

# **Marshallian and Walrasian Theory, Complementary or Alternative Approaches ? The Views in Presence**

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# Marshallian and Walrasian Theory, Complementary or Alternative Approaches? The Views in Presence

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## Abstract

The aim of this paper is to examine economists' views about the relationship between Marshallian and Walrasian theory. Are they complementary, as is usually believed, or do they constitute alternative research programmes? My paper compares two viewpoints on this matter, the conciliatory and the antagonistic views. After describing these, I present my own standpoint: I do believe that there is a Marshall–Walras divide but I have serious objections to the way in which the argument for this divide is usually made. In particular, I object to the tendency to treat the Marshallian approach as good and the Walrasian one as bad. In the last part of the paper, I dispute the view held by several authors that an embryonic general equilibrium model is to be found in Marshall's *Principles*.

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## 1 Introduction

Marshall and Walras, the Cambridge and Lausanne masters, are the towering figures of neoclassical economic theory. A testimony to their influence is that the way in which problems are posited nowadays can still be traced back to their methodological choices. Beyond doubt, they had much in common. They both adhered to marginalist principles. They shared the same subjective theory of value grounding market supply and demand functions on agents' optimising behaviour. But, as widely admitted, Marshall and Walras differed sharply in terms of their methodological inclinations. The question then is: to what extent did they differ? Are their approaches complementary or alternative? The standard view is that Marshall's partial equilibrium analysis and Walras' general equilibrium analysis are complementary. The first being bottom up, the latter top down, they must, it is believed, sooner or later join up. However, a minority of economists take the opposite stance, arguing that the Marshallian and Walrasian approaches constitute alternative research programmes. A related bone of contention is whether Marshall engaged in general equilibrium analysis, Walras's territory. My purpose in this paper is to confront these opposing viewpoints.

In Section 2, I present the evidence on Marshall and Walras's opinions of each other. In Section 3, I ponder the standpoints taken by subsequent economists, examining successively the conciliatory and the alternative research programme interpretations. In Section 4, I assess these opposing standpoints. Finally, in the last section, I critically examine the claim that a general equilibrium model can be found in Marshall's *Principles*.

## 2 Marshall and Walras's opinions of each other

Though contemporaries, Marshall and Walras never met<sup>1</sup>. While they corresponded occasionally, it was in a cold way, devoid of real intellectual discussion. Perhaps they mistrusted each other, fearing that one might steal the other's ideas. Marshall's attitude towards Walras was "to commit himself no further than civility required" (Whitaker 1975: 105). As vividly noted by Groenewegen:

Associations with Walras are in a class of their own in so far as Marshall's uncollegiality and incivility are concerned. Despite Marshall's several later claims to have come into contact with Walras as early as 1873, contact by correspondence did not start until 1883, never led to a personal meeting and fizzled out before the 1880s had ended. Perhaps a letter in 1882 from Foxwell to Walras, praising Marshall, induced Walras to send Marshall a collection of his early theoretical paper. Marshall reciprocated by sending Walras the *Economics of Industry*, prompting a gift of Walras's *Elements of Pure Economics* not long thereafter. Marshall's response to this last gift

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<sup>1</sup> Cf. Whitaker (1975: 99–107) and Groenewegen (1995).

showed his rudeness in the manner in which it raised matters of priority, demonstrating once again the high degree of sensitivity Marshall had on the subject. Subsequent lack of response to Walras's theoretical contributions is explicable from the fact that Marshall failed to read very far in the *Elements*. ... Walras was subsequently largely ignored by Marshall in his public utterances and, on some occasions, even actively censored (Groenewegen 1995: 778)<sup>2</sup>.

Walras's stance was hardly more positive. Being in the underdog position, he had to take a more deferential attitude when addressing his Cambridge colleague, but at heart he reciprocated Marshall's opinion, as is evident from his correspondence with third parties<sup>3</sup>.

Later on, Walras's fears that Marshall might overtake him subsided. By then, he had become aware of their differences. In a letter to Barone, dated August 26, 1894, he indicated that he and Marshall did not belong to the same school (an opinion that Marshall would probably have shared), castigating Marshall as an adversary of the mathematical school (Jaffé 1965, vol. II: 615).

### 3 Subsequent opinions

#### 3.1 The complementary interpretation

Authors adopting a complementary view of Walras and Marshall's positions readily admit that the two approaches differ in general perspective and method. They view them as complementary as they assign the study of isolated parts of the economy to the Marshallian approach and the task of piecing these partial results together to the Walrasian approach. In other words, partial equilibrium and general equilibrium stand in a relationship of continuity, general equilibrium being the extension of partial equilibrium. This is indeed what the 'partial' and 'general' terminology suggests.

One of the first authors to express this view was Hicks in his 1934 *Econometrica* article on Walras:

The modern reader of Walras's *Elements d'Economie Pure* is struck by its affinity, not with the work of Jevons or Menger, but with that of Marshall. For a quite considerable part of the way Walras and Marshall go together, and when they separate, it is a difference of interests, rather than of technique that divides them. While Walras was seeking for an analytical instrument capable of easier application to particular problems of history or general principles, which underlie the working of an exchange economy, Marshall forged experience. Yet, since the followers of Walras cannot al-

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<sup>2</sup> See also Groenewegen (1995: 478).

<sup>3</sup> See his letters to Vergé, dated August 16, 1887 ((Jaffé 1965, vol. II: 220) and his letter to Munro dated October 10, 1887 ((Jaffé 1965, vol. II: 224).

ways afford to be pure philosophers, and Marshallians have their moments of reflection, the two systems have inevitably tended to grow back into one another as the years pass by ([1934] 1983: 86).

Negishi (1989) trod in Hicks's footsteps. Acknowledging a difference in purpose between Marshall and Walras, he nonetheless hardly viewed their approaches as antagonistic:

Walrasian models are in general not useful for practical purposes. ... Walras's theoretical interest was not in the solution of particular problems but in what Hicks called the pursuit of the general principles that underlie the working of a market economy. On the other hand, Marshallian theories respectively correspond to special states of the real world economy. ... Thus, Marshallian models are practically useful to apply to what Hicks called particular problems of history or experience (1989: 346)

It cannot be denied, in any case, that Marshall's partial equilibrium analysis is an indispensable complement to Walras's general equilibrium analysis in forming the foundations of current mainstream economics (1989: 345).

Hicks and Negishi's assessments aim to bring out the fact that Walras and Marshall have opposing qualities and flaws — intellectual rigor and aesthetic appeal accompanying real-world irrelevance in Walras, while conceptual sloppiness is combined with empirical relevance when it comes to Marshall.

If this complementary view is taken, wanting to construct a specifically Marshallian general equilibrium theory makes little sense since this job has been attended to by Walras. As Schumpeter said in his semi-centennial appraisal of Marshall, "A full elaboration of the theory of general equilibrium could only have duplicated the work of Walras" ([1941] 1952: 100). The central tenet of the complementary approach is that a relation of continuity exists between partial and general equilibrium analysis, i.e. the former is a particular case of the latter. In the *Elements* (Walras 1954), Walras starts his analysis with the study of an exchange economy composed of many agents and two goods (oats and wheat). If it can be shown that Marshall's elementary exchange model (the corn model, presented in Book V Chapter 2 of his *Principles* (1920)) is equivalent to the oats–wheat model, the continuity claim can be considered vindicated.

In a sense, this is the case. As Mas-Colell, Whinston and Green (1995) show in Chapter 10 of their book, the Marshallian partial equilibrium model can be made identical to the Walrasian two-good economy model if two important simplifications (which they admit are not benign) are made. Both income and substitution effects need to be eliminated. To this end, it suffices to assume that the utility function is quasi-linear. Such an assumption was implicitly made by Marshall (see Newman 1990). But he expressed the matter differently as a case of a constant marginal utility of money. This assumption was appropriate, he declared, whenever the expenditure in the market being studied represented only a small portion of a household's total expenditure.

Mas-Colell et al. take the further step of replacing what was money-holding in Marshall's reasoning with a single composite commodity, representing all the other goods that are present in the economy. Thereby they fall back into the Walrasian oats–wheat scenario, except that they now have an oats–composite (or wheat–composite) commodity exchange. The Marshallian *market*, initially a fraction of the overall economy, becomes transformed into a two-good *economy*. The continuity claim is thus vindicated.

However this conclusion can be questioned. First, Marshall's exchange model with false trading is a particular model that cannot be generalised. Whenever market expenditure is significant, the constant marginality utility of money (or of a composite good) must be abandoned. Moreover, Marshall wanted to analyse what he considered as the normal form of a market, i.e. an institutional set-up for exchanging a given good against money. A market wherein a good would be traded against a composite good would have seemed a preposterous construction to him.

Another reservation is that Mas-Colell et al.'s point is valid as long as the study is confined to the issue of the logical existence of equilibrium. However, it ceases to be so when attention is drawn to the institutional set-up and adjustment aspects. In the Walrasian scenario, the realisation of equilibrium is due to the adoption of the auctioneer hypothesis and its correlates, price-taking agents and the exclusion of disequilibrium trade. In the Marshallian scenario, agents are price makers and trade occurs bilaterally. Moreover, Walras's exchange model is a barter model while, by contrast, the Marshallian market is monetary <sup>4</sup>.

So, if the institutional set-up/adjustment dimension is considered important, the continuity conclusion must be dismissed. Small wonder that the authors defending the discontinuity claim are also those who insist on the need for economic theory to go beyond the study of the logical existence of equilibrium.

### **3.2 The alternative-research-programmes interpretation**

While most economists have no qualms about the complementary viewpoint, a few are fiercely against it. These economists have usually a Marshallian affiliation. Complaining about the predominance of Walrasian economics, they strive to reverse this state of affairs and to rehabilitate the Marshallian programme, which they consider to have been stamped out.

Two streams of thought can be distinguished within the defenders of a Marshall–Walras divide. First, we have Milton Friedman and his followers. They support Marshall's view that economic theory should be geared to solving concrete issues. They find that general equilibrium models of the economy, unlike industry models, are too abstract to serve such a purpose. They accuse general equilibrium theorists of sacrificing relevance to mathematical elegance. Second, we have Clower and Leijonhufvud and their followers, who are not against general equilibrium theory *per se* but rather against *Walrasian* general equilibrium. They indict it for giving prominence to the

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<sup>4</sup> Mas-Colell et al.'s (1995) reason as if the *numéraire* and money were identical, which is not the case.

study of the logical existence of equilibrium over that of its formation. They also criticise it for its adoption of the auctioneer hypothesis, to them, a betrayal of the *explanandum* of economic theory, a decentralised economy.

### 3.2.1 *The Friedman line*

*Friedman*<sup>5</sup>

To the best of my knowledge, Milton Friedman is the first author to have claimed that there was a methodological divide between Walras and Marshall. In the final section of his 1949 article on the Marshallian demand curve, he launched a harsh attack on Walrasian theory, regretting that it had overtaken the Marshallian approach in influence. In his oft-quoted words, “We curtsy to Marshall but we walk with Walras” (Friedman [1949] 1953: 89).

To Friedman, Marshall and Walras’s respective purposes and methods were poles apart. To Marshall, economic theory was “an engine for the discovery of concrete truth” and models needed to be as close as possible to reality. Walras in turn was interested in matters of a more abstract nature such as assessing the logical existence of a state of general equilibrium. This led Friedman to dismiss Walras on several grounds: that “abstractness, generality, and mathematical elegance” had become ends in themselves (Friedman [1949] 1953: 91); that the Walrasian approach gave precedence to the realism of assumptions over their predictive ability; that it eliminated the industry notion and was bound to endorse the theoretical line of monopolistic competition. While the first of these claims has a definite foundation and became a *leitmotif* of subsequent authors discussing the Marshall–Walras divide, the two others are shallower, and have rightly been discarded. Finally, Friedman claimed that the difference between the two approaches is not a matter of partial versus general equilibrium, a theme to which I shall return in Section 4.

One of Friedman’s lesser-known writings, a 1951 commentary on a paper presented by Christ at a NBER Conference on Business Cycles, is also worth looking at. In his paper Christ (1951) had criticised general equilibrium simultaneous equation models *à la* Klein by claiming that they were unable to make short-term predictions. This was of course music to the ears of Friedman, who was the discussant of Christ’s paper. In his remarks, he argued that this failure had a broader significance: “The probability that such a process [of constructing a model for the economy as a whole] will yield a meaningful result seems to me almost negligible” ((Friedman 1951: 113). The right line to be taken was to return to the study of industries:

The direction of work that seems to me to offer most hope for laying a foundation for a workable theory of change is the analysis of parts of the economy in the hope that we can find bits of order here and there and gradually combine these bits into a systematic picture of the whole. In the language of model builders, I believe our chief

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<sup>5</sup> This section draws on De Vroey (2007).

hope is to study the sections covered by individual structural equations separately and independently of the economy. (Friedman 1951: 114)

This quotation brings out the quintessence of Friedman's position. The names of Walras and Marshall are not evoked in this discussion, but they could have been. In effect, studying the individual structural equations separately is nothing other than doing Marshallian industry analysis, while Klein's attempt to grasp the economy as a whole is treading in Walras's footsteps.

Friedman returned to assessing Walrasian theory and contrasting it with Marshallian theory in his 1955 review of Jaffé's translation of Walras's *Elements*. This piece has a less aggressive tone than the 1949 article. "Walras's achievement", Friedman wrote, "cannot but impress the reader with its beauty, its grandeur, its architectonic structure" (1955: 23-4). Walras is also credited with having given economists "a framework for organising their ideas". However, despite these laudatory remarks, the bottom-line remains the same: it is time to return to the business of "meaningful theory" (1955: 27). And, "Walras has little to contribute in this direction; for this we must turn to other economists, notably, of course, Alfred Marshall. ..." (Friedman 1955: 27).

Friedman did not change his mind over the years. This is evident when looking at the well-known discussion between Friedman and his critics organised by Gordon (Friedman 1974). Section 3 of Friedman's "Comments on the Critics" is entitled "What explains the difficulty of communication?" (between Tobin and himself). His answer to this question was that "the difficulty is a different approach to the use of economic theory — the difference between what I termed a Marshallian approach and a Walrasian approach in an article I wrote many years ago" (1974: 145). Friedman went on quoting extensively from his 1949 article. Later, when discussing Patinkin, he returned to the same theme of the contrast between Marshall and Walras:

... Patinkin, even more than Tobin, is Walrasian, concerned with abstract completeness, rather than Marshallian, concerned with the construction of special tools for special problems (1974: 159)<sup>6</sup>.

### *Stigler*

Stigler, Friedman's long-time accomplice, shared his basic disdain for the Walrasian approach. However, he had some complimentary observations to make:

This writer has no sympathy with those modern economists who spend their time establishing and counting systems of equations, always discovering with elation that their system may be determinate. Indeed the general equilibrium theory has contributed little to economic analysis beyond an emphasis on the mutual dependence of economic phenomena; the problems are far too complicated to be grasped *in toto*. Yet this particular theory [Walras's] describing the nature of general equilibrium was essential; such an idea had to appear before rigorous study could proceed. It was Wal-

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<sup>6</sup> See also Snowdon and Vane's (1997) interview with Friedman.



ras's great contribution — one of the few times in the history of post-Smithian economics that a fundamentally new idea has emerged (Stigler 1941: 242).

However, as with Friedman, such compliments should not hide a fundamentally dismissive opinion. To Stigler, general equilibrium theory is a vain project:

The general equilibrium method is not fertile: we sacrifice content to formal generality until we achieve the state of the perfect dilettante, and know nothing about everything (1939: 471)<sup>7</sup>.

### *Harrod*

Cambridge economists were highly suspicious of Walrasian theory<sup>8</sup>. The translation of Walras's *Elements of Pure Economics* into English by Jaffé in 1954 at last gave them — not only Cambridge economists of course, but also all economists who did not read French — the opportunity to have direct contact with his ideas. This event spurred a series of new reactions<sup>9</sup>. The most famous review was probably Friedman's ([1955] 1993) evoked above. But Harrod seems to have been second to none as far as Walras-bashing is concerned, expressing loudly and clearly sentiments that, I suspect, many other economists shared yet dared not express. To Harrod, Walras should be put on a par with Keynes — but John Neville not John Maynard Keynes!

If one regards Walras's essential task as giving the complete, final and polished proof of Adam Smith's central theorem, then it would seem to follow that he should be accorded a status in the history of economics, not on a level with a great pioneer like J. M. Keynes, but rather one similar to that occupied by his father, J. N. Keynes, in the history of logic. J. N. Keynes gave a far more complete and highly polished account of syllogistic logic than had been given before, and one which is not likely to be improved on. (In fairness to J. N. Keynes one must add that his lucidity and presentation were much superior to those of Walras.) (Harrod 1956: 309).

When it came to comparing the respective merits of Marshall and Walras, Harrod did not hesitate: the Cambridge economist deserved the prize.

When I came to the *Principles*, I was naturally deeply impressed. I was struck by the lucidity of the exposition, the grave thoughtfulness, the sureness of touch, the architect-

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<sup>7</sup> These quotations are both from Stigler's early writings. The following, much later, wry eulogy to Marshall bears witness to the constancy of his views: "One should reckon among a scholar's achievements not only what he wrought but also what he prevented. I believe that Marshall, by his towering prestige, delayed the coming-of-age of abstract formalism of the Lausanne tradition by at least a generation, and with the aid of his premier student, Keynes, by possibly two generations. Marshall insisted that the primary task of economics was the explanation of observable economic phenomena, and displayed impatience with theorising which was not closely oriented to that task" (Stigler 1990: 12).

<sup>8</sup> For example, Clower quotes an extract of a letter from Keynes to Georgescu-Rodan, dated December 1934, which runs as follows: "All the same, I shall hope to convince you some day that Walras's theory and all the others along those lines are little better than nonsense!" (Clower ([1975] 1984): 190).

<sup>9</sup> Cf. Bridel (1996).

tural quality of the book as a whole, the firmness of the skeleton of abstract thought underlying it, the immense pains taken to relate the abstract concepts to the actual phenomena of the world in which we live, the justice done to various points of view, the careful reservations, the nuances, the subtlety and the comprehensiveness which has so often enabled subsequent generations of teachers to prove to some giddy young enthusiast for a new idea that it was in Marshall all the time. ... Almost all those general qualities that made Marshall's *Principles* a great classic, despite the fact that its original contributions to pure theory are admittedly limited, are lacking in Walras. He had little regard for the actual phenomena of our economic life, no comprehensiveness, few reservations and little nuance or subtlety. The presentation is extremely clumsy. There is fierce concentration on a single point.... But this was none other than Adam Smith's design. Walras gave precise, explicit and mathematical formulation to thoughts already implicit. To do this was an important task, and it was accomplished with thoroughness and some distinction. Precise formulation is always an advantage, and the power to make it in economics sometimes demands rare intellectual quality. But I would add that the advancement of economics depends on rather different qualities (Harrod 1956: 311).

#### *More recent authors*

For all its brevity, Friedman's contrast between Marshall and Walras was etched into the minds of many subsequent authors who recognised their own methodological feeling in Friedman's remarks. A testimony to Friedman's influence is that his ideas have kept being re-expressed, often quasi-literally, in essays written decades later<sup>10</sup>. Among his followers, I will retain just two, Daniel Hammond (1992, 1996) and Kevin Hoover (2006a, 2006b), for further commentary.

To Hammond we owe a fine summary of the methodological differences between the Marshallian and the Walrasian approaches:

Marshallian theory is problem oriented in the following sense: 1) that it is focused on actual problems from the world of experience; 2) that one begins analysis of a problem well-armed with observed and related facts; 3) that the structure of analysis is dictated by the specific problem one is dealing with; 4) that real world institutions are accounted for and dealt with; 5) that definitions of terms are problem specific; and 6) that mathematical considerations do not take a dominant place in the analysis. The Walrasian approach is to be more concerned with generality: to make theory more abstract, and less connected with problems of policy or experience and institutions, to check the theory or otherwise resort to empirical evidence only after the theory has been worked out; and to emphasise logical consistency and mathematical elegance (Hammond 1992: 226).

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<sup>10</sup> Mayer (1993) is a striking example.

As to Hoover, he uses the Marshall–Walras divide to nail down the differences between Friedman and Lucas (Hoover 1984). He also (Hoover 2006a) draws a distinction between theory and methodology and claims that the difference between Marshall and Walras is methodological rather than theoretical. For example, according to Hoover, Friedman does not criticise Walrasian theory but only Walrasian methodology. As to the difference between Marshallian and Walrasian methodology, like Friedman, Hoover sees it as a difference “between a theory that is comprehensive and one that is purpose-built” (Hoover 2006a: 81).

### ***3.2.2 The Clower-Leijonhufvud line***

#### *Clower and Leijonhufvud*

To Friedman, being Marshallian means refusing to accept a general equilibrium perspective (more on this in section 4). Other authors, in particular Clower and Leijonhufvud, although opposed to Walrasian general equilibrium, are not against general equilibrium *per se*. What they champion is Marshallian general equilibrium, which they view as radically different from Walrasian general equilibrium. In particular, they claim that the focus should be on adjustment, on the equilibration process rather than on the characteristics of the attractor (the study of the logical existence of equilibrium). Clower and Leijonhufvud came to make this claim in an effort to rehabilitate Keynes’s theoretical project, which they capture as an attempt to resolve the question: “Is the *existing* economic system, in any *significant* sense, self-adjusting?” (Clower and Leijonhufvud [1975] 1984: 209; their emphasis). They argue that, to get Keynes straight again, it is necessary to depart from a Walrasian interpretation of his work and return to a view where his Marshallian inclination is re-asserted.

To Clower and Leijonhufvud, a central component of the Marshall–Walras divide is trade technology. To them, a Marshallian economy, the subject matter of Marshallian general equilibrium theory, is poles apart from a Walrasian economy, the subject matter of Walrasian general equilibrium theory. The former is totally unable to come to grips with the decentralised nature of real-world market economies. What is needed is an alternative, Marshallian, account of the trade process. Its traits should be that it

- (1) lacks a central information-processing and bill-collecting agency; (2) has, instead, middlemen trying to coordinate production and consumption activities in each output market separately; (3) makes the management of stocks of inventories essential to the co-ordination of these activities; and (4) has the system potentially subject to commercial crises associated with expansions and contractions of the volume of bank and non-bank credit. All this might be J.S. Mill or Alfred Marshall (Clower and Leijonhufvud [1975] 1984: 217)

These insights have been reiterated by Clower and Leijonhufvud in several subsequent papers. Here I will limit myself to discussing two of Leijonhufvud’s recent articles (2006a; 2006b). In the second of these (2006b: 31) he presents a table, taken from Leijonhufvud (1998), summarising

the contrast between ‘classical’ (Marshallian) and ‘modern’ (Walrasian) theoretical approaches, which is reproduced in Table 1.

**Table 1. Leijonhufvud’s characterisation of the differences between classical (Marshallian) and modern (Walrasian) approaches to economic theory**

	<b>Classical</b>	<b>Modern</b>
Objective of theory	Laws of motion of the system	Principle of efficient allocation
Individual motivation	Maximize utility or profit (intent)	Maximize utility or profit (performance)
Individual behavior	Adaptive, “Procedural” rationality	Optimizing choice, “Substantive rationality”
Behavior and Time	Backward-looking causal	Forward-looking teleological
Cognitive competence	Capable of learning, well adapted “locally”	“Unbounded”
Role of institutions	Essential in guiding behavior; making behavior of others predictable	Problematic: Why use money? Why do firms exist?
Equilibrium concept	Constancy of observed behavior (point attractor)	Mutual consistency of plans

Leijonhufvud also draws attention to another contrast between the two approaches: whether they provide both a theory and a model (the Marshallian approach), or only a model (the Walrasian approach). In other words, in the Marshallian approach, the theory and the model are distinct entities, while Walras inaugurates the ‘modern’ vision, which merges the two. According to Leijonhufvud, a theory is a “set of beliefs about the world and about how best to understand it” (2006a: 70). The model is the result of transforming theoretical insights into a mathematical language. The problem, Leijonhufvud declares, is that not all theoretical ideas can be translated into a model. In particular, Marshall’s theoretical ideas were dynamic — he was mainly interested in adjustment — but in his time only static mathematical tools were available. Hence the need for some compromise.

Marshall tamed the complex dynamics of his theory by dealing separately with the various adjustment processes, while assuming that their adjustment speeds could be given a strong ranking such that the thus separate processes would converge on point-attractors without interfering with each other (Leijonhufvud 2006a: 69).

In the Walrasian approach the situation is different. The adjustment dimension is assumed away for “Walrasian systems are always on equilibrium trajectories” (Leijonhufvud 2006a: 69). Moreover, the distinction between theory and model is eradicated, the two terms being understood as synonymous, to Leijonhufvud’s deep regret.

### *Colander*

Another author worth mentioning is David Colander for his role in fostering the Clower-Leijonhufvud research programme. He has edited two volumes of papers putting forward ‘Post-Walrasian theory’, which is nothing other than a return to Marshallian theory (Colander 1996; 2006a). The Marshall–Walras divide is a recurrent theme in several of these papers. For example, in his introduction to the 2006 volume, Colander criticises the Walrasian approach for its lack of attention to institutions, and its assuming away “the complexity of interactions that characterises complex systems” (Colander 2006b: 9).

### **3.2.3 Walker**

In a series of articles and a book, *Walras’s Market Model* (Walker 1996), Donald Walker has proposed a provocative re-reading of Walras’s *Elements*. He makes three main claims. First, he argues that the third edition of Walras’s book constitutes its apex<sup>11</sup>. As to the modifications introduced into the fourth edition, he dismisses them as a regression due to Walras’s declining intellectual abilities. Second, he claims that the short passage of the *Elements* where Walras describes the functioning of the 3% French *rentes* on the Paris stock market constitutes the foundation of Walras’s theoretical construction. Third, Walker disputes the usual understanding of the term ‘model’ as meaning a mathematical model. To him, a model is a theoretical scenario about trade technology, i.e. about what allows markets to function, “market institutions, participants, procedures, rules, and behavioural patterns that determine and express the pricing and exchange procedure processes” (Walker 1996: 53). The 3% *rentes* ‘model’ is then the Walrasian model *par excellence*. In turn, he calls mathematical models a ‘system of equations’. His claim is that the model must have the upper hand over the system of equations. If there is any incongruity between them, the system of equations must yield.

Walker’s ultimate judgment about the *Elements* is that its mathematical part, which is usually viewed as justifying Walras’s place in the pantheon of great economists, is of no interest, and ought to be disposed of because of its incompatibility with the ‘model’ of the 3% *rentes* market — quite a revolutionary conclusion, which has been insufficiently stressed. However, for Walker, this negative conclusion is hardly dramatic. It does not amount to stating that Walras

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<sup>11</sup> The *Elements* went through five successive editions. The first edition consisted of two instalments, published in 1874 and 1877, the second dates from 1889, the third from 1896, and the fourth from 1900. The fifth edition was published posthumously in 1926. The English translation by Jaffé, published in 1954 is based on the fifth edition. While the changes from the second to the third and from the fourth to the fifth editions were minimal, substantive changes were made in the second and the fourth editions. All commentators agree that the second edition saw considerable progress with respect to the first. It was taken for granted that same judgment could be made with respect to the changes between the third and the fourth, until Walker claimed the opposite.

failed to contribute to economic theory. It is just that, contrary to appearances, the field to which he contributed was partial equilibrium analysis — and, as a stout Marshallian, Walker prefers good partial equilibrium to bad general equilibrium analysis<sup>12</sup>!

How does Walker’s view fit into my distinction between the complementary and the alternative research programmes? It cannot be considered part of the complementary approach. Since, to Walker, what is usually called ‘Walrasian general equilibrium theory’ (i.e. Walras’s mathematical models) should be dispensed with, there remain no two theoretical streams to be conciliated. Should Walker’s view thus be considered part of the alternative research programmes conception? Yes, but there is a twist. Authors like Clower and Leijonhufvud, who dislike the Walrasian approach, nonetheless identify it with the traditional understanding of Walras’s contribution to economic theory. In contrast, Walker claims that Walras was no ‘Walrasian’ whenever this modifier is understood as referring to the *Elements*’ mathematical models and/or the Arrow-Debreu model. To Walker, Walras was, on the contrary, a fully-fledged Marshallian economist<sup>13</sup>. Hence he can see no divide between Marshall and Walras, unlike the other authors surveyed here. Nonetheless, he belongs to the Clower-Leijonhufvud camp, sharing their view about what good economic theory should be, i.e. an analysis based on Marshallian principles. In this light, Walker’s original contribution can be characterised as whispering to the members of his gang, ‘Look, guys, that Walras, the alleged leader of the enemy gang, is actually one of ours’! And bringing in a new recruit of such rank is of course a stunning achievement.

## 4 An assessment

### 4.1 A lack of symmetry

The claim that a Marshall–Walras divide exists is mainly made by Marshallian economists. With a few exceptions, Walrasian economists have felt no need to attack the Marshallian approach<sup>14</sup>. Two factors may explain this state of affairs. The first is that Walrasian economists believe in the continuity viewpoint: Mas-Colell et al.’s (1995) book is a testimony to this. The second is the mix of benign neglect and arrogance, which Walrasians typically display towards their Marshal-

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<sup>12</sup> Walker’s views do not stand up to close scrutiny as I have argued in a critical review of his book (De Vroey 1999a).

<sup>13</sup> Not that Walker qualifies Walras in this way. It is just that he takes for granted that there is no other correct way of posing issues than the Marshallian approach.

<sup>14</sup> The only author castigating the Marshallian approach from a Walrasian standpoint that I have encountered in my investigation is Paul Samuelson: “But where Marshall threw off two generations of scholars was in his insistence on having his cake and eating it too. He would try to treat at the same time cases of less-than-perfect competition and of perfect competition. He would try to achieve a spurious verisimilitude by talking about vague biological dynamics, and by failing to distinguish between reversible and irreversible developments. He would insist on confusing the issue of external economies with the entirely separable (and separate!) issue of varying laws of returns. Marshall was so afraid of being unrealistic that he merely ended up being fuzzy and confusing – and confused” (Samuelson 1967: 111).

lian colleagues. The following passage from an interview with Robert Lucas, a modern herald of Walrasian general theory, can be seen as an example of such condescension:

Question [to Lucas]: *You acknowledge that Friedman has had a great influence on you, yet his methodological approach is completely different to your own approach to macroeconomics. Why did his methodological approach not appeal to you?*

Answer: I like mathematics and general equilibrium theory. Friedman didn't....

Question: *His methodological approach seems more in keeping with Keynes and Marshall.*

Answer: He describes himself as Marshallian, although I don't know quite what it means. Whatever it is, it's not what I think of myself (Snowdon and Vane 1998, 132).

#### **4.2 Which Marshall? Which Walras?**

Any attempt at confronting Marshall's and Walras's approaches faces the difficulty of identifying their precise content. Marshall's writings comprise two distinct streams. Traditionally, the emphasis was placed on Book V of the *Principles*, making Marshall a value- or equilibrium-theorist. More recently, people interested in Marshall have brought the other stream to the forefront, making Marshall the forerunner of evolutionary economics (see Raffaelli 2002). Leijonhufvud's synthesis, presented above in Table 1, definitely tilts towards this second strand. Likewise, no unanimity exists about how to interpret Walras's work. When trying to compare Walras's views with those of Marshall it makes a huge difference whether we are referring to the *Elements* as interpreted by Jaffé (1983) or by Walker (1996). Moreover, interpreters disagree as to whether Walras's theory and neo-Walrasian theory as reconstructed by Arrow and Debreu can be put in the same category. Beyond doubt, this twofold ambiguity puts a heavy strain on the project of wanting to draw a contrast between the two approaches. Nonetheless, this does not render it illegitimate or impossible.

#### **4.3 My own position**

I definitely take the side of those authors who defend the existence of a Marshall–Walras divide (De Vroey 1999b; 2002; 2003). This standpoint follows from my belief that economic theory cannot be concerned exclusively with the issue of the logical existence of equilibrium. The institutional set-up and the adjustment towards equilibrium are equally important topics. Once this is granted, the continuity viewpoint has to yield.

That being said, I nonetheless disagree on several scores with authors who defend the existence of a Marshall–Walras divide. My bones of contention amount to four, which I shall discuss in turn below.

*The alleged dominance of the Walrasian approach*

First of all, I want to question the recurrent claim by authors who contend that there is a divide between Marshall and Walras, that the Walrasian approach has dominated economics for the last half century<sup>15</sup>. Oddly enough, in view of these authors' allegiance to empiricism, they provide no justification for this claim. This has been the case from Friedman's 1949 paper onwards. His statement that "We curtsy to Marshall but we walk with Walras", is certainly a powerful image but it is hardly a correct account of the contemporary state of affairs. At the time, Walras's *Elements* had not been translated into English. Arrow and Debreu had not started their collaboration. Only a few sources (e.g. Stigler 1941) and the works of Cassel and Wicksell were available to economists who wished to become acquainted with Walrasian theory but were unable to read French, and their account of Walras's theory was rudimentary. A few works of mathematical economics, by authors such as Moore, Hotelling and Schultz, had seen the light of day. Their aim, which could not but have looked odd to Walras himself, was to render the Walrasian conceptual apparatus statistically operational. Thus, their perspective was poles apart from the line pursued by Arrow, Debreu and Mackenzie, which I view as being more faithful to Walras's own methodological precepts. Admittedly, a revival of Walrasian theory, triggered by Hicks's *Value and Capital* and Samuelson's *Foundations* was under way. It is also true that Friedman was in direct contact with some of the few US-located Walrasian economists and enjoyed many opportunities to compare his views with theirs when attending seminars at the Cowles Commission. Yet, all in all, these economists were a small minority in the profession. Therefore, Friedman's image is totally inappropriate. If the 'we' in his epigram means the majority of economists at the time, I cannot see how the epigram could be justified.

True, Walrasian general equilibrium became more important at the end the 1950s and in the two following decades, only to peter out in the last decades of the past century, except in the field of macroeconomics. Still, my guess is that, even at the height of its prestige, only a minority of economists were engaged in it. Prestige is one thing, constituting the conceptual apparatus adopted by the majority of the profession is another. Anyhow, this is a matter that could be settled empirically, for example by studying the contents of leading academic journals<sup>16</sup>.

*An unfair account of the Walrasian approach*

I cannot refrain from thinking that Marshallians treat Walras in an unfair way<sup>17</sup>. Again, it all began with Friedman's 1949 paper, a polemical piece rather than a balanced comparison of the two approaches<sup>18</sup>. The dice are loaded against Walrasian theory, which is presented as a gratuitous, somewhat frivolous, attempt at elegance, while Marshallian theory is hailed for its concern

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<sup>15</sup> See, e.g., Hoover (2004: 154) and Colander (2006c: 51).

<sup>16</sup> To the best of my knowledge, such studies have not been undertaken with the exception of a short paper by Ellig (1986). Tabulating citations of Marshall and Walras in the Social Science Index from 1974 to 1984, he observed that Marshall received almost five times as many citations as Walras.

<sup>17</sup> This indictment concerns the Friedman rather than the Clower-Leijonhufvud line.

<sup>18</sup> For a detailed criticism of Friedman's argumentation, see De Vroey (2007).



with serious real-world problems. Actually, at the time Friedman had only an indirect knowledge of Walrasian theory, and the reason why he attacked it had more to do with his opposition to authors who, rightly or wrongly, had put themselves under the Walrasian banner, than with the content of the *Elements* (see De Vroey 2007)<sup>19</sup>. While Friedman may be excused for his biased account of Walras's theory, it is less acceptable that economists of following generations have contented themselves with repeating his claims instead of addressing the matter afresh.

*Too rudimentary a confrontation*

All commentators agree that Marshall and Walras had different methodological inclinations and were pursuing different objectives. What separates them is their opinion as to whether these opposing methodological priorities put Marshall's and Walras's theories into different orbits. While agreeing with Friedman, Clower and Leijonhufvud and their followers that this is the case, I am of the opinion that to date the differences between the two research programmes have been described too superficially. A more in-depth study is needed. It should bear on the methodological differences but also on other topics. I am thinking of the constitutive concepts of the two approaches, in particular the notion of equilibrium upon which they rest, and the way in which the time dimension is integrated into their analyses. Another topic that should be addressed is the institutional set-up and the representation of the economy underpinning the Marshallian and Walrasian approaches.

*Opposing a 'good' and a 'bad' approach*

All the commentators I have mentioned so far take the side of Marshall. I, for one, see no reason to give him all the laurels and disparage Walras. I prefer to see the two approaches as alternative programmes, each having their pros and cons.

Marshall and Walras did not disagree on the need to move from the simple to the complex but they differed in the strategies they used to this end. Marshall was adept at breaking complex problems up into elementary parts, which were then studied in isolation. By contrast, Walras's strategy consisted of simplifying the economy to the extreme without ever departing from the study of a complete economy.

An analogy may be useful here. Marshallian theory can be compared to a roadmap. Such maps cover a specific area. The larger their scale, the more detailed the picture of the area they are able to provide but the smaller this area is. In turn, Walrasian theory can be compared to a globe, which represents the whole earth at once. As to the pros and cons of maps versus globes, they are obvious. Maps permit a small area to be described in detail, but it is impossible to piece them together to cover the whole surface of the earth. Globes, on the other hand, provide a great bird's

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<sup>19</sup> As mentioned above, Friedman took a more balanced view in his 1955 review of Jaffé's translation of the *Elements*.

eye view of the earth, illuminating the relative positions of the different oceans and continents. But they are of little help in solving practical issues, such as finding one's way around!

David Warsh in his book, *Knowledge and the Wealth of Nations* refers to Donald Stokes's Pasteur's quadrant (Warsh 2006: 102).

**Table 2. Pasteur's quadrant as applied to the Marshall–Walras divide**

Research inspired by:

		Consideration of Use?	
		No	Yes
Quest for Fundamental Understanding?	Yes	Pure basic (Bohr)	Use-inspired (Pasteur)
	No		Pure applied (Edison)

This box-diagram proves to be a fine way of capturing the difference in purpose between Marshall and Walras. The obvious slot for Walrasian theory is the upper-left box. As to Marshallian theory, it certainly ought to be placed in the right column, although it is debateable whether it fits better in the upper or the lower slot. My point is to ask on what grounds it can be asserted that the right column is superior to the left, once it is admitted that theories which were put forward without any consideration of use have generated useful applications in the long run?

Beyond doubt, the Walrasian approach is of little direct usefulness. All its proponents admit this<sup>20</sup>. Starting from basic principles, the journey towards concreteness cannot but be long. But then Walrasian theorists have their own hierarchy of values. For them, rigour has to have the upper hand over relevance. They are adepts of Wittgenstein's principle that it is best to remain mute about whatever cannot be rigorously expressed. Marshallians hold to the opposite viewpoint. With reference to Wittgenstein, they would suggest that it is better to say what needs to be said clumsily, than to remain mute. When the contrast between the two approaches is drawn in such terms, it is clear that no conclusion can be drawn as to the superiority of one or the other. Rigour is fine, but it has a price in terms of relevance. Relevance is fine but it has a price in terms of rigour. Nothing, expect subjective opinion, supports the claim that one route is better than the other<sup>21</sup>.

<sup>20</sup> Here, I have in mind Walrasian of the old school (the like of Arrow, Debreu and Hahn) and not real business cycle Walrasians.

<sup>21</sup> The same point can be made in terms of Leijonhufvud's distinction between theory and model. As seen, is firmly convinced that the Marshallian-Keynesian theory is right but admits that the tools enabling it to be transformed into a model are missing. Still, to him, the theory must have the upper hand over the model; somebody with a different

## 5. Another interpretative quarrel: did Marshall develop a general equilibrium analysis?

### 5.1 Schumpeter and others

The conciliatory position is underpinned by the view that a division of labour has evolved between the Marshallian and Walrasian approaches. Marshallian accounts are concerned with partial analysis (the study of an isolated fraction of an entire economy, its other parts remaining unchanged) while Walrasian accounts consider general analysis (the study of the economy as whole, no part being omitted). However, some authors have claimed that Marshall also constructed a general equilibrium approach, albeit only in an embryonic way. Joseph Schumpeter is one of these as this extract from his *History of Economic Analysis* (1954) shows:

The partial-analysis viewpoint is so much in evidence throughout Marshall's text, and the handy concepts of partial analysis that he forged or refurbished have been so generally received into current teaching that there is some excuse for those who see in Marshall the master of partial analysis and nothing more. All the same, this fails to do justice to the depth and range of Marshall's thought. It is not only that the wider conception of the general interdependence of all economic quantities receives intermittent attention in the *Principles*: Marshall actually formulated this wider conception — in an embryonic way but still explicitly — in the notes XIV and XXI of the Appendix. And the *Memorials* contain a passage (p. 417), rightly emphasised by Mr. Shove that reads: "My whole life has been given and will be given to presenting in realistic form as much as I can of my note XXI". It seems fair, therefore to list Marshall also among the builders of the general-equilibrium analysis per se (Schumpeter [1954] 1994: 836)<sup>22</sup>.

Another famous author who adopted Schumpeter's viewpoint is Lionel Robbins, as his LSE *Lectures on the History of Economic Thought*, reveal:

The school of Lausanne are always spluttering about the restriction of the British School under the influence of Marshall to partial equilibrium analysis. Nonsense! If you look at Marshall's 'Mathematical Appendix', you can see that he understood perfectly well the generalisation which Walras and his school were elaborating. But as a trained mathematician, he felt that there were more interesting things to do, and insofar as he was interested in applied economics, well, partial equilibrium was obviously the instrument to hand. But how *anybody* who has read Chapters 1 and 2 of Book 6 of Marshall, which takes a broad view of the economic system, as foreshad-

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methodological inclination will stick to the opposite standpoint, that only models matter. To me, there is no objective way of deciding which of these two standpoints is better.

<sup>22</sup> Schumpeter had already made this point in his semi-centennial appraisal of Marshall's *Principles* (Schumpeter [1941] 1952). Dimand (1990) takes up Schumpeter's message.

owed in Book 5 and Books 3 and 4, could arrive at such a misapprehension beats my understanding. I think the Lausanne School did themselves harm by insisting that they, and they only, were the proprietors of general equilibrium analysis (Robbins 1998: 306)<sup>23</sup>.

In my eyes, neither Schumpeter nor Robbins is convincing. The Robbins's quotation is an excellent piece of evidence. Its oral character gives it a stamp of genuineness that would be absent from a written text. But then the shallowness of the argumentation is evident as well. Both Schumpeter and Robbins speak of authority without providing any justification for their claim. In particular, they fail to make it clear exactly what they mean by general equilibrium. The most plausible definition of general equilibrium analysis consists of stating that a model can be considered as 'general equilibrium' as soon as its object of study is an entire economy rather than a fraction of it. The immediate implication is that all models that fail to meet this criterion must be considered as partial equilibrium models. The joint study of two markets (for example the market for a given good and the markets for its inputs) constitutes partial equilibrium even it is concerned with an interdependency phenomenon. If Schumpeter or Robbins — or, for that matter, their present-day followers — disagree with this definition, they should make clear the content of their alternative conception.

As soon as the line between general and non-general equilibrium is drawn in this way, the claim that Marshall's Mathematical Note XXI generalised his partial equilibrium theory into a general equilibrium analysis, breaks down. Marshall's note is concerned with the phenomenon of joined and composite supply and demand. Clearly an element of interdependency is involved. But widening the scope of the analysis from a single market to a group of related markets cannot be viewed as tantamount to analysing an entire economy.

Turning to another argument evoked by Schumpeter and often repeated subsequently, the fact that Marshall wrote to John Bates Clark in 1908 that all his life had been devoted to giving flesh to this note, should not be taken for more than it was — a declaration of intent. Authors must be judged on their theories rather than on their meta-theoretical comments.

To conclude, I agree with Whitaker who wrote:

Marshall's treatment of market interdependence fell far short of a full theory of general equilibrium on Walrasian lines. Even when formalising market interdependence in the mathematical appendix to the *Principles*, he simply treated the demand or supply of each commodity as a function of nothing but the price of the commodity itself. The links between the generation of income in factor markets and the expenditure of that income in product markets were left quite vague. Again, it must be recalled that

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<sup>23</sup> The same view can be found in Shove (1952: 300, note 5).

the development of comprehensive fully articulated equilibrium theories was not Marshall's aim (Whitaker 1987: 360).

The last sentence of this quotation from Whitaker is decisive: Marshall intentionally neglected — for defensible reasons — the project of studying mutual interdependency at the level of the entire economy.

## 5.2 Friedman

Oddly enough, authors championing Marshall against Walras, such as Friedman and Stigler, tend to agree with Schumpeter's judgment. Friedman's attitude is paradoxical. In his 1949 demand article, he castigated the Walrasian approach, but claimed that Marshallian analysis was also general:

Marshall and Walras alike dealt with general equilibrium; partial equilibrium as usually conceived is but a special kind of general equilibrium analysis — unless indeed partial equilibrium analysis is taken to mean erroneous general equilibrium analysis (Friedman [1949] 1953: 90).

To me, the meaning of this statement is hard to fathom. Perhaps, we have here a sort of territorial dispute. The term 'general equilibrium' has a positive connotation of completeness, while the term 'partial equilibrium' suggests an admission of incompleteness. Hence the struggle of Marshallian authors to stop the Walrasian camp from monopolising the field with positive connotations. Little is to be gained from this attempt. To Friedman, industry analysis has advantages of its own that are lost when the economy as a whole becomes the object of study. Why try to brand the study of an industry as general equilibrium analysis as if the failure to engage in the latter type of work were an unbearable stigma? It is illogical to hail Marshall for having resisted the temptation to develop a fully articulated theory of the economy as a whole and simultaneously to claim that Marshallian theory is in fact a general equilibrium theory.

## 5.3 Stigler

For his part, Stigler argues that the opposition between partial and general equilibrium is a false one. While readily admitting that the Walrasian perspective is more general than the Marshallian one, Stigler claims that Walras's approach is not really general, as it still comprises a series of data that are taken as given.

A partial equilibrium is one which is based on only a restricted range of data. ... General equilibrium is ostensibly based on all of the data relevant to the problem which is being studied. ... But *general* equilibrium is a misnomer: no economic analysis has ever been general in the sense that it considered *all* relevant data. ... The most that can be said is that general studies are *more* inclusive than partial equilibrium studies, never that they are complete (Stigler, 1946: 28).

The flaw in Stigler's reasoning lies in his failure to separate two types of data or given: those elements which are considered as given because they do not belong to the ultimate theoretical *quaesitum*, on the one hand, and those elements which do belong to the *quaesitum* but which are provisionally ignored for the purpose of tractability, on the other. As a result, he misses a basic methodological difference between Marshall and Walras. Buchanan (1958) aptly captures the point at issue. Coming close to the Walrasian standpoint, he considers that the genuine *ceteris paribus* variables are the fundamental "wants, resources, and technology, the values for which, at least conceptually, are not modified by the changes imposed on the system" (1958: 260). By contrast, the variables that are held constant in partial analysis

are among the total set of interdependent variables of the system. They are treated as parameters because the analyst desires to work with a subset rather than the whole set. But subset analysis will yield economically meaningful results only if the final shifts in the values of the parameters are reasonably small (Buchanan 1958: 260).

#### **5. 4 Dardi**

Another, more recent, attempt at defending the view that Marshallian theory is a general equilibrium theory is worth considering. Marco Dardi (2003) suggested that equilibrium is not an on/off property of the economy. When a shock arises in an ideal situation where the economy is fully in equilibrium, only a fraction of the economy is affected by it. While this section of the economy enters a state of disequilibrium, other sections remain in equilibrium. Hence, Dardi claims, the questions to be addressed are of the type: how much equilibrium is there in an economy? What would be the minimum conceivable level of equilibrium? The economy is in partial equilibrium because parts of it are in equilibrium while others are in disequilibrium. If this view is taken, there is no longer an opposition to be drawn between partial and general equilibrium. The notion of partial equilibrium refers to the degree to which the overall economy is in equilibrium. An economy can be at one and the same time in equilibrium and in disequilibrium, with disequilibrium pertaining to the parts of the economy that are affected by the shock and equilibrium to those parts which remain unaffected. To Dardi, the opposite of partial equilibrium is partial disequilibrium rather than general equilibrium!

Dardi's reconstruction is clever and appealing. It provides a further justification for Marshall's strategy of studying parts of the economy in isolation from the others. Still, against my definition of the partial/general equilibrium distinction, Dardi's analysis is undoubtedly a partial equilibrium approach. Moreover, it fails to resolve the basic problem facing any partial equilibrium or industry analysis: the fact that there is no way of delineating one industry from another as a matter of principle (rather than in empirical way).

#### **6. Concluding remarks**

My aim in this paper was to clarify the neglected issue of what is the range of views about the relationship between Marshallian and Walrasian theory. I have shown that two opposite standpoints are present, the complementary and the alternative research programme views. I have endorsed the latter but expressed several doubts about the way it is usually defended. In particular, I have argued that there is no way of saying that either the Marshallian or the Walrasian approach is superior to the other. To me, such an attempt at a claim of supremacy is vain (and, of course, the same judgement holds for Walrasians claiming that their approach is superior to the Marshallian). Finally, I have addressed the claim made by some authors that the existence of notes XIV and XXI in the Appendix of Marshall's *Principles* warrants the conclusion that he developed a general equilibrium analysis parallel to that of Walras. This claim, I have shown, does not stand up to close scrutiny.

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