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## The ‘Pareto School’ and the *Giornale Degli Economisiti*

by

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‘The *Giornale degli Economisti* ... has always been the journal par excellence of Pareto and his school’ *Giovanni Demaria*<sup>i</sup>

### Introduction

Many leading international sites for the dissemination of scientific economic thought were established, and their reputations developed, when the second generation of marginalist economists was placing their authority on the profession. As Magnani (2003, p. 14) has noted, journal such as the *Quarterly Journal of Economics* (1886), the *Revue d'Économie Politique* (1897), the *Economic Journal* (1891), the *Journal of Political Economy* (1892) and even the *American Economic Review* (1911) emerged during the epoch of marginalism – the period when the production and dissemination of marginalist ideas was growing rapidly.

In Italy too, journals played a large part in the dissemination of marginalist thought and, between 1890 and 1920, none were more significant than the *Giornale degli Economisti*. Importantly, the development and dissemination of original marginalist ideas in the *Giornale degli Economisti* over this time rivalled those of the abovementioned international journals. An appreciation of the international importance of developments disseminated in this journal is now emerging, with E. Roy Weintraub commencing his article ‘Why so many Italian economists?’ with the following introduction:

I recently received an e-mail from a former student. In it, he told me ‘I have become aware of a fairly large literature on utility and demand written by Italians, and published mostly in the *Giornale degli economisti* between around 1890 and 1915. The mathematics used is typically fairly sophisticated by the standards of most economists of the time, and a number of results in Slutsky either correct problems in the Italian literature or build directly on foundations built by the Italians, especially Pareto. Despite this, these papers in the *Giornale* seemed to have been largely (but not completely) ignored outside of Italy right up to the present day.’

(E. Roy Weintraub 1997, p. 253)<sup>1</sup>

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<sup>1</sup> Weintraub partly attributes this situation to the evolution of ideas from the first generation of neoclassical scholars running through Pareto in Italy, rather than through Marshall as in the English speaking world.

## **The *Giornale degli Economisti***

A complete history of the *Giornale degli Economisti* is beyond the scope of the present study. Nevertheless, to identify the culture of science that prevailed in this journal during the period when Pareto and his followers were active contributors, it is necessary to consider the major moments in its evolution.<sup>2</sup>

The first series of the Journal was not marked by continuity or success. It was established in 1875 by the *Associazione per il Progresso degli studi Economici in Italia* in Padua under the management and editorial direction of Eugenio Forti. However production was suspended in 1878. Over this initial period, the Journal's content was largely aligned with the approach to economics typified by the German historical school. In particular, it revealed a protectionist approach to public policy. The first series of the *Giornale degli Economisti* was revived again in 1886, this time operated from Bologna under the management and editorial direction of Count Alberto Zorli. Over the next few years, the Journal became an 'arena for all opinions' (Magnani 2003, p. 25): free traders put some views while protectionist and advocates of the historical school put different view. Maffeo Pantaleoni also contributed the regular 'Rassegna finanziaria' to review issues in public finance. However, the Journal was still unable to sustain itself and slowly degenerated into reporting reviews, bibliographical information and the like.

The last issue of the 'first series' of the *Giornale degli Economisti* was published in 1890. The first issue of the 'second series' was published in July of the same year, but with three additional directors: with Ugo Mazzola (1863-1899), Antonio de Viti de Marco (1858-1943) and Maffeo Pantaleoni (1857-1924). Each had acquired a one quarter share of the Journal and, as a consequence, the editorial direction had largely come under the control of Italy's then leading public economists who were also committed marginalists. These new editorial directors were also among that country's most forceful and articulate advocates for liberty in economic and political matters and restraint and sustainable balances in matters of public finances.

Prior to becoming directors of the Journal, these three new directors had all made important contributions to the grounding of fiscal studies in the hedonistic approach of the early stages of the marginal revolution. *Teoria della Pressione Tributaria* (Pantaleoni 1887), *Il Carattere Teorico dell'Economia Finanziaria* (de Viti de Marco 1888) and *Il Fondamento Scientifico dell' Economia di Stato* (Mazzola 1888) had all been published prior to the 1890. In addition, Pantaleoni had already published *Principii di Economia Pure* (1889), a book of considerable historical importance for providing Italy with its first fundamentally marginalist text in which the general laws of the economic phenomenon were considered in the context of social evolution. Pantaleoni's book had a particularly significant influence on Pareto who, in a letter of 8 August 1911 to Guido Sensini, wrote that:

I was induced to study pure economics and mathematical economics<sup>3</sup> by reading Pantaleoni's *Principii*. Before that I began to read the works of Walras, but could not proceed because the part that is metaphysics, for which I had disgust, was very large in those works. From Pantaleoni's *Principii*, I was made aware that pure economics

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<sup>2</sup> Italo Magnani has reviewed the emergence of the *Giornale degli Economisti* in Italy with great clarity his excellent in *Dibattito Tra Economisti Italiani di Fine Ottocento* (Magnani 2003). All dates and events cited in this chapter that pertain to series one and series two of the *Giornale degli Economisti* are sourced from Magnani 2003.

<sup>3</sup> As discussed earlier, in Pareto's methodological framework pure economics is a subset of mathematical economics.

offers things other than metaphysics. I returned to read the works of Walras without noticing the metaphysics, as if it had not been written, and I saw that there was a theory of great importance... I owe it to Pantaleoni that I have a concrete conception of pure economics and to Walras that I have a clear conception of economic equilibrium.

(Pareto 1975, p. 735)

The scientific hallmark of the second series of the *Giornale degli Economisti* was a commitment to the dissemination of the new marginalist economics and new ideas in public economics. Its social and cultural hallmark was an equally strong commitment to the dissemination of public policy ideas based on economic and political liberty. As Pantaleoni was to note: ‘The *Giornale* will have a strictly liberalist direction and it will be anti-protectionist and, as such, anti-socialist’ (Pantaleoni, letter to Domenico Berardi of 24 April 1890, cited in Magnani 2003, pp. 68-9).

From the early editions of the second series, Pantaleoni, Mazzola, and de Viti de Marco engaged in policy polemics, attacking customs restrictions and legislative restrictions on working hours. The policy dimension of the Journal was even evident from its subtitle *Rivista Mensile Degli Interessi Italiani (Periodical of Italian Interests)*. In addition to scientific articles, from 1891 the Journal introduced a special feature entitled ‘Cronaca’ which chronicled developments in public policy, public finances and the state of the economy. In the early stages, these chronicles were written by Ugo Mazzola.

The first point that must be made about the relationship between Pareto and the *Giornale degli Economisti* is that it was by no means limited to scientific issues. Pareto fully supported the liberal agenda. In September 1891, Pareto actually stood in for Mazzola by writing the chronicle for one issue of the Journal. His general commitment is clear from his letter to Maffeo Pantaleoni of 7 March 1893, when he offered to write the chronicles for the Journal:

In regard to the *Cronaca*, and as for any other work that you may need, I am at your disposition. It is unnecessary to talk of the circumstances that prevent you from making remuneration for the work. If I had means, as perhaps I will one day, it would be my *duty* to make a substantial contribution to sustain the *Giornale* that defends liberalist ideas. But I do not have money, and therefore I *must* provide at least that which is in my power; that is, work. Therefore, not just for one month ‘yes’ and another month ‘no’, but for all the months, if there is need, I am ready, very ready, to prepare the *Cronaca*, and whatever else you want. ... I am at your disposition to undertake any work necessary for the *Giornale* to defend liberal ideas.

(Pareto 1960a, p. 354)<sup>4</sup>

Between 1893 and 1897, the *Giornale degli Economisti* published 52 of Pareto’s chronicles, which were generally very critical of Italian Government policy.<sup>5</sup> By 1897 Pareto became concerned that his continued strong criticism of government and special interest was beginning to harm the Journal and, in view of this, he expressed a desire to be relieved of this duty. De Viti de Marco took over responsibility for writing each *Cronaca* from 1897. At that time, Mazzola was suffering from serious health problems and was in

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<sup>4</sup> Pareto also insisted that this occur only if it does not give offense to Mazzola, a good friend and ‘liberalist’ (Pareto 1960a, pp 354-5). The offer was no doubt made in the light of Mazzola’s poor health.

<sup>5</sup> These chronicles have since been collected in *Écrit Politiques* (Pareto 1974); volume 17 of Pareto’s complete works.

his final years of life (he died in his 30s) and de Viti de Marco was a more optimistic, and less controversial, liberal figure than Pareto.

During the period in which Pareto was writing the chronicles, the Government of Italy was lead by Prime Ministers Francesco Crispi (1887-91 and 1893-96) and Antonio Starabba di Rudini (1881-92 and 1896-98). Pareto was particularly critical of the Crispi Government for military and imperial adventurism, protectionism, banking and monetary crisis and supporting particular interests without regard to the general interest or maintaining sustainable fiscal balances. While Rudini appeared liberal in opposition, during the early stages of his second term of government Pareto expressed some alarm at early signs of backtracking on constraining public spending, although he conceded that imperialist activities in Africa, initiated by earlier governments, had reduced the discretionary component of budget expenses .

The zeal with which the *Giornale degli Economisti* advocated an almost radical form of liberalism was matched by the enthusiasm with which the new economics was being explored and disseminated. The culture of liberalism in public policy matters was a reaction to the prevailing state of government. In many ways it was an ideological response. Tommaso Giacolone-Monaco (1960) has pointed out that Pareto's *Cronaca* bears all the hallmarks of a moralist. The moral indignation at the action of Italian political elites proved a motivating factor for the huge effort required in producing so many chronicles for the Journal. But, while indignation influenced the critical tone of the chronicles, it did not displace careful investigation.

Given the background of Pantaleoni, de Viti de Marco and Mazzola, it is no surprise that careful investigation extended from the practice of public finances to the theory of public finances, with the Journal becoming the primary site for the dissemination new ideas in the Italian tradition of fiscal studies. James Buchanan (1960, p. 73) has observed that prior to 1920 almost all important contributions in this field were published in the *Giornale degli Economisti*. The same emphasis on the critical investigation also extended to general economic theory, with major contributions to general equilibrium economics made by Pareto, Barone and others within the first few years of the second series of the Journal. Many of these economic expositions relied extensively on mathematical formulation; and the *Giornale degli Economisti* became the premier journal for the publication of mathematical economics in Italy.

With its second series then, the *Giornale degli Economist* had evolved to an extent where there was a coincidence between the critical thought in the defence of liberty in practical matters and critical and original thought on scientific matters. This was especially so when scientific thought had clear implications for public policy, such as welfare theory and trade theory. It mattered little how scientific thought was expressed: mathematically, textually, statistically or historically, no approach was ruled out. As it was open to different methods, the Journal was became the window through which Italian economists considered formative thought and debate it.

This became a critical feature of the relationship between the Journal and Pareto, especially in the initial and intermediate phases of his scientific work. However, there was an asymmetric aspect to Pareto's personality: he was more than willing to criticize the work of other, but was very sensitive to criticisms of his own ideas. While he was embraced by the Journal, he tended to adopt the slightly paranoid stance of a scholar just outside the dominant clique by tending to highlight things that differentiate him from other Italian economists, and largely ignore their common ground. Initially, Pareto saw both his own work and the *Giornale degli Economisti* as outsiders to the mainstream of economic science, which he regarded as fundamentally socialist or linked to the historical school in a manner that emphasizes state intervention. By the second phase of his work,

he had come to set himself slightly apart from his contemporary marginalists too. However, by that stage the association between Pareto and the Journal had become strong enough to withstand difficulties – the scientific reputation of the *Giornale degli Economisti* had increased substantially because of its association with Pareto, a personal bond of friendship had forged between Pareto and the directors of the Journal, most especially with Pantaleoni, and Pareto had a stage from which he could rapidly disseminate new ideas to his Italian followers and from which these followers could also make their voice known across the economics profession in Italy. While scholars working on Paretain issues published in many sources, the *Giornale degli Economisti* was the main journal, a situation which continued beyond its second series.

A ‘third series’ of the *Giornale degli Economisti* commenced in 1910 under the title *Giornale degli Economisti e Rivista di Statistica* in which the existing owners and editorial directors, namely Pantaleoni and de Viti de Marco, were joined by the statisticians Giorgio Mortara (1885-1967) and Alberto Beneduce (1877-1944). De Viti de Marco withdrew as director during World War I and was not replaced, but, following Pantaleoni’s death in 1924, Gustavo del Vecchio joined the Journal in 1925 as a director.

While the *Giornale degli Economisti* is recognized for disseminating new contributions to economic theory, the scientific scope of the Journal went well beyond pure theory. This was, to a considerable extent, a product of its acceptance of liberty in the world of ideas and a perception that economists have many areas of interest. The classification of articles that the Journal prepared for its first three series of the *Giornale degli Economisti* includes:

**General Matters:** covering education issues, bibliographical issues, the methodology of the social science and the history of the social sciences; **Statistics:** covering statistical theory, applied statistics, applied financial statistics, statistics applied to demography, statistics applied to social matters; **Sociology:** covering general matters and particular matters; **Economic and Social History,** covering the history populations, colonialisation, migration, agriculture, industry, commerce, communications, money and prices, credit and insurance, consumption, public finance and protection, and the relationship between social classes, guilds and corporations; **Economic Demography and Economic Geography:** focusing extensively on population economics; **Economic Theory:** covering general economic science, theory of economic equilibrium, production, circulation of money, distribution theory, business economic; **Applied Economics and Economic Policy:** covering the economic situation and economic cycles in Italy, the economic situation abroad, international economics and commercial policy, colonial economics, economic organization and its legal problems, money and savings, transport communications and tourism, urbanization and municipal government, agricultural commodities, mineral and energy economics, and industries; **Social Policy:** covering social conditions, labour laws and protection of labour, organization of labour, pensions and insurance, social assistance and public health; **Public Finance:** covering general issues, international issues (war debts and reparation payments), Italian public finances, taxes, public spending; and **Domestic and International Politics:** covering electoral issues, political parties, the political situation, political issue in Europe, political issue outside of Europe.

In 1938, following the 14 July *Manifesto degli Scienziati Razzisti* and the application of the Royal Decree N1390 of 5 September, the Journal faced a crisis with both del Vecchio and Mortara being expelled from their Universities (Bologna and Milan

respectively) on the basis of their racial origins and were barred from academic activities.<sup>6</sup> In the next year the Journal was resurrected as a ‘new series’ established after merging with the *Annali di Economia del’ Università Bocconi* and under the extended title of the *Giornale degli Economisti e Annali di Economia*. The management of this ‘new series’ was located at the Università Bocconi in Milan where it operated under the editorial direction of Giovanni Demaria from 1939 to 1975.<sup>7</sup> The Journal continued after Demaria’s retirement from his editorial role and is still published today under the same title by the Università Bocconi. It is currently under the editorial direction of Michele Polo.

The strong association between the *Giornale degli Economisti*<sup>8</sup> and Pareto had its foundation in the liberalism of the editorial directors of the Journal second series. The longevity of this relationship, however, requires further consideration. Undoubtedly, the strength of Pareto’s personal friendship with Pantaleoni was a significant factor. However, the broad scope of issues treated in the Journal also meant that Pareto’s more mature contributions, as his primary interest in theory broadened from economic equilibrium to social equilibrium, could be readily accommodated. It was in the interests of the *Giornale degli Economisti* to maintain the relationship as the contribution of Pareto and his followers improved the standing of the *Giornale degli Economisti* among the community of economists. As Pareto’s reputation grew on Italy, Europe and the World, the importance of the Journal also became more widely recognized, with Edgeworth and Slutsky making contributions to the Journal based on Pareto’s work and Kühne, Sanger, Fisher and Schultz and others citing the work of Paretians published in the *Giornale degli Economisti*.

Pareto’s followers also had additional reasons to associate with the Journal. The sentimental, but still significant, reason concerns the desire to follow in the footsteps of the master by taking the same path that Pareto took to the Italian community of economists. In following the same path, the opportunity for forming a school of thought also emerged by facilitating dissemination of their scientific product to the community in a manner that has the greatest probability of influencing the profession. Also, the Journal’s willingness to publish mathematical and sociological treatment of economic issues was important as most of Pareto’s followers were mathematically proficient and many developed an interest in sociology. Related to this is the general culture of knowledge associated with the *Giornale degli Economisti* in which the scope of scientific investigation is very wide. In this regard, part of Pareto’s intellectual legacy in Italy concerned examination of the sociological part of economic phenomena and, in this journal, economics and sociology were not necessarily strange bedfellows.

### **Pareto’s Major Scientific Contributions to the ‘*Giornale degli Economisti*’**

Pareto’s first entry in the *Giornale degli Economisti*, ‘L’insegnamento dell’economia politica’ (Pareto 1890 [1982]), was motivated by public policy issues and presented

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<sup>6</sup> Details on these racist laws and the scholars excluded from university life are available from the Università Bocconi’s electronic newsletter ‘Matematica’ at <http://matematica.uni-bocconi.it/giornomemo/italiani.htm> (accessed 22 March 2006).

<sup>7</sup> Year I of the new series is 1939, year II is 1940 etc, but year V actually covers 1943 to 1946, due to disruption during the Second World War.

<sup>8</sup> Henceforth the phase *Giornale degli Economisti* is used as a generic reference covering series one and two of *Giornale degli Economisti*, series three entitled *Giornale degli Economisti e Rivista di Statistica* and the ‘new’ series entitled *Giornale degli Economisti e Annali di Economia*.

economic science as way of revealing the naked self interest of protectionism. The article commences:

Our protectionists have already done great and beautiful things. They have ruined Italy's commercial exports; created artificial industries, such as the steel mills of Terni, that cannot survive without the largest government subsidies; they have raised the cost of living through custom duties on cereals, and helped increase the State's spending out of all proportion to the economic power of the nation. Now they triumph. They enjoy their return, harm to everyone, and want to recreate in themselves a spirit of little ideal. They are disturbed by economic science, which does not want to justify that which gives them joy and pleasure: they are required to hear, and hear repeated, that protection is nothing if not the art of legally appropriating other people's goods.

(Pareto 1890 [1982], p. 1)

The sarcasm of the above article became a feature of many of Pareto's polemic writings. The article also served the purpose of putting a policy position which fully reflected the views of the editorial directors of the *Giornale degli Economisti*. In contrast, his final contribution to the Journal, the 1918 "Economia sperimentale" (Pareto 1918 [1980]), completely replaced normative concerns with discussion of the scientific basis of economic doctrines.

In this brief article I propose to investigate if, and to what extent, the doctrines of political economy, in the way they are usually expounded, are logico-experimental. I could just say logical, because, as far as I am concerned, logic is an experimental science like all other sciences. However, so as not to start with a dispute, which is, after all, unhelpful to the aim I have in mind, I will treat logic and experience as distinct.

(Pareto 1890 [1980], p. 719)

This last article finds that economics, 'in the way that it is usually expounded', is sadly wanting from a scientific perspective and then goes on to clarify how scientific economics is developed from the logico-experimental methodology. In the period between 1890 and 1918, Pareto contributions to the *Giornale degli Economisti* comprise 53 entries entitled 'Cronaca' and a further 39 articles. Most of his articles were concerned with scientific matters, although, as evident from the above quote from his first article, the early articles in the first few years had a foot in each camp: they considered economic science while also advocating non-interventionist public policy. By 1892, however, Pareto's articles had become almost exclusively scientific. While the treatment of some economic issues in a scientific manner did have obvious policy implications, and these were generally consistent with the liberal philosophy espoused by the Journal, scientific demonstrations came to dominate considerations.

In the previous chapter, Pareto's continuation to core scientific thought was considered in three sequential phases: an initial phase, an intermediate phase and the final phase. The following consideration of Pareto's scientific contribution to the *Giornale degli Economisti* adopts the same approach.

#### *The Initial Phase – 1890-1899*

In this study, the initial phase of Pareto's scientific work is characterised by placing Walras analysis of general equilibrium theory in the context of successive approximation.

That is, pure theory concerns the primary phenomena of economic equilibrium, with applied economics considering: 1) uniformities in the real economic phenomenon from ‘disturbances’ not considered by pure theory; 2) study of virtual movements utilizing analysis developed in pure theory; and 3) identification of general empirical uniformities associated with the economic phenomenon.

During this initial phase, Pareto’s was in his most active period of collaboration with the *Giornale degli Economisti* on scientific matters. While the full methodological framework associated with successive approximations was developed in the *Cours*, ideas on the importance of founding economics on a positive basis and formative economic analysis which, in some cases, anticipated and, in other cases, influenced the *Cours* were first considered in the *Giornale degli Economisti*.

Pareto’s articles in the Journal between 1890 and 1891 can be largely set aside because they were more influenced by liberal political culture than scientific thought: ‘L’insegnamento dell’economia politica’ (Pareto 1890 [1982]) was a defence of liberalism in public policy; ‘Le industrie meccaniche e la protezione (Pareto 1891a [1975]) considered the impact of protectionism on industry; and ‘Lettera d’un Vignaiuolo’ (1891b [1975]), a letter written under the pseudonym Nando detto Marzocco, queried the contradictions of protection. These were all republished in volume 17 of Pareto’s complete works which collects his *Political Writings*. ‘Lasciate fare, lasciate passare’ (Pareto 1891c [1975]) was also republished in the same volume. It was essentially a review article of Gustave de Molinari’s *Notions Fondamentales d’Economie Politique et Programme Économique* (1891). While the economic program considered is discussed in terms of the liberal *laissez-faire* tradition, thereby justifying its inclusion in the Political Writings volume of his complete works, it also dealt with the methodology of scientific thought. Pareto revealed considerable appreciation for de Molinari’s integration of evolution with economics and his general scheme of abstraction, suggesting that the treatment of economic actions by hedonistic *homo œconomicus* is very similar to the arrangement in mechanics. This was to prove influential in the emergence of the *Cours*, in which the mechanical analogy played a major role and applied economics is condition by the general state of social evolution and the prevailing ‘social physiology’ of society. Other themes reviewed in this article also reappear in a reworked form in Pareto’s *Cours*, such as the discussion of the economics of the production of man and the comments on positive, zero and negative rents from land use has similarities to the theory of rent that emerged in the *Cours* (although, in a much more general form, with rents extending to capital and economic factors).

Pareto’s most significant scientific contributions to the *Giornale degli Economisti* during the initial phase of his scientific economic thought commenced in 1892, with a remarkable sequence of papers on mathematical economics published in the Journal over the subsequent five years. The main theoretical contributions concerns equilibrium and value theory, although, given his economic motivation was driven by his support for liberal policy positions, it is not surprising that scientific analysis of international trade and protectionism also featured.

Pareto’s first essentially scientific article was a reflection on mathematical economics: ‘Di un errore del Cournot nel trattare l’economia politica colla matematica’ (Pareto 1892a [1982]). He provided a critique of Cournot’s mathematical trade model in which free trade between two countries reduces the real income of the importing nation by the same value as the increase in real income of the exporting nation. In this paper, Pareto urged care in the application of mathematical economics, with the ‘error’ that Pareto successfully revealed being an error of interpretation: Cournot had demonstrated one thing and interpreted his results as demonstrating something else. In this regard, Pareto

confirmed Cournot's analysis can be maintained in aggregate across two trading countries, with the real income gain of the exporting country matching the real income loss of the importing country, but he rejected Cournot's interpretation because it ignores the economic consequences that derive from the reduction in labour time (or resource costs generally) in the importing country that results from a move to free trade. Economic use of these freed resources will increase aggregate real income across the two countries.

This trade and protectionist theme was taken up again in 'La teoria dei prezzi dei signori Auspitz e Lieben e le osservazioni del professore Walras' (Pareto 1892b [1982]) and 'Ancora della "Theorie des Preises" dei signori Auspitz e Lieben' (Pareto 1892c [1982]), although this time Walras' ideas were introduced. The analysis by Rudolf Auspitz and Richard Liebman (1889) utilized demand curves similar to Marshallian offer curves to argue in favour of protection (Chipman 1976 [1999], p.174). Pareto criticised this, using the Walrasian notion of interdependence in which variations in prices are considered with respect to all prices, including prices for the services of production. The analysis of Auspitz e Lieben was partial, with the numeraire for money assumed to have a constant marginal utility. While revealing limitations of the analysis by Auspitz and Lieben and showing that protection can be harmful, Pareto did not demonstrate that tariffs are *necessarily* harmful to the nations that impose them (Chipman 1976 [1999], p.175).

Perhaps the first sign that Pareto was a really exceptional talent in economics came with 'Considerazioni sui principii fondamentale dell'economia politica pura' (Pareto 1892-93 [1982]). This article was published in 5 parts between May 1892 and October 1893 and is important to the development of Paretian thought for a number of reasons. In terms of methodology, it gives a clear outline of the scope of pure economics and its relationship to the observed phenomenon, including rejection of the metaphysical concept of absolute perfection (a theme subsequently expounded upon with great effect in the *Trattato*). In terms of mathematics in economic theory, it makes clear that the objective of value theory is to explain and connect observable facts pertaining to prices, with the hedonistic basis of economic theory presented in that context. The main application of mathematics in this article concerned additive utility and the theory of value. The fundamental characteristic of pure economics is presented as the general proposition that the final degree of utility for goods, including instrumental goods, varies with the prices of consumable commodities and with other market conditions. In setting complementary and substitute (or what Pareto called fungible) goods temporarily aside, Pareto undertook analysis of exchange on the presumption that: the final degree of utility of a good is a function of the quantity of that good only; and that Daniel Bernouilli's theorem, concerning diminishing final degree of utility, holds.

Pareto's analysis focused on the final degree of utility rather than total utility. He was of the view that people have a clear perception of variations in utility from some existing social state, but did not accept that people had a clear conception of total utility at the prevailing, or even an alternative, social state. As a result, he questioned whether total utility existed, settling for the view that in pure economic analysis, it is acceptable to assume that utility exists when the final degree of utility of a good is independent of other goods. Over his career, Pareto continued to make statements conditioned by the comment 'if' utility (or ophelimity from 1896 onwards) exists.

Inspired by Walrasian interdependence, Pareto's 'Considerazioni' demonstrated the shortcomings of analysis that presumes the final degree of utility for money is held constant and, more importantly, demonstrated that the presumption was unnecessary. From his analysis of additive utility, Pareto derived a general downward sloping demand curve by undertaking comparative static analysis, involving the use of Hessian determinants, to find the solution to a general equilibrium system with diminishing final

degree of utility in which the initial equations specify that: the relative prices of goods reflects their relative final degrees of utility; and markets fully clear for the given supply of consumer goods. Pareto also undertook extensive investigations of the potential form that functions for the final degree of utility could take if they were to conform with the findings of experience and observation. He utilised a range of functions of variables, and functions of logarithmic variables, some of which reveal characteristics of the Cobb-Douglas utility function (Weber 1998).

‘Considerazioni’ also laid the foundation for much of Pareto’s future work on pure economics. Being an early systematic work on the fundamentals of his approach to pure theory, it points to the issues that attracted most of his attention. If one single characteristic of this work stands out, it is the emphasis on the necessity for mathematical representation of pure theory to fundamentally conform with reality, as attested to by the long investigations of functional forms of marginal utility equations and the discussion of how these relate to theory and reality. It was his concern with these type of issue that lead Pareto to revisit economic equilibrium theory in the intermediate phase of his work, culminating in the development of choice theory.

Over the next four or five years, the ‘Considerazioni’ was followed by a succession of scientific articles that dealt mainly with what Pareto considered applied economics. His first scientific discussion of this character concerned population economics in ‘La mortalità infantile e il costo dell’uomo adulto’ (Pareto 1893 [1982]). This study considered the extent of economic advantage that a nation derives from a low infant mortality rate. It may be classified as concerning uniformities in the real economic phenomenon from disturbances which are outside the scope of pure economics. The basic goal of the article was to estimate the cost of producing a man while considering diverse infant mortality rates. To achieve this, Pareto utilised Samuel Engel’s work on population and the cost of raising children and introduced a general density function to represent the population distribution of surviving children between zero and twenty years of age. The primary finding is that the economic advantage enjoyed by nations with a low infant mortality rate is less than what is often assumed because of the costs of caring for non surviving infants. In this regard, nations with a low infant mortality rate may have a higher mortality rate for older children between fifteen and twenty years of age, for whom costs would accumulate over a longer period of time.

This general issue was to be dealt with again in the *Cours*, in the applied economics section dealing with ‘personal capital’ (Pareto 1896-97 [1987], pp. 305-319). It also laid the foundation for the broad treatment of demographic issues in the *Cours*, including the critical assessment of Malthusian views on population and investigation of the relationship between population growth and economic prosperity. The article is also relevant because it introduced a child population distribution function that was similar to the income distribution function which was given some prominent treatment in the *Cours*<sup>9</sup>

By 1894, Pareto’s contributions to economics had matured considerably, with attention returned to the formalization of general equilibrium theory of international trade and a profound contribution to welfare economics. Again, in this year his work primarily

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<sup>9</sup> Specifically, the distribution function is a density function that is similar to the ‘second’ of the Pareto distributions discussed in the previous chapter. In its infant mortality form, the function is:

$$N_x = \frac{a}{(x+b)^\alpha}$$

where  $N_x$  is an ordinate that indicates the number of surviving children with an age of  $x$ . In its income distribution form  $N_x$  becomes the cumulative sum that indicates the number of people with an income of  $x$  or above.

concerned applied economics, but of the analytical type where virtual movement is investigated in a manner that utilizes mathematical methods of analysis develop in pure theory.

The general equilibrium theory of international trade was developed in 'Teoria matematica dei cambi forestieri' (Pareto 1894a [1982]). It commences with an exposition of Walrasian theories of exchange and production, in which the provision of productive services is modelled on the presumption that coefficients of production are fixed. Pareto modifies Walras' system to accommodate two markets (countries) for consumer goods. Quantities of consumer consumption sourced from domestic production and from imports are determined in equilibrium given the new exogenously given international prices, subject to the constraint that the value of exports equals the value of imports in each market.

The next article published was the seminal 'Il massimo di utilità dato dalla libera concorrenza' (Pareto 1894b [1982]). The Walrasian system of production again provides the starting point, but the theory of exchange is largely set aside. The resulting analysis represents the definitive nineteenth century study of production efficiency. It is also significant for introducing variable coefficients of production to economics for the first time, which facilitated his demonstration of the theorem that a point of equilibrium under free competition must yield an economic maximum when the cost of productive services is minimized by the competitive process. If society moves from an initial state that is not a point of free equilibrium to a subsequent state that is a point of free equilibrium, an economic residual (surplus) is generated from the more efficient use of productive services.

Importantly, Pareto also makes the point in this article that social welfare is increased when the coefficients of production are altered in a manner that increases the product returned to each individual member of society but harms no one. Consequently, this article posited both the basic Pareto principle and the first theorem in welfare economics (an economic maximum in terms of the Pareto principle is given by a point of equilibrium under free competition). The article is also suggestive of the second law of welfare economics (any point of economic maximum can be realized under conditions of free exchange), through its discussion of the socialist economies and the role of the Ministry of Production in setting coefficients of production. As Chipman (1976 [1999], p178) has perceptively pointed out, the 'compensation principle' is introduced in this article when Pareto discusses variation in the coefficients of production in socialist economies. In this regard, he indicated that the coefficients of production could be altered even when someone is harmed provided that a quantity of the numeraire good is taken away from those who have experienced a gain and used to 'compensate' those who have experienced a loss. This would yield an equilibrium that could be achieved under free competition with the appropriate initial resource endowment.

This analysis of welfare generally, and welfare in socialist countries in particular, is further developed in the *Cours* (Pareto 1896-97 [1987], pp. 722-34). However, the weakness of the article is also preserved in the *Cours*, with analysis focusing on production (albeit with variable coefficients of production) while largely ignoring the issue of exchange, which is necessary for a general specification of the fundamental theorems of welfare economics.

In 1895, Pareto contributed 3 scientific articles to the *Giornale degli Economisti* on applied economics: 'La legge della domanda' (1895a [1982]), 'Teoria matematica del commercio internazionale' (Pareto 1895b [1982]) and 'Per la verità' (Pareto 1895c [1982]).

‘La legge della domanda’ (Pareto 1895a [1982]) considers the impact of income on demand. Pareto employed ‘a simple empirical law’ on the distribution of income that he says will be presented in some detail in the *Cours*. The proposed distribution is:

$$y = \frac{a}{(x)^h}$$

While similar to the simplified version of the Pareto distribution that appeared in the *Cours*, it is not the same:  $y$  is the ordinate for number of taxpayers with a particular income  $x$ , not the sum of the number of people with an income of  $x$  or above. Consequently the  $h$  parameter has an average value of 2.5, higher than the 1.5 average for  $\alpha$ . Nevertheless, as an indicator of inequality of income distribution, Pareto used  $h$  in the same way as  $\alpha$ . That is, he considered a reduction in the inequality of income as being represented by a reduction in  $h$ . He then considered the demand for a product, in this case wheat, as a function of its price and income to estimate the parameters necessary to reproduce the relationship between the price of wheat and the wheat harvest that Gregory King had estimated in the seventeenth century. While finding tentative support for this law, the important point for the development of Pareto’s work was the recognition that an individual’s demand was influenced by their income, and that market demand was constrained by broad contextual factors that influence the degree of inequality in the distribution of income.

The quantity  $h$  depends on all the quantities which qualify the economic state, so when the quantity of economic goods demanded varies, so does  $h$ . However, using a procedure that is well known in mathematics, we can start by assuming that  $h$  is constant, and then take its change into account.

(Pareto 1895a [1982], p. 300)

As such, ‘La legge della domanda’ provides insight into the relationship between Pareto’s interest in the relationship between general empirical uniformities associated with the economic phenomenon and pure economic theory. Specifically, he regarded inequality of income distribution as a parameter to be estimated when considering demand, although as income inequality was relatively stable (with changes only occurring over long periods) it could be considered as a constant rather than a variable influence, at least over the medium term. While the Pareto distribution itself did not appear in this article or elsewhere in the *Giornale degli Economisti* prior to appearing in the *Cours*, Pareto’s explorations into child population distributions, income distribution and demand in the *Journal* played a formative role in the development of Pareto’s law.

In his ‘Theory of International Values’, Edgeworth (1894, p. 442) indicated that he was unaware of any additional conclusions when trade theory was taken beyond a 2 good model. In the footnote to this comment, Edgeworth was critical of ‘Teoria matematica dei cambi forestieri’ (Pareto 1894a [1982]) because the net advantages to countries from trade need to be considered with respect to ‘total utility’ and not by the final degree of utility. In response, Pareto wrote ‘Teoria matematica del commercio internazionale’ (Pareto 1895b [1982]) and attempted to extend his work in the previous year on welfare issues to the subject of international trade. His starting point, which became typical of his subsequent work on welfare theory, was an equilibrium state, but in this case the equilibrium provides for free international trade in consumer goods. He then considered the imposition of trade restriction, and calculated the additional cost that a country would

incur to maintain the level of consumption that was prevailing under free exchange.<sup>10</sup> Again, this discussion was influential in the subsequent but fuller treatment of international trade and welfare maximization in the *Cours* (Pareto 1896-97 [1987], pp 879-84). Later in the year Pareto wrote a brief note, 'Per la verità' (Pareto 1895c [1982]) in which he defended the use of Walras rarità and Jevon's final degree of utility in economic theory, and point to its consistency with respect to Francesco Ferrara's theory of the cost of reproduction.

Pareto's contributions to the *Giornale degli Economisti* in 1896 and 1897 fell into two categories: (i) methodology; and (ii) the Pareto distribution.

In regard to the first issue, 'Il modo di figurare i fenomeni economici' (Pareto 1896a [1982]), 'L'uomo delinquente di Cesare Lombroso' (Pareto 1896b [1982]) and 'Polemica col Prof. Lombroso' (Pareto 1897b [1982]) all emphasise the experimental character of science, be it economics, criminology or the study of the relationship between economic phenomena and criminal activity.

In regard to the second issue, Pareto utilized the Journal to respond to Edgeworth's (1896 [1999]) comments on the originality of the Pareto distribution, especially the suggestion that it has some similarities with Pearson's probability distribution. While Edgeworth admitted that this similarity is more apparent than real, he nevertheless pointed to the lack of theoretical rationale for Pareto's distribution. When this is taken together with statistical merit of Pearson's equation and Pearson's status in the scientific community, Edgeworth reveals a strong preference for adopting Pearson's probability density function ahead of the Pareto distribution.

Pareto's responses in the *Giornale degli Economisti*, 'La curva delle entrate e le osservazioni del prof. Edgeworth' (Pareto 1896c [1982]) and 'Aggiunta allo studio sulla curva delle entrate' (Pareto 1897a [1982]), were ill-tempered as he saw Edgeworth's comments as a 'thinly veiled accusation of plagiarism' (Chipman 1976 [1999], p.210). Pareto also suggested that the rational basis for his distribution would follow, but went on to indicate that Otto Ammon's theory of 'social heterogeneity' may provide the answer. In terms of the emergence of Paretian thought, the relevant point is that Pareto was, in the *Cours*, in the early stages of developing his theory of elites (aristocracies in the *Cours*). It is likely that the bitterness of his reaction to Edgeworth's comments on his income distribution function, motivated Pareto to further develop his theory of elites during the next phase of his scientific work and present it, in part, as a rational and empirical explanation for his income distribution curve.

During this initial phase, Pareto's contributions to pure theory are largely represented by the five part 'Considerazioni'. These contributions informed the representation of pure theory in the *Cours*, but the discussion of the relationship between particular functions and the observable economy went beyond the *Cours*, and can be seen as motivating developments that Pareto made to pure economics in the *Manuel* during the subsequent phase in the development of Paretian thought. In regard to applied economics, the same pattern of contributions evident in the *Cours* is also evident in his articles in the *Giornale degli Economisti*. Uniformities related to the real economic phenomenon from 'disturbance' not considered in pure theory are examined, as in the case of demographics and population economics. Virtual movements utilizing mathematical methods of

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<sup>10</sup> Chipman (1976 [1999], pp.179-80) has pointed to a significant slip in Pareto work in this article. The balance of trade equation is miss-specified, showing free trade with pre trade prices resulting in revenues from tariff initiatives not being properly accounted for. More fundamentally, the analysis does not consider the possibility in which bilateral welfare effects across the two trading countries are negative, but where one nation experiences a gain and the other experiences and even larger loss.

analysis developed in pure theory are considered, as in the case of trade theory and welfare theory. General empirical regularities associated with the economic phenomenon, in conjunction with their relevance for interpreting pure theory, are also considered, as in the case of preliminary studies of income distribution, and the defence of the Pareto distribution once it had been developed. In short, many of Pareto's most original contributions to applied economics were developed and showcased in the *Giornale degli Economisti* prior to appearing in the *Cours*.

#### *The Intermediate Phase – 1900-1911*

In the intermediate phase, Pareto's association with the *Giornale degli Economisti* diminished notably, largely to make time for his increasing efforts in sociology, such as his work on elite theory in 'Un'applicazione di teoria sociologiche' (Pareto 1900a [1980]) for the *Rivista Italiana di Sociologia* and, of course, to write the *Systèmes Socialistes*. However, the work that he did contribute was primarily focused on pure theory, with formative contributions to choice theory first introduced to economics through the *Giornale degli Economisti*.

Choice theory was initially developed in a two part article, 'Sunto di alcuni capitoli di un nuovo trattato di economia pura' (Pareto 1900b [1982]). In this article, Pareto demonstrated that, for a system of indifference curves in which each curve is labelled by an index number, the shape of the indifference curves is unaltered when an arbitrary transformation function is used to change the index numbers. The system of index numbers applied to different consumption bundles could reflect the (cardinal) measure of pleasure as a quantity, but this would be just one of an infinite range of possible index number systems, none of which would alter the shape of indifference curves. When the transformation function is constrained by the requirement that the value of index numbers increases when passing from one indifference curve to another that corresponds to a more favoured preference, Pareto demonstrated that the outcome of equilibrium analysis in which the index represents pleasure as a quantity is identical to the outcome achieved when index numbers increase in (monotonic) relation to preference ordering. In both cases, the equilibrium is given by the tangent between indifference curve, with the highest index number, and the curve of obstacles.

The 'Sunto' is superior to the subsequent *Manuale* and *Manuel* in one significant respect: the text of the article contains a flawless literal exposition of an ordinal approach to optimality and equilibrium and the appended 'analytical solution to the problem' contains a near flawless mathematical formalisation of an ordinalist system, with just one cardinal condition retained (McLure 2005). Complexities associated with the greater range of additional issues addressed in Pareto's post 'Sunto' studies contributed to a diminution of his emphasis on ordinalism in economic theory.

However, the introduction of ordinalist indexes was not 'an end', rather, it was a means to make economics experimental by focusing on the 'fact of choice' and dispensing with considerations on the motives for choice. The statistical problem presented here depends on data from the observation of choice and, through interpolation, estimation of the equation for indifference curves in the area that is close to equilibrium, with index numbers included in the equation which increase with preferred combinations of goods (Pareto 1900b [1982], p. 413). This goes some way to providing the foundation for a revealed preference approach to equilibrium, but the formalism is not axiomatic and the focus remains on indifference curves.

The "Sunto" was followed by a series of open letters in the *Giornale degli Economisti* written by Pareto, in 'Sul fenomeno economico: lettera a Benedetto Croce' (1900c [1999]) and 'Sul principio economico' 1901a [1999]), and Benedetto Croce, in 'Sul

fenomeno economico: lettera a Vilfredo Pareto (1900 [1999]) and ‘Replica all’articolo del Professore Pareto’ (1901 [1999]).<sup>11</sup> This exchange was one of the few occasions that Pareto treated his opponent in a scientific debate with great respect. Methodologically these articles are important for the provisional introduction of the Pareto’s distinction between logical and non-logical action, highlighting the positive basis of his work, by emphasizing the study of the ‘economic phenomenon’ ahead of the specification of ‘economic principles’, and for clarifications that he made to choice theory. In regard to choice theory, Croce regarded human will as the appropriate basis for considering economics, which Pareto had set aside in his focus on the fact of choice in the ‘Sunto’. In response, Pareto differentiated two types of choice, real choice and potential choice, which Martin Gross and Vincent Tarascio (1998) suggest provided the basis for two complementary approaches to choice theory. The ‘real’ approach relies on observation of human choice. This largely reflects the system outlined in the “Sunto”, although discussion of preference order in the article is also suggestive of a potential choice approach. The ‘potential’ approach provisionally outlined in his open letters to Croce, was subsequently clarified in the *Manuale* (1906 [1974], pp. 120-1) as the basis for binary choice experiments (Georgescu-Roegen 1975 [1999], pp. 491-95).

Pareto’s next article in this phase also dealt with pure theory and methodology. The text of ‘Le nuove teorie economiche: Appunti’ (Pareto 1901b [1982]) is largely an introductory review of the goals and objectives of marginalist economics, the role of mathematics in economics and the relevance of non-mathematical economics. It also included a mathematical appendix which contained his first attempt to specify dynamic equilibrium in equation form by accounting for variation in the level of savings in violation of Walras’ Law. However, the success of this was limited, as variations in ophelimity functions over time were not accommodated. Perhaps the issue of most historical relevance in this article is the linking of the concept of value with non-scientific notion, as subsequently mentioned in the *Manuale* and which came to exert a very significant influence over his direct followers:

**Value:** for many this term has a significance that is a little mystical, indicating a mysterious entity that is becoming a divinity that one can feel but cannot define. It is unnecessary to add that if one then searches to find what it is, one will effectively find no more than what Zeus found upon Olympus. ... Value does not have *one* cause. It is as equally worth while to search for this cause in the cost of production as it is in the *final degree of utility*, in *rareté* or in any other entity.  
(Pareto 1901b [1982], pp. 467-8)

Around the same time, Pareto wrote a similar general introduction to mathematical economics which was published in the German encyclopaedia *Encyklopädie der Mathematischen Wissenschaften* in 1902. The article was subsequently translated by Guido Sensini and published as ‘Applicazioni della matematica all’economia politica’ (Pareto 1906b [1982]) in the *Giornale degli Economisti*. It is elegant overview of mathematical economics and covers both the hedonistic approach to pure theory and Pareto’s new choice approach, although in a truncated form.

In 1902 and 1903, Pareto returned to the category of applied economics, where virtual movement is considered using mathematical methods derived from pure economics. The motivation for this was Gaetano Scorza’s review of Cassel’s *Grundriss einer Elementaren*

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<sup>11</sup> This, and subsequent, debate between Pareto and Croce has recently been considered in some detail by Bruni (2002).

*Preislehre*. This review was critical of Walras and Pareto, suggesting that Cassels' work shows that the proposition that equilibrium under free competition is an economic maximum is nothing but 'gross sophistry'. Pareto responded to this in 'Di un nuovo errore nello interpretare le teorie dell'economia matematica' (Pareto 1902 [1982]), prompting Scorza to respond in "A proposito del massimo di ofelimità data della libera concorrenza' (Scorza 1902), with the debate concluding with Pareto's 'A proposito del massimo di ofelimità' (Pareto 1903 [1982]).

The author of this study has previously examined the Pareto-Scorza polemic in detail (McLure 2000). Consequently, it is only necessary to provide a brief overview on this occasion. As Pareto's work on welfare economics had, until that time, focused on production, there was some basis to Scorza's critique. Pareto's reaction, while full of sarcasm and scorn, was also substantive as he extended his previous analysis of welfare to include both exchange and production. In the process, he provided economics with its first, analytically sound, first-order demonstration of the first fundamental theorem of welfare economics. Scorza, however, was not satisfied, pointing to problems with second order conditions and the potential for multiple equilibria.

Between 1900 and 1902, Pareto's work in the *Giornale degli Economisti* continued to recognise the distinction between pure economics and applied economic, but it now had a curious element. Specifically, pure theory was choice theory, but applied economics that relied on mathematics to investigate virtual movement in commodity space, as in welfare economics, was expressed in terms of the hedonistic approach to theory.

Pareto's next article, 'Il costo della produzione dell'uomo e il valore economico degli emigranti (A proposito di un articolo del Prof. F. Coletti)' (Pareto 1905 [1982]), was again in the field of applied economics. It concerned the valuation of a man in society, and, the more complex issue, of how to measure the change in the economic state that will result from the emigration of a citizen to another nation. Pareto essentially pointed to the complexity of the issues, especially if reasoning is undertaken in term of ophelimity rather than monetary values.

Next, Pareto responded to Vito Volterra's review of the *Manuale*. Unlike the polemic with Scorza, this time Pareto treated his critic with respect in the reply article 'L'ofelimità dei cicli non chiusi' (Pareto 1906a [1982]), much of which was reproduced in the extended mathematical appendix to the *Manuel*. Volterra essentially re-opened the question of path dependence within the ophelimity field by suggesting that the case of three goods or more requires further consideration than that provided in the *Manuale*, which tended to utilise two good specifications. Pareto had briefly touched on path dependence in the 'Considerazioni' and the 'Sunto' in discussion of the influence of the order of consumption on ophelimity, but had not dealt with the issue in a systematic manner because he considered it of some psychological interest but of little interest to economics. In 'L'ofelimità dei cicli non chiusi', Pareto developed an objective index of ophelimity from an arbitrary function of marginal ophelimity (determined from observed ratios of marginal utility), with the consequences for this index investigated for a circular consumption path in commodity space, from an initial arbitrary point that returns to that point. He used the term 'closed circle' when marginal ophelimity at the initial coordinates for a point in commodity space is unchanged following a circular consumption path and the term 'open circle' when a circular consumption path results in a change in marginal utility at the initial coordinates. That is, ophelimity is path independent when it is in a closed circle, and path dependent when it is in an open circle. Although Pareto did not establish the conditions for integrability in this, or other works, he concluded that equilibrium can be determined when elementary ophelimity is a closed circle, or when it is in an open circle but the path is determinate.

Pareto's contributions to the *Giornale degli Economisti* finish with a two part article entitled, 'L'interpolazione per la ricerca delle leggi economiche' parts 1 and 2, (Pareto 1907-08 [1982]), which deals with the analysis of time series data in economic and social research. He investigates how Cauchy's interpolation equation could be employed to fit curves. This serves to reiterate Pareto consistent focus on positive methods, and the desire for statistical information to establish general empirical regularities as part of the second approximation along the lines of that developed for the Pareto distribution to estimate the general form of functions for pure theory. In regard to the latter point, Chipman (1976 [1999], p232) has already noted that these articles treat theoretical models as approximations with specification errors, and utilize a mixture of interpolation and least squares methods to account for both specification and measurement error. The second phase comes to an end with an appreciative obituary entry 'L'opera scientifica di Leone Walras' (Pareto 1910 [1982]).

Like the first phase of his contribution to scientific thought, Pareto's original, and internationally enduring, contribution in the intermediate phase started as development in the *Giornale degli Economisti*. His greatest single contribution to pure economics during this phase concerned pure theory: the development of choice theory. The ideas developed in this Journal on choice were contributed well before they re-appeared in the *Manuale*. In the areas of applied mathematical economics, the Pareto Scorza polemic produced seminal and enduring contributions to welfare economics, with Pareto's contribution over this time significantly influencing the *Manuale* and the *Manuel*.

#### *The Final Phase – 1912 onwards*

By the final phase in the development of Pareto's scientific thought, his association with the *Giornale degli Economisti* had his scientific focus had now shifted almost entirely to sociology. Prior to the publication of the *Trattato*, Pareto contributed just one article, 'Il Massimo di utilità per una collettività in sociologia' (Pareto 1913 [1980]). However, this was a noteworthy extension of the non-additive economic welfare theory, which does not require interpersonal comparisons of ophelimity, to a sociological theory of social welfare which specifies social utility in homogenous terms based on the interpersonal comparisons of individuals and government. The article is reproduced almost in its entirety in the *Trattato*, and has already been discussed in the previous chapter.

Pareto's last contribution to the *Giornale degli Economisti* was 'Economia sperimentale' (Pareto 1918 [1980]). It was published two years after the *Trattato*, and is essential reading for scholars seeking to appreciate Pareto's view on economics in the final phase of his contribution to economic science. It differentiates between the economic part of the economic phenomenon, which is the subject of the science of economics, and the sociological part of the economic phenomenon, which is the subject of sociology. The critical point here is that this article defines the study of economic phenomena during the final phase of Pareto's contribution to scientific thought. It is not often recognized that Pareto treated 'experimental economics' during this phase in a dualistic manner, with experimental economics utilizing economic science, to study the economic part of economic action, and sociology, to study the sociological part of economic action. This article is of some importance, and is given further consideration in chapter 6 and a translated version of the article has been included in Part II of the book.

## Pareto Inspired Articles in the *Giornale degli Economisti* before 1923

During the initial phase of Pareto's work, he had no core followers writing in the *Giornale degli Economisti*, although there were some articles on themes initiated by Pareto. Most notably, Francis Ysidro Edgeworth (1897) and Rudolfo Benini (1897) considered economic aspects relating to the Pareto distribution and Enrico Barone had written articles on consumer demand, consumer surplus and production and distribution journal that had Paretian elements.

Edgeworth clarified his critique of the Pareto distribution and Benini undertook empirical exercises in which he found  $\alpha$  to be broadly in line with Pareto's estimate, but did not use  $\alpha$  as a measure of inequality. In 'A proposito delle indagini del Fisher', Barone (1894a) developed a critique of Marshall's notion of demand and consumer surplus that confirmed Pareto's finding in the 'Considerazioni' on the unnecessary presumption of constant marginal utility of money when the price of a commodity changes. In 'Sopra un libro del Wickseil' (Barone 1895), he not only adopted the commodity production functions that Pareto developed to investigate the welfare consequences of free competition in 'Il massimo di utilità dato dalla libera concorrenza', he also enhanced them by considering the influence of scale of output and working capital on production (Dooley 1998, p. 76). Barone also drafted of a review of Wicksteed's *Essays on the Coordination of the Laws of Distribution* (1894) which: pointed to Pareto's use of production functions with variable coefficients of production; and developed the marginal theory of productivity further. He submitted his review to the *Economic Journal*, but it was rejected. As Barone had noted that Pareto's work on variable coefficients of production pre-dated Wicksteed's work, this rejection contributed to the souring of relations between Pareto and Edgeworth (Chipman 1976 p. 90).

Barone also outlined a marginal theory of productivity in which coefficients of production varied with the scale of production as well as factor combinations, which influenced the structure of his seminal *Studi sulla distribuzione* (Barone 1896). While his contribution to the marginal theory of productivity is closely related to Pareto's analysis, the fundamental idea was conceived independently of Pareto (Dooley 1998, p. 77). In this regard, Pareto (1896-97 [1971], p. 723) came to object to the marginal theory of production because an increase in one productive service is not necessarily 'compensated' for by a decrease in other productive services. Some productive services are fixed, others are variable, some are partially fixed and partly variable and all this is constrained by the state of technology. Consequently, by 1896 Pareto came to the view that basing production theory on the presumption of perfect substitution of productive services was too approximate for economic theory, even though that is what he effectively did in earlier studies (Pareto 1894b [1982]). Interestingly, Pareto also convinced Barone of the main flaws in the marginal product theory of distribution (Schultz 1929 [1999] p. 432)<sup>12</sup>.

On balance, in the last decade of the nineteenth century Barone is most properly considered an eminent contemporary of Pareto, rather than his follower. Like Pareto, his interest was focused in the implications of Walras' work. He was an independent thinker who also investigated issues in a manner that Pareto did not. In particular, he was interested in partial equilibrium to a much greater extent than Pareto, even taking steps to define the relationship between the two approaches. For example, in 'Sulla consumer's rent' (Barone 1894b), he presented the partial equilibrium approach to consumer surplus of Marshall as a reasonable approximation to the more rigorous the general equilibrium

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<sup>12</sup> In *Principi di Economia* (Barone 1908a [1936-37]), the influence of Pareto's ideas on production and the marginal productivity theory of distribution are clear. See Dooley (1998, p.78)

approach to consumer demand of Walras and in ‘Sul trattamento di questioni dinamiche’ (Barone 1894c) he utilised Marshallian type analysis of equilibrium adjustments. None of these issues are Paretian in character. .

It was not until the intermediate phase of Pareto’s scientific work, when his major contribution to pure theory was developed, that a discernable circle of specifically Paretian scholars emerge. Between 1900 and Pareto’s death in 1923, there were 40 articles published in the *Giornale degli Economisti* that dealt with Paretian themes, of which 6 were critical assessments or book reviews. The themes can be broadly categorized as pure economics, fiscal studies which draw on sociology, applied economics, and other general studies. Articles pertaining to these themes are chronologically listed in Table 1.<sup>13</sup>

In the field of pure economics, Pareto’s followers mainly worked on issues associated with the intermediate phase of Pareto’s scientific contributions. Of these, the most influential were by Pasquale Boninsegni, Enrico Barone and, of course, Eugen Slutsky. Luigi Amoroso’s pure economics at this relatively early stage of his career work was also important, although mainly as impressive precursors to his *Lezioni di economia matematica* (Amoroso 1921) and other studies after Pareto’s death.

Boninsegni’s initial articles (1901a, 1901b) attacked the notion of ‘economic convenience’ developed and defended by Ulisse Gobbi (1900, 1901), where both means and ends associated with heterogeneous actions are analysed in monetary terms using mathematical functions. Gobbi’s approach is not only rejected for lacking rigour, but for being a backward step that is fundamentally at odds with mathematical economics. In short, Boninsegni used his criticism of one formulation of pure economics to highlight the strength of mathematical economics along the lines of Pareto (Mornati 1999). In ‘I fondamenti dell’economia pura: a proposito di un libero del sig. A. Aupetit’, Boninsegni (1902) also took the opportunity of criticising *Essai sur la théorie générale de la monnaie* by Aupetit (1901), in which money is directly incorporated into general equilibrium theory, to highlight, and extend, Pareto’s analysis.

Boninsegni objected that there were not enough equations to determine the elementary ophelimity of the numeraire (or money) as well as the goods exchanged. More importantly, he contrasted the Paretian approach with the monetary theory of choice being developed by Aupetit. Fiorenzo Mornati observed that Boninsegni also modified Pareto’s approach to choice in the ‘Sunto’ in an original manner (Mornati 1999, pp. 164-6). Specifically, while following Pareto in finding equilibrium at the point of tangency between indifference curves (with different index numbers that are an arbitrary function of tastes) and the function for obstacles, Boninsegni represented obstacle as a linear budget constraint, whereas Pareto used non-linear constant output curves derived from his obstacles’ functions. As such, Boninsegni presented choice theory in the context of the consumer, whereas Pareto presented it in the concurrent context of exchange and production. As such, Mornati finds that Boninsegni’s enhancement is similar to that subsequently developed by Hicks and Allan (1934).

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<sup>13</sup> The critical reviews of Pareto’s approach published in the *Giornale degli Economisti* during his lifetime are not included in the Table as most have been discussed already.

Table 1

**Paretian Articles in the *Giornale degli Economisti*: 1900-1923**

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Pure Economics<sup>(a)</sup>

<i>Year</i>	<i>Author</i>	<i>Article</i>
1901	Pasquale Boninsegni	The principle of economic convenience and the science of quantities (two part article)
1901	Pasquale Boninsegni	The concept and importance of pure economics
1902	Pasquale Boninsegni	The fundamentals of pure economics: a review article of Aupetit's <i>Essai sur la théorie générale de la monnaie</i>
1903	Pasquale Boninsegni	A new treatise on mathematical economics
1904	Pasquale Boninsegni	Investigative research on the functions of demand and supply in the case of barter exchange assuming linear elementary ofelimità (marginal utility)
1906	Umberto Ricci	Flat product supply curves
1907	Guido Sensini	The theory of external exchanges
1908	Enrico Barone	The ministry of production in the collectivist state
1908	Vladimir Furlan	Overview of a generalisation of the concept of ophelimity
1915	Eugene Slutsky	On the theory of the consumer's Budget
1916	Luigi Amoroso	On the theory of the curve of utility
1917	Luigi Amoroso	Indifference curves in the theory of collective phenomena with two arguments

(a) 12 articles on pure economics

Public Finance and Sociology<sup>(b)</sup>

<i>Year</i>	<i>Author</i>	<i>Article</i>
1912	Roberto Murray	The fundamental problems of fiscal economics: a contribution to the theory of financial equilibrium
1913	Roberto Murray	About the notion of public needs
1915	Roberto Murray	The science of public finance, financial law and the notion of the state
1915	Roberto Murray	The application of mathematical procedures to the social sciences in the present moment
1919	Gino Borgatta	Economic-financial studies after the war
1920	Gino Borgatta	The scientific study of fiscal phenomena (two part article)
1920	Guido Sensini	The theory of Ricardo on the diverse effects of debt and taxation.
1920	Guido Sensini	General classification of the principal problems in public finance.
1920	Guido Sensini	Further classifications of the principal problems in public finance

(b) 9 articles on public finance

### Applied Economics<sup>(c)</sup>

<i>Year</i>	<i>Author</i>	<i>Article</i>
1907	Constantino Bresciani Turrone	On the interpretation and comparison of income and patrimony series
1908	Guido Sensini	The usual method of calculating the cost of producing a man (two part article)
1909	Vladimiro Furlan	Note on the Paretian income curve
1919	Luigi Amoroso	Contribution to the mathematical theory of interpolation.

(c) 4 articles on applied economics

### General<sup>(d)</sup>

<i>Year</i>	<i>Author</i>	<i>Article</i>
1905	Vittorio Racca	Of the social utility of an international institute for agriculture.
1910	Luigi Amoroso	The application of mathematics to political economy
1911	Luigi Amoroso	The application of mathematics to the study and economic and social phenomena.
1911	Roberto Murray	Mathematical economics and deductive static economics
1912	Luigi Amoroso	Paretaio and the “Paretian spirit”
1914	Luigi Amoroso	On the theory of the variations in the value of money
1919	Luigi Amoroso	The economic situation
1921	Luigi Amoroso	The Italian economy in 1921
1922	Guido Sensini	Producer ‘benefits’
1922	Guido Sensini	About producer benefits
1923	Guido Sensini	About some points of the ‘rent theory’

(a) 11 articles on general or miscellaneous matters

Nevertheless, it should be recalled that the illustrative numerical example Pareto provided in the ‘Sunto’ specified the effect of obstacles on equilibrium as a linear equation and that variations in the obstacles using this equation were discussed entirely in terms of a variation in the consumer budget (Pareto 1900a [1982], pp.419-23). Consequently, Boninsegni’s contribution to choice theory concerns the form of theory and not its substantial concepts. That is, he used Pareto’s ordinal conception and simplified numerical illustration of choice theory as the basis for presenting general consumer theory in isolation from the broader framework that Pareto used when formalising general economic theory.

Curiously, some non-Italian economists overstate Boninsegni’s contribution. For example, Dooley has observed that “Boninsegni (1902) ... is the nearly forgotten originator of the ordinal approach to indifference curve analysis” (Dooley 1998, p.89). This view no doubt derives from Pareto’s note in the Appendix to the *Manuale* when dealing with the equations that represent the system of indifference curves using index numbers: ‘For greater elucidation see P. Boninsegni, I fondamentali dell’economia pura, in the *Giornale degli Economisti*, Roma, February 1902’ (Pareto 1906 [1974], p.368). The same note is repeated in the *Manuel* (1909 [1971], p.392). It appears that Pareto actively promoted his talented protégé in the scientific community. Perceptions of his importance were also enhanced by Pareto’s reference to Boninsegni (1904) in the

*Manuale* and *Manuel* when discussing the complexities of mathematical analysis based on ophelimity:

In the *Giornale degli Economisti*, Roma, September 1904, Professor Boninsegni has published an excellent study which investigates ‘the functions of demand and supply in the case of barter, assuming that elementary ophelimity is linear’ (Pareto 1906 [1974], p376)

In Italy, Boninsegni is recalled, but sometimes in dismissive terms. This is discussed further in the next chapter. Another of Pareto’s students at Lausanne, Vladimir Furlan, attempted to generalise Pareto’s notion of ophelimity and choice theory in the *Giornale degli Economisti*. In ‘Cenni su una generalizzazione del concetto d’ofelimità’ (1908), Furlan introduced an axiom concerning human behaviour, by explicitly specifying that individuals maximise ophelimity through choice, with the choice of a preferred combination of goods yielding maximum ophelimity for the individual in question.

Of the other major studies in pure economics from Table 1, Enrico Barone’s (1908a) ‘Il ministro della produzione nello stato collettivista’ and Eugen Slutsky’s (1915) ‘Sulla teoria del bilancio del consumatore’, are the most important, but are too well known to devote much space to their propositions of each. However, it is appropriate to briefly consider the relationship between these studies and Pareto’s work.

While Pareto is celebrated from his pioneering work on collective economic welfare, it is generally accepted that he still left gaps in the literature. In the *Cours*, Pareto’s discussion of socialism went some way to developing the second law of welfare economics, but he made an interpretive error. As John Chipman (1976, p.93) has pointed out, Pareto got the treatment of redistribution correct (unconditional lump sum transfers) but misinterpreted his analysis when concluding that the coefficients of production for a socialist state should remain unchanged from those under free competition. The change in the composition of demand resulting from the redistribution, efficiency dictates that coefficients of production will require different coefficients to maximise welfare: Pareto should have concluded that while the production functions are unchanged, the coefficients will change from those prevailing under free competition before the lump sum redistribution to those that would prevail if free competition were to operate under the new distribution of resources following the lump sum transfers. In the *Manuale*, Pareto (1906 [1974], p.255-7) clarified his interpretation of this issue, but he did not provide the analysis to demonstrate the result.

For the purpose of this study, the important thing is that ‘Il ministro della produzione nello stato collettivista’ presented a competitive general equilibrium model that analysed welfare along the lines developed by Pareto, which Barone explicitly acknowledges. The resulting general equilibrium model, in which initial endowments and coefficients of production are exogenous, but individuals’ tastes are directly observed is able to analyse welfare effects for individuals, competitive collectives and socialist collectives in terms of a numeraire indicator. It is also able to make provisional assessments of welfare from distributional changes.

The influence of Pareto’s goal for experimental equilibrium analysis is clear and the article was cited favourably by Pareto in the appendix to the *Manuel*. Under the heading of equilibrium for one individual with any number of goods and constant prices, Pareto discussion of how experiments can be used to deduce the theory of economic equilibrium and concludes with a note that: ‘This point of view is developed in a scholarly article by E. Barone. See *Giornale degli Economisti*, Rome, September 1908’ (Pareto 1909 [1971], p. 416). Barone’s main advance in this article was his clarification of the relationship

between the first and second theorems of modern welfare economics. By relying on experimental observations of tastes he was able to further develop the ‘compensation’ principle that Pareto introduced in ‘Il Massimo do utilità dato della libera concorrenza’ (1904b) to make compare different states. As Chipman and Moore (1978, 548) have noted, Barone mentioned the compensation principle no less than four times. However, this classic article has also been criticised for not fully accounting for the impact of choice on the unique system of processes used in the welfare analysis, with Allais, who was most impressed by Pareto’s equivalent surplus notion of welfare, arguing that: ‘*From a scientific point of view, Barone’s article was a step down from the summits reached by Pareto*’ (Allais 1975 [1999] p. 457, italics from the original text).

However, the equivalent surplus approach to welfare comparisons for which Pareto is justifiably famous was not included in the *Manuale*, published before Barone’s article, but in the *Manuel* (Pareto 1909 [1971], pp. 474-5), which was published one year after Barone’s article. It appears likely that, after reflecting on Barone’s article, Pareto was inspired to reconsider how measurement issues associated the compensation principle, which he himself had developed twelve years earlier, could provide the basis for a surplus approach to welfare. It should also be noted that Barone made significant contributions to fiscal theory in articles published in the *Giornale degli Economisti*. Most notably, his two part article ‘Studi di economia finanziaria’ (1912) investigated incomes and fiscal burden, taxation theory, tax shifting and the excess burden from indirect taxation. However, this extended economic analysis to individual fiscal events that went well beyond the level of economic analysis of fiscal events that Pareto would contemplate and could not be considered Paretian in the strict sense.

Amoroso’s ‘Sulla teoria delle curve di utilità’ (1916) is of some historical interest because it reviewed William Ernest Johnson’s ‘The pure theory of utility curves’ (1913) published in the *Economic Journal*. Amoroso pointed out that the ordinal theory presented by Johnson was developed without any prior knowledge of Pareto’s work on the subject, and lamented that this lack of knowledge on Pareto is not limited to Johnson, but extends to his entire area. The issue of Johnson and Pareto on ordinal utility theory is discussed in a well researched paper by Ivan Moscati (2005).

In spite of the limited penetration of Pareto’s ideas on utility in the United Kingdom, the development of demand theory in the *Giornale degli Economisti* did attract attention in some European centres. While a faculty member of the *Kiev Institute of Commerce*, Eugen Slutsky wrote his famous ‘Sulla teoria del bilancio del consumatore’ (1915). This article extended Pareto’s derivation of a downward sloping demand curve from his investigation of general utility functions in ‘Considerazioni sui principii fondamentale dell’economia politica pura’ (Pareto 1892-93d [1982]). Slutsky’s great achievement was to extend Pareto’s contribution by re-specifying the analysis for a generally ordinal specification of utility and to then isolate the income and substitution effects. Pareto (1892-93d [1982]) considered utility as independent and additive and did not isolate these two effects. Moreover, his subsequent treatment of the issue in the *Manuel* did not achieve full ordinal specification. Perhaps in light of this, R.G.D. Allen was to reflect that ‘the present theory of the consumer’s behaviour, as developed by Hicks and others, is essentially as much a development of Slutsky’s work as it is of Pareto’s’ (Allen 1950, pp. 210-1).

The relative contribution of Pareto and Slutsky to the development of consumer theory has been the subject of some debate. Dooley (1983 [1999]) has pointed out that Slutsky followed Pareto’s procedure and demonstrated that Pareto’s solution for the partial derivative of the quantity of a good with respect to its own price is mathematically the same as Slutsky’s equation, it just does not isolate the two effects. This suggests that

‘Pareto was the true master, Slutsky the gifted disciple, who improved the master’s work’ (Dooley 1983 [1999], p292). Christian Weber (1999), however, pointed out that Pareto had no intention of systematically examining the effect of income on demand. From the text of the *Manuale* (1906 [1974], p. 193), it is clear that Pareto fully appreciated that the change in demand for a good following an increase in income may take any sign (positive, negative or zero). In view of this, and in light of Pareto’s methodology, Weber suggests that Pareto may have considered the theoretical representation of the effect of income changes on demand as a waste of time:

If the mathematical analysis yields a definite sign, the theory was contradicted by facts. If it yielded an uncertain sign, nothing new had been learned, so what is the point?

(Weber 1999, p.581)

Weber’s suggestion is indeed plausible and, on this basis, Slutsky should be considered as more than a disciple following the master. While he followed Pareto in terms of procedure, at least in part, he investigated an issue that was to become attractive to formal consumer theory in the twentieth century, but in a manner that represented something of a departure from acceptable experimental relationship between fact and theory within Pareto’s methodology of science.<sup>14</sup> The Italian reaction to this issue was to jointly recognise the contributions of both scholars by, as Dooley and Weber have both noted, referring to the ‘Pareto-Slutsky’ analysis of demand, as in D’Albergo (1949).

The substantive fact of all these contributions to pure economics is that they derive from the intermediate phase of Pareto’s scientific contributions, with Amoroso, Barone, Boninsegni and Furlan (and Sensini, as discussed below) directly following Paretian methodology and theory of studies in pure economics and Slutsky following Pareto mathematically but not necessarily methodologically. However, if these scientific contributions to pure economics are considered in isolation, a strong case for a ‘Pareto school’ does not emerge. Walker’s assessment is basically correct and it would be appropriate to use the term Lausanne school. Dooley (2001) too refers to the Lausanne School (whose core members he describes as Walras, Pareto and Barone) in his discussion of production theory and the theory of the firm, and his classification is difficult to fault. This is not changed when Paretian studies of an applied nature are considered. Even empirical work on Pareto distribution of income was primarily concerned with statistical investigation of a possible empirical regularity: the particular Paretian character emerges in its complete form when income distribution is linked to the circulation of elites and sociological theory.

General studies provide some insight into what may define the Pareto school. The relationship between mathematics and science features strongly in the studies of Murray and Amoroso. Also, the studies of rent by Sensini are a direct extension of the unique relationship between production and rent that Pareto developed in his *Cours* and *Manuale*. However, it is only when the field of public finance is considered does the grounds for referring to a Pareto school clearly emerge, as it is in this area that the broadest treatment of equilibrium that Pareto developed in his final phase of scientific thought. That is, it is in the field of public finance that the influence of sociological phenomena on economic equilibrium and the social state emerged in a uniquely Paretian line. The main contributors were Roberto Murray, Guido Sensini and Gino Borgatta, although Murray’s

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<sup>14</sup> This is not to suggest that Slutsky did not pursue a positive agenda, as Pareto’s experimental economics accords observation a place that is extreme among equilibrium economists.

association with Pareto was, to some degree, self assessed. Without the scholarship of this group of fiscal scholars, the basis for suggesting that a Pareto school, in the fullest sense, developed in Italy is difficult to sustain.

However, these fiscal scholars do not form a homogenous group in the second decade of the twentieth century. Murray was the first to initiate developments in fiscal studies along a Paretian line, but his approach was soon overtaken by developments contributed by Sensini and Borgatta. Along the way, Borgatta and Murray were at odds over the relevance of methodological individualism in fiscal studies. As Paretian fiscal sociology, which emerged in the immediate post World War I period, is the primary subject of subsequent chapters, developments in this area are not discussed here.

### **Pareto Inspired Articles in the *Giornale degli Economisti* after 1923**

From Pareto's death in 1923 until 1975, the number of Paretian articles published in the *Giornale degli Economisti* alone is staggering: over 100 articles were published on Pareto inspired themes or on the work of Pareto himself. The year 1975 is significant because it was the last year in which Giovanni Demaria edited the Journal and from that year onwards, works pertaining to Pareto virtually disappeared from the Journal. As a consequence, the focus in this subsection is limited to the period 1924 to 1975, with articles published over this period listed in Table 2 using the same general subject headings adopted in Table 1.

The time span covering Table 2 includes two brief 'commemorative' periods: 1924-26, the first few years after Pareto's death; and 1948-49, with articles celebrating the centenary of Pareto's birth in 1848. Articles written in these brief periods were generally reflective and account for around 40% of the Paretian articles published in the *Giornale degli Economisti* in the 52 years to 1975. In Italy, a similar flurry of commemorative publications occurred at other significant occasions, although not in the *Giornale degli Economisti*. The fiftieth anniversary of Pareto's death in 1973 was marked by a major conference, with speakers including J. R Hicks, Maurice Allais, Raymond Aron, Gottfried Eisermann, Samuel Finer, Norberto Bobbio, Talcott Parsons, Nicholas Georgescu-Roegen and Giovanni Busino, with the proceedings published in *Accademia Nazionale dei Lincei* (1975). Similarly, around the centenary of the Cours in 1996-97 three international conferences were convened (Pisa, Torino, Lausanne), with the proceedings from each published in Faucci (1997), Bridel and Tatti (1999) and Malandrino and Marchionatti (2000). This has some sociological relevance: it reveals that the community of economists and sociologists in Europe, particularly Italy, reveal a desire to commemorate and reflect on the work of Pareto at regular intervals corresponding with significant anniversaries. It supports the case for a Pareto school, not necessarily in terms of the science contributed by Pareto and his circle, but in the sociological sense where this intellectual episode is preserved and kept as a living part of intellectual history.

Outside of these commemorative periods, there were relatively large numbers of articles published which have been categorized as 'general' in Table 2.

Paretian Articles in the *Giornale degli Economisti*: 1924-1975

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Pure Economics <sup>(a)</sup>		
<i>Year</i>	<i>Author</i>	<i>Article</i>
1924	Umberto Ricci	Pareto and pure economics
1924	Luigi Amoroso	The mechanical economy
1924	Alfonzo de Pietri-Tonelli	Vilfredo Pareto's general equations of general equilibrium
1924	Ulysse Gobbi	Pure economics and the concrete economic phenomenon
1925	Ugo Broggi.	About the mechanical economy
1925	Luigi Amoroso	About the mechanical economy
1929	Luigi Amoroso	The differential equations of dynamic economics
1930	Guido Sensini	The equations of economic equilibrium on the hypothesis that wealth utilised by the government, for the service of determinate individuals of the collective, is excluded
1947	Guido Sensini	The mathematical theory of 'closed circles' and of 'open circles' in pure economics.
1947	Guido Sensini	Considerations on the 'closed circles' and of 'open circles' in mathematical economics
1948	Zuccherini, G.	Determinateness of ophelimity functions: historical curves and dynamic demand curves
1948	Felice Vinci	Monopoly and competition in the thought of Pareto
1949	Guido Sensini	The studies of Vilfredo Pareto on the functions of demand and supply
1949	Emilio Zaccagnini.	New problems of the Scorza-Pareto polemic
1949	Ernesto D'Albergo	A generalisation of the Pareto-Slutsky equations
1949	Valentino Dominedò	The conditions of maximum collective ophelimity according to Pareto
1950	Guido Sensini	More about the studies of Vilfredo Pareto on the functions of demand and supply
1951	Guido Sensini	Mathematical considerations concerning variable prices
1952	Guido Sensini	Mathematical theory of export premiums
1974	Giovanni Demaria	Stability in Pareto's system
(a) 20 articles on pure economics		
Public Finance and Sociology <sup>(b)</sup>		
<i>Year</i>	<i>Author</i>	<i>Article</i>
1924	Gino Borgatta	The relationships between the science of economics and sociology in Paretian work
1924	Giuseppe Prato	Paretian corollaries in the present time
1924	Robert Michels	Pareto and historic materialism
1924	Ettore Ciccotte	Pareto and historical studies

1925	G. Majorana	Ancient and new forms of reducing private property in a construction of Vilfredo Pareto
1926	Luigi Amoroso	That which is science and that which is faith in the field of economic doctrine
1929	Guido Sensini	Outline of theoretical public finance
1932	Georges-Henri Bousquet	Observations on the economic dimensions of theory
1936	Alfonzo De Pietri Tonelli	Considerations about stock Markey speculation
1947	Filippo Burzio	Pareto's 'non logical action'
1948	Pasquale Jannaccone	Vilfredo Pareto: the sociologist
1948	Federico Chessa	Vilfredo Pareto's theory of circulation
1948	Agostino Lanzillo.	Social equilibrium and classism
1949	Benvenuto Griziotti	At the school of Vilfredo Pareto and Maffeo Pantaleoni
1949	Mauro Fasiani	Pareto's contributions to the science of public finance
1949	Augusto Bordin	On some coercive utility maxima
1949	Giuseppe de Meo	Circulation of aristocracies and social change
1950	Aldo Scotto	The scientific work of Gino Borgatta
1954	Aldo Scotto	Note in the margin of a new book on public finance
1955	Guido Sensini	The equations of static economic-financial equilibrium in some complex cases
1958	Tullio Bagiotti	On the Paretian journal and on analytical unity as the criteria for the integration of the social sciences
1963	Ernesto D'Albergo.	Public finance and welfare: burdens and advantages at the 'frontier' of collective usefulness
1963	Ernesto D'Albergo	Public finance and welfare: necessary reflections in opposition to hedonistic grandeur
1963	Ernesto D'Albergo	Public finance and welfare: presumptions of the generality of the gnoseologic Paretian model
1964	Norberto Bobbio	Introduction to Pareto's sociology
1964	Ernesto D'Albergo	Public finance and welfare: logical reduction to a Paretian model of functions and schemes of welfare connected to plans for the fiscal budget
1964	Ernesto D'Albergo	Public finance and welfare: real validity of the rationale Italian genesis of the maximum collective utility
1966	Achille Agnati	Vilfredo Pareto's <i>Trattato di Sociologia Generale</i> as a 'first approximation' in the study of concrete economic reality
1967	Tommaso Giacalone-Monaco	The fiftieth anniversary of Vilfredo Pareto's "Sociologia"
1967	Ernesto D'Albergo	Identification of a scheme for financial economics
1973	T. de Montbial	Note on Pareto's law and the idea of ergodism in social sciences

(b) 31 articles on public finance, politics and sociology

### Applied Economics <sup>(c)</sup>

<i>Year</i>	<i>Author</i>	<i>Article</i>
1924	Gustavo del Vecchio	The theories on circulation in the writings of Pareto
1924	Rodolfo Benini	From Malthus and Ricardo to Vilfredo Pareto
1924	Giuseppe Morara	Pareto Statistician
1924	Felice Vinci	Calculation of the probability and distribution of incomes in the thought of Pareto
1932	Agostino Lanzillo	The Paretian curve on the distribution of income and the inferences it suggests
1932	C. Alimenti	The Paretian curve for the distribution of income
1932	Agostino Lanzillo	The Paretian curve for the distribution of income: Reply
1949	Raffaele D'Addario	Research on the curve of incomes
1949	Fernando Giaccardi	On the 'curve of incomes'
1949	Harold T. Davis	Pareto Statistician
1953	Guido Sensini	Research on economic laws by means of interpolation of statistical data
1973	Francisco Gonzales Quijano	The Pareto curve considered ALS OB

(c) 12 articles on applied economics

### General <sup>(d)</sup>

<i>Year</i>	<i>Author</i>	<i>Article</i>
1924	Maffeo Pantaleoni	On the occasion of Pareto's death: reflections
1924	Enrico Barone	The work of Vilfredo Pareto and the progress of science
1924	G. Rocca and F. Spinedi.	Bibliography of Vilfredo Pareto
1924	Marco Fanno	Controversial points of the theory of the customs duties
1924	F. Zugaro.	Pareto and the military disciplines
1924	R. Dalla Volta	Pareto at the 'Accademia dei Georgofili'
1927	Umberto Ricci	Talking with Mr. Bousquet
1930	Georges-Henri Bousquet	Economic laws
1948	Georges-Henri Bousquet	An unpublished manuscript of Vilfredo Pareto
1948	Jan Tinbergen	Models of international commerce
1948	Alfonzo De Pietri Tonelli	How a supposed paradox in the practice of international exchange is nothing but a misunderstanding of theory.
1948	Luigi Amoroso	Pareto, mathematician and economist
1952	Giovanni Busino	Vilfredo Pareto and the 'Società delle Nazioni'
1952	M. Casari	Observations on the Ricardian paradox and on Pareto's critique
1954	Otto Weinberger	Reflexions on the occasion of the republication of Vilfredo Pareto's 'theoretical writings'
1955	Benvenuto Griziotti	Vilfredo Pareto's open letter to Minister Cremona
1956	Giuseppe Palomba	The salient facts of macroeconomics and the development of the Paretian system

1956	Georges-Henri Bousquet.	V. Pareto – his family, his infancy and his youth (a note for a biography)
1957	Georges-Henri Bousquet	Rectifying bibliography to complement the writings of V. Pareto
1957	Tommaso Giacalone-Monaco	New unpublished letters of Vilfredo Pareto
1958	Giuseppe La Ferla	Note on Pareto
1958	Giovanni Demaria	Paretian soliloquy
1958	Vilfredo Pareto	My journal
1959	Tommaso Giacalone-Monaco	Pareto and Bakounine
1960	Tommaso Giacalone-Monaco	The political and economic “chronicles” of Pareto
1962	Tommaso Giacalone-Monaco	Paretian papers
1963	Giovanni Busino	Pareto and the authorities of Lausanne
1963	Tommaso Giacalone-Monaco	Pareto and A. de Pietri Tonelli
1963	Tommaso Giacalone-Monaco	Engineer Vilfredo Pareto in the ‘Società delle Strade Ferrate Romane’
1963	Georges-Henri Bousquet	Note on the proper name initials in the «correspondence of Vilfredo Pareto» published by professor Sensini
1965	Tommaso Giacalone-Monaco	Preface to the “chronicles” di Vilfredo Pareto
1967	Tommaso Giacalone-Monaco	Research into the youth of Vilfredo Pareto
1967	Georges-Henri Bousquet	An unpublished manuscript of Pareto from the «Fonds Walras de Lausanne»
1967	Tommaso Giacalone-Monaco	Two documents on the life of Vilfredo Pareto
1968	Tommaso Giacalone-Monaco	Vilfredo Pareto’s mysterious preparation in Greek and Latin
1969	M. Lucheti	Education and ophelimity in Pareto’s «Course in political economy»
1972	T. Matsuura	The interpretation of Paretian research in Japan today
1972	Giovanni D’Alauro	Pareto and Cabiati: two letters from 1908
1974	Piet Tommissen	Note on ‘effertz’ and Pareto
1974	Giovanni Busino	Paretian studies from 1971 to 1973
1975	Giovanni Busino.	The work and its interpretations: on recent Paretian studies

(g) 41 articles on general, historical and miscellaneous articles

By the middle of the twentieth-century, Pareto’s historical significance had become so well recognized in Italy that a broad range of Paretian research areas, and many specialist areas, were investigated. In the *Giornale degli Economisti*, some of Pareto’s letters were published (Griziotti 1955, Giacalone-Monaco 1957, 1962), unpublished manuscripts discussed (Bousquet 1967), biographical notes written (Bousquet 1956, 1957, 1963, Giacalone-Monaco 1959, 1967, Busino 1963, ) diaries published (Demaria 1958, Pareto 1958, Bagiotti 1958), a number of works written on Pareto’s ‘Chonache’ for the Journal (Giacalone-Monaco 1960, 1965) and a survey article included on recent Paretian studies.

Two contributors were also active in publishing books on Pareto. Tommaso Giacalone-Monaco edited Pareto's letters and papers to Carlo Placci (Giacalone-Monaco 1957), Léon Walras (Giacalone-Monaco 1960) and Emilia Peruzzi (Pareto 1968). Giovanni Busino published his surveys of Paretian studies, ranging from 1960 to 1973 (as well as observations on Pareto and his critics between 1923 and 1959) in *Gli Studi so Vilfredo Pareto Oggi* (1974). Busino is also the editorial director of Pareto's complete works.

Outside the 'general category', the number of articles published in the *Giornale degli Economisti* diminished during the non-commemorative periods. In the field of applied economics, there is little sign of new Paretian type analysis undertaken, although, the debate between Lanzillo (1932a, 1932b) and Alimento is of interest for touching on the relevance of the Pareto distribution for elites and societies. The number of Paretian articles on pure economics and public finance, politics and sociology was also much reduced.

In pure economics, the most prolific Paretian writer publishing in the *Giornale degli Economisti* was Guido Sensini. His papers either dealt with issues that Pareto investigated; such as the path dependence and independence of ophelimity in open and close circles (Sensini 1947a, 1947b) and the variable prices in mathematical economics (Sensini 1951); or investigated Pareto's treatment of functions in economics (Sensini 1950). His most significant contribution in pure theory was 'Le equazioni dell'equilibrio economico nell'ipotesi di sottrazioni di ricchezza operate del governo sugli i determinati individui della collettività' (Sensini 1930). This study, which re-worked studies undertaken a decade earlier, formalized pure equilibrium outcomes, for both complete competition and monopoly, once government has reduced individuals' real income directly (direct taxation) or indirectly via changing the coefficients of production (indirect taxation). Instead of undertaking general equilibrium modelling of a world that abstracts for the notion of government, this paper carves out a place for pure equilibrium economics in a world that recognizes government, leaving a deliberate gap to be filled by studies in public finance, which is the area of research where Sensini's contributions are most remembered today.

However, the most important contribution to pure theory by a Paretian was made by Luigi Amoroso, and of his contributions to the *Giornale degli Economisti*, 'Le equazioni dell'equilibrio economico dinamico' (Amoroso 1929) is perhaps his most significant. Pareto's work in pure economics was essentially static. His attempts to consider dynamic influences were tentative and constrained, mainly because he realized that sociological factors act to make human action, including the ophelimity and utility associated with such action, path dependent over time. Amoroso embraced the study of dynamics, and the importance of this article is that it was a stepping stone from which Amoroso was to make significant contributions to dynamic theory (Amoroso 1932, 1940).

A similar story emerges in the area of fiscal studies and sociology, as most papers in the *Giornale degli Economisti* during the commemorative periods are reflective assessments. Outside these periods, the most significant paper is Guido Sensini's 'Cenni di Finanza teorica' (1929), which marks the final development in Paretian public finance. After that, research in Paretian fiscal sociology almost disappears from the Journal although it continued to endure for another few decades in Italian public finance textbooks. For example, Marco Fanno's *Elementi di Scienza delle Finanze* (1936) and Jacopo Tivaroni's *Compendio di Scienza delle Finanze* (1942) both discuss the various approaches to public finance, including that of the 'Teoria Sociologica' (Fanno 1936, pp. 12-16 and Tivaroni 1942, pp. 18-19). Similarly, in his *Principii di Scienza delle Finanze*, Mauro Fasiani (1941) carefully specified the system within which fiscal decisions are made in a manner that drew extensively from Pareto's work. However, the Paretian

approach to public finance, or more specifically fiscal sociology, rarely re-appeared in research. Perhaps the only innovative, significant, and almost covert, Paretian research in this period of decline was by Aldo Scotto, a student of Mauro Fasiani, in his ‘Di un indice di decentramento finanziario’ (Scotto 1950). Around this time, the Paretian approach was subject to quite sustained criticism. Celestino Arena (1950) was supportive of a moderate version of ‘sociological finance’, but not the extreme position taken by Pareto’s followers. Gustavo Del Vecchio in *Introduzione alla Finanza* (1954 [2001]) went so far as to deny the possibility of determining scientific principles for ‘sociological finance’ although, this provocative assessment did not go unchallenged in the *Giornale degli Economisti*. Scotto wrote ‘Note in margine ad un nuovo libro di finanze’ (1954) which contained a systematic defence of the sociological approach to public finance although, curiously, he used Maffeo Pantaleoni’s work on selection theory as the main basis for the defence and not the work of Pareto or the Paretians.<sup>15</sup>

Fiscal sociology then disappeared from the *Giornale degli Economisti* until Ernest D’Albergo wrote a series of public finance articles between 1963 and 1967. However, its reappearance was not for the purposes of developing it further. Rather, D’Albergo used the scheme developed by Sensini in ‘Cenni di finanza teorica’ (1929) to differentiate his work from fiscal sociology and advocate a public economics that utilises Pareto sociological concepts. In short, he absorbed the welfare analysis from Pareto’s sociology within an economics of public finance and dispensed with the sociology of public finance. As schools are necessarily episodic, this supports the notion of a Pareto school: with the final demise of a school may be associated with the absorption of selected scientific elements of the school by the new mainstream, with the rest being discarded. Other elements of Paretian fiscal sociology were then largely discarded.

## Conclusion

One of the striking features of this chapter is the extent to which Pareto’s core scientific thought, as reviewed in the previous chapter, was initially developed in the pages of the *Giornale degli Economisti*.

*Methodology*: the issue of methodology is systematically dealt with in Pareto’s books, and also in his early sociological articles published outside the *Giornale degli Economisti*, such as ‘Il compito della Sociologia fra le scienze sociali’ (Pareto 1897d [1980]), ‘I problemi della sociologia’ (Pareto 1899 [1980]) and ‘Programma e Sunto di in Corso di Sociologia (1906d [1980]). However, the experimental character of economic science is given significant emphasis in Pareto’s contributions to this journal, especially in his articles on pure economics. He also discussed the issue of methodology when reflecting on the work of others, such as his debate with Lombroso and comments on Novicow and Fornasari. But especially important is his ‘Economia sperimentale’ for identifying experimental approaches to economics phenomena which draw on his whole body of work, including methods in sociology, including exegesis as an experimental method in which the written work is treated as data, when investigating economic phenomena.

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<sup>15</sup> On this basis, Scotto (1954) could be readily excluded from table 2. However, it has been included because the article is relevant to the plight of Paretian fiscal sociology and because Scotto, like his mentor, had reflected seriously on the significance of Pareto’s sociology for public finance, as well as on the fiscal studies of Borgatta and Sensini. This is discussed in Amedeo Fossati’s ‘L’opera scientifica di Aldo Scotto’ (1993).

*Pure Theory of Economic Equilibrium:* the core scientific elements concerning Pareto's pure economics were all almost entirely developed in the *Giornale degli Economisti* before being included in Pareto's major books. The 'Considerazioni' articles anticipated the solution to the downward sloping demand curve and the demonstration that elementary ophelimity is not constant as the economic state changes. Also, the concern with the existence of ophelimity in the *Cours* is anticipated in the 'Considerazioni', which goes one step further by devoting considerable attention to the actual form that such functions might take in order to be a reasonable approximation to reality. Most importantly, the experimental index analysis of the *Manuale* for studying choice as a balance between tastes and obstacles was first developed in the 'Sunto', where the ordinalist character of choice theory is much clearer than in the subsequent *Manuel*.

*Applied Economics:* almost all of Pareto's enduring contributions to applied welfare theory commenced with articles in the *Giornale degli Economisti*. While the highest stage in the development of Pareto's work on the theorems of welfare economics is to be found in Pareto's *Manuel*, this was only possible given the developments in several of Pareto's articles between 1894 and 1903, including the articles written during his polemic with Scorza in this journal. Similarly, Pareto's contributions to general equilibrium trade theory were first developed in this journal. While Pareto's theory of rent was first introduced in the *Cours*, hints to the development of that theory can be seen in the Journal, especially 'Lasciate fare, lasciate passare' in which Pareto reflection on Gustave de Molinari's work, which appears to have inspired the subsequent development of 'positive' and 'negative' rents. Similarly, while the Pareto distribution first appeared in a pamphlet published in Lausanne and then in the *Cours*, the basic ideas concerning the distribution of income were developed in the *Giornale degli Economisti*. In particular, a similar equation was discussed when investigating the relationship between income distribution and demand, anticipating subsequent discussion of the issue in the *Cours*. The work of Pareto in the *Giornale degli Economisti* on population economics also subsequently featured in the *Cours*.

*General Theory of Social Equilibrium:* the general theory of social equilibrium was developed in the *Trattato*, not in the pages of the *Giornale degli Economisti*. Prior to the publication of the *Trattato*, the only contribution to the Journal which influenced the theory of social equilibrium was a tangential treatment of sociological maximization in 'Il Massimo di utilità per una collettività in Sociologia'. Nevertheless, this article was to prove very influential in Italy, especially among public finance economists, becoming a core aspect of Paretian scientific thought. However, perhaps the critical contribution to social equilibrium in the *Giornale degli Economisti* was Pareto's post-*Trattato* article 'Economia sperimentale' which clarified the influence of sociological influences on economic phenomena. The importance of this article is that it outlines the relationship between economic and sociology in mature Paretian thought.

In terms of the sociology of knowledge, it may be said that the editorial directors' commitment to liberalism and opposition protectionism, unsustainable fiscal policies and unstable monetary policies attracted Pareto to the *Giornale degli Economisti*. In the period up to the publication of the *Cours*, Pareto's work on scientific issues in economics was occurring at the same time as his labour intensive 'chronicles' prepared for this

journal. Another attractive feature was the willingness of the Journal to publish new and challenging ideas, irrespective of the mode in which the exposition was developed. As Pareto came under the influence of Walras' general equilibrium, the *Giornale degli Economisti* was the ideal site from which he could develop and disseminate his work in mathematical pure theory and mathematical applied theory, as well as his work on economic statistics and literary discussion of economic issues. All forms were welcome, and with Walras' influence being felt around Italy, this was to become the leading Italian journal in mathematical economics.

The willingness of the Journal to publish economics in mathematical form was also a contributing factor to the attraction of Pareto's peers and followers to the Journal. Barone, Boninsegni, Furlan, Sensini and Amoroso were all mathematically competent and inspired to follow Walras and Pareto, to varying degrees, in the presentation of economics and a mathematical discipline. However, as the core scientific thought of Pareto developed into its final phase, the emphasis on mathematical economics was complemented by a growing emphasis on sociological (non-mathematical) matters. As the scope of Pareto's scientific thought broadened, so to did the work of his followers. Again, this was accommodated by the *Giornale degli Economisti*, which had achieved its reputation for excellence in mathematical economics while concurrently developing scientific thought in a wide range of related areas, including public finance. The Journal continued to suit the needs of Pareto and his followers as the scope of Paretian studies broadened. At this stage, the association with Pareto had served to enhance the scientific standing of the *Giornale degli Economisti*, not just in Italy, but in other parts of Europe too.

The fiscal scholars who followed Pareto most closely in the *Giornale degli Economisti* commenced their sociological studies before the publication of the *Trattato*. As such, there is some variation between their diverse approaches, and some dispute over the extent to which they followed Pareto. This will be developed further in subsequent chapters, but from this Journal the period of active research in the Paretian approach to fiscal sociology ended by around 1930. The active phase of Paretian research in pure and applied economics in *Giornale degli Economisti* continued until after World War II, but this was largely centred around the work of Sensini. Italian economics had come under the influence of a new leadership group, comprising del Vecchio, Bresciani Turrone and others, and the focus of research had moved to monetary economics and economic dynamics, with the latter issue most often having its roots in the work of Pantaleoni rather than Pareto.<sup>16</sup>

As the Paretian episode in contemporary research wound down from the 1930s, the *Giornale degli Economisti* shifted from being the primary disseminator of new Paretian thought, to being the primary site for historical investigation of the Paretian episode in Italy. Under the editorial direction of Giovanni Demaria, the Journal performed this role with distinction until 1975, with articles published in the *Giornale degli Economisti* over these years still providing considerable insight for historians of thought interested in Pareto and his Italian legacy. This journal was also the source through which Paretian thought was absorbed by contemporary economics, with D'Albergo's thoughtful work on public finance reviving fiscal sociology briefly enough to excise some of Pareto's sociological contributions to welfare, and import it within public economics.

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<sup>16</sup> Luigi Amoroso was a follower of Pareto and, while this is reflected in his work on economics dynamics, it should be noted that Amoroso was also an admirer of Pantaleoni. Furthermore, after the 1920s, Amoroso's work tended to be published in sources other than *Giornale degli Economisti*.

## Bibliography

- Accademia Nazionale Dei Lincei 1975. *Convegno Internazionale Vilfredo Pareto (Roma 25-27 ottobre 1973): Atti dei Convegni Lincei*, 9, Roma: Accademia Nazionale dei Lincei.
- Agnati, A. 1966. 'Il Trattato di Sociologia Generale di Vilfredo Pareto come "prima approssimazione" allo studio delle realtà economica concreta' *Giornale degli Economisti e Annali di Economia*, 25(5-6), pp. 495-532.
- Alimenti, C. 1932. 'La curva paretiana di distribuzione dei redditi' *Giornale degli Economisti e Rivista di Statistica*, 47(72), pp. 730-37.
- Allen, R. D. G. 1950. 'The Work of Eugen Slutsky' *Econometrica*, 18(3), pp. 209-16.
- Amoroso, L. 1909. 'La teoria dell'equilibrio economico secondo il prof. Vilfredo Pareto' *Giornale degli Economisti*, 19(39), pp. 353-67.
- Amoroso, L. 1910a. 'L'applicazione della matematica all'economia politica' *Giornale degli Economisti e Rivista di Statistica*, 20(40), pp. 57-63.
- Amoroso, L. 1910b. 'Considerazioni analitiche sulla «boule de neige»' *Giornale degli Economisti e Rivista di Statistica*, 20(40), pp. 353-66.
- Amoroso, L. 1911. 'L'applicazione della matematica allo studio dei fenomeni economici e sociali' *Giornale degli Economisti e Rivista di Statistica*, 21(42), pp. 349-70.
- Amoroso, L. 1912. 'Paretaio e «spirito paretiano»' *Giornale degli Economisti e Rivista di Statistica*, 22(44), pp. 76-80.
- Amoroso, L. 1914. 'Sopra la teoria delle variazioni di valore della moneta' *Giornale degli Economisti e Rivista di Statistica*, 24(48), pp. 53-69.
- Amoroso, L. 1917. 'Le curve di indifferenza nella teoria dei fenomeni collettivi di due argomenti' *Giornale degli Economisti e Rivista di Statistica*, 27(55), pp. 12-28.
- Amoroso, L. 1919a. 'La situazione economica' *Giornale degli Economisti e Rivista di Statistica*, 29(57), pp. 205-17.
- Amoroso, L. 1919b. 'Contributo alla teoria matematica dell'interpolazione' *Giornale degli Economisti e Rivista di Statistica*, 29(59), pp. 319-24.
- Amoroso, L. 1921. 'L'economia italiana nel 1921' *Giornale degli Economisti e Rivista di Statistica*, 31(61), pp. 45-52.
- Amoroso, L. 1924. 'La meccanica economica' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 45-54.
- Amoroso, L. 1925. 'A proposito di «meccanica economica»' *Giornale degli Economisti e Rivista di Statistica*, 40(65), pp. 40-2.
- Amoroso, L. 1926. 'Ciò che è scienza e ciò che è fede nel campo della dottrina economica' *Giornale degli Economisti e Rivista di Statistica*, 41(66), pp. 365-77.
- Amoroso, L. 1929. 'Le equazioni differenziali della dinamica economica' *Giornale degli Economisti e Rivista di Statistica*, 44(69), pp. 39-40.
- Amoroso, L. 1932. *Contributo alla teoria matematica della dinamica economica*, Torino: UTET.
- Amoroso, L. 1940. 'The Transformation of Value in the Production Process' *Econometrica*, 8(1), pp. 1-11.
- Amoroso, L. 1948. 'Pareto matematico ed economista' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 594-611.
- Arena, C. 1950. 'La finanza sociologica e gli interessi di classe' in *Finanza Pubblica Contemporanea*, edited by Jacopo Tivaroni, Bari: Gius. Laterza & Figli, pp. 17-28.
- Aupetit, A. 1901. *Essai sur la théorie générale de la monnaie*, Paris: Guillaumin.
- Auspitz, R. and Lieben, R. 1889. *Untersuchungen über die Theorie des Preises*, Leipzig: Duncker & Humblot.

- Bagiotti, T. 1958. 'Del giornale paretiano e dell' unità analitica come criterio d'integrazione delle scienze sociali' *Giornale degli Economisti e Annali di Economia*, 17(1-2), pp. 3-32.
- Baldassarri, M. and Ciocco, P. *Roots of the Italian School of Economics and Finance: From Ferrara (1857) to Einaudi (1944)*, Houndmills: Palgrave Macmillian.
- Barone, E. 1894a. 'A proposito delle indagini del Fisher' *Giornale degli Economisti Economisti*, 4(8), pp. 431-39.
- Barone, E. 1894b. 'Sulla consumer's rent' *Giornale degli Economisti Economisti*, 4(9), pp. 211-24.
- Barone, E. 1894c. 'Sul trattamento di questioni dinamiche' 4(9), pp 407-35.
- Barone, E. 1895. 'Sopra un libro del Wicksell' *Giornale degli Economisti Economisti*, 5(11), pp. 524-39.
- Barone, E. 1896. 'Studi sulla distribuzione' *Giornale degli Economisti Economisti*, 6(12), pp. 107-55.
- Barone, E. 1908a. 'Il ministro della produzione nello stato collettivista' *Giornale degli Economisti*, 8(37), pp. 309-53.
- Barone, E. 1908b. 'Principii di economia politica', appendix to the *Giornale degli Economisti Economisti*, reprinted in *Le Opere Economiche*, 2, Rome: Zanichelli, pp. 5-349.
- Barone, E. 1912a. 'Studi di economia finanziaria' *Giornale degli Economisti Economisti e Rivista di Statistica*, 22(44), pp. 309-53 and pp. 469-505, and 22(45), pp. 1-75.
- Barone, E. 1924. 'L'opera di Vilfredo Pareto e il progresso della scienza' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 20-6.
- Benini, R. 1897. 'Di alcune curve descritte da fenomeni economici avanti relazione colla curva del reddito o con quella del patrimonio' *Giornale degli Economisti e Rivista di Statistica*, 7(14), pp. 177-214.
- Benini, R. 1924. 'Da Malthus e Ricardo a Vilfredo Pareto' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 90-102.
- Bobbio, N. 1964. 'Introduzione alla Sociologia di Pareto' *Giornale degli Economisti e Annali di Economia*, 23(1-2), pp. 2-46.
- Boninsegni, P. 1901a. 'Il principio della convenienza economica e la scienza delle quantità' *Giornale degli Economisti*, 11(22), pp. 470-84.
- Boninsegni, P. 1901. 'Il principio della convenienza economica e la scienza delle quantità', *Giornale degli Economisti*, 11(23), pp. 62-6.
- Boninsegni, P. 1901b. 'Il concetto dell'importanza nell'economia pura' *Giornale degli Economisti*, 11(23), pp. 75-7.
- Boninsegni, P. 1902. 'I fondamenti dell'economia pura (a proposto di un libero del sig. A. Aupetit)' *Giornale degli Economisti*, 12(24), pp. 106-33.
- Boninsegni, P. 1904. 'Tentativi di ricerca sulle funzioni di domanda e di offerta nel caso del baratto supposte le ofelimità elementari lineari' *Giornale degli Economisti*, 14(28), pp. 210-36.
- Bordin, A. 1949. 'Di taluni massimi d'utilità coattiva' *Giornale degli Economisti e Annali di Economia*, 8(3-4), pp. 174-89.
- Borgatta, G. 1919. 'Gli studi economico-finanziari dopo la guerra' *Giornale degli Economisti e Rivista di Statistica*, 29(59), pp. 265-85.
- Borgatta, G. 1920. 'Lo studio scientifico dei fenomeni finanziari', parti one e due, *Giornale degli Economisti e Rivista di Statistica*, 30(60), pp. 1-24 e pp. 81-116.
- Borgatta, G. 1924. 'I rapporti fra la scienza economica e la sociologia nell'opera paretiana' *Giornale degli Economisti e Rivista di Statistica*, 39(64), pp. 81-9.

- Bousquet, G.H. 1930. 'Leggi economiche' *Giornale degli Economisti e Rivista di Statistica*, 45(70), pp. 138-45.
- Bousquet, G.H. 1932. 'Osservazioni sulla teoria delle dimensioni economiche' *Giornale degli Economisti e Rivista di Statistica*, 47(72), pp. 669-76.
- Bousquet, G.H. 1948. 'Un manoscritto inedito di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 701-9.
- Bousquet, G. H. 1956. 'V. Pareto – la sua famiglia, la sua infanzia e la sua giovinezza (nota per una biografia)' *Giornale degli Economisti e Annali di Economia*, 15(11-12), pp. 591-600.
- Bousquet, G.H. 1957. 'Bibliografia rettificatrice e complementare degli scritti di V. Pareto' *Giornale degli Economisti e Annali di Economia*, 16(7-8), pp. 411-21.
- Bousquet, G.H. 1963. 'Note sur les initiales des noms propres dans la « corrispondenza di Vilfredo Pareto » publiée par le professeur Sensini' *Giornale degli Economisti e Annali di Economia*, 22(11-12), pp. 834-5.
- Bousquet, G.H. 1967. 'Un manuscript inédit de Pareto dans le Fonds Walras de Lausanne' *Giornale degli Economisti e Annali di Economia*, 26(7-8), pp. 517-27.
- Bresciani Turrone, C. 1907. 'Sull'interpretazione e comparazione di seriazioni di redditi e patrimoni' *Giornale degli Economisti*, 17(34), pp. 13-47.
- Bridel, P. and Tatti, E. (eds) 1999. *Cahiers Vilfredo Pareto: Revue Européenne des Sciences Sociales*, 37(116), Genève: Librairie Droz.
- Broggi, U. 1925. 'A proposito di «meccanica economica»' *Giornale degli Economisti e Rivista di Statistica*, 40(65), pp. 38-9.
- Buchanan, J 1960. 'La Scienza delle Finanze: The Italian Tradition of Fiscal Theory', in *Fiscal Theory and Political Economy: Selected Essays*, 6, Chapel Hill: University of North Carolina Press, pp. 24-74.
- Burzio, F. 1947. 'Le 'azioni non logiche' di Pareto' *Giornale degli Economisti e Annali di Economia*, 6(9-10), pp. 525-39.
- Busino, G. 1952. 'Vilfredo Pareto e la Società delle Nazioni' *Giornale degli Economisti e Annali di Economia*, 11(9-10), pp. 661-6.
- Busino, G. 1963. 'Pareto e le autorità di Losanna' *Giornale degli Economisti e Annali di Economia*, 22(3-4), pp. 260-303.
- Busino, G. 1973. *Gli Studi so Vilfredo Pareto Oggi*, Roma: Bulzoni Editore.
- Busino, G. 1974. 'Gli studi paretiani dal 1971 al 1973' *Giornale degli Economisti e Annali di Economia*, 33(3-4), pp. 215-46.
- Busino, G. 1975. 'L'opera e le sue interpretazioni: a proposito di studi paretiani recenti' *Giornale degli Economisti e Annali di Economia*, 34(5-6), pp. 347-76.
- Casari, M. 1952. 'Osservazione sul paradosso ricardiano e sulla critica di Pareto' *Giornale degli Economisti e Annali di Economia*, 11(3-4), pp. 237-44.
- Chessa, F. 1948. 'La teoria della circolazione di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 649-57.
- Chipman, J. 1976 [1999]. 'The Paretian heritage', *Cahiers Vilfredo Pareto: Revue Européenne des Sciences Sociales*, 14(37), pp. 65-171, reprinted in *Vilfredo Pareto: Critical Assessments of Leading Economists*, 2, edited by John C. Wood and Michael McLure, London: Routledge, 1999, pp. 157-257.
- Chipman, J. and Moore 1978. 'The New Welfare Economics 1939-1974' *International Economic Review*, 19(3), pp. 547-84.
- Ciccotte, E. 1924. 'Pareto e gli studi storici' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 114-9.
- Croce, B. 1901a. 'Sul principio economico: lettera al prof. Vilfredo Pareto' *Giornale degli Economisti*, 11(22), pp. 15-26.

- Croce, B. 1901b. 'Sul principio economico: replica all'articolo del prof. Pareto' *Giornale degli Economisti*, 11(23), pp. 121-30.
- D'Addario, R. 1949. 'Ricerche sulla curva dei redditi' *Giornale degli Economisti e Annali di Economia*, 8(1-2), pp. 91-144.
- D'Alauro, G. 1972. 'Pareto e Cabiati: due lettere dal 1908' *Giornale degli Economisti e Annali di Economia*, 31(5-6), pp. 110-25.
- D'Albergo, E. 1949. 'Un generalizzazione delle equazioni di Pareto-Slutsky' *Giornale degli Economisti e Annali di Economia*, 8(1-2), pp. 53-90.
- D'Albergo, E. 1963. 'Finanza Pubblica e Benessere: oneri e vantaggi alla "frontiera dell'utilità collettiva"' *Giornale degli Economisti e Annali di Economia*, 22(1-2), pp. 1-46.
- D'Albergo, E. 1963. 'Finanza Pubblica e Benessere: ponderazione necessaria di contrapposte grandezze edonistiche' *Giornale degli Economisti e Annali di Economia*, 22(3-4), pp. 207-46.
- D'Albergo, E. 1963. 'Finanza Pubblica e Benessere: presupposti della "generalità" del modello gnoseologico paretiano' *Giornale degli Economisti e Annali di Economia*, 22(7-8), pp. 495-536.
- D'Albergo, E. 1964. 'Finanza Pubblica e Benessere: riducibilità logica al modello paretiano di funzioni e scheme del welfare collegati con piani di bilanci finanziari' *Giornale degli Economisti e Annali di Economia*, 23(1-2), pp. 41-72.
- D'Albergo, E. 1964. 'Finanza Pubblica e Benessere: validità attuale della genesi razionale italiana del massimo utile collettivo' *Giornale degli Economisti e Annali di Economia*, 23(3-4), pp. 240-61.
- D'Albergo, E. 1967. 'Un identificazione di scheme per l'economia finanziaria' *Giornale degli Economisti e Annali di Economia*, 26(11-12), pp. 879-905.
- Dalla Volta, R. 1924. 'Il Pareto all'Accademia dei Georgofili' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 142-3.
- Davis, H. T. 1949. 'Pareto statistico' *Giornale degli Economisti e Annali di Economia*, 8(3-4), pp. 199-206.
- De Meo, G. 1949. 'Circolazione delle aristocrazie e ricambio sociale' *Giornale degli Economisti e Annali di Economia*, 8(3-4), pp. 207-38.
- de Molinari, G. (1891) *Notions Fondamentales d'Economie Politique et Programme Économique*, Paris: Guillaumin et Cie.
- de Montbrial, T. 1973. 'Note sur la loi de Pareto et l'idée d'ergodisme dans les sciences sociales' *Giornale degli Economisti e Annali di Economia*, 32(5-6), pp. 305-17.
- de Pietri Tonelli, A. 1948. 'Come un supposto paradosso della pratica degli scambi internazionale, non sia che un malinteso della teoria' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 658-69.
- de Pietri-Tonelli, A. 1924. 'Le equazioni generali dell'equilibrio generale di Vilfredo Pareto' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 55-61.
- Del Vecchio, G. 1924. 'Le teoria sulle circolazione negli scritti del Pareto' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 62-8.
- Del Vecchio, G. 1954, 'Introduzione alla finanza', *Rivista di Diritto Finanziario*, pp. 225-46, English translation in 2001. *Roots of the Italian School of Economics and Finance: From Ferrara (1857) to Einaudi (1944)*, 1, edited by Mario Baldassarri and Pierluigi Ciocco, Houndmills: Palgrave Macmillian, pp. 305-32.
- Demaria, G. 1958. 'Soliloquio paretiano' *Giornale degli Economisti e Annali di Economia*, 17(1-2), pp. 1-2.
- Demaria, G. 1974. 'La stabilità nel systema di Pareto' *Giornale degli Economisti e Annali di Economia*, 33(5-6), pp. 384-402.

- de Viti de Marco, A. 1888. *Il Carattere Teorico dell'Economia Finanziaria*, Roma: Pasqualucci.
- Dominedò, V. 1949. 'Le condizioni del massimo collettivo di ofelimità secondo Pareto' *Giornale degli Economisti e Annali di Economia*, 8(3-4), pp. 190-8.
- Dooley, P. C. 1998, 'Enrico Barone' in *Italian Economists of the 20<sup>th</sup> Century*, edited by Ferdinando Meacci, Cheltenham: Edward Elgar, pp. 67-94.
- Dooley, P. C. 2001, 'The School of Lausanne and the Theory of the Firm' *History of Economic Ideas*, 9(2), pp. 39-57.
- Edgeworth, F. Y. 1896. 'Theory of International Values' *Economic Journal*, 4, pp. 35-50, pp. 424-43, pp. 606-38.
- Edgeworth, F. Y. 1897. 'La curva delle entrate e la curva di probabilità' *Giornale degli Economisti*, 7(14), pp. 215-8.
- Edgeworth, F. Y. 1922. 'The Mathematical Economics of Professor Amoroso' *Economic Journal*, 32, pp. 400-7.
- Fanno, M. 1924. 'Punti controversi della teoria dei dazi doganali' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 69-77.
- Fanno, M. 1936. *Elementi di Scienza delle Finanze*, Settima Edizione, Torino: S. Lattes & C. - Editori.
- Fauci, R.(ed) 1997. *History of Economic Ideas*, 3, Pisa: Istituti Editoriali e Poligrafici Internazionali.
- Fasiani, M. 1949. 'Contributi di Pareto alla scienza delle finanze' *Giornale degli Economisti e Annali di Economia*, 8(3-4), pp. 129-73.
- Fossati, A. 1993. 'L'opera scientifica di Aldo Scotto', *Rivista di Diritto Finanziario e Scienza delle Finanze*, 4(1), pp. 475-528.
- Furlan, L. V. 1908. 'Cenni su una generalizzazione del concetto d'ofelimità' *Giornale degli Economisti*, 18(35), pp. 255-65.
- Furlan, L. V. 1909. 'Note su la curva paretiana dei redditi' *Giornale degli Economisti*, 19(39), pp. 695-701.
- Georgescu-Roegen, N. 1975 "Vilfredo Pareto and His Theory of Ophelimity", *Convegno Internazionale Vilfredo Pareto* (Roma 25-27 ottobre 1973), Atti dei Convegni Lincei 9, *Accademia Nazionale Dei Lincei*, Rome, pp. 223-265, Reprinted in 1999 *Vilfredo Pareto: Critical Assessments*, 1, edited by John C. Wood and Michael McLure , London: Routledge, pp. 474-519.
- Giacalone-Monaco, T. (ed) 1957a. *Vilfredo Pareto dal carteggio con Carlo Placci, con 40 lettere inedite del Pareto*, Padova: CEDAM.
- Giacalone-Monaco, T. 1957b. 'Nuove lettere inedite di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 16(11-12), pp. 635-51.
- Giacalone-Monaco, T. 1959. 'Pareto e La Bakounine' *Giornale degli Economisti e Annali di Economia*, 18(3-4), pp. 190-220.
- Giacalone-Monaco, T. (ed) 1960. *Pareto – Walras: da un carteggio inedito 1891-1901*, Padova: CEDAM.
- Giacalone-Monaco, T. 1960. 'Le 'cronache' politiche ed economiche di Pareto' *Giornale degli Economisti e Annali di Economia*, 19(11-12), pp. 788-815.
- Giacalone-Monaco, T. (ed) 1960-61. *Pareto e Sorel: Riflessioni e ricerche con 69 lettere inedite di Pareto*, 2 volumes, Padova: CEDAM.
- Giacalone-Monaco, T. 1962. 'Carteggi paretiani' *Giornale degli Economisti e Annali di Economia*, 21(9-10), pp. 656-60.
- Giacalone-Monaco, T. 1963. 'L'ing. Vilfredo Pareto nella Società delle Strade Ferrate Romane' *Giornale degli Economisti e Annali di Economia*, 22(7-8), pp. 537-8.

- Giacalone-Monarco, T. 1963. 'Pareto e A. de Pietri Tonelli' *Giornale degli Economisti e Annali di Economia*, 22(9-10), pp. 687-94.
- Giacalone-Monarco, T. 1965. 'Proemio alle 'cronache' di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 24(1-2), pp. 117-30.
- Giacalone-Monarco, T. 1967. 'Il cinquantenario della "Sociologia" di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 26(3-4), pp. 292-303.
- Giacalone-Monarco, T. 1967. 'Due documenti sulla vita di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 26(9-10), pp. 732-9.
- Giacalone-Monarco, T. 1968. 'La misteriosa preparazione latino e greca di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 27(3-4), pp. 249-55.
- Giaccardi, F. 1949. 'Sulla «curva dei redditi»' *Giornale degli Economisti e Annali di Economia*, 8(1-2), pp. 115-21.
- Gobbi, U. 1900. 'Sul principio della convenienza economica', *Memorie dell'Istituto Lombardo di Scienze e Lettere*, Milano: Hoepli.
- Gobbi, U. 1901. 'In difesa del principio della convenienza economica' *Giornale degli Economisti*, 11(23), pp. 67-74.
- Gobbi, U. 1924. 'Economia pura e fenomeno economico concrete' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 78-80.
- Gonzales Quiano, F. 1973. 'La curva de Pareto consideradà ALS OB' *Giornale degli Economisti e Annali di Economia*, 32(3-4), pp. 211-20.
- Griziotti, B. 1949. 'Alla scuola di Vilfredo Pareto e Maffeo Pantaloni' *Giornale degli Economisti e Annali di Economia*, 8(1-2), pp. 122-8.
- Griziotti, B. 1955. 'Lettera aperta al Ministro Cremona di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 14(9-10), pp. 468-73.
- Gross, M. and V. J. Tarascio (1998) 'Pareto's theory of choice', *History of Political Economy* 30 (2), pp. 171-87
- Hicks, J. R. (1939) *Value and Capital*, Oxford: Oxford University Press.
- Hicks, J. R. and R. G. D. Allen 1934. 'A Reconsideration of the Theory of Value, Parts 1 and 2', *Economica*, 1 (1) pp. 52-76; 1 (2), pp. 196-219.
- Jannaccone, P. 1948. 'Vilfredo Pareto, il sociologo' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 612-26.
- Johnson, W. E. 1913. 'The pure theory of utility curves' *Economic Journal* 23, pp. 483-513.
- La Ferla, G. 1958. 'Nota su Pareto' *Giornale degli Economisti e Annali di Economia*, 17(3-4), pp. 210-28.
- Lanzillo, A. 1932. 'La curva paretiana di distribuzione dei redditi e illazioni che suggerisce' *Giornale degli Economisti e Rivista di Statistica*, 47(72), pp. 133-43.
- Lanzillo, A. 1932. 'La curva paretiana di distribuzione dei redditi: Replica' *Giornale degli Economisti e Rivista di Statistica*, 47(72), pp. 738-40.
- Lanzillo, A. 1948. 'L'equilibrio sociale e il classismo' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 670-88.
- Lucheti, M. 1969. 'Educazione e ofelimità nel "Corso di economia politica" di Pareto' *Giornale degli Economisti e Annali di Economia*, 28(11-12), pp. 831-55.
- Magnani, I. 2003. *Dibattito tra Economisti Italiani di Fine Ottocento*, Milano: FrancoAngeli.
- Majorana, G. 1925. 'Le forme antiche e nuove di riduzione della proprietà privata e una costruzione di Vilfredo Pareto' *Giornale degli Economisti e Rivista di Statistica*, 40(65), pp. 357-65.
- Malandrino, C. and Marchionatti, R. (eds) 2000. *Economia, Sociologia e Politica nell'Opera di Vilfredo Pareto*, Firenze: Leo S. Olschki.

- Marchionatti, R. and Gambino, E. (1997) 'Pareto and Political Economy as a Science: Methodological Revolution and Analytical Advances in Economic Theory in the 1890s', *Journal of Political Economy* 105 (6), pp. 1322-48.
- Matsuura, T. 1972. 'L'importazione delle ricerche paretiane nel Giappone odierno' *Giornale degli Economisti e Annali di Economia*, 31(7-8), pp. 485-502.
- Mazzola, V. 1888. *Il Fondamento Scientifico dell' Economia di Stato*, Napoli: Stabilimento Tip. Dell'Unione.
- McLure, M. 2000. 'The Pareto-Scorza Polemic on Collective Economic Welfare' *Australian Economic Papers*, 39(3), pp. 347-71.
- McLure, M. 2005. 'A note on Pareto's «Sunto»' *Journal of the History of Economic Thought*, 27(3), pp. 399-403.
- Michels, R. 1924. 'Pareto e il materialismo storico' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 110-3.
- Morara, G. 1924. 'Pareto statistico' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 120-6.
- Mornati, F. 1999. *Pasquale Boninsegni e la Scuola di Losanna*, Torino: UTET.
- Moscato, I. 2005. 'W.E. Johnson's 1913 Paper and the Question of His Knowledge of Pareto,' *Journal of the History of Economic Thought*, 27(4), pp. 283-304.
- Murray, R. A. 1911. 'Economia matematico ed economia statico induttiva' *Giornale degli Economisti e Rivista di Statistica*, 21(43), pp. 550-5.
- Murray, R. A. 1912. 'I problemi fondamentali dell'economia finanziaria: contributo alla teorica dell'equilibrio finanziario' *Giornale degli Economisti e Rivista di Statistica*, 22(44), pp. 255-301.
- Murray, R. A. 1913. 'Intorno alla nozione dei bisogni pubblici' *Giornale degli Economisti e Rivista di Statistica*, 23(46), pp. 320-3.
- Murray, R. A. 1915. 'La scienza delle finanze, il diritto finanziario e la nozione di stato' *Giornale degli Economisti e Rivista di Statistica*, 25(51), pp. 27-37.
- Murray, R. A. 1915. 'L'applicazione dei procedimenti matematici alla scienze sociali nel momento attuale' *Giornale degli Economisti e Rivista di Statistica*, 25(51), pp. 221-39.
- Murray, R. A. 1916. 'Perché e come il concetto dell'utilità economica è obbiettivamente indefinibile' *Giornale degli Economisti e Rivista di Statistica*, 26(52), pp. 1-12.
- Palomba, G. 1956. 'I fatti salienti della macro-economia e gli sviluppi del sistema paretiana' *Giornale degli Economisti e Annali di Economia*, 15(5-6), pp. 227-41.
- Pantaleoni, M. 1887. *Teoria della Pressione Tribtaria*, Roma: Pasqualucci.
- Pantaleoni, M. 1889. *Principii di Economia Pure*, Firnze: Barbara, translated into English by T. Boston Bruce 1898. *Pure Economics*, London: Macmillian.
- Pantaleoni, M. 1924. 'In occasione della morte di Pareto: riflessioni' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 1-19.
- Pareto, V. 1890 [1982]. 'L'insegnamento dell'economia politica' *Giornale degli Economisti*, 1(1), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 1-4.
- Pareto, V. 1891a [1975]. 'Le industrie meccaniche e la protezione' *Giornale degli Economisti*, 2(2), reprinted in *Œuvres Complètes 17: Écrits Politiques*, edited by Giovanni Busino, Genève: Librairie Droz, 1975. pp. 410-5.
- Pareto, V. 1891b [1975] 'Lettera d'un vignaiuolo' *Giornale degli Economisti*, 2(2), reprinted in *Œuvres Complètes 17: Écrits Politiques*, edited by Giovanni Busino, Genève: Librairie Droz, 1975. pp. 420-5.

- Pareto, V. 1891c [1975]. ‘Lasciate fare, lasciate passare’ *Giornale degli Economisti*, 2(3), reprinted in *Œuvres Complètes 17: Écrits Politiques*, edited by Giovanni Busino, Genève: Librairie Droz, 1975. pp. 443-57.
- Pareto, V. 1892a [1982]. ‘Di un errore del Cournot nel trattare l’economia politica colla matematica’ *Giornale degli Economisti*, 2(4), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 5-18.
- Pareto, V. 1892b [1982]. ‘La teoria dei prezzi dei signori Auspitz e Lieben e le osservazioni del professore Walras’ *Giornale degli Economisti*, 2(4), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 19-57.
- Pareto, V. 1892c [1982]. ‘Ancora della “Theorie des Preises” dei signori Auspitz e Lieben’ *Giornale degli Economisti*, 2(5), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. p. 58.
- Pareto, V. 1892-93 [1982] ‘Considerazioni sui principii fondamentale dell’economia politica pura’ Parts 1 to 5, *Giornale degli Economisti*, 2(4), 2(5), 3(6), and 3(7), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 59-237.
- Pareto, V. 1893 [1982]. ‘La mortalità infantile e il costo dell’uomo adulto’ *Giornale degli Economisti*, 3(7), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 237-43.
- Pareto, V. 1894a [1982]. ‘Teoria matematica dei cambi forestieri’ *Giornale degli Economisti*, 4(8), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp.244-75.
- Pareto, V. 1894b [1982]. ‘Il massimo di utilità dato dalla libera concorrenza’ *Giornale degli Economisti*, 4(9), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 276-94.
- Pareto, V. 1895a [1982]. ‘La legge della domanda’ *Giornale degli Economisti*, 5(10), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 295-304.
- Pareto, V. 1895b [1982]. ‘Teoria matematica del commercio internazionale’ *Giornale degli Economisti*, 5(10), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 305-27.
- Pareto, V. 1895c [1982]. ‘Per la verità’ *Giornale degli Economisti*, 5(11), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 328-9.
- Pareto, V. 1896a [1982]. ‘Il modo di figurare i fenomeni economici (a proposito di un libero del dottor Fornasari)’ *Giornale degli Economisti*, 6(12), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 330-42.
- Pareto, V. 1896b [1980]. ‘L’uomo delinquente di Cesare Lombroso’ ‘Polemica col Prof. Lombroso’ *Giornale degli Economisti*, 6(13), reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp.111-18.
- Pareto, V. 1896c [1982]. ‘La curva delle entrate e le osservazioni del prof. Edgeworth’ *Giornale degli Economisti*, 6(13), reprinted in *Ouvres Complètes 26: Écrites d’économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 343-52

- Pareto, V. 1897a [1982]. ‘Aggiunta allo studio sulla curva delle entrate’ *Giornale degli Economisti*, 7(14), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 353-64.
- Pareto, V. 1897b [1980]. ‘Polemica col Prof. Lombroso’ *Giornale degli Economisti*, 7(14), reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 119-25.
- Pareto, V. 1897c [1982]. ‘Ultima risposta al prof. Edgeworth’ *Giornale degli Economisti*, 7(14), pp. 219-20.
- Pareto, V. 1897d ‘Il compito della Sociologia fra le scienze sociali’ *Rivista Italiana di Sociologia*, July, pp. 81-92. reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 130-9.
- Pareto, V. [1896-97] 1971. *Corso di Economia Politica [Cours d'Économie Politique]*, Torino: Unione Tipografico-Editrice Torinese.
- Pareto, V. 1899 ‘I problemi della sociologia’ *Rivista Italiana di Sociologia*, March, pp. 145-57, reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 169-77.
- Pareto 1900a [1980]. ‘Un’applicazione di teoria sociologiche’ *Rivista Italiana di Sociologia*, reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 178-238.
- Pareto, V. 1900b [1982]. ‘Sunto di Alcuni Capitoli di un Nuovo Trattato di Economia Pura’, Parts 1 and 2, *Giornale degli Economisti*, 10(20), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 368-423.
- Pareto, V. 1900c [1999]. ‘Sul fenomeno economico: lettera a Benedetto Croce’ *Giornale degli Economisti*, 10(21), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 424-47.
- Pareto, V. 1901a [1999]. ‘Sul principio economico’ *Giornale degli Economisti*, 11(22), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 448-55.
- Pareto, V. 1901b [1982]. ‘Le nuove teorie economiche: Appunti’ *Giornale degli Economisti*, 11(23), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 456-87.
- Pareto, V. [1901-02] 1974. *I Sistemi Socialisti [Les Systèmes Socialistes]*, Torino: Unione Tipografico-Editrice Torinese.
- Pareto, V. 1902 [1982]. ‘Di un nuovo errore nello interpretare le teorie dell’economia matematica’ *Giornale degli Economisti*, reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 488-520.
- Pareto, V. 1903 [1982]. ‘A proposito del massimo di ofelimità’ *Giornale degli Economisti*, 13(26), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 521-2.
- Pareto, V. 1905 [1982]. ‘Il costo della produzione dell’uomo e il valore economico degli emigranti (A proposito di un articolo del Prof. F. Coletti)’ *Giornale degli Economisti*, 15(30), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 523-8.
- Pareto, V. 1906 [1974]. *Manuale di Economia Politica*, Padova: CADEM.
- Pareto, V. 1906a [1982]. ‘L’ofelimità dei cicli non chiusi’ *Giornale degli Economisti*, 16(33), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 529-44.

- Pareto, V. 1906b [1982]. 'Applicazioni della matematica all'economia politica' *Giornale degli Economisti*, translated from German by Guido Sensini, 16(33), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 545-74.
- Pareto, V. 1906d 'Programma e Sunto di in Corso di Sociologia' *La Libertà Economica*, 5 June, pp. 758-9, 20 June, pp 773-6. reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 719-43.
- Pareto, V. 1909. *Manuel d'Économie Politique*, Paris: V. Giard and E. Brière, translated into English by A. S. Schwier from the 2nd edition *Manuel of Political Economy* (New York: Augustus M. Kelly), 1971.
- Pareto, V. (1911) *Économie Mathématique*, in: Jules Monk (Ed), *Encyclopedie des sciences mathématiques pures et appliqués*, 4 (1), Paris: Gauthier-Villars), translated into English by J. I. Griffin and in 'Mathematical Economics' *International Economic Papers*, 5, 1955, pp. 58-102.
- Pareto, V. 1907-07 [1982]. 'L'interpolazione per la ricerca delle leggi economiche', parts 1 and 2, *Giornale degli Economisti*, 17(34) and 18(36), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 575-625
- Pareto, V. 1910 [1982]. 'L'opera scientifica di Leone Walras' *Giornale degli Economisti Economisti e Rivista di Statistica*, 20(40), reprinted in *Ouvres Complètes 26: Écrites d'économie politique*, edited by Giovanni Busino, Genève: Librairie Droz, 1982. pp. 644-6.
- Pareto, V. [1913] 1980. 'Il Massimo di Utilità per una Collettività in Sociologia', *Giornale degli Economisti Economisti e Rivista di Statistica*, 23(46), reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 601-5.
- Pareto, V. [1916] 1935. *Mind and Society [Tratatto di Sociologia Generale]*, New York: Harcourt, Brace and Company.
- Pareto, V. 1918. 'Economia Sperimentale' *Giornale degli Economisti e Rivista di Statistica*, 28(57), reprinted in *Œuvres Complètes 22: Écrits Sociologiques Mineurs*, Edited by Giovanni Busino, Genève: Librairie Droz, 1980. pp. 719-43.
- Pareto, V. 1958. 'Mon journal' *Giornale degli Economisti e Annali di Economia*, 17(1-2), pp. 33-91 and 17(3-4), pp. 115-209.
- Pareto, V. 1960a. *Lettere a Maffeo Pantaleoni: 1*, edited by Gabriele de Rosa, Roma: Banca Nazionale del Lavoro.
- Pareto, V. 1960b. *Lettere a Maffeo Pantaleoni: 2*, edited by Gabriele de Rosa, Roma: Banca Nazionale del Lavoro.
- Pareto, V. 1960c. *Lettere a Maffeo Pantaleoni: 3*, edited by Gabriele de Rosa, Roma: Banca Nazionale del Lavoro.
- Pareto, V. 1968. *Lettere ai Peruzzi 1872-1900*, edited by Tommaso Giacalone-Monaco, Roma: Edizioni di storia e letteratura.
- Pareto, V. 1974. *Œuvres Complètes 17(2): Écrit Politiques*, edited by Giovanni Busino, Genève: Librairie Droz.
- Pareto, V. 1975. *Œuvres Complètes 19(2): Correspondance*, edited by Giovanni Busino, Genève: Librairie Droz.
- Prato, G. 1924. 'Corollari paretiani dell'ora presente' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 103-9.
- Racca, V. 1905. 'Della utilità sociale di un istituto internazionale di agricoltura' *Giornale degli Economisti*, 15(30), pp. 490-4.

- Ricci, U. 1906. 'Curva piane di offerta dei prodotti' *Giornale degli Economisti*, 16(33), pp. 223-40.
- Ricci, U. 1908. 'Rassegna del movimento scientifico economica' *Giornale degli Economisti*, 18(36), pp. 65-84.
- Ricci, U. 1924. 'Pareto e l'economia pura' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 27-44.
- Ricci, U. 1927. 'Discorrendo col signor Bousquet' *Giornale degli Economisti e Rivista di Statistica*, 42(67), pp. 588-91.
- Rocca, G. and Spinedi, F. 1924. 'Bibliografia di Vilfredo Pareto' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 144-53.
- Scorza, G. 1902. 'Osservazioni su alcuni teoria di economia pura' *Giornale degli Economisti*, 12(25), pp. 503-16.
- Scorza, G. 1903. 'A proposito del massimi di ofelimità dato della libera concorrenza' *Giornale degli Economisti*, 13(26), pp. 41-62.
- Scotto, A. 1950. 'Di un indice di decentramento finanziario' classe' in *Finanza Pubblica Contemporanea*, edited by Jacopo Tivaroni, Bari: Gius. Laterza & Figli, pp. 379-94.
- Scotto, A. 1954. 'Note in margine ad un nuovo libro di finanze' *Giornale degli Economisti e Annali di Economia*, 13(11-12), pp. 618-37.
- Schultz 1929 'Marginal Productivity and the General Pricing Process, *Journal of Political Economy*, 37(5), pp. 505-551, reprinted in Reprinted *Vilfredo Pareto: Critical Assessments*, 2, edited by John C. Wood and Michael McLure, London: Routledge, 1999, pp. 403-439
- Sensini, G. 1906. 'Traduzione dell'articolo di V. Pareto sulle «Applicazioni della matematica all'economia politica»' *Giornale degli Economisti*, 16(33), pp. 425-53.
- Sensini, G. 1908. 'Il metodo ordinario di calcolo del costo di produzione dell'uomo' *Giornale degli Economisti*, 18(36), pp. 481-96 and 18(37), pp. 197-212.
- Sensini, G. 1920. 'La teoria di Ricardo sui diversi effetti del prestito e dell'imposta' *Giornale degli Economisti e Rivista di Statistica*, 30(60), pp. 57-74.
- Sensini, G. 1920. 'Classificazione generale dei problemi principali della finanza' *Giornale degli Economisti e Rivista di Statistica*, 30(60), pp. 269-83.
- Sensini, G. 1920. 'Ulteriori classificazioni dei problemi principali della finanze' *Giornale degli Economisti e Rivista di Statistica*, 30(60), pp. 405-19.
- Sensini, G. 1922. 'I "benefici" del produttore' *Giornale degli Economisti e Rivista di Statistica*, 62, pp. 101-10.
- Sensini, G. 1922. 'Intorno ai "benefici" del produttore' *Giornale degli Economisti e Rivista di Statistica*, 62, pp. 621-9.
- Sensini, G. 1923. 'Intorno ad alcuni punti della «Teoria della rendita»' *Giornale degli Economisti e Rivista di Statistica*, 38(63), pp. 397-401.
- Sensini, G. 1929. 'Cenni di finanza teorica' *Giornale degli Economisti e Rivista di Statistica*, 44(69), pp. 373-84.
- Sensini, G. 1930. 'Le equazioni dell'equilibrio economico nell'ipotesi di sottrazioni di ricchezza operate del governo sugli i determinati individui della collettività' *Giornale degli Economisti e Rivista di Statistica*, 45(70), pp. 689-709.
- Sensini, G. 1947. 'La teoria matematica dei «cicli chiusi» e dei «cicli aperti» in economia pure' *Giornale degli Economisti e Annali di Economia*, 6(9-10), pp. 515-24.
- Sensini, G. 1947. 'Considerazioni sui «cicli chiusi» e sui «cicli aperti» dell' economia matematica' *Giornale degli Economisti e Annali di Economia*, 6(5-6-7-8), pp. 251-7.
- Sensini, G. 1949. 'Gli studi di Vilfredo Pareto sulle funzioni di domanda e di offerta' *Giornale degli Economisti e Annali di Economia*, 8(1-2), pp. 1-18.

- Sensini, G. 1950. 'Ancora intorno agli studi di Vilfredo Pareto sulle funzioni di domanda e offerta' *Giornale degli Economisti e Annali di Economia*, 9(3-4), pp. 237-44.
- Sensini, G. 1951. 'Considerazioni matematiche intorno ai prezzi variabili' *Giornale degli Economisti e Annali di Economia*, 10(9-10), pp. 460-7.
- Sensini, G. 1952. 'Teoria matematica dei premi all'esportazione' *Giornale degli Economisti e Annali di Economia*, 11(5-6), pp. 341-54.
- Sensini, G. 1953. 'La ricerca delle leggi economiche mediante l'interpolazione dei dati statistici' *Giornale degli Economisti e Annali di Economia*, 12(9-10), pp. 573-83.
- Sensini, G. 1955. 'Le equazioni dell'equilibrio statico economico-finanziario in taluni casi complessi' *Giornale degli Economisti e Annali di Economia*, 14(9-10), pp. 435-54.
- Slutsky, E. 1915. 'Sulla teoria del bilancio del consumatore' *Giornale degli Economisti e Rivista di Statistica*, 25(49), pp. 1-26.
- Spiller, C. And Pomini, M. 2005 'The economic dynamics in Amoroso's contribution', 9<sup>th</sup> Annual Conference of the *European Society for the History of Economics Thought*, Stirling University, 9-12 June 2005.
- Tinbergen, J. 1948. 'Modelli di commercio internazionale' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 627-48.
- Tivaroni, J. 1942. *Compendio di Scienza delle Finanze*, Decima Edizione, Bari: Gius. Laterza & Figli.
- Tommissen, P. 1974. 'Note sur effertz et Pareto' *Giornale degli Economisti e Annali di Economia*, 33(1-2), pp. 166-75.
- Vinci, F. 1924. 'Calcolo delle probabilità e distribuzione dei redditi nel pensiero di Pareto' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 127-9.
- Vinci, F. 1948. 'Monopoli e concorrenza nel pensiero di Pareto' *Giornale degli Economisti e Annali di Economia*, 7(11-12), pp. 689-700.
- Volterra, V. 1906. 'L'economia matematica e il nuovo manuale del prof. Pareto' *Giornale degli Economisti*, 16(33), pp. 296-301.
- Weber, C 1999. 'Pareto and the 53 Percent Ordinal Theory of Utility' *History of Political Economy* 33 (3), pp. 541-76.
- Weber, C 1998. 'Pareto and the Wicksell-Cobb-Douglas Functional Form' *Journal of the History of Economic Thought*, 20(2), pp. 203-210.
- Weinberger, O. 1954. 'Riflessioni in occasione della ristampa degli «Scritti Teorici» di Vilfredo Pareto' *Giornale degli Economisti e Annali di Economia*, 13(7-8), pp. 410-30.
- Weintraub, E. Roy (1997) 'Why so Many Italian Economists' *Rivista di Storia Economica*, Nuovo serie, 13(2), pp. 253-259.  
<http://www.econ.duke.edu/~erw/Preprints/italian.economists.html>
- Wicksteed P. 1894. *Essays on the Coordination of the Laws of Distribution*, London: Macmillan.
- Wood, J. C. and M McLure (eds) 1999. *Vilfredo Pareto: Critical Assessments*, 4 vols., London: Routledge.
- Zaccagnini, E. 1949. 'Nuovi problemi della polemica Scorza-Pareto' *Giornale degli Economisti e Annali di Economia*, 8(1-2), pp. 19-52.
- Zuccherini, G. 1948. 'Determinatezza della funzione dell'ofelimità: curve storiche e curve dinamiche di domanda' *Giornale degli Economisti e Annali di Economia*, 7(3-4), pp. 176-86.
- Zugaro, F. 1924. 'Pareto e le discipline militari' *Giornale degli Economisti e Rivista di Statistica*, 39(65), pp. 130-41.

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<sup>1</sup> Demaria (1958, p. 1)