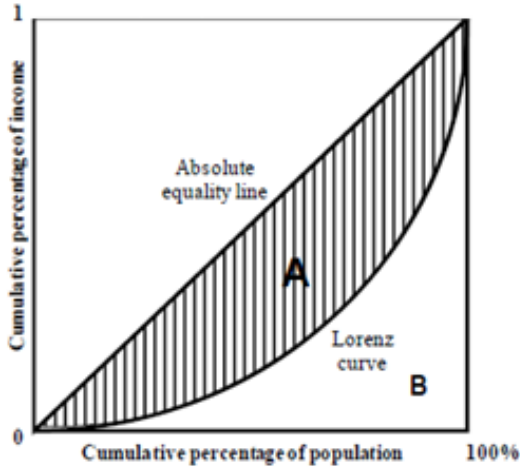


Figure 1 : Graphical representation of the Gini coefficient.

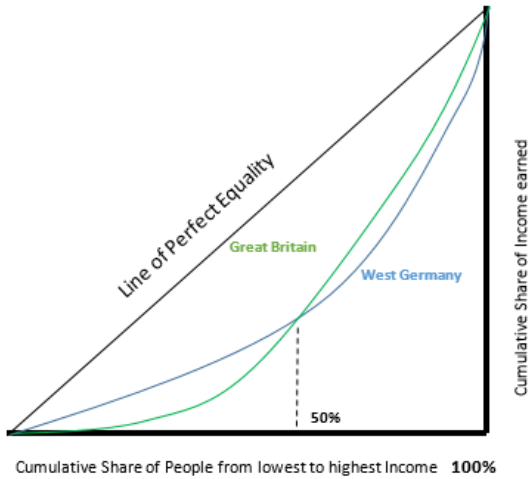


Figure 2: (illustration)