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A.C. Pigou's Wealth and Welfare.

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Author: McLure, Michael

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Abstract: This paper marks the centenary of A.C. Pigou's *Wealth and Welfare*, published by Macmillan in 1912. Consideration is given to the content and contributions of *Wealth and Welfare* and its relationship to Pigou's earlier articles; its relationship to Pigou's subsequent work on wealth and welfare; its reception within the broader economics community; and its relationship to Marshall's approach to economics. In contrast to the conclusion of a recent study it is suggested in this paper that Pigou's general approach to wealth and welfare was complementary to, and not contrary to, the work of Marshall. *Wealth and Welfare* is a book that makes important and enduring contributions to economics, but it does so while remaining firmly within the Marshallian tradition.

1 Introduction

Wealth and Welfare was the first major book on economics that A.C. Pigou wrote after succeeding Alfred Marshall to the Chair of Political Economy in the University of Cambridge. His election to the professorship had been fiercely contested and, although Alfred Marshall was not an elector, he was active in supporting Pigou's appointment and Marshall's role in that process has been the subject of some critical assessment (Coase 1972; Coates 1972; Groenewegen 1995). *Wealth and Welfare* represented the first opportunity for the 35 year old Pigou to make a substantial theoretical statement that would stamp his authority as Marshall's legitimate successor.

But as behoves the most important ideas of great scholars that become progressively more influential over time, streams of dissenting and alternative ideas emerge in opposition. In the case of Pigou some prominent economists from outside the Cambridge tradition came, over time, to react decisively against aspects of 'Pigouvian' welfare economics. In something of a curiosity, however, there has been a delayed challenge to the Marshallian roots of part of Pigou's work, which has its origins in Marshall's annotated comments on his personal copy of *Wealth and Welfare*. Since then, some historians have gone as far as to suggest that the gap between Marshall and Pigou on the treatment of welfare issues was so fundamental that the two masters considered 'externality' type issues in an entirely different way.

This commemorative paper is presented in seven sections. Overviews of the major elements of *Wealth and Welfare* are presented in sections 2 to 4 inclusive. The significance of *Wealth and Welfare* for Pigou's subsequent economic work is discussed briefly in section 5. The reactions to Pigou's work--both in terms of initial book reviews and the more substantive longer term critical reactions--are considered in section 6. The paper concludes in section 7 with the suggestion that *Wealth and Welfare* is an influential Marshallian treatise which proved to be one of the most important twentieth century books on welfare economics.

2 A Framework for Considering Wealth in Relation to Welfare

Perhaps the first point to note in a paper that commemorates the centenary of *Wealth and Welfare* is that Pigou's prior scholarship--undertaken as a student, fellow and finally professor--was a significant influence on the development of this book. (1) First, and probably most obviously, the book formally extended Marshall's analysis to questions of economic welfare, with Pigou's formative thinking on those questions progressively developed in articles published in the *Economic Journal*. 'Some remarks on Utility' (2002 [1903]), 'Monopoly and Consumer Surplus' (2002 [1904]) and 'Producers' and Consumers' Surplus' (2002 [1910]) are most notable in that regard. Second, and perhaps less obviously, Pigou's preparatory reflections on individuals, consciousness and society as a student of ethics and a student of poetry were also to prove significant (McLure, 2013a). *Wealth and Welfare* is not simply a treatise on the neoclassical approach to welfare economics. Rather, it is a work prepared by a scholar schooled in the moral sciences, with Henry Sidgwick, the Cambridge philosopher and ethicist (and economist), exerting an influence on Pigou in significant ways (Myint 1948; O'Donnell 1979; Medema 2009; Daunton 2010; Tribe 2011). He was also influenced by the 'British idealism' associated with the Oxford philosopher T.H. Green.

The resulting book is presented by Pigou in four parts. The first part, 'welfare and the national dividend', discusses the general relationship between wealth and welfare. It commences with a quote from G.E. Moore's *Principia Ethica*, which, in truncated form, states that 'good is good ... it cannot be defined' (Moore, cited by Pigou 1912: 3). Pigou argued that the same is true of welfare, though, notwithstanding this, he asserts that 'ethics' have something to say about what things belong to 'welfare' and writes two general propositions about 'welfare' and the purpose of *Wealth and Welfare*. First, welfare includes states of consciousness only. Second, welfare can be considered by categories such as 'greater or lesser'. Pigou then presents his taxonomy of what is 'good' by prescribing 'economic welfare' as just one part of 'welfare', the part that directly concerns the 'national dividend' (or 'the community's net income that easily enter into relation with the measuring rod of money') and its allocation. (2) 'Welfare' and 'economic welfare' are broadly correlated, but they are not synchronised to the point where a change in 'economic welfare' necessarily yields an equal change in 'welfare'.

Within that context, Pigou (1912: 66) defines economic welfare with reference to social changes which, other things being equal, increase economic welfare in a probabilistic sense. The three social changes that he associates with an increase in economic welfare are: 1) 'an increase in the size of the national dividend'; 2) an 'increase in the absolute share of the national dividend accruing to the poor'; and 3) a 'diminution in the variability of the national income, especially of the part accruing to the poor'. To simplify exposition in this paper, the above-mentioned 'changes' are respectively referred to as the 'wealth-efficiency' criterion; the 'distributive fairness' criterion; and the 'macroeconomic stability' criterion.

From Pigou's general introductory discussion of the relationship between wealth and welfare it is clear that he regards the relative 'harmony' and 'disharmony' between each of these three criteria as a fundamental issue in welfare economics. Economic welfare is enhanced, at least in a probabilistic sense, when an outcome meets one or more of these three criteria and there is no disharmony with the remaining criteria/criterion. For example, economic welfare would be increased if an improvement in distributive fairness had no adverse impact on either wealth-efficiency or macroeconomic stability. But, very significantly, Pigou does not rule out the possibility of economic welfare improving even in the face of 'disharmony', such as when disharmony is only evident in the short run.

3 Wealth and Efficiency

Part II of the book, 'the magnitude of the national dividend', is the largest part, accounting for almost half of the total text, and contributed to Pigou establishing himself as an authority on the measurement of national income (Collard 2002: xxxi). It also contains Pigou's single most enduring idea, as well as his single most criticised idea, in the field of welfare economics.

The first chapter deals with Pareto's law: the proposition that the income of the poor changes in the same direction as changes in aggregate national taxable income. Pigou's purpose is to roundly criticise Pareto's empirical and analytical work in support of that law. While the critical analysis in Pigou's chapter is flawed in a very fundamental manner, his rationale for criticising Pareto's law still serves to underscore his motivation for studying welfare economics. (3) In Pigou's terminology, Pareto's law supports the proposition that the criteria concerning wealth-efficiency and distributive fairness are necessarily in 'harmony'; whereas, Pigou considered these criteria to be often--although not always--in 'disharmony'. As such, he accepted the possibility that one criterion could be achieved at the expense of the other and he worked to make the potential for such disharmony explicit and to treat it within the scope of welfare economics.

Having noted the potential for disharmony between the various criteria for an improvement in economic welfare, the remainder of Part II mainly considers the wealth-efficiency issue in isolation. The analysis is predicated on 'money' being a cardinal indicator of economic welfare. In that context, Pigou relates the greatest magnitude of the national dividend to equality of marginal net products, with his most significant analysis directed towards the investigation of 'hindrances' to that equality. Pigou's notion of 'hindrances' suggests that there will be 'maladjustments' in the movement towards efficient market equilibrium, which have the same general meaning as the modern phrase 'market failures'.

The most enduring contribution of *Wealth and Welfare* to the study of market failure within a competitive environment concerns Pigou's investigation of 'hindrances' to investment, which introduces the distinction between 'marginal private net product' and 'marginal social net product'. The resulting analysis provided the basis for subsequent analysis in welfare economics concerning the relationship between investment and what became known as 'externalities', which Pigou effectively 'made a centerpiece of his *Wealth and Welfare*' (Medema 2009: 182), with corrective taxes and subsidies being presented as possible ways of eliminating maladjustments attributable to differences between 'marginal private' and 'marginal social' net products.

Nonetheless, the theoretical foundation for such analysis derives from his *Economic Journal* article 'Producers' and Consumers' Surplus' (Pigou 1910), which treats the issue of externalities in a more general framework. Specifically, the prominence of the 'net' products from investment in *Wealth and Welfare* is replaced by a more general emphasis on the market in 'Producers' and Consumers' Surplus', with the supply price considered with reference to a distinction between 'private marginal supply price' and 'collective marginal supply price', and, the demand price also considered with reference to a distinction between 'private marginal demand prices' and 'collective marginal demand price'. In terms of Pigou's more enduring influence on welfare economics, however, it is the specific focus on investment presented in *Wealth and Welfare* that proved to be the most influential, perhaps because the concept of externalities is more typically considered with reference to supply side market failures and the associated consequence for over, or under, investment. His prior discussion of externalities caused by demand side market failures was to prove less influential.

The next most discussed 'hindrance' that Pigou addressed in *Wealth and Welfare* concerns the topic of competition and increasing returns. As in the case of a 'hindrance' due to the potential inequality between 'marginal private net products' and 'marginal social net products', Pigou's analysis of 'hindrance' to investment due to competition and increasing returns also derives from his article, 'Producers' and Consumers' Surplus'

(Pigou 1910). Indeed, both these 'hindrances' are analysed using common tools: Pigou framed supply decisions within a static context to contrast the decisions of an individual supplier with the aggregate industry supply of a good. While this proved effective in isolating 'externalities', in modern parlance it proved problematic in dealing with goods produced in industries that do not exhibit constant returns to scale.

Pigou gave most attention to the case of industries that exhibit increasing returns (which he is careful to differentiate from industries with external economies but within which firms face decreasing returns), but his analysis also extended to diminishing returns. When calculating the supply price, he examines changes in the total supply of the industry, which, as Allyn Young (1913) demonstrated, had the effect of attributing rents that firms realise from increasing returns to the marginal net product of resource. On that basis, Pigou concluded that taxes and bounties could be considered for industries that do not exhibit constant returns to scale, but the appropriateness of such a policy prescription has not been widely accepted among economists.

Other 'hindrances' to equality between marginal net products under simple competition are also discussed. These include imperfections in the mobility of labour, and differences in the relative variability of labour and 'waiting' in different industries. In addition to the earlier mentioned 'hindrances' to the promotion of wealth-efficiency in a competitive context, Pigou's discussion of the potential to diminish the net national dividend extends to other cases of goods being produced 'by one set of people and sold to another set' such as 'simple monopoly', 'discriminating monopoly', 'monopolistic competition' and 'purchasers' associations'. It should perhaps be stressed, however, that Pigou's discussion of 'monopolistic competition' is not a strict precursor of the seminal work of Edward Chamberlin. Pigou's notion of 'monopolistic competition' concerns predatory pricing. Specifically, in the case of two or more firms, with substantial shares of the market, Pigou reflects on whether or not each of the firms will consider engaging in 'cut-throat' price warfare with a view to eliminating rivals from the market.

Specific chapters on special cases are also included, such as public operation of railways and 'purchaser organisations'. Part II ends with three chapters that clarify, and delimit, the potential for public intervention to enhance the wealth-efficiency goal. The titles of those chapters are: 'state intervention', 'public control of monopoly' and 'public operation of industries'.

4 Distributive Fairness and Macroeconomic Stability

Pigou's treatment of 'the distribution of the national dividend' is developed in Part III of the book, in which the goal of improving distributive fairness is considered from two general perspectives. First, and most indirectly, the potential to alter income distribution through variations in the wage rate is reviewed. Second, the potential to 'directly' alter income distribution through the transfer of funds, from the rich to the poor, is discussed.

The theory of wages and employment is treated extensively across a number of chapters. Pigou's objectives and analysis of labour economics here draws significantly from his *Principles and Methods of Industrial Peace* (1905), both of which consider whether an 'artificial' rise in the wage rate beyond its natural level can result in a transfer of resources from the rich to the poor. After reflecting on issues related to the elasticity of demand for labour and the presence, or absence, of differentiated wages for heterogeneous labour within an industry, Pigou's general probabilistic conclusion is that it is unlikely that distributive fairness will be enhanced by altering wage rates, mainly because of the importance of exchange to the economic process. Nevertheless, he does not rule it out altogether. On a related issue, Pigou considers whether high 'artificial' wages are likely to act against the wealth-efficiency goal. Again, in general, he finds this to be the case, especially in the long run, but nevertheless he insists that it is still possible to defend increases in the wage rate for the lowest classes of labour.

Having pointed to the significant limits of using wage policy to effect income redistribution, Pigou then considered the possibility of achieving the same end by using direct transfer measures, either by philanthropists or by the State. One chapter is devoted to introducing the problem, mainly to remind readers of the interdependence between the welfare criteria of wealth-efficiency and distributive fairness. The chapters that follow consider the effects of direct transfer measures on the rich (that is, the incentive effects of taxation) and the poor (changes in work effort).

Part III ends with an important chapter on the 'national minimum' which brings together the earlier analysis of both wealth-efficiency and distributional fairness based on a late utilitarian view of collective wellbeing. Specifically, the national minimum provides for redistribution in cash and services such as through minimum standards in housing, education, sanitary provisions and safety in the working environment, to the point where the poor's marginal benefit from the last dollar of redistribution received is equal to the marginal cost from the last dollar of the national income given up to fund the national minimum. (4)

The treatment of 'the variability in the national dividend' in Part IV is mainly concerned with the effects of macroeconomic fluctuations on wages and wage rates. It is not, in large part, a macroeconomic study, although it includes discussion of some elements of macroeconomics. Rather, it presents a study of the welfare effects of macroeconomic fluctuation on the poor, partly achieved by direct consideration of wage income in aggregate. It also includes consideration of the interdependence between variability in the consumption of the poor, with consumption by the poor declining during economic downturns, variability in the employment of labour, with reduced hours of work or complete loss of employment increasing during downturns, and the increases in insecurity and uncertainty that fluctuations engender.

But before systematically investigating the above relations, Pigou raised two contextual issues in separate chapters. One was the practical matter of a working person's insurance and consideration of whether it should be voluntary (perhaps with government backing) or compulsory. The other issue was the theoretical matter concerning monetary theory in relation to the 'variability of general prices'. This discussion of monetary theory focuses on the quantity theory of money and price adjustments rather than variations in economic output. General prices are considered by reference to the supply of 'money', the supply of 'money proper', the elasticity of money supply and the demand for money.

In the final chapters of Part IV, Pigou analysed how economic fluctuations may alter resources available for the purchase of labour (the 'labour fund'). He also outlined his proposition that variability in the income of the working class is magnified beyond that of the rest of the community because goods consumed by the working class tend to be especially variable in supply. This is complemented by an investigation of economic fluctuations and the effects on the movement of aggregate wages relative to the movement in the wage of the representative working person when the mobility of labour between different locations is limited.

In view of events in recent years, perhaps special note is warranted of the chapter on the 'variability of error in business forecasts', which focuses on forecasting errors that are related to financial activities. Such variations were important to Pigou because they altered expectations and influenced investment decisions:

Experience suggests that, apart altogether from the financial ties, by which different business men are bound together, there exists among them a certain measure of psychological interdependence. A change of tone in one part of the business world diffuses itself, in a quite unreasoning manner, over the other and wholly disconnected parts. ... There comes into play a quasi-hypnotic system of mutual suggestion (Pigou 1912: 460)

To better understand these influences, Pigou reflected on the character of modern industry, the personal qualities of forecasters, the reaction to different forecasts from different forecasters and the 'reproductive power' of errors. Sen (2009: 8) recently highlighted the relevance of Pigou's discussion of the 'psychological causes' of errors in business forecasting, especially 'the Pigouvian process of infectious pessimism', to the development of an understanding of the Global Financial Crisis. But although Sen's citations and references were to Pigou's *Industrial Fluctuations* (1927), almost all of the features of the 'Pigouvian' approach to which Sen drew attention so approvingly, were, in fact, already evident in *Wealth and Welfare*, which was published some fifteen years earlier. (5)

5 Wealth and Welfare and Pigou's Subsequent Scholarship

As the preceding paragraph indicates, *Wealth and Welfare* was the platform from which Pigou developed much of his subsequent work. In Harry Johnson's words, the 'remainder of Pigou's long working life can be regarded as largely occupied with strengthening the foundations laid in *Wealth and Welfare* and elaborating the superstructure erected on them' (1960: 153). Indeed, it would not, I think, be a significant misrepresentation to label Pigou's general research program as the study of 'wealth and welfare'. His next major book was essentially a new edition of *Wealth and Welfare*, although it was re-titled *The Economics of Welfare* (1920) because of the extensive revisions and additions. But these changes and additions were largely complementary. For example, the introduction of a new part on 'the national dividend and government finance', which eventually was removed and formed the basis of a new book, *A Study in Public Finance* (1928), was an extension and application of themes raised in *Wealth and Welfare*. In subsequent editions of *The Economics of Welfare*, the part dealing with macroeconomic stability was also removed and largely included in *Industrial Fluctuations* (1927) (Collard 1996b: 586).

Nevertheless, questions of wealth-efficiency, distributive fairness and macroeconomic stability remained central to Pigou's work. Even his *The Theory of Unemployment* (1933), which was subjected to attack by Keynes in the *General Theory* (1936), and his subsequent *Equilibrium and Unemployment* (1941), are related to the content of Parts III and IV of *Wealth and Welfare*, which, among other things, consider labour markets, monetary theory and economic fluctuations. As such, it can be suggested that the most basic features of Pigou's body of work tended to deal with matters related to wealth-efficiency, distributive fairness and macroeconomic stability, often set in relation to real and monetary analysis of employment and unemployment (and consequences for the poor).

Of course, this is not to suggest that Pigou's work did not progress. Even in the direct area of welfare economics and policy, his work became more nuanced with the identification of possible corrections of market failure extending to a range of areas beyond fiscal instruments. The subtlety of Pigou's more mature consideration are alluded to in the 'Pigou Redux' section of Medema's *The Hesitant Hand* (2009: 121-4) and extended in Medema's subsequent chapter on 'Pigou's Prima Facie Case' (2010).

6 Reactions to Wealth and Welfare

Wealth and Welfare was reviewed in prominent journals shortly after it was published. Reviews were published in January 1913, by A.W. Flux in the *Journal of the Royal Statistical Society*, March 1913, by F.Y. Edgeworth in the *Economic Journal*, August 1913, by Allyn Young in the *Quarterly Journal of Economics*, and in September 1913, by John Maurice Clark in the *American Economic Review*. As these reviews have been recently discussed by Tribe (2012), they are only briefly considered in this paper.

The review by Flux (1913) is only a few pages in length. It points to the skill with which Pigou had developed both his analysis and his 'dialectic', but argues that not all readers will be able to accept all the judgements that Pigou makes on the basis of the 'balance of probabilities'. He also points out that some of Pigou's diagrams, such as those related to the case of increasing returns, require further explanation.

Edgeworth (1913) offered little by way of substantial criticism. Rather, he acknowledged the significance of Pigou's book and attempted to place it in its economic and philosophical context. He reminds readers that Pigou uses Marshall's tools and, like T.H. Green, denies aggregate notions of 'welfare' proper because welfare proper fundamentally deals with states of consciousness. Considerable emphasis is then placed on Sidgwick's, in contrast to Mill's, strain of utilitarianism as perhaps the main philosophy that underlies Pigou's approach to his subject. Tribe quite reasonably summarises Edgeworth's review as 'Sidgwick + Marshall = Pigou' (2012: 9).

The most well considered, profound, and critically reflective, of the reviews of *Wealth and Welfare* was written by Allyn Young. It is a 15-page review that is comparable in scope to a modern 'review essay'. Young pointed to some technical errors in the book, such as Pigou's erroneous

interpretation of Pareto's law as being in agreement with results that derive from standard deviation analysis of income distribution. However, he devoted most of his pages to the character of Pigou's 'new and powerful instrument of economic analysis' (Young 1913: 676), namely, the curve of marginal supply prices, which Young suggests would be more accurately labelled as the 'curve of aggregate expenses' for the industry as a whole. As previously mentioned, the heart of Young's critical appraisal concerns Pigou's case for subsidies (taxes) in industries with increasing (decreasing) returns, because aggregate expenses, or Pigou's marginal supply price, unintentionally includes rents. Young's criticism of Pigou on the issue of non-constant returns was followed a decade later by a series of related debates.⁶ On one of those occasions Pigou conceded that 'Professor Allyn Young's criticism' was 'substantially valid as regards long period problems' (1924:31).

The last of the major reviews, by Clark (1913), commences by endorsing Edgeworth's favourable review, but goes on to write that 'the merits of the work make one resent its faults the more'. The review then continues to dwell on the faults of the book. Clark's greatest concerns are what he regarded as Pigou's 'abuse' of the mathematical method (there is too much algebra), use of unverified probabilities and an over-reliance on graphs that are difficult to interpret - with the last two of these concerns serving to reinforce the problems identified by Flux.

In the decades subsequent to the publication of *Wealth and Welfare*, some of the key tenets of the book came under serious criticism. In the period between the two world wars, the economic community as a whole came to rely more on the Paretian framing of economic welfare, which was primarily concerned with the issue of 'wealth-efficiency' from a positive perspective in the form of 'optimal' efficiency and did not directly address distributive fairness as an issue. As a result, the late utilitarianism of Sidgwick and idealism of Green struggled to endure within the mainstream approach to the theory of economic welfare, especially outside of Cambridge; and especially after publication of Lionel Robbins's *An Essay on the Nature and Significance of Economic Science* (1932). J.R. Hick's extension of the ordinal representation of utility from the theory of equilibrium, as introduced by Vilfredo Pareto, also came to dominate the 'old', essentially Pigouvian, welfare economics. But Pigou's greatest single insight to economic welfare has never been lost. The Paretian formulation of welfare economics typically accommodated, and, indeed, gave prominence to, the Pigouvian concept of externalities.

It should also be recognised that the dominance of the ordinally based new welfare economics has not gone unchallenged. For example, in 'Were the Ordinalists Wrong About Welfare Economics.?', Cooter and Rappoport (1984) argue in favour of the old welfare economics of Pigou (and others) because of its direct focus on 'material' welfare. Pigou's cardinal position has perhaps been strengthened in recent years by the re-emergence of the economics of happiness, which typically utilises, and emphasises, the economic relevance of cardinal measurement.

Subsequent to World War II the greatest challenge to Pigouvian welfare economics came from Coase in his article 'The Problem of Social Cost' (1960).⁷ Two Coasian criticisms of Pigou are important. First, the problem of market failure due to the difference between private and social costs may diminish, or potentially disappear, when individuals have the legal right to protect their private property from damage or harm caused by the economic activities of others. Alternatively, remedies other than corrective Pigouvian taxes and subsidies may be found through regulation or privately initiated market activities. In such circumstances the relevance of social cost diminishes, although typically transaction costs will be incurred from economic solutions or legal or regulatory remedies. Second, and largely a consequence of the institutional context within which transaction costs are incurred, Coase is highly critical of Pigou for a level of abstraction that ignores or diminishes the importance of institutions in economic activity (Coase 1972: 485).⁸

7 A Marshallian Treatise?

Pigou dedicated his book *Wealth and Welfare* to Marshall with the words: 'To Dr. Alfred Marshall'. But as Pigou is also an historically significant original scholar in his own right, the extent to which *Wealth and Welfare* may be considered as a Marshallian treatise does not depend on the existence of differences in the welfare analysis of Marshall and Pigou; rather, it depends on the character of those differences and their relationship to other more general similarities in their analysis.

The essential character of those similarities and differences has been highlighted in Kla Myint's monograph *Theories of Welfare Economics* (1948). In regard to similarities, Myint (1948:178) points out that Pigou follows Marshall in two fundamental ways: he draws a boundary between welfare in general and economic welfare in particular; and, when considering the theoretical representation of questions of economic welfare, he does so with reference to the 'measuring rod of money'. In regard to differences, Myint places great weight on the fact that Marshall's analysis of economic welfare centres on his conception of consumer surplus, based on the analysis of surplus generally outlined in Appendix K of the *Principles*, whereas Pigou avoids the use of surpluses and focuses on the national dividend, considered analytically with respect to the equality, or divergences to the equality, of marginal net social products. (9)

The above distinctions were highlighted by Myint as a reaction against the tendency to lump Marshall and Pigou together as the 'Cambridge Welfare Economics' in toto (1948: 178). There is no surviving record of correspondence between Marshall and Pigou on *Wealth and Welfare* or *The Economics of Welfare*. Nevertheless, Myint's dissent about lumping Marshall and Pigou together is supported by Marshall's annotations in the margins of his personal copy of *Wealth and Welfare* expressing his concerns about much of the work, which took some sixty years to enter the public domain when they were published and analysed by Bharadwaj (1972). (10) The main theme of Marshall's annotations was the perceived lack of realism in the book, with analysis resulting from excessive reliance on the static method, especially in the context of increasing returns.

In more recent years there has been an increasing tendency among historians to stress Marshall's concerns with Pigou's work, with some suggesting that Pigou took Cambridge economics in a direction that was contrary to that which Marshall had desired. Most notably, there has been an expansive literature, with prominent contributions by Neil Hart (2003, 2012) and Tiziano Raffaelli (2004), on Pigou's formal solution to the problem of non-constant returns in economic theory that he presented in the wake of the late 1920s 'costs controversy', which developed

followed publication of Piero Sraffa's (1926) 'The Laws of Returns Under Competitive Conditions'. In his 'An Analysis of Supply' (2002 [1928]), Pigou addressed concerns over the incompatibility of increasing returns and competition by replacing Marshall's notion of the 'representative' firm, which reflected the real historically determined distribution of firms, with his own formulation of an 'equilibrium' firm, which was derived in static theory. Prima facie, Pigou's removal of Marshall's 'representative' firm from equilibrium economics may not appear to be relevant to the question of whether *Wealth and Welfare* is a Marshallian treatise because it relates to work done more than a decade and a half after the book was published. But that objection is only valid for the particular solution proposed in the article. The problem being addressed, namely, the difficulty of representing increasing returns in pure economic theory, is much the same problem as Pigou addressed in *Wealth and Welfare*, which he had solved at that stage by introducing marginal supply curves derived from expenditure for the industry as a whole. While the solution outlined in *Wealth and Welfare* was formally different from the one that he subsequently proposed in his article of 1928, they both shared a similar property that differs from Marshall's approach to industry and firms. The focus on aggregate (or average) changes in industry expenses in *Wealth and Welfare* and the focus on the 'equilibrium firm' in 'An Analysis of Supply' (1928 [2002]) both abstract from evolutionary influences that have contributed historically to the composition of industry at a particular time. The mixture of firms, with a diverse range of internal and external economies that result from historical processes, is set aside. Marshall, in contrast, relies on a representative firm, which reflects the actual distribution of firms within an industry that developed over historical time. As a consequence, it is sometimes suggested that the analysis of industry and supply in the face of non-constant returns in *Wealth and Welfare* reduces the realism of economic theory and extends the scope of static equilibrium analysis more than Marshall was willing to contemplate.

More recently, Katia Caldari and Fabio Masini (2011) have made a case for the proposition that Pigou's work on externalities also represents an extension in the scope of static equilibrium analysis beyond that favoured by Marshall. In brief, their argument is referenced to Marshall's views on green fields and fresh air, as having external features that provide important benefits to members of communities, and the fact that he did not assess those benefits in a mechanistic manner, such as through the externality framework that Pigou had developed.

Consequently, the concern shown by Marshall and some historians of Marshallian thought with Pigou's treatment of increasing returns and 'externalities' is also grounded on a common theme: the limit to the scope of static equilibrium analysis. A question for this commemorative piece to consider is: is this concern significant enough to deprive Pigou's *Wealth and Welfare* of its status as a Marshallian treatise? In my judgment, for four reasons elaborated below, the answer is a resounding no.

First, as both Marshall and Pigou accepted the working assumption that the marginal utility for different individuals is proportionate to money, there is no basic inconsistency between welfare analysis that focuses on 'surpluses' and that which focuses on changes in the 'national dividend': the direction of an expected change in both is the same (at least they are when the 'hindrances' that Pigou drew attention to are not decisive). While different generations of contributors to 'Cambridge Welfare Economics' developed different theoretical tools for welfare analysis, the substantive similarities and general consistencies in the theoretical conclusions of Marshall and Pigou ensures that the underlying Marshallian basis to Pigou's *Wealth and Welfare* is not submerged. In addition, Pigou's first analytical treatment of supply and demand-related externalities was published in his article 'Producers' and Consumers' Surplus' (1910). The analysis included in that article was to influence *Wealth and Welfare* greatly, and that analysis was explicitly inspired from Marshallian 'surplus' conceptions of welfare.

Second, the argument that Pigou's work on externalities is too mechanical and static to be associated with Marshall has not been developed to the extent where it can be accepted. A fundamental point to recognise is that Pigou carefully differentiated between 'welfare' (or 'total welfare') and 'economic welfare'. The suggestion of incongruity between Marshall and Pigou on external effects, be they Pigouvian externalities or Marshallian increasing economies, does not take full account of that distinction. The external or public benefits envisaged by Marshall from green spaces and fresh air improve the quality of life, yes, but those effects fall within Pigou's category of 'welfare' (which concerns states of consciousness), not 'economic welfare'. Just as it is difficult to envisage Pigou raising objection to Marshall's comments on the social benefits from green fields and fresh air, so too is it difficult to envisage Marshall objecting to Pigou's 'economic welfare' assessment of 'hindrances' and 'maladjustments' associated with the mismatch between private and social costs (at least not one allowance is made for Pigou's treatment of increasing returns when considering that mismatch).

Third, the static analytical apparatus that facilitated Pigou's discussion of externalities and treatment of non-constant returns is fundamentally the same. Like almost all advances in economic theory, Pigou's contributions came with advantages and disadvantages. A clear advantage was that it facilitated the development of an important extension to welfare theory. The disadvantage, evident to Marshall, was the reduced power of economics when considering issues in which the historical evolution of a state is important. But even when that is acknowledged, account must also be taken of the fact that Pigou gained a 'First' in the historical tripos and made contributions to the study of economic history. (11) He was certainly alive to the importance of issues relating to continuity and discontinuity over time and the difference between Marshall and Pigou appears to be limited to the extent to which history and dynamics can be feasibly incorporated within economic theory; not to a difference over the importance of history and dynamics.

Fourth, while Marshall himself did have concerns with Pigou's treatment of non-constant returns to scale, they were not of such significance that he decided to comment on them in public. This may partly reflect Marshall's reluctance to enter into public controversy with colleagues. But one may have expected that Marshall would have attempted to distance himself from Pigou publicly if the significance of the difference was of a high order. However, it must be conceded that this last point is speculative. Marshall may have had other reasons for not commenting publicly. (12)

Tribe recently argued that *Wealth and Welfare* saw Pigou turned from 'Marshall's student to Marshall's successor' (2012: 1). This is hard to disagree with. There are advances in that book that mark Pigou's own contribution to economics and yet it is still a work that is Marshallian in spirit. Even Young, the scholar who wrote the most critical and most insightful review of *Wealth and Welfare*, portrayed the book in that light:

No assessment of Wealth and Welfare should, in my judgement, result in readers coming to disagree with Young's review of that book, even though his review was published ninety-nine years ago. (13)

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Notes

- (1) For a discussion of Pigou's early influences, and biographical matters more generally, see Knight and McLure (2013).
- (2) For Pigou's purpose, indirect considerations taken into account by individuals when acquiring and expending income, such as Fisher's conception of a psychic return, do not form part of economic welfare, although they are a part of welfare in general.
- (3) Pigou interprets Pareto's result as a consequence of the slope of the log specification of the Pareto's curve of income distribution being fixed, but Pareto's analytical demonstration of his law extended to the case where the slope of the income distribution curve varies (McLure, 2013b).
- (4) A correction is declared: it should be noted that reference to the 'national minimum wage' in McLure (2010: 646-7) is incorrect. It should have simply read 'national minimum', which is the phrase that Pigou employed; and which has a much broader meaning than that implied by the phrase 'national minimum wage'. I thank Nahid Aslanbeigui for bringing this to my attention.
- (5) Pigou's contribution to economic cycles has been investigated in some detail by D.A. Collard (1983; 1996a; 1996b).
- (6) Those debates considered: (i) the relevance (or irrelevance) of decreasing and increasing returns, as discussed in the 'empty economic boxes' debate (Clapham 1922a; Pigou 1922; Clapham 1922b); (ii) the difficulty of developing an effective treatment of increasing returns, as discussed in the second round of debate on 'those empty boxes' (Robertson 1924; Pigou 1924); and (iii) the 'costs controversies' associated with the compatibility of increasing returns and competition (Sraffa 1926; Pigou 1927; Robertson 1930). Pigou's contribution to these debates has been reviewed by Aslanbeigui (1996).
- (7) After World War II it has also been suggested that Pigouvian welfare economics was challenged by the emergence of public choice economics (even from within the ranks of public choice economists). However, this view may be largely set aside on two grounds. First, Pareto's economics shows, among other things, that welfare theory can sit side-by-side with analysis of public choice elements. Second, Cambridge economists, such as Pigou, did not ignore many issues raised in public choice economics (see Backhouse and Medema 2013).
- (8) There have been several studies by historians on the decline of Pigouvian welfare economics and the associated challenges. Notable studies

include those by Aslanbeigui (1990; 1992), Aslanbeigui and Medema (1998) and Medema (2009).

(9) Marshall's approach to welfare analysis has been labelled as the 'doctrine of surpluses' (Groenewegen 2010: 26).

(10) In correspondence Peter Groenewegen kindly pointed out that, on Marshall's death, his personal copy of *Wealth and Welfare* went to Cambridge University, but Mary Paley had it withdrawn from the Marshall library once Piero Sraffa had drawn her attention to the annotations. It was only replaced in 1944 following her death, but even then the Library did not store the book on open shelves for use by general readers; rather, it was kept 'in reserve' until 1959 (Bharadwaj 1972: 32). Unfortunately, because of the lack of surviving correspondence between the two masters, historians do not have any documentary evidence of whether Pigou read Marshall's annotations, and, if he did, what he thought of them.

(11) Relevant in this regard is Pigou's fellowship thesis 'The Causes and Effects of Changes in the Relative Values of Agricultural Produce in the United Kingdom during the Last Fifty Years' (1901) and his book *Aspects of British Economic History 1918-1925* (1947).

(12) Peter Groenewegen suggested to the author that there is a possibility that the master may have been sensitive to (implicit) criticism from his chosen successor.

(13) During the copyediting of this paper David Collard kindly provided the author with a copy of his conference paper 'Pigou's Wealth and Welfare: A Centenary Review' (Collard 2012). There is no reflection on the content of that review in this paper, but it should at least be noted that is a thoughtful review.

Michael McLure *

* Economics Program, University of Western Australia, 35 Stirling Highway, Crawley WA 6009, Australia. Email: michael.mclure@uwa.edu.au. I am greatly indebted to Peter Groenewegen, who, as the discussant for this paper at the 2012 History of Economics Society Conference (Brock University, St. Catharines, Ontario, June 22-25), provided me with helpful critical feedback.

Its spirit, like that of Marshall's great treatise, is one of sane conservatism, tempered by an attitude of open-minded receptivity towards such new proposals as seen to stand the test of careful analysis. ... No one not thoroly familiar with the concepts and technical apparatus of Marshall's *Principles* will be able to read it intelligently (1913: 672)

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