Welfare, State and Values: The winding road of the normative approach to inequality measurement (1912-1970)*

Ignacio Hauser**

(Univ Lyon, UJM Saint-Etienne, GATE UMR 5824, F-42023 Saint-Etienne, France)

Abstract:

This research is embedded in the general history of income inequality indices, whether or not they are linked to welfare. A notable discontinuity in the scientific production linked to the normative, ethical, or welfare-based approach to inequality measurement occurs between the first contribution proposed by Dalton (1920) inspired by Pigou (1912), and its return by Kolm (1966, 1969) and Atkinson (1970). This paper argues that this relegation was strongly driven by a claim of axiological neutrality proper to economics—well-captured by Robbins (1932)—which aspired to be a positive science free of ethical commitments. I establish multiple reasons leading to its return, and highlight the specific awareness in these contributions about the previous discussions of values in economics that sent it into exile.

Key words: Inequality measurement - normative approach - social welfare - ethical values - Public Finance - Public Economics.

1. Introduction

A constant feedback loop between policy debate and academic research in recent decades has brought to the table a growing concern about inequality and its political, social, economic and environmental effects (Piketty 2013, 2021). In the multiple ways of measuring inequality, the rank of a social state depends strongly on the index or distribution measurement tool chosen, as well as which dimensions (income, education, welfare, etc.) are considered. Thus, understanding each measure, the context of its creation, the foundations of its construction and the debates that emerge from it, becomes relevant when advising on measurement indices for public decision making.

The first attempts to measure personal income inequality by Vilfredo Pareto (1895, 1896/1897) and the subsequent work of authors such as Max O. Lorenz (1905), Corrado

* This paper is currently undergoing a Revise & Resubmit process at *The European Journal of the History of Economic Thought*. Please do not cite or distribute this article without the author's permission.

** CONTACT: ignacio.hauser@univ-st-etienne.fr, GATE Lyon-Saint-Etienne, Université Jean Monnet, F-42023 Saint-Etienne, France.

Gini (1909, 1910, 1912, 1914), Gaetano Pietra (1915) and Humberto Ricci (1916) were purely statistical exercises that sought to analyze the dispersion in the frequency distribution of a variable, such as income, wealth, or inheritances. Similarly, this method could be used to analyze dispersion in demographic, anatomical or physiological variables. The main rationale was to "describe", through quantitative tools and empirical data, the inequality of a given distribution in the most objective way possible.

Hugh Dalton (1920b) proposed an alternative measurement of inequality in terms of a *normative* notion of social welfare. He assumed that an increase in income inequality corresponded to a lower level of social welfare. This normative or welfare-based approach would be popularized by Anthony B. Atkinson (1970) [2].

By proposing a chronology of the evolution of the ideas, contributions and foundations of the normative approach to inequality measurement, we identify a discontinuity in the scientific production linked to it. After its emergence with Hugh Dalton (1920b) taking up concepts introduced by Arthur C. Pigou (1912), a decline of this approach continued in the following decades, for a later "rebirth" through the contributions of Serge-Christophe Kolm (1966, 1969) and Anthony Atkinson (1970). However, the evolution in the construction of such contributions, and, mainly, the reasons behind their decline and subsequent rebirth, have been completely neglected in the literature. Here, we attempt to fill this gap.

This paper argues that its relegation was mainly due to a pretension of axiological neutrality proper to economics, which aspired to be a positive science, where the normative foundations, value judgments and ethical commitments of such an approach were excluded.

On the other hand, we determine multiple reasons that lead to its "rebirth": an economic science that deals again with value judgments under its explicitness; a turbulent socio-economic context that brings to the forefront issues such as poverty and inequality; a greater availability of data; and the emergence of new tools coming from decision theory under uncertainty which were transferred to the measurement of inequality.

The paper is structured as follows. In the first section, we develop the proposition of a methodological and epistemological understanding of inequality by Pigou (1912) and Dalton (1920b), highlighting the emergence of a normative approach to inequality measurement. We discuss the context of its emergence, the role of inequality within their definitions of the field of Public Finance, and we argue the causes behind the relegation of this approach. In the second section, we highlight the rationale behind the rebirth of the normative approach to inequality measurement, taking up the work of Kolm (1966, 1969) and Atkinson (1970) and their respective contributions by placing the problem of distribution at the core of Public Economics. In the last section we set out the paper's conclusions.

[2] Even if we find a differentiation between "positive" and "normative" theory of income distribution in Tinbergen (1970), this distinction was not strictly linked to the measurement of inequality. We can probably attribute the nomenclature of "normative" measurement for the first time and the distinction with the "objective" or "positive" one to Sen ([1973] 1997: 2-3). He even later adds the terminology "ethical measurement" as an alternative for normative measurement (Sen 1978).

2. The birth (and decline) of the normative approach in the study of personal inequality problems (1912-1970)

We can say that, the normative, ethical, or social-welfare based approach to measuring inequality was conceived within the constructs of the first or "old" Welfare Economics (Mongin 2002). Having acquired its foundations from Alfred Marshall and consolidation of its structure through the efforts of Arthur Pigou, this First Welfare Economics pragmatically embraced a strong utilitarian heritage from Jeremy Bentham, which provided useful tools for the measurement and improvement of individual and collective welfare (Baujard 2017). Through the use of some tools, such as, the consumer surplus deepened by Marshall, or the distinction between private and social marginal cost proposed by Pigou, Old Welfare Economics proposed among its essential motivations the recommendation of public policies (Baujard 2016). Hence, practitioners proposed to study social welfare through the evaluation of individual utilities. Along the same lines, Pigou delved with precision into the study of the corrective role of the State (Mongin 2006: 21). Emphasizing the greatness of the practical task of economic science, Pigou was convinced to search for instruments to improve human life, since "misery", "the injurious luxury of some wealthy families" or "the terrible uncertainty overshadowing many families of the poor" were evils that could not be ignored (Pigou 1912: 488). Some years later, under the inspiration of his work, but certainly in a more radical way, Hugh Dalton (1920b) would take up his approach and formally propose the first normative measurement of inequality.

2.1. Pigou and the acceptance of inequality as a constraint to economic welfare: the "principle of transfers" and the explicit insertion of the State

Pigou arrived at *Wealth and Welfare* (1912) due to a need to understand the relationship between the general body of economic activity and the causes of unemployment, in which he had been interested in for several years. His book developed some of the ideas introduced and discussed by Alfred Marshall, Henry Sidgwick and John Maynard Keynes, retaining an influence of the thinking of these authors[3]. Both Marshall and Pigou would later earn the name of "fathers" of Welfare Economics.

Pigou raises the difficulty of defining welfare, and states that "it is the chief task of ethics to say, whether, and in what way, particular things belong to welfare" (Pigou 1912: 3). Economic welfare was "a part" of general welfare, being that which arose in connection with the earning and expenditure of the national dividend, and which could easily come into relation with the measuring rod of money (Pigou 1912: 3). Pigou claimed that even this economic welfare did not contain *all* the emerging welfare in a complete sense, so that it should be thought of as "a part of a part" of welfare. This did not in any way detract from the importance of the study of economic welfare, since Pigou suggested that to reach this conclusion "would be to misconceive the whole purpose of economic investigation" (Pigou 1912: 4). For the author:

[3] Pigou dedicated the book precisely to Marshall, and thanked Keynes for his careful reading and comments. For the legacy of Sidgwick's thought in Pigou's work, see O'Donnell (1979).

> That purpose is not primarily scientific, if by science we intend the single-eyed search after knowledge for its own sake. It is rather practical and utilitarian, concerned chiefly to lay bare such parts of knowledge as may serve, directly or indirectly, to help forward the betterment of social life. (Pigou 1912: 4)

His conception of the purpose of economic research was the backbone of all his work, and served as inspiration for the next generations of economists.

Although Pigou was concerned "not with measurement, but with causation" (1912: 19), as far as the personal distribution of income was concerned, he adopted a position that none of the authors linked to the study of inequality at that time dared to adopt: the recognition of less inequality as a benefit for economic welfare, on the one hand, and the explicit "responsibilization" of the State in the management of such inequality, on the other. His concern with inequality would naturally arise from his categorization between economic welfare and total welfare, where the distribution "among the people" and "over time" of the national dividend were preconditions for his own conception of welfare. Despite his own idea of the purpose of economic research, Pigou would continue to address both questions in a rigorous analytical manner in the next reprints of his work under the name *The Economics of Welfare* (1920).

Pigou (1912) puts forward three "important propositions" to structure his thinking. The first argues that any cause that increases the size of the "dividend" [4] without decreasing the absolute share of any group of its members is "likely" to increase the economic welfare of the community as a whole. The second proposition, and undoubtedly the one that would later become more popular, asserts that an increase in economic welfare is likely for anything that, other things being equal, "renders the distribution of the national dividend less unequal". Pigou goes further, and states that, under the assumption that all members of the community possess a similar temperament and that these members are only two,

> "it is easily shown that any transference from the richer to the poorer of the two, since it enables more intense wants to be satisfied at the expense of less intense wants, must increase the aggregate sum of satisfaction" (Pigou 1912: 24).

In this way Pigou introduced, for the first time, what would later be known as the "*principle of transfers*". It is interesting to note that, while at the same time in Italy Gini spoke of the "intensity" of a quantitative variable (Gini 1912: 3; 1914: 1204), Pigou spoke of the greater or lesser "intensity" of the desires to be satisfied. Although Pigou recognizes that in a society with more than two individuals this principle was more ambiguous, he believed that, under the assumption of similarity of temperament among the members, it could be shown that a decrease in the inequality of the distribution, in the sense of a decrease in the mean square deviation of the mean income, was likely to increase satisfaction. However, Pigou did not consider it necessary for his purpose "to

[4] Pigou borrows from Marshall the concept of "national dividend", a preliminary version of what will later evolve and become known as Gross Domestic Product (GDP).

give a precise definition of the meaning of a diminution in the inequality of distribution", since the existence of cases where one measure recorded an increase and another a decrease in inequality, made the author think that "these cases are not likely to be of large practical importance" (Pigou 1912: 25). Finally, in his third proposition, Pigou continues along the same lines, arguing that any introduction of a cause that decreases the variability, or inequality over time of the dividend, "and especially of that part of it which accrues to the poorer classes", is likely to increase the economic welfare of the community as a whole (Pigou 1912: 32).

Following this logic of State responsibility regarding distributive issues, Pigou (1928) would later naturally articulate the problem of inequality within its boundaries for the field of Public Finance. However, even if from the first page of his *Study in Public Finance* (1928) he recognized among the functions of the governing authority the public expenditure and the raising of revenue, his vision of inequality would be focused specifically on taxation. Along these lines, the author affirmed that "least aggregate sacrifice is an ultimate principle of taxation" and, therefore, all government activity should promote the welfare of its citizens to the greatest extent possible (Pigou [1928] 1947: 43)[5]. Pigou differentiated between "the form" in which the proceeds of total monetary taxation were distributed among persons "with different degrees of wealth" and, on the other hand, the "scheme of formulas" in which the particular responsibility of each taxpayer was defined (Pigou [1928] 1947: 55). Despite admitting the complicated interrelationships between these two aspects of taxation, both were to lead to the "principle of least sacrifice". The author clarified that the distributional aspect of taxation could only be considered useful in regard to tax schemes as wholes. Pigou was, however, opposed to excessive taxation. He argued that high rates for the rich had excessive effects on accumulation, while excessive rates on the poor brought harmful effects on efficiency. Thus, "an arrangement less severe both to the very rich and to the very poor" was necessary (Pigou [1928] 1947: ix). An example of this was his change of opinion regarding the capital levy, which he accepted for the payment of the debt incurred after the Great War, but then rejected once this had been achieved. This would not go unnoticed among some of his colleagues (Dalton 1928: 220-221).

For some, Pigou's concern for the social dividend led him to always cautious and rarely radical positions on redistribution or welfare provision (Collard 2014: 954). Even if, as we will see later, he was less radical than his colleagues, Pigou's ambition for a more egalitarian distribution was somewhat radical in itself, in an epistemological context where the assessment of distribution was strongly shaped by a purely descriptive approach. Even if in terms of redistribution issues the "principle of transfers" would later receive the greatest attention from economists of the Welfare Economics, Pigou's work was ahead of its time, addressing issues such as the "national minimum", unpaid domestic work and even air and environmental pollution by companies.

[5] Putting the airs and graces of the times, Pigou argued that "the day in which the welfare of one category of citizens could plausibly be ranked above that of another is past. Nobody would venture to claim now that a smaller amount of welfare accruing, say, to a nobleman should be preferred to a larger amount that might be made to accrue to a peasant" (Pigou [1928] 1947: 43).

2.2. Dalton and the turning point: the first normative approach to inequality measurement

In 1920, Hugh Dalton, a Welsh economist then lecturing at the *London School of Economics*, took up Pigou's work on welfare. Unlike his "master", however, Dalton was also concerned with the measurement of income inequality. Dalton had been interested in the study of income distribution since his student days at Cambridge. Inspired by the work of Edwin Cannan, in 1911, Dalton began his future *Some Aspects of the Inequality of Incomes in Modern Communities* (1920a). Interrupted in 1914 by four years of military service, he was not able to continue until May 1919. Dalton tells how due to the need to publish as quickly as possible, he ends up modifying his outline and excluding a large amount of material that he planned to include, mainly, a discussion on the measurement of inequality (Dalton 1920a, Preface: vii-ix). For this reason, in September 1920, the author published individually "The Measurement of the Inequality of Incomes" (1920b), an article that would mark the beginning of the normative approach to inequality measurement.

Dalton (1920b) lamented the inadequacy of the statistics of the time which made it difficult to measure and compare inequalities, the improvement of which was "the business of statisticians" (Dalton 1920b: 348). However, he believed that the problem of measurement should also be solved theoretically. Dalton disagreed with Warren M. Persons (1909), who had compared years before the work by economists in the measurement of wealth inequality with that carried out in the measurement of any inequality in a natural science (Persons 1909: 430-431). The latter meant adopting the role of a mere "observer of facts"—the distinctive feature of the first contributions to personal inequality measurement—whose objective was only the description of the existing inequality in the distribution. Dalton concluded that "for the economist is primarily interested, not in the distribution of income as such, but in the effects of the distribution of income upon the distribution and total amount of economic welfare, which may be derived from income" [6] (Dalton 1920b: 348).

Dalton assumes then that people's economic welfare is additive, that the relationship between income and economic welfare is the same for everyone, and finally, that, for each individual, as income increases, his or her marginal economic welfare decreases. In the same way as Pigou, he viewed social welfare "through resolutely utilitarian eyes" (Atkinson and Brandolini 2015: 210). These assumptions, led Dalton to infer that, if a given level of income is distributed among a group of people, it is "self-evident" that economic welfare will be maximized in a situation of total equality. Dalton's notion of social welfare was *normative* in the same way as Pigou's, where equality was necessary to achieve the greatest economic welfare in a society. However, Dalton was clear that inequality "though it may be defined in terms of economic welfare, must be measured in terms of income" (Pigou 1920: 349).

Dalton defines the inequality of a distribution as the ratio between the total economic welfare attainable under an egalitarian distribution and the total economic welfare

[6] Dalton provides a simple analogy, stating that a cultivator is not interested in rain as such, but in the effects of the rain on the crops that can be obtained from the land.

attained under the observed distribution. According to this definition, the ratio would be equal to 1 in the case of an egalitarian distribution, and greater than one for all unequal distributions.

Dalton considers it pertinent to propose a set of general principles, a set of "desirable properties" for any measure of inequality. He subsequently tests some of the existing statistical measures against his principles. Again, the choice of these desirable properties was normative in nature according to Dalton's own measurement proposition. However, there will be one in particular that will occupy the most attention: *the principle of transfers*[7]. The author tests the sensitivity to the transfers principle of absolute and relative versions of the "mean deviation from the arithmetic mean", the "standard deviation from the arithmetic mean", "Professor Bowley's quartile measure of dispersion" and Gini's "Mean Difference"[8]. Finally, Dalton discusses Pareto's controversial contribution, arguing it could not be tested, since according to Pareto's definition, the distribution was uniquely determined. For Pareto, regardless of time and place, there was a general tendency for the distribution of income to follow a certain curve. Giving a "law" character to this tendency, Pareto argued that income inequality depended much more on the "nature" of men than on the economic organization of society, therefore, any intervention or redistribution of income would not produce significant changes in distribution (Pareto 1897: 363). Thus, the principle of transfers and Pareto's definition went in diametrically different directions.

Dalton concludes according to the principle of transfers that the standard deviation and the Gini's Mean Difference "are good measures", "Bowley's quartile measure is a very indifferent measure", the mean deviation is a "bad measure", and that, finally, the Pareto measure "evades judgment" (Dalton 1920b: 354) [9]. However, Dalton recognized that the scope of the principle of transfers was limited, so he tested the measures under three additional principles: "*the principle of proportionate additions to incomes*", "*the principle of equal additions to incomes*" and "*the principle of proportionate additions to persons*"[10] [11]. After the tests, even if no measure passed the test of "proportionate

[7] Even though the introduction of the principle of transfers as a desirable property for the measurement of inequality is widely accorded to his article (Dalton 1920b: 351), we find that the author had already referred to this principle in his first book on several occasions, e.g. (Dalton 1920a: 346).

[8] In a review of Dalton's contribution, Atkinson and Brandolini (2015: 210), confuse Gini's "relative Mean Difference" with the Gini Coefficient, considering both as the same measure. It is important to clarify that Dalton only "tests" the Mean Difference proposed by Gini in 1912, and not so his concentration ratio *R* (or "Gini coefficient"), proposed in 1914. We can confirm this, first, in the fact that in Dalton's paper we only find citations to *Variabilità e Mutabilità* (1912), while we do not find any citation to *Sulla misura della concentrazione e della variabilità dei caratteri* (1914). Similarly, in the "clarification" reply that Gini (1921) makes to Dalton, the Italian scholar suggests the reading of some papers, among them his work "*Sulla misura*" of 1914, clarifying that "probably these papers have escaped Mr. Dalton's attention owing to the difficulty of access to the publications in which they appeared" (Gini 1921: 124).

[9] These tests of the transfer principle to existing measures, and its proposition as a desirable axiom for a measure of inequality, led Sen ([1973] 1997: 27) to rename it the "Pigou-Dalton condition", then evolved into "Pigou-Dalton transfer principle".

[10] For definitions of them, see Dalton (1920b: 355-357).

[11] Dalton was probably the first to propose a set of desirable properties for an inequality index, with the principle of transfers at the forefront. This procedure has been widely endorsed throughout history and up to the present day. Over time other properties were added. See Fleurbaey, Marc. 1996. *Théories économiques de la justice*. Economica.

additions to incomes", the relative measures were closer than the absolute ones. On the other hand, the absolute ones did not pass the test of "equal additions to incomes" either. For this reason, Dalton discarded the absolute measures for relative ones, and defined the same order of merit as according to the principle of transfers. While Dalton highlighted the advantage of his measure, which linked income to economic welfare and fulfilled the desirable properties, he also provided some advice in case of using the alternative measures.

One thing that is clear is that Dalton continued in the same normative vein as Pigou with respect to his vision of "*less income inequality, more economic welfare*", and of "*making the State responsible*" for the management of inequality. This is seen, for example, when the author highlighted the ineffectiveness of the average deviation according to the principle of transfers, making a direct association between such transfers with the provision of old-age pensions to those with small incomes, funded by a tax on high incomes (Dalton 1920b: 352). In this way, Dalton's greatest contribution was probably the inference of these two ideas coming from Pigou into the formal methodology for the measurement of inequality, establishing the principle of transfers as a "desirable property" for any measurement tool.

This line of thought was already present in his first book (1920a), where he argued that "the whole field of Public Finance is relevant" in issues of inequality (Dalton 1920a: 346). For him, "the whole of Public Finance", both from the point of view of income and expenditure, "resolves itself into a series of transfers of real income from certain persons to certain other persons, and a transfer from richer to poorer involves a reduction of inequality" (Dalton 1920a: 346). Like Pigou, Dalton reinforced and reaffirmed this position in subsequent works, particularly his *Principles of Public Finance* (1922).

A year after his paper on the measurement of inequality, Dalton reviewed some contemporary contributions to the study of Public Finance. He began by stating that it was a "peculiarity of English economists"—that unlike their American, French, Italian and German colleagues— "they do not write general treatises on public finance" (Dalton 1921: 199). Dalton had probably already identified the gap that he would seek to fill the following year with his textbook. He found multiple root causes behind such a "gap", but two of them were particularly relevant. First, he highlighted the fact that in England there was no chair of Public Finance at any university. Second, due to the permanence of a rather negative view in England of the economic activities carried out by the State, "the theoretical study of public expenditure has been neglected […] even more than elsewhere" (Dalton 1921: 200). For Dalton, the failure to overcome this tradition had practically circumscribed all theoretical discussion in the field of Public Finance to the problems of taxation, thus not allowing the development of a complete and exhaustive theory of this field. This idea would be key to Dalton's conception of the treatment of inequality and its insertion within the boundaries of his idea of Public Finance.

The author began the preface of his *Principles of Public Finance* with exactly the same argument. For Dalton (1922), Public Finance should be governed by the "Principle of Maximum Social Advantage", and he proposed three main criteria or "tests" for the pursuit of the principle. The first was the preservation of the community in its present form, against internal disorders and external attacks. The second and third, "the more

strictly economic tests" for the improvement of economic welfare, were improvements in production and improvements in the distribution of what was produced. The latter was nothing more than "a reduction in the great inequality" of the incomes of different individuals and families, and "a reduction in the great variability" between different time periods of the incomes of particular individuals and families (Dalton [1922] 1936: 11). This variability was intertwined with the better organization of production.

Dalton analyzed the distribution of the tax burden from the point of view of equity, with a particular interest in the progressivity of taxation. Under this analysis, he included income taxes, expenditure taxes, inheritance taxes, a general property tax, land taxes and corporate taxes. However, true to his fundamental argument, he focused on the direct and indirect effects of public expenditure on distribution, devoting the whole of Chapter XIX to it. In the last paragraph, Dalton stated that "the central problem of public finance is no less, and no more, so the problem of securing the best disposal of the economic resources of the community" (Dalton [1922] 1936: 239). Under this perspective, "public expenditure should reduce the inequality of incomes" (Dalton [1922] 1936: xiv). This difference in the ways in which Pigou and Dalton chose to address the problem of inequality, i.e., through public spending or not, appeared again as a normative choice. Dalton's point would become more evident in his review of Pigou's work *A Study in Public Finance*. Dalton (1928) criticized Pigou for the lack of an attempt to construct a theory of public expenditure, something he considered "by far the most serious gap in the modern literature of Public Finance" (Dalton 1928: 217). However, on the redistributive question, probably his harshest criticism was of Pigou's change of mind in relation to the capital levy. Dalton regretted that "the practical man [Pigou]" had "looked the facts in the face" and "conquered the analytical man", since these facts were nothing more than "the prejudices and misconceptions and timidities of influential men". For Dalton, Pigou's book was between "between two stools", that of the perfection of theory, and that of the practice of statesmanship guided by administrative officialdom. Dalton stressed the importance of having a balance in the study of Public Finance, since an excess of abstraction was apt "to seem especially unreal" while "an excess of conventional rule-of-thumb especially half-witted" (Dalton 1928: 221)[12].

2.3. The attack on ethics in economics: a decline for the normative … inequality measurement

A year later, Gini (1921) offered an "argumentative" response to Dalton's (1920b) critique. Gini clarified that "the methods of Italian writers" were not comparable to that of Dalton, since the former did not aim at estimating inequalities of economic welfare, but those of income and wealth, "independently of all hypotheses as to the functional relations between these quantities and economic welfare or as to the additive character of the economic welfare of individuals" (Gini 1921: 124). For Gini, the measurement of

[12] Recently, King (2019) stated that Dalton's work in the field of Public Finance was strongly driven by his belief in the need to reduce inequality, which, according to the author, was also his main motivation in advocating a tax on capital (King 2019: 305).

economic inequality was a purely statistical exercise aimed at analyzing the dispersion in the frequency distribution of income or wealth. Gini did not seek to analyze the effect of inequality on welfare, nor did he make any explicit assumption that greater equality was preferable. Its aim was only to *describe* the distribution. On the other hand, in response to Dalton's insinuation about a "packaged" approach only to income and wealth, Gini clarified that his methods were applicable to all other quantitative variables, be they economic, demographic, anatomical or physiological. However, as we will see in this section, besides Gini's response, there would not be many other reactions later on.

By analyzing different databases and bibliographic sources, Atkinson and Brandolini (2015) highlight the limited impact of Dalton's (1920b) paper in the years following its publication. Although there was the quick response by Gini (1921) and a critique on practical grounds by Dwight B. Yntema (1933), it received no more than a few superficial citations before Dalton's death in 1962. This relegation may be found not only for Dalton's paper, but also generally for the production of works related to the normative approach to inequality measurement. Thus, the vast majority of the literature identifies Dalton (1920b) and Atkinson (1970) as the main referents of the normative approach (see Sen 1973 and 1978; Osmani 1978; Silber 1999). No more than a few isolated works on the subject would be published, mostly in the 1970s (see Aigner and Heins 1967; Tinbergen 1970; Bentzel 1970).

There has not been much discussion in the literature about the 50-year pause to this approach. For Atkinson and Brandolini (2015) the relegation of Dalton's work was not necessarily due to a "lack of interest" in distributional issues, since during that time the debate over Pareto's Law continued (Bresciani Turroni 1939; Persky 1992). This was also the case for the Italian interwar and postwar literature, which fervently discussed the measurement of inequality in renowned journals such as the *Giornale Degli Economisti*, *Statistica*, or *Metron*—created in 1920 by Corrado Gini and still active (Gabutti 2020; Giorgi 1990). Instead, Atkinson and Brandolini (2015) identified its cause "possibly because of these practical and analytical difficulties [of Dalton's paper]", its "ahead of time" nature, which would not be fully understood until the post-war developments of the theory of social choice under uncertainty. Superficially this is plausible especially given Dalton's short academic career. After seventeen years as Lecturer (1919-1920), Reader in Commerce (1920-1925) and Reader in Economics (1925-1936) at the *London School of Economics*, where he combined his academic career with a political career, in 1936 he finally decided to give up academia to devote himself full time to politics[13]. However, this does not explain the scarcity of citations of his work, nor the lack of scientific production linked to this approach.

Certainly, the arrival of the Great Depression, as well as the years following WWII, led the economic discipline to focus its efforts on other issues, especially macroeconomic ones, such as price formation and economic growth (Ramos Pinto and Paidipaty 2020).

[13] Anyone interested in the history of WWII would be fascinated by Dalton's political career, where as Minister of Economic Warfare he created and headed the famous "SOE" (Special Operations Executive) sabotage team, which trained civilians without any military experience in the tasks of espionage and "disloyal" techniques, to be later sent to be part of the resistance in the countries occupied by the Nazis in Europe.

The study of inequality was not a priority for economic science. In the U.S., a wave of macroeconomist scholars emerged in the late 1930s peaking in the early 1960s, shaping the policy-making process and focusing their main concern on issues linked to growth, inflation, employment, stability or productivity (Berman 2022). Under a "growthmanship" dynamic, much of the hope was pinned on an economic growth that would bring prosperity (Schmelzer 2016). Simon Kuznets' (1955) pioneering paper where he highlighted the link between economic growth and income inequality as "central to much of economic analysis and thinking" was a consequence of this dynamic (Kuznets 1955: 26).

However, more or less as a priority, to a greater or lesser extent, the measurement of inequality during this period was not through the normative approach. I argue that his relegation was mainly the product of an epistemological pretension proper to economic science, i.e., the exclusion of ethical issues, value judgments and all the *normative* in economics.

In 1932, Lionel Robbins published his *Essay on the Nature and Significance of Economic Science*, a work that would not go unnoticed in the academic world (Backhouse and Medema 2009a, 2009b, 2009c). Robbins materialized and formalized some ideas that had been in the air since the times of Pareto—that economic science was a positive science—, its foundations coming from facts and observation. He had already anticipated his idea of change for economics during the inaugural lecture delivered at the *London School of Economics* on January 30th, 1930. There, Robbins described an economic science "too deductive and theoretical", which needed to progress towards historical and statistical inductions that would allow it to discover "laws of economic behavior". This would enable economic science to be placed "on a basis of equality with the Natural Sciences" (Robbins 1930: 20). Technicality should be embraced if necessary, and it should be known that this economics would not be accessible to all: "The days are gone when Political Economy was a fit subject for a gentleman to study in his moments of relaxation" (Robbins 1930: 23). For Robbins (1932), any ethical question or value judgment was not part of a positive science, and was therefore outside of economic science. Such a conception, where interpersonal utility comparisons were forbidden as not being part of an observable positive science, determined the very evolution and foundations of Welfare Economics (Baujard 2017). The "New Welfare Economics" emerged and developed between the 1930s and 1950s, where the only non-controversial normative criterion was the Pareto criterion (Mongin 2002 and 2006; Baujard 2017). Any redistributive issue was excluded from its framework, postponing the "principle of transfers" from its toolbox (Baujard 2016). A clear separation was marked between the role of the economist and that of the politician. The latter was ultimately to make the decision to redistribute or not, after evaluating the "objective" information obtained by the economist (Samuelson 1947). Although Robbins did not refer specifically to the measurement of inequality or to Dalton's paper (1920b), his conception of economic

science attacked the tools and structure of the normative approach to inequality measurement[14].

Robbins complained of an erroneous use of the Law of Diminishing Marginal Utility as a criterion for all forms of political and social activity affecting distribution. He argued that the implicit adoption of the Law of Diminishing Marginal Utility as an assumption for each individual, coupled with the possibility of making interpersonal utility comparisons, had led to an interpretation that whatever led to greater equality without adversely affecting production was justified by this law, and whatever led to inequality, condemned. Robbins stated that these propositions were "the basis of much that is written on the Theory of Public Finance" and that it was "safe to say that the great majority of English economists accept them as axiomatic" (Robbins 1932: 120-121). According to the law, the more real income the individual possesses, the less his additional income units are valued; therefore, the marginal utility of a rich man's last dollar is less than the marginal utility of a poor man. Under such an assumption, any "progressive" transfer from the rich to the poor was considered to increase total utility. It is not difficult to see that Robbins' argument targeted the principle of transfers proposed by Pigou (1912) and Dalton (1920b)[15].

Even if Robbins admitted that the plausibility of the premise of a relationship between transfers and Diminishing Marginal Utility was "overwhelming", he argued that it was misleading, since it took the law into a field in which it was totally "illegitimate". Robbins claimed that the law departed from his fundamental conception of economic goods, making assumptions that could not be verified through observation or introspection. Reiterating his rejection of interpersonal utility comparisons, he argued that it was not possible to evaluate the magnitude of the satisfaction of a person *A* compared to that of a person *B*. For him such an extension of the Law of Diminishing Marginal Utility and its rationale lacked scientific foundation. There is probably no clearer and more precise description than the following:

> The Law of Diminishing Marginal Utility does not justify the inference that transferences from the rich to the poor will increase total satisfaction. It does not tell us that a graduated income tax is less injurious to the social dividend than a non-graduated poll tax. Indeed, all that part of the theory of Public Finance which deals with "Social Utility" goes by the board. Interesting as a development of an ethical postulate, it is entirely foreign to the assumptions of scientific Economics. It is simply the accidental deposit of the historical association of English Economics with Utilitarianism. (Robbins 1932: 125)

To attack the assumption of Diminishing Marginal Utility, the foundations of the principle of transfers, and the normative notion between social welfare/utility and income, was to attack the essence of the normative approach to inequality measurement, as well as an important part of the practical application basis of Public Finance in distributive matters. This attack on its key assumptions and tools would leave its aftermath.

[14] In his book Robbins only made a slightly incorrect reference to Dalton's *Some Aspects of the Inequality of Incomes in Modern Communities* (1920b), citing it as *Inequality of Incomes* (Robbins 1932: 64).

[15] Somewhat paradoxically, it was Dalton who, during his tenure at the LSE, recommended hiring Robbins (Peacock 2008: 360).

Backhouse (2009) situates Robbins' argument of "non-scientificity" of interpersonal utility comparisons within a much broader argument, i.e., the interrelations between ethics and economic science. In this case, the normative approach would similarly fall under the orbit of this broader argument. Robbins was clear arguing that propositions involving "ought" were on an entirely different plane from those involving "is".

We have seen how Robbins' publication and his claim of axiological neutrality for economic science had determining consequences both for Welfare Economics (Backhouse 1985; Blaug 1997; Baujard 2016, 2017 and 2021) and for the discipline in general (Backhouse and Medema 2009a, 2009b, 2009c). The normative approach to inequality measurement was no exception, and its relegation was strongly influenced by the pretensions of the time to a positive economic science free of ethical considerations.

Recently, Sandmo (2015) commented on how the study of income distribution being so closely tied to normative questions of equity and fairness, has meant that many economists, seeking a value-free version of their research, have tended not to consider it. However, Sandmo also comments on how others have found the connection attractive and have taken up the challenge of deepening the distinction between positive and normative questions of distribution (Sandmo 2015: 5). After Dalton's (1920b) publication, it would take several decades for the latter to happen.

3. Revisiting the "rebirth": Kolm and Atkinson's contributions to the measurement of inequality in the service of (public) economics

Much of the literature agrees on a massive revival in interest in the measurement of inequality starting in 1970 (Sen 1992: 93; Atkinson and Brandolini 2015: 212). As the architect of this revival, all roads point to a single name: *Anthony Barnes Atkinson*. In 1970, the young academic from Caerleo, South Wales, the same homeland as his intellectual inspiration, Hugh Dalton, published his "On the Measurement of Inequality". In just under 20 pages in the *Journal of Economic Theory*, the paper would mark a break in the history of the study of the measurement of inequality (Giorgi 1990: 184; Sen 1992: 97; Giorgi 1993: 87; Brandolini, Jenkins and Micklewright 2018: 185).

Before considering Atkinson, we first need to examine the contribution of *Serge-Christophe Kolm*. In 1966, on the occasion of the *International Economic Association* conference, Kolm presented his paper "The Optimal Production of Social Justice", where he outlined several seminal contributions to Public Economics, the analysis of social justice, and the measurement of inequality. His article was distributed during the conference in English and French, and a volume of the conference was subsequently published in French (1968) and English (1969).[16]

In the acknowledgements of his paper, Atkinson realized that he had not discovered Kolm's work until after his paper was accepted for publication (Atkinson 1970: 262), and admitted in a footnote the priority of Kolm's publication as a turning point in the subsequent revival (Note by A. B. Atkinson, in Atkinson and Brandolini 2015: 212).

[16] This conference was a "seedbed" of great contributions to Public Economics, for example, as was also the case of Richard A. Musgrave and Paul A. Samuelson. See Desmarais-Tremblay (2017).

Lambert (2007) highlighted some key concepts and results from Atkinson's paper, which had already appeared in Kolm's work. Among them, the "heart" of Atkinson's contribution stands out, i.e., the concept of "*equally distributed equivalent*" level of income, historically attributed to Atkinson, also the concept of "*cost of inequality*", or even a similar presentation of Atkinson's index, as Kolm called it, the "*relative injustice per dollar of social income*" (Kolm [1969] 2001: 280).

The issue had been scarcely mentioned in the literature on inequality, or even presented in the sparse literature on the history of inequality measurement. Silber (1999) highlighted this problem, arguing that "unfortunately" Kolm's important publication only became known much later, "so that it is really Atkinson's (1970) paper 'On the Measurement of Inequality' which, I believe, specialists in the history of economic thought would consider as actually having launched the research on the topic" (Silber 1999: 2-3) [17].

Having said this, we can ask ourselves how two scholars in different continents, different university networks, and with different backgrounds and training, arrive individually and without any previous contact at very similar results, using analogous tools. We will see below that the answer to this question will probably be intrinsically linked to the reasons that would lay the foundations and allow the "rebirth" of the normative approach, as well as an important part of the take-off in interest in inequality measurement after Atkinson's publication in 1970.

3.1. Value judgments, social unrest and new tools: Discussing some causes behind the "rebirth"

Robbins' (1932) publication ignited a heated debate around value judgments in economic science. This debate would touch different branches of the discipline, as well as the tools used for public decision making, including those linked to the measurement and evaluation of distributional problems.

During the 1930s and 1940s, the New Welfare Economics, with referents from the British approach such as Nicholas Kaldor, John Hicks and Tibor Scitovsky, and the American approach, including Abraham Bergson and Paul Samuelson, excluded all value judgments from their analysis and limited themselves only to the Paretian criterion, thus clearly separating the roles between the politician and the scientist/economist[18].

An alternative approach was proposed by Ian Little (1950), later supported by Richard Hare (1952) and Ezra Mishan (1960). Little (1950) stressed the difficulty of not incurring in value judgments when discussing distributional issues in welfare economics, where the objective was to advise public decision-making and achieve improvements in the social welfare. Little proposed to "overcome" the problem through an explicit manifestation or statement of the values adopted or decided to incur. This approach, contemporarily called

[17] As an illustration, a quick search in Google Scholar (09/20/2022) shows 1051 citations for Kolm's article (adding both English and French versions), versus 9521 citations for Atkinson's article. In addition, bibliometric studies place Atkinson's 1970 paper among the most cited articles published between 1970 and 2002 in major peer-reviewed economic journals (Kim, Morse and Zingales 2006: 193, Table 2). It is important to note that Kolm's article, which is over 40 pages long, only addresses inequality measurement in sections 6 and 7. The rest of the work is mainly known for its contributions to the then emerging field of Public Economics.

[18] For a detailed description of each approach and nuances, see Baujard (2016).

"the transparency requirement" (Baujard 2021: 215), marked a middle ground between the two extremes that dominated the epistemological environment of Welfare Economics, i.e., the incursion into value judgments of the First Welfare Economics, or the exclusion of the New Welfare Economics. However, it was necessary to make these values explicit in a neutral way, through tools that would allow the formalization and quantification of normative criteria. In pursuit of this quest, the "social welfare approach" was developed under the heritage of the Bergson-Samuelson school of the New Welfare Economics and the Social Choice, where its "quantifying device of intersubjective neutrality" for excellence was the Social Welfare Function (SWF), which allowed the analysis of situations and to classify them according to clear normative criteria (Baujard 2021: 217). Both the "transparency requirement" and the explicitness of a "quantifying device of intersubjective neutrality" became extremely relevant, not only because they offered an alternative approach, but also because they would inspire and constitute the backbone of Atkinson's contribution (1970).

Cherrier and Fleury (2017) highlighted how during the immediate post-war period, economists became increasingly involved in the daily activity of policy design and evaluation, which even led them to orient their theoretical developments towards the practical applications. Such involvement often implied assuming normative positions, in an epistemological context of economic science that increasingly demanded an analysis free of any value judgments or ethical implications. Unlike the 1950s, when economists tended to emphasize the similarities between the values of individuals through notions such as "public interest", the work of the 1960s on public policy emphasized conflict as a distinctive feature of societies, reflecting the growing social unrest and discontent during the 1960s (Cherrier and Fleury 2017: 33).

Unrest and discontent would be particularly evident in the social and institutional life of the United States, where issues such as poverty and inequality would rise to the fore. The set of domestic programs—"The Great Society"—established in 1964 by Democratic President Lyndon B. Johnson made clear the need to respond to pressing issues such as poverty and racial injustice. Social scientists would have a major influence in launching this "war on poverty" (Forget 2011). This program exposed the inequalities in income and access to basic goods between the deep South—with a large majority of black Americans—and the North of the country, where notable disparities prevailed in housing sanitation, access to education or investment in communities. A system where black Americans were disproportionately excluded prevailed, and where business and middle-class opposition to taxation and public spending put a limit on the different social security and work programs (Brown 1999). This inequality was also evident in the Vietnam War drafts, where there was a sense of defending a homeland that did not defend them[19]. Thus, the Civil Rights movement laid its foundations in a striking political, economic and social inequality.

[19] In his "Beyond Vietnam" speech delivered at Manhattan's Riverside Church on April 4, 1967, Dr. Martin Luther King Jr. stated: "We were taking the black young men who had been crippled by our society and sending them eight thousand miles away to guarantee liberties in Southeast Asia which they had not found in southwest Georgia and East Harlem" (Luther King Jr., 1967).

This social dynamic also began to take hold and influence the evolution of other disciplines. Laslett and Runciman (1969) highlighted a "revival" of political philosophy in the English-speaking world during the 1960s, and a renewed interest in the prescriptive discussion of social and political issues (Laslett and Runciman [1967] 1969: 1-3). The authors emphasized an operation of "containment" and even "counterattack" against positivism, where issues such as rights, justice, or racial discrimination featured prominently in the works of the time. A similar dynamic would occur in the literature on development economics, with notable contributions from authors such as Gunnar Myrdal or Theodore Schultz, both Nobel laureates in the subject during the 1970s.

Kolm was precisely in the U.S. since 1963, holding a position at Harvard, where he would prepare his seminal contribution to the normative approach to inequality measurement[20]. It was in this dynamic that new theoretical and applied efforts in Public Economics developed. The 1966 "Public Economics" conference of the *International Economic Association* manifested these new interests, bringing together Paul Samuelson, Amartya Sen, Richard Musgrave and Serge Kolm.

Somewhat interestingly, Atkinson also spent a year in the U.S. between 1966 and 1967, working as a research assistant for Robert Solow at the *Massachusetts Institute of Technology* (Brandolini, Jenkins and Micklewright 2018). This sojourn probably also gave him a quick insight into the turbulent airs of the time. When he returned to the UK in 1967, the context was somewhat different, but also with a conflicting socio-economic scenario emerging. From the end of the WWII, the British Welfare State had faced structural problems including an aging population, an increasing burden of pension expenditure on the Social Security budget, and the problem of the incomes of low-paid workers. This situation probably led Atkinson (1969) to focus his efforts on research related to poverty and the British Social Security System. He did not deal "directly" with the problem of inequality until his celebrated 1970 publication (Tomlinson 2020: 523). After "On the Measurement", he would consolidate his involvement in policy issues linked to distributional questions with his book *Unequal Shares: Wealth in Britain* (1972). His work did not go unnoticed, and it began to shift the focus from the strong tradition of poverty studies in Britain to distributional issues. Under increasing pressure, the Labour government established the *Royal Commission on the Distribution of Income and Wealth* (1974), which represented the desire by the government to conciliate with the trade unions on disagreements over wages[21]. From then on, Atkinson would establish taxation as the main workhorse for reforms on redistribution issues.

In addition to an evolution in response to the epistemological needs of the time, along with a turbulent socio-economic context conducive to the treatment of distributional problems, we cannot ignore the influence of greater availability and computing power of microdata from household surveys and administrative records. This stimulated empirical research and applications that the previous databases did not allow. In the United States,

[20] We can think that for Kolm the situation was enhanced, given that in France during the 1960s a student, worker and then union unrest was brewing, which would trigger the "May '68". Kolm never dissociated himself from France, even securing a 6-month work agreement in each country during his stay at Stanford. His concern with "May '68" is cited as an example in later works (Kolm 1976: 419).

[21] This account about the British political context in which Atkinson's work on inequality emerges is extracted from Tomlinson (2020).

the 1967 *Survey of Economic Inequality* was particularly attractive as it was one of the few sources of individual data, relating to a small sample of 3,203 male heads of household (Atkinson and Stiglitz [1980] 2015: xv).

There was another particularly crucial factor that led to the development of the contributions of Kolm (1966/1969) and Atkinson (1970), as well as to the subsequent "revival". This was the availability of new tools and results from other branches of the discipline and their application to distribution problems. These mainly came from *decision theory under uncertainty*.

Certainly, a key starting point was the book *Theory of Games and Economic Behavior* (1944) by John von Neumann and Oskar Morgenstern. The later called "von Neumann-Morgenstern utility function" allowed to guide the behavior of a decision maker under uncertainty, being widely adopted in decision theory due to its properties capturing whether decision-makers are risk-averse, risk-neutral or risk-lovers.

However, Harsanyi (1953) was probably the first to include under the same idea the concepts of income distribution, social welfare, cardinal utility in Welfare Economics and the theory of choices involving risk. In just two pages, his paper planted a clue to be investigated, i.e., a potential relationship between the social welfare of Welfare Economics and the theory of choices involving risk. Putting forward an idea very similar to what Rawls called later "the veil of ignorance"[22], Harsanyi (1953) asserted that a value judgment regarding income distribution would reach its maximum level of impersonality if the one making it was completely unaware of his own relative position in the chosen system, and, above all, if he had the same chance of obtaining any possible position on the income scale. For Harsanyi, "this choice in that hypothetical case would be a clear instance of a 'choice involving risk'", and he concluded that an analysis of impersonal value judgments concerning social welfare suggested a close affinity between the concept of cardinal utility of welfare economics and the concept of cardinal utility of the theory of choices involving risk (Harsanyi 1953: 435). Harsanyi continued to further develop this line of research in other major and influential contributions, like *Cardinal Welfare, Individualistic Ethics, and Interpersonal Comparisons of Utility* (1955) or his *Essays on Ethics, Social Behavior, and Scientific Explanation* (1976).

The 1960s would bring additional contributions from decision theory under uncertainty by John Pratt (1964), Kenneth Arrow (1965), or Michael Rothschild and Joseph Stiglitz (1969), linked to the measurement of a decision-maker's risk aversion. These provided multiple insights including the "*certainty equivalent*", the "*proportional risk premium*" and the "*concept of a mean preserving spread*", which allowed for parallels applicable to inequality measurement tools. Kolm (1966, 1969) and Atkinson (1970) based their contributions on the measurement of inequality on these tools and the results of decision theory under uncertainty.

[22] See Rawls, John. 1971. *A theory of justice*. Cambridge (Mass.), USA: Harvard University Press.

3.2. Kolm, social justice, and the distribution of welfare as "one of the raisons d'être and fundamental social functions of the public economy"

Kolm received an engineering education at the *Ecole Polytechnique* and the *Ecole Nationale des Ponts et Chaussées*, two prestigious French institutions known for their rigor in mathematical theory and formalism. He belongs to a tradition, that of the so-called French "engineer-economists" (Fleurbaey et al. 2011: 7). Kolm grew up during the German occupation of France, witnessing a period of extreme inequality, deprivation and needs. He even admits to finding in this experience a part of his interest in economics and social ethics (Lambert 2012: 60). Very early in his training Kolm became formally interested in economic issues, especially the income distribution, redistribution and the effect of income transfers on inequalities. He prepared his dissertation on these topics, directed by François Divisia (co-founder of the *Econometric Society* and *Econometrica*) and Paul Lévy (renowned mathematician and engineer). After some years as a "senior civil servant" in Senegal and collaborations with public organizations in France, Kolm received a letter from Vassily Leontieff inviting him to Harvard. He accepted and took up a position in 1963[23]. It was during his stay at Harvard that Kolm prepared his paper for the 1966 Biarritz conference.

Kolm (1969) put on the table an essentially normative and social welfare-based approach to the measurement of inequality, which constituted the backbone of social justice, the latter constituting the backbone of Public Economics. For Kolm, useful study of Public Economics necessarily required an explicit analysis of social justice, and the distribution of welfare was "one of the *raisons d'être* and fundamental social functions of the public economy" (Kolm [1969] 2001: 251). Kolm argued that this question was intertwined with the problem of efficiency, and the disjunction between the two was found in practically all problems of Public Economics.

Kolm believed it was necessary to reflect on the normative aspects of welfare distribution, i.e., about "social justice," arguing that most welfare economists tried "to get rid" of this problem "instead of trying to solve it" (Kolm [1969] 2001: 251). He was clearly referring to the economists of the New Welfare Economics. Kolm was well aware of the heated debates around value judgments and normative issues in economics that had taken place in the preceding decades. Even if we see much less present this "ambition" to make value judgments explicit in his work than we see in Atkinson's, Kolm did not overlook the question. For him, the definition of the optimal distribution of welfare did not result from any value judgment made by an economist, but the economist had to play the role of an "observer" of the value judgments and opinions of citizens. In this perspective, Kolm asserted that a "useful" normative economics was therefore "a positive science since its basis is the *objective* observation of subjective opinions" (Kolm [1969] 2001: 253). This idea ran throughout Kolm's work, and probably led him to coin the term "*isophily*" (liking equality) to characterize what would later become popular under the term "*inequality aversion*" (Lambert 2007: 214)

[23] All these details of his biography and more can be found in Lambert (2012).

According to Kolm, in all questions of taxation, public spending, regulation and so on, the problems of distributive and compensatory justice were present. Following this line, per capita social income could not be considered as a good measure of the welfare of a society, since it omitted the "consumption" of social justice. Like his predecessors Pigou and Dalton, Kolm believed this compensatory justice could be realized from income transfers or the *transfers principle*, which he calls "*rectifiance*", by choosing the optimal progressivity of income taxes.

In a long and cumbersome paper, Kolm argued we should go beyond the mere observation that certain distribution of individual incomes may be unequal, or more or less equal. In formal terms only, he defended that the measure of the injustice due to the inequality of a given distribution depended on how one judge that inequality does worsen the social state, independently of the average individual income in this social state. Kolm stated that the assessment of an income distribution depended on the "*equal equivalent*" of the distribution, which he defined as "the individual income which, if everybody had the same income, would yield a situation as good as the one under consideration" (Kolm [1969] 2001: 254). For a given unequal distribution x and a given attitude towards inequality, the equivalent income $\bar{\bar{x}}$ may depart from the actual average income $\bar{x}$ of this distribution. Kolm concluded that the "*injustice*" of the distribution could be measured by "the difference between the per capita income and this equivalent" (Kolm [1969] 2001: 254). Kolm introduced an absolute index i capturing the injustice derived from the perception of the inequality of the distribution, which he called "*the injustice per person*": $\bar{\bar{x}} - \bar{x}$; and he also introduced the corresponding relative index $\hat{\imath}$, —*i.e.* the ratio of this absolute index on the average income—, which he called "*injustice per dollar of social income*"[24]*:*

$$\hat{\imath} = \frac{i}{\bar{x}} = \frac{\bar{\bar{x}} - \bar{x}}{\bar{x}} = 1 - \frac{\bar{\bar{x}}}{\bar{x}} \qquad (1)$$

The bigger the deviation between the equal equivalent $\bar{\bar{x}}$ and the average income $\bar{x}$, the higher the index of injustice.

Within the range and scope of his contributions, Kolm was particularly known for his pioneering contributions to Public Economics. His understanding, definition, and conceptualization of inequality and social justice were at the core of his own idea of what Public Economics should be. As he explained, "most of the Biarritz paper is not about the theory of inequalities", rather the "basic novelty was to emphasize that income distribution is a public good—a joint concern" (Kolm's statement, in Lambert 2012: 61).

Perhaps Kolm's experience as a member of "*les grands corps de l'État*" influenced the lesser emphasis on the explicitness of values in his work than in Atkinson's work. Kolm's involvement in development programs in Africa led him to pursue social justice and combat inequality and deprivation first on the ground in an applied way, and then

[24] For the full development and preconditions, see Kolm [1969] (2001): 279-280.

theoretically. His open proposition of the need for a normative economics, or his view of distribution as a "public good", are probably in the same direction. As Marc Fleurbaey, Maurice Salles and John Weymark (2011) comment, the combination of his academic activity in conjunction with his constant links with French ministries and government agencies, for which he carried out various studies of applied Public Economics, were decisive in his seminal works. Under a feedback dynamic, practice provided him with ideas for theory, while theory helped him to solve practical problems. This can be seen, for example, in his *Introduction à la Théorie Economique de l'Etat: Les Fondements de l'Economie Publique* (1964), in his pioneering work on multidimensional inequality, or in his questionnaire approach to analyzing inequality (Fleurbaey, Salles and Weymark 2011).

3.3. "Any measure of inequality involves judgements about social welfare": Atkinson's measurement device as a tool for public decision making

After finishing school and working for IBM for a year, Atkinson went to Hamburg to volunteer for 9 months in a hospital in a deprived community. This experience marked a starting point for some of the concerns that would later run through his research career. Returning to Cambridge, Atkinson began studying mathematics, but after a year switched to economics. After graduating in 1966, his interest in research led him to spend a year in the U.S., an interest that continued on his return, however, he decided not to pursue a PhD. In 1967, he obtained a fellowship at St John's College, Cambridge, where he would conceive his 1970 paper[25]. Atkinson's paper reversed a trend regarding the interest of academics in the measurement of personal inequality. As he mentioned in his 1970 paper, his interest in the question of inequality measurement was originally stimulated by reading a preliminary version of the article by Michael Rothschild and Joseph Stiglitz (1969). In this he probably also justifies the adoption of the meta methodology of his work, i.e., the parallels with the measurement of risk in the theory of decision-making under uncertainty and the use of some of his results for the measurement of inequality.

Atkinson claimed there was a gap to be filled both regarding the conceptual issues behind the measurement of inequality and its theoretical foundations. He lamented the "conventional approach in nearly all empirical work", which simply adopted "some summary statistic of inequality", this "with no very explicit reason being given for preferring one measure rather than another" (Atkinson 1970: 244).

Following Dalton (1920b), Atkinson defended that any measure of inequality implied some concept of social welfare. At first, on the basis of decision theory under uncertainty, the Lorenz curve, and the adoption of the *principle of transfers*, Atkinson proposed a framework through which it was possible to obtain rankings between two distributions without the need to know the form of the social welfare function. This was a purely ordinal ranking, which suited the requirements of ordinal comparisons aspired to—while opposing cardinal comparisons—by the New Welfare Economics. However, Atkinson showed that this ordinal ranking allowed only a comparison between two distributions,

[25]All these details of his biography were extracted from Brandolini, Jenkins, and Micklewright (2018).

and did not allow to determine the precise level of inequality in each. In order to obtain rankings between multiple distributions based on a comparable measure of inequality of each one, Atkinson argued that it was necessary to specify the form of the social welfare function.

Adopting the *principle of transfers*, but formally departing from Dalton's approach, Atkinson's measure was explicitly based on decision theory under uncertainty. Atkinson introduced what he called the "*equally distributed equivalent*" level of income (y_{EDE}), defined as "the level of income per head which if equally distributed would give the same level of social welfare as the present distribution" (Atkinson 1970: 250). He clarified the closeness between the concept of "*equally distributed equivalent*" level of income and that of "*certainty equivalent*" in decision theory under uncertainty[26]. Atkinson made a parallelism of the attitudes towards risk and towards inequality: a decision maker is "inequality lover", "inequality averse" and "inequality neutral", depending on whether y_{EDE} is lower, higher or equal to the actual average income (μ) of the distribution $Y = y_1, \dots, y_n$. Thus, a greater inequality is perceived when y_{EDE} is far from the average income (μ) in the distribution, i.e., depending on the value of $\mu - y_{EDE}$. Now expressed as a ratio of the mean of the current distribution, Atkinson obtained a general measure of inequality I:

$$I = 1 - \frac{y_{EDE}}{\mu} \qquad (2)$$

which ranged from 0 (complete equality) to 1 (complete inequality).

Asserting that "y_{EDE} is simply the analogue of the certainty equivalent and I is equal to the proportional risk premium as defined by Pratt"[27] (Atkinson 1970: 251), Atkinson chose a specific form of the social welfare function. Precisely, he selected a "C.E.S. utility function" for the utility of income: the constant elasticity of substitution (C.E.S.) of this function, noted ε, captured the (constant) degree of aversion towards inequality. After a number of developments, he derived the following form of the inequality index:

$$\begin{cases} I(Y) = 1 - \left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\mu}\right)^{1-\varepsilon}\right]^{\frac{1}{1-\varepsilon}} & for\ \varepsilon \neq 1, \\ I(Y) = 1 - \prod_{i=1}^{n}\left(\frac{y_i}{\mu}\right)^{\frac{1}{n}} & for\ \varepsilon = 1. \end{cases} \qquad (3)$$

The central idea of the normative approach proposed by Atkinson rests then on the choice of the parameter ε, which aims to explicitly capture the degree of aversion to inequality within the social welfare function. Therefore, the higher the value of ε chosen,

[26] The "certainty equivalent" is the sum of money or guaranteed return that a decision maker would accept, rather than take the risk of obtaining a perhaps higher, but uncertain, return. An absolute measure of risk premium (among other potential measures) is the difference between the certainty equivalent and the average outcome. If it is equal to zero, the decision maker reveals his neutrality towards risk; if it is positive, he is a risk lover; if it is negative, he is risk averse. This tool thus makes it possible to determine decision-makers' attitudes towards risk, which can be reflected in the form of their utility functions (Guyse 2001).

[27] See Pratt, John Winsor. 1964. "Risk aversion in the small and large". *Econometrica* 32: 122–136.

the more inequality-averse the decision-maker is. On the other hand, an ε equal to zero implies an inequality-neutral decision maker.

Regarding the arrival at the concept of y_{EDE}, in a footnote, Atkinson explained that "this line of approach was suggested to me by discussions with David Newbery" and that "it also resembles the work of Mirrlees and Stern in a quite different context" (Atkinson 1970: 250). This measure, based on the concept of *equally distributed equivalent*, had a fundamentally redistributive essence. For Atkinson, an important part of its attractiveness was that it allowed comparing "the gains from redistribution with the costs that it might impose—such as any disincentive effect of income taxation—and with the benefits from alternative economic measures" (Atkinson 1970: 250). Like Kolm, Atkinson thought of his index as a tool to support public decision-making.

For Atkinson, contributions up to that time had concentrated on the problem of the choice between different summary measures for measuring inequality. In this process, discussions were held on the ease of calculation or interpretation, the range of variation or the information that was necessary to have on the distribution under study. However, for Atkinson, "the central issue clearly concerns the underlying assumption about the form of the social welfare function that is implicit in the choice of a particular summary measure" (Atkinson 1970: 253). Thus, he probed and presented the implicit assumptions about the form of the social welfare function embodied in five conventional measures, i.e., the variance, the relative mean deviation, the coefficient of variation, the Gini coefficient and the standard deviation. To this end, Atkinson evaluated such measures according to a set of desirable principles, in particular inequality aversion and the principle of transfers, taking also into account the relative sensitivity of the measures at different income levels. He concluded, by examining such assumptions implicit in the conventional measures, that "they have properties which are unlikely to be acceptable, and in general there are no grounds for believing that they would accord with social values" (Atkinson 1970: 262).

Atkinson stated the major advantage of his index was the fact that it allowed the social welfare function to be "explicitly" specified, so that the principles and values underlying this social welfare function chosen by each researcher could be "sincerified". In order to overcome this "misleading" conventional method of approach, Atkinson believed it more reasonable to consider directly the social welfare function we would like to employ, rather than "indirectly" by means of conventional summary statistical measures. He recognized the difficult task of choosing and agreeing on the desirable form of the function to adopt. However, this method offered the possibility of discarding those with less conciliation, but, above all, "to emphasise that *any* measure of inequality involves judgements about social welfare" (Atkinson 1970: 257).

Finally, we can ask ourselves why Kolm's contribution to the measurement of inequality went unnoticed for so many years, while Atkinson's gained such notoriety, even for much of the literature being the trigger for the increase in interest in research on the subject (Giorgi 1990: 184; Sen 1992: 97; Giorgi 1993: 87). Lambert (2007) suggested that "perhaps his [Kolm] penetrating and elegant deductive style, which is also very condensed, was difficult for economists to grasp?" (2007: 214). Later, Lambert (2012) asked Kolm his opinion on the matter, to which Kolm replied: "You were talking of

mathematical writing. This style was rather usual in French scientific work you should see the works of my friend Gérard Debreu, not to mention Bourbaki!" (Kolm's statement, in Lambert 2012: 67).

On the other hand, before the late 1980s, only a handful of Kolm's articles were published in English and none of his books (Fleurbaey et al. 2011: 5). This meant that multiple results, especially those related to Public Economics, were only confined to the French-speaking world. However, this was not the case for his seminal articles on inequality, which were published in English from the beginning and in prestigious journals[28]. Moreover, we can also think his use of very odd terms such as "*rectifiance*" or "*isophily*", where the lack of intuition of previously non-existent terms ends up making their adoption very complex[29]. Another explanation for the lack of recognition could be the insularity of his research[30]. Probably all these reasons had some influence, but, nevertheless, the complexity, the extensive formalisms and the mathematical technicality were perhaps, paradoxically, his Achilles heel in the popularization and recognition of his contributions. As an illustration, in the references of his 1977 paper, a pioneering article in the multidimensional approach to the measurement of inequality, we find only four people referenced: three mathematicians for their respective publications in mathematical journals, and himself, citing four of his previous works[31].

Many would likely agree that an important part of the relevance and subsequent widespread popularity of Atkinson's contribution was the "user-friendly" aspect of his tool. Despite Kolm's chronological paternity of multiple results, Atkinson was able to arrive at his results by transparently explaining the tools employed, as well as by intuitively highlighting the parallels coming from other branches of the discipline. In this respect, Atkinson also developed the tools to the end, while Kolm remained at a higher level of generality that made the application of inequality measures a more complex task. While remaining technical, Atkinson deserves recognition for his contributions, but also for his ability to communicate and to present a clear, useful and operational tool for public decision making. As Sandmo (2017) argued, "he typically took up problems that had been classical policy concerns in the established literature and that could be illuminated by use of the new tools of analysis" (Sandmo 2017: 614).

This would be particularly reflected in *Lectures in Public Economics* (1980), in which inequality issues would occupy a central place. Under the influence of the new developments and tools available, but especially of the much greater availability of data at the end of the 1960s, Atkinson and Stiglitz (1980) incorporated explicit models to evaluate the impact of taxation and public spending on income inequality. In *Lecture 9*, the authors address the questions: "How does fiscal policy affect the inequality of

[28] Kolm, Serge-Christophe. 1976. "Unequal inequalities I." *Journal of Economic Theory* 12: 416–42.
— 1976. "Unequal inequalities II." *Journal of Economic Theory* 13: 82–111.
—1977. "Multidimensionnal egalitarianism" *The Quarterly Journal of Economics* 91: 1–13.

[29] We can think of the case of Pareto's "ophélimité", which ended up being scarcely adopted.

[30] In a quick search of his publications on normative economics, theory of justice, equality, and inequalities, we find approximately 6 books, 65 published papers and 30 research documents, all written by himself alone, with no co-authors linked.

[31] See "*Les choix financiers et monétaires*" (1966) ; "*The Optimal Production of Social Justice*" (1969) ; "*Justice et équité* " (1972) ; "*Unequal inequalities I* " (1976).

incomes?" and, "Does the benefit from public spending go mainly to those with low incomes, and who bears the tax burden?". For Atkinson and Stiglitz's Public Economics, as well as Dalton's Public Finance, the problem of inequality must be addressed on both fronts, i.e., taxation and public spending. In addition to analyzing the incidence of taxation and the allocation of the benefits of public spending, the authors considered "the present-day distributional issues" and the dynamic impact of the policy, i.e., taking into account its effect on capital accumulation and the extent of intergenerational redistribution (Atkinson and Stiglitz [1980] 2015: 216). Additional issues such as inheritances, the transmission of earning power, and the role of chance or "luck" were also included. Despite a considerable gap between theory and empirical work, which led them to use proxy measures or supplementary hypotheses, Atkinson and Stiglitz contributed new results to the analysis of the inequality problem and the role of public decision in the latter. They later reaffirmed the "centrality" of distributional concerns in Public Economics, arguing that "restricted to efficiency considerations in a world of identical agents would fail to address the key questions of public policy" (Atkinson and Stiglitz [1980] 2015: xx).

Multiple contributions would stimulate research interest in inequality measurement in the decades following Atkinson's 1970 paper. Amartya Sen (1992) emphasized how "the connection between inequality and social welfare has […] been invoked more often than any other" (Sen 1992: 94)[32].

4. Concluding remarks

In this paper I have proposed a sequential investigation of the main contributions of the normative approach to inequality measurement, its underlying ideas, and some of the evolving debates. This approach proposed an alternative measurement of inequality in terms of a *normative* notion of social welfare, in which it was assumed that a decrease in income inequality was desirable since it brought with it a higher level of welfare. I have highlighted its emergence, its consequent relegation, and its subsequent rebirth, developing the main reasons behind these dynamics.

The normative approach was conceived within the "Old" Welfare Economics and under a strong utilitarian heritage. Taking up some key concepts and ideas from the work of Pigou (1912), Dalton (1920b) made the first significant contribution to the normative measurement of inequality. Both the recognition of lower inequality as a benefit for economic welfare and the explicit "responsibilization" of the State in the management of such inequality would be at the core of the contributions of both economists. However, they had different views on this management of the problem of inequality, according to their own delimitations of the field of Public Finance. While for Pigou this problem was

[32] Amartya Sen's contributions played a significant role in this wave of interest. Sen repeatedly highlighted the shortcomings of the normative approach to inequality measurement (Sen 1972, 1973, 1978, 1992), and would later propose his understanding of inequality through his capability approach. Jacques Silber (1999) argued that Atkinson, Kolm and Sen "are the three scholars mainly responsible for the explosion of research which has taken place in this field during the past thirty years" (Silber 1999: 2).

to be addressed through taxation, for Dalton, on the other hand, it was to be addressed through taxation and public expenditure.

I have also argued how, under an epistemological ambition that claimed axiological neutrality for economic science (Robbins 1932), the assumptions, tools, and thus the structure of the normative approach to inequality measurement came under attack, being subsequently relegated to the sidelines for several decades.

I have identified multiple reasons that led to the rebirth of the normative approach to inequality measurement beginning with Kolm (1966, 1969) and Atkinson (1970), as well as to the subsequent "revival" in interest from the 1970s onwards. These include: the greater involvement of economists in public policy in a turbulent socio-institutional context, in which problems such as poverty or inequality are brought to the fore; an economic science that returned to dealing with value judgments under conditions of their explicitness; the greater availability of data; and the appearance of new tools from other branches of the discipline, especially from decision theory under uncertainty. The normative approach of Dalton, Kolm and Atkinson, managed to penetrate and insert itself into a more general dynamic emerging in the 1960s, which was beginning to be known as *Public Economics*. Both Kolm and Atkinson were major contributors, and placed the question of inequality at the center of their delimitation of this new field.

We can outline some additional concluding remarks. First, a continuity around the same normative notion of social welfare—and of the influence of inequality on the latter—is observed both in the normative approach of Dalton (1920b) under the inspiration of Pigou (1912) and in the approaches proposed by Kolm (1966, 1969) and Atkinson (1970). However, there is also an important difference. While Pigou and Dalton's approach "adopted" and implicitly assumed value judgments, Kolm and Atkinson's approach called for an "explicitness" of them. This paper argues that such "awareness" and explicitness in Kolm and Atkinson's approach appears as a "learning" from the epistemological discussions that led to the exile of Dalton's proposition. In this way, both Kolm and Atkinson were part of the "debated issue of the relevance of normative concepts in the economic study of the public sector" (Kolm 2010: 687). Second, we have identified that, although inequality in distribution has occupied a central role both in the field of Public Finance and later in Public Economics, the ways of addressing this problem through the tools of the State have not necessarily been the same, oscillating between taxation and public spending. Third, we see that, despite the differences among the various contributions to the normative approach to inequality measurement, as among the ways of addressing distributional problems, there is a systematic association of the "*principle of transfers*" to their definitions and thus to their tools for measuring inequality.

Acknowledgments

A first version of this paper was presented at the 25th ESHET Conference in Padua, Italy, and a second version at the EJHET Workshop "From Public Finance to Public Economics" in Graz, Austria, and at the 24th ESHET Summer School "Inequality and social justice in economics and beyond" in Strasbourg, France. I would mainly like to thank the editors of the Special Issue, Maxime Desmarais-Tremblay, Marianne Johnson and Richard Sturn for their valuable comments and suggestions on each

presentation, which greatly improved this paper. I would also like to thank Steven G. Medema, Herrade Igersheim and André Lapidus for their careful reading and constructive criticism. Finally, I thank Antoinette Baujard for her follow-up and advice throughout the whole evolution of this paper. All errors are my own.

Disclosure statement

No potential conflict of interest was reported by the author.

References

Aigner, Dennis J., and Arthur J. Heins. 1967. "A social welfare view of the measurement of income equality." *Review of Income and Wealth* 13 (1): 12–25.

Arrow, Kenneth Joseph. 1965. *Aspects of the theory of risk-bearing*. Helsinki: Yrjö Jahnsonian Sä ̈tiö.

Atkinson, Anthony Barnes, and Andrea Brandolini. 2015. "Unveiling the Ethics behind Inequality Measurement: Dalton's Contribution to Economics." *The Economic Journal* 125 (583): 209–34.

Atkinson, Anthony Barnes, and Joseph Eugene Stiglitz. [1980] 2015. *Lectures on Public Economics*. Princeton, USA, and Oxford, UK: Princeton University Press.

Atkinson, Anthony Barnes. 1969. *Poverty in Britain and the Reform of Social Security*. London: Cambridge University Press.

Atkinson, Anthony Barnes. 1970. "On the Measurement of Inequality." *Journal of Economic Theory* 2 (3): 244–63.

Backhouse, Roger Edward, and Steven George Medema. 2009a. "Defining economics: The long road to acceptance of the Robbins definition." *Economica* 76: 805–20.

Backhouse, Roger Edward, and Steven George Medema. 2009b. "Retrospectives: On the definition of economics." *Journal of economic perspectives* 23 (1): 221–33.

Backhouse, Roger Edward, and Steven George Medema. 2009c. "Robbins's Essay and the Axiomatization of Economics." *Journal of the History of Economic Thought* 31 (4): 485–99.

Backhouse, Roger Edward. 1985. *A History of Modern Economic Analysis*. Oxford: Basil Blackwell.

Backhouse, Roger Edward. 2009. "Robbins and welfare economics: a reappraisal." *Journal of the History of Economic Thought* 31(4): 474–84.

Baujard, Antoinette. 2016. "Welfare Economics." In *Handbook of the History of Economic Analysis*, Vol. 3, edited by Gilbert Faccarello and Heinz D. Kurz, 611–23. Cheltenham, UK: Edward Elgar Publishing Limited.

Baujard, Antoinette. 2017. "L'économie du bien-être est morte. Vive l'économie du bien-être !" In *Philosophie économique : Un état des lieux*, edited by Gilles Campagnolo and Jean-Sébastien Gharbi, 77–128. Éditions Matériologiques.

Baujard, Antoinette. 2021. "Values in Welfare economics." In *The Routledge Handbook of Philosophy of Economics*, edited By Conrad Heilmann and Julian Reiss, 211–22. New York: Routledge.

Berman, Elizabeth Popp. 2022. *Thinking like an Economist: how efficiency replaced equality in U.S. public policy*. Princeton, US: Princeton University Press.

Blackorby, Charles, Walter Bossert, and David J. Donaldson. 2005. *Population issues in social choice theory, welfare economics, and ethics*. No. 39. New York: Cambridge University Press.

Blaug, Mark. 1997. *Economic Theory in Retrospect. 5th Edition*. Cambridge, UK: Cambridge University Press.

Brandolini, Andrea, Stephen P. Jenkins, and John Micklewright. 2018. "Anthony Barnes Atkinson." *Biographical Memoirs of Fellows of the British Academy* 17: 179–90.

Bresciani Turroni, Costantino. 1939. "Annual Survey of Statistical Data: Pareto's Law and the Index of Inequality of Incomes." *Econometrica* 7 (2): 107–33.

Brown, Michael K. 1999. *Race, money, and the American welfare state*. Ithaca, US: Cornell University Press.

Collard, David. 2014. "Pigou's Wealth and Welfare: a centenary assessment." *Cambridge Journal of Economics* 38 (4): 945–60.

Dalton, Hugh. [1922] 1936. *Principles of public finance,* 3rd Edition. London, UK: Routledge & Kegan Paul Ltd.

Dalton, Hugh. 1920a. *Some Aspects of the Inequality of Incomes in Modern Communities*. London: Routledge.

Dalton, Hugh. 1920b. "The Measurement of the Inequality of Incomes." *The Economic Journal* 30 (119): 348–61.

Dalton, Hugh. 1921. "Some Recent Contributions to the Study of Public Finance." *Economica* (2): 199–206.

Dalton, Hugh. 1928. "Book Review: *A Study in Public Finance* by A. C. Pigou." *Economica* (23): 216–21.

Desmarais-Tremblay. 2017. "Musgrave, Samuelson, and the Crystallization of the Standard Rationale for Public Goods." *History of Political Economy* 49 (1): 59–92.

Fleurbaey, Marc, Maurice Salles, and John A. Weymark. 2011. "An Introduction to Social Ethics and Normative Economics." In *Social Ethics and Normative Economics*, 1–18. Berlin, Heidelberg: Springer.

Fleurbaey, Marc. 1996. *Théories économiques de la justice*. Economica.

Forget, Evelyn. 2011. "A Tale of Two Communities: Fighting Poverty in the Great Society." *History of Political Economy* 43(1): 199–223.

Gabbuti, Giacomo. 2020. "Between Pareto and Gini: The Origins of Personal Inequality Measurement in Italy, 1894–1939." *History of Political Economy* 52 (3): 435–54.

Gini, Corrado. [1910] 2001. "Concentration and Dependency Ratios." In *Roots of the Italian School of Economics and Finance: From Ferrara (1857) to Einaudi (1944)*, 2, edited by Mario Baldassarri and Pierluigi Ciocca, 355–75. Houndmills UK: Palgrave.

Gini, Corrado. 1909. "Il diverso accrescimento delle classi sociali e la concentrazione della ricchezza." *Giornale degli Economisti* 38 (Anno 20): 27–83.

Gini, Corrado. 1912. *Variabilità e Mutuabilità. Contributo allo Studio delle Distribuzioni e delle Relazioni Statistiche*. Bologna: C. Cuppini.

Gini, Corrado. 1914. "Sulla misura della concentrazione e della variabilità dei caratteri". *Atti del Reale Istituto Veneto di Scienze, Lettere Ed Arti* 73: 1203–48.

Gini, Corrado. 1921. "Measurement of Inequality of Incomes." *The Economic Journal* 31 (121): 124–26.

Giorgi, Giovanni Maria. 1990. “Bibliographic portrait of the Gini concentration ratio.” *Metron* 48 (1-4): 183–221.

Giorgi, Giovanni Maria. 1993. “A fresh look at the topical interest of the Gini concentration ratio.” *Metron* 51 (1-2): 83–98.

Guyse, Jeffery. 2001. “Certainty equivalence”. In *Encyclopedia of Operations Research and Management Science*, edited by Saul I. Gass and Carl M. Harris, 83–4. New York: Springer.

Hare, Richard Mervyn. 1952. *The Language of Morals*. Oxford: Clarendon Press.

Harsanyi, John Charles. 1953. “Cardinal Utility in Welfare Economics and in the Theory of Risk-taking.” *Journal of Political Economy* 61 (5): 434–35.

Kim, E. Han, Adair Morse, and Luigi Zingales. 2006. “What Has Mattered to Economics Since 1970.” *Journal of Economic Perspectives* 20 (4): 189–202.

King, John Edward. 2019. “Hugh Dalton (1887–1962).” In *The Palgrave Companion to LSE Economics*, edited by Robert A. Cord, 289–310. London: Palgrave Macmillan.

Kolm, Serge-Christophe. [1969] 2001. “The Optimal Production of Social Justice”. In *The Economics of Poverty and Inequality*, vol. I, edited by Frank Cowell, 2003, 251–94. Cheltenham and Camberley, UK: Edward Elgar Publishing.

Kolm, Serge-Christophe. 1976. “Unequal inequalities I.” *Journal of Economic Theory* 12 (3): 416–42.

Kolm, Serge-Christophe. 2010. “History of public economics: The historical French school.” *The European Journal of the History of Economic Thought* 17 (4): 687–718.

Kuznets, Simon. 1955. “Economic Growth and Income Inequality.” *The American Economic Review* 45 (1): 1–28.

Lambert, Peter James. 2007. “Serge Kolm's ‘The Optimal Production of Social Justice’.” *Journal of Economic Inequality* 5 (2): 213–34.

Lambert, Peter James. 2012. “An interview with Serge-Christophe Kolm.” *Social Choice and Welfare* 38 (1): 59–83.

Laslett, Peter, and Walter Garrison Runciman. [1967] 1969. *Philosophy, Politics and Society: Third Series*. Oxford, UK: Basil Blackwell.

Little, Ian Malcolm David. 1950. *A Critique of Welfare Economics*. Oxford: Oxford University Press.

Lorenz, Max Otto. 1905. “Methods of Measuring the Concentration of Wealth.” *Publications of the American Statistical Association* 9 (70): 209–19.

Luther King Jr., Martin. “Beyond Vietnam: A Time to Break Silence.” (Manhattan's Riverside Church, New York, U.S, April 4, 1967).

Mishan, Ezra Joshua. 1960. “A Survey of Welfare Economics, 1939–1959.” *The Economic Journal* 70: 197–265.

Mongin, Philippe. 2002. “Is there progress in normative economics?” In *Is there progress in economics?*, edited by Stephan Boehm *et al*., Ch. 10, 145–70. Cheltenham, UK, and Northampton, MA, USA: Edward Elgar.

Mongin, Philippe. 2006. “Is there progress in normative economics?” *Economics and Philosophy*, 22 (1): 19–54.

Morgenstern, Oskar, and John Von Neumann. [1944] 1947. *Theory of games and economic behavior*, 2nd Edition. Princeton, US: Princeton University Press.

O'Donnell, Margaret G. 1979. “Pigou: an extension of Sidgwickian thought.” *History of Political Economy* 11 (4): 588–605.

Osmani, Siddiqur R. 1978. “On the Normative Measurement of Inequality.” *The Bangladesh Development Studies* 6 (4): 417–42.

Pareto, Vilfredo. 1895. “La legge della domanda.” *Giornale degli economisti* 10 (Serie Seconda, Anno 6): 59–68.

Pareto, Vilfredo. 1896–97. *Cours d’économie politique*. Lausanne: F. Rouge.

Peacock, Alan. 2008. “Dalton, Edward Hugh John Neale.” In *The New Palgrave Dictionary of Economics*, edited by Steven N. Durlauf and Lawrence E. Blume, 360. Hampshire: Palgrave Macmillan.

Persons, Warren M. 1909. “The variability in the distribution of wealth and income.” *The Quarterly Journal of Economics* 23 (3): 416–49.

Pietra, Gaetano. (1915) 2014. “On the Relationships between Variability Indices (Note I).” *Metron* 72 (1): 5–16.

Pigou, Arthur Cecil. [1928] 1947. “*A study in public finance*”, 3rd Edition. London: Macmillan & Co.

Pigou, Arthur Cecil. 1912. *Wealth and welfare*. London: Macmillan & Co.

Piketty, Thomas. 2013. *Le capital au XXIe siècle*. Paris: Éditions du Seuil.

Piketty, Thomas. 2021. *Une brève histoire de l'égalité*. Paris: Éditions du Seuil.

Pinto, Pedro Ramos, and Poornima Paidipaty. 2020. “Introduction: Measuring Matters.” *History of Political Economy* 52 (3): 413–34.

Pratt, John Winsor. 1964. “Risk aversion in the small and large.” *Econometrica* 32 (1/2): 122–36.

Ricci, Umberto. 1916. “L'indice di variabilità e la curva dei redditi.” *Giornale degli economisti e rivista di statistica* 53 (3, Anno 27): 177–228.

Robbins, Lionel. 1930. “The Present Position of Economic Science.” *Economica* 28: 14–24.

Robbins, Lionel. 1932. *An essay on the nature and significance of Economic Science*. London, UK: Macmillan.

Rothschild, Michael and Joseph Eugene Stiglitz. 1969. “Increasing risk: A definition and its economic consequences.” *Cowles Foundation Discussion Paper 275.*

Samuelson, Paul Anthony. 1947. *Foundations of economic analysis*. Cambridge, MA: Harvard University Press.

Sandmo, Agnar. 2015. “The principal problem in political economy: income distribution in the history of economic thought.” In *Handbook of income distribution*, vol. 2, edited by Anthony B. Atkinson and François Bourguignon, 3–65. Oxford, UK: Elsevier.

Sandmo, Agnar. 2017. “Tony Atkinson 1944–2017: A Lifetime Commitment to the Study of Inequality.” *The European Journal of the History of Economic Thought* 24 (3): 612–23.

Schmelzer, Matthias. 2016. *The hegemony of growth: the OECD and the making of the economic growth paradigm*. Cambridge, UK: Cambridge University Press.

Sen, Amartya. 1972. “Utilitarianism and inequality.” *Economic and Political Weekly*: 343–44.

Sen, Amartya, and James Eric Foster. 1973 [1997]. *On Economic Inequality*. Oxford: Clarendon Press.

Sen, Amartya. 1978. “Ethical Measurement of Inequality: Some Difficulties”. In *Personal Income Distribution*, edited by Wilhelm Krelle and Anthony F. Shorrocks, 81–94. Amsterdam: North-Holland.

Sen, Amartya. 1992. *Inequality Reexamined*. New York: Russell Sage Foundation.

Silber, Jacques (ed). 1999. *Handbook of income inequality measurement*. New York: Springer Science & Business Media.

Tinbergen, Jan. 1970. “A positive and a normative theory of income distribution.” *Review of Income and Wealth* 16 (3): 221–34.

Tomlinson, James. 2020. “Social Democracy and the Problem of Equality: Economic Analysis and Political Argument in the United Kingdom.” *History of Political Economy* 52 (3): 519–38.

Yntema, Dwight Baldwin. 1933. “Measures of the Inequality in the Personal Distribution of Wealth or Income.” *Journal of the American Statistical Association* 28 (184): 423–33.