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A REVIEW OF KUHNIAN AND LAKATOSIAN 'EXPLANATIONS' IN ECONOMICS*

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In the last few decades the influence on economics of the ideas of T. Kuhn and I. Lakatos was considerable. The increasing use of terms like «paradigms» and «scientific research programmes» in almost every field of economics, is indicative of the influence of these two philosophers. Furthermore, the introduction of the ideas of Kuhn and Lakatos in economics gave the stimulus for work on the nature of growth of economic knowledge. The paper starts by presenting the main influence of T. Kuhn on theories concerned with the evolution of economic theory. It continues with a review of the main criticisms regarding the appropriateness and applicability of Kuhnian ideas for economics. The same approach is followed in the case of I. Lakatos. After a classification and discussion of the main findings, the paper attempts to offer an interpretation of the general impact of these two philosophers science on ideas relating to the development of economic theories.

1. Introduction

Until the 1970's the dominant methodological views among the vast majority of economists were based on the philosophy of logical positivism. In particular, they were content to follow the so-called hypothetico-deductive model of scientific explanation, which emerged in the beginning of the century mainly from the work of the Vienna circle (Blaug 1980, 1-4; Caldwell 1982, 11-18). These ideas were brought in economics mainly by T. Hutchison (1938). A clear indication of the powerful influence of positivism in economics was the great popularity of the term "positive" among economists which became widely known mainly from M. Friedman's (1953) work on economic method. Although Friedman's argument was rooted in economics rather than philosophy, it summarized the «mature positivist»

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approach (Backhouse 1994, 182, and Caldwell 1982, 173). However, in the last few decades the influence of post-positivist philosophers of science (Popper, Kuhn, Lakatos, etc) became significant. More specifically, there was an increasing number of methodological works in economics that were critical of the traditional approach and also reflected the post-positivist spirit (see Redman 1993; Dow, 2002).

It can be argued that the work of Popper gave the initial momentum to the gradual undermining of the positivist approaches (see, e.g., Caldwell 1982). Thus, in this sense, it provided the ground for the subsequent growth of the ideas of Kuhn and Lakatos in economics. (One can note here that it was Latsis' 1976 book which stimulated further economists' interest in post-positivist philosophies of science).** The influence of Popper is still quite substantial. However, the ideas of Kuhn and Lakatos gave the stimulus for work on the nature of growth of economic knowledge. In other words, they made economists think about the way that economic ideas develop. The increasing use of terms like Kuhnian paradigms and Lakatosian research programmes indicates the influence of these philosophers on the formation of ideas about the development of economic theory. Furthermore, the substantial growth of the relevant literature is another indication of the previous point (see for instance the volume by de Marchi and Blaug 1991).

In the recent years however, the influence of Kuhn and Lakatos among economic methodologists seems to have weakened. In particular, various forms of naturalism, pragmatism and constructivism are gaining popularity. Furthermore, science studies and cultural history are viewed more appropriate as tools for the historical reconstruction of economics (for a comprehensive treatment of the new currents in economic methodology, see Hands 2001). In spite of this, a great number of economists continue to employ Kuhnian or Lakatosian modes of methodological explanation in almost all fields of economics. One can find recent examples from the theory of choice (List 2004), monetary economics (Bofinger and Wollmershauser 2003), development economics (Fine 2002), law and economics (Krecke 2003), market equilibrium (De Vroey 2001), health economics (Edwards 2001), economic fluctuations (Louca 2001). This implies that in spite of the relative decline among methodologists, these ideas are still influential among practicing economists. Thus, it seems that a critical survey of the influence of these two philosophers of science on the economic methodology might be useful for the appropriateness of

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use of Kuhnian and Lakatosian concepts in economics and for the further understanding of their continuing influence on economics in general. Furthermore, this survey will attempt to update older surveys by examining recent uses of Kuhnian and Lakatosian concepts.

Given the above, the paper will start with a presentation of the main influence of T. Kuhn as is found in influential works. The next section will concentrate on the main criticisms concerning the appropriateness and applicability of Kuhn's influence on the history of economics. The same approach is followed in the case of I. Lakatos. After a classification and discussion of the main findings, the paper attempts to offer an interpretation of the general impact of these two philosophers of science on ideas relating to the development of economic thought.

2. The Influence of Thomas Kuhn

The basic ideas of Kuhn can be found in *The Structure of Scientific Revolutions* (1970). Very briefly, according to Kuhn a given «paradigm» guides the scientific community. The concept of paradigm implies a general theoretical viewpoint that members of the community share (subsequently, Kuhn replaced this concept with «disciplinary matrices» for reasons of clarity). Scientific revolutions occur because the established paradigm faces a scientific crisis which occurs because of accumulation of anomalies or unsolved scientific puzzles. Gradually, a new paradigm becomes dominant. The revolutionary period is characterized by «extraordinary science» while non revolutionary periods are characterized by «normal science». It has to be noted that this process has psychological rather than a rational basis and this is the basic reason why there is what Kuhn calls the incommensurability problem between competing paradigms. Subsequently, Kuhn moved from a psychological explanation of incommensurability to one based in the philosophy of language (see Bird 2002, and, for a detailed discussion of Kuhn's ideas, see Kuhn 1970, 2000; Redman 1993, and Dow 2002).

Within the first few years after the appearance of *The Structure of Scientific Revolutions* (first edition 1962), a number of economists attempted to explain the growth of economic knowledge by following Kuhn's ideas. Thus, a representative example of a general application of Kuhn's scheme is Kunin and Weaver (1971) who believe that of all social sciences, economics is more appropriate for the application of Kuhnian ideas. The strong theoretical consensus that is observed in economics is the main reason for this. However, the authors caution that the level of generality at which a paradigm is defined is im-

portant for its successful application. Furthermore, the concept of paradigm change is more complex and subtle in economics, since not only our views concerning economic phenomena change but also the phenomena themselves.

Historians of economics have applied the Kuhnian approach not only to mainstream, but also to radical economics. The notion of Kuhnian paradigm as applied to radical economics was the central theme of a special issue of the *Review of Radical Economics* in 1971. The main point was that the Kuhnian approach in a wide sense, is useful in understanding the development of economic thought (e.g., Sweezy 1971, Zweig 1971). Similarly, Eichner and Kregel (1975) argued that Post-Keynesian theory constitutes a new paradigm in the Kuhnian sense.

As was noted, the Kuhnian analysis of the nature of scientific process has two main components: a) regarding the nature and the rate of progress of the discipline itself, namely if it is on a paradigmatic level; and b) the existence of scientific revolutions in a specific science. In the coming pages we will explore if these characteristics of the Kuhnian analysis have found fruitful grounds in economics.

In regard to the paradigmatic level of economics, the historians of economics started as early as in the mid 1960's to investigate the presence of Kuhnian paradigms. Gordon's (1965) article was the first one to apply Kuhn's paradigmatic process in economics. Gordon (1965, 123-124) argued that the ruling paradigm in economics is Smith's postulate of the maximizing individual in a free market environment. Since then, a number of historians of economic thought tried to fit the Kuhnian approach to the development of economics. However, the first example of the systematic application of Kuhn's views to economic thought can be found in Coats (1969). Coats applied Kuhn's methodological tools to the history of economic thought. His main conclusion was that there has been only one paradigm: equilibrium theory based on the idea of market mechanism. Some years later, Loasby (1971) argued that there exists the profit-maximization paradigm in economics, while an emerging paradigm could be the behavioural theory of the firm.

The next systematic application of Kuhnian views was provided by B. Ward (1972). He adopts some of Kuhn's criteria in order to examine if economics can be characterised as a mature science much like physics. His reference is the orthodox neoclassical theory. In his view, the existence of an «invisible college» of Neoclassical economists with common method and agreement concerning what are the important problems of the field, indicate the maturity of neoclassical economics. Furthermore, he continues to find puzzle-solving behaviour giv-

ing as a prime example of the classical versus the marginalist theory of value. Apart from the Neoclassical school, Ward examines the development of Marxian economics. He discerns some puzzle-solving behaviour especially with regard to the issue of values and prices. However, he believes that it fits less to the Kuhnian framework since he is unable to find examples of crises and scientific revolutions. As he writes «[Marxism] passes most of the tests necessary for a Marxist economic science to exist in the Kuhnian test, but in practice it has failed because of the virtual absence of an integrated social system of scientists oriented toward the systematic development of the science through study of problems of detail» (1972, 70).

Dow (1981) claimed that general equilibrium analysis must rather be considered as a Kuhnian paradigm. A few years later and in more general terms, Dow (1985) uses Kuhnian analysis for macroeconomic schools of thought such as Mainstream, post-Keynesian, Marxian and Neo-Austrian. Even more recently, G. Argyrous (1992) writes that with certain modifications the concept of paradigm (or disciplinary matrices, Kuhn's subsequently substitute term) can explain to a great extent the historical development of the Neoclassical consumption function. Dobson (1994, 76) argued that financial economic theory of the firm shows a paradigm shift in a Kuhnian sense but he does not adequately analyses its specific characteristics. A more recent application of Kuhnian approach is to be found in a study of the philosophical foundations of transaction cost economics. Following Kuhnian methodology, Miller (1993) believes that this field serves a puzzle-solving role for neoclassical economics and thus it can not be considered as new-institutional economics but part of the orthodox school. The above discussion is summarized in Table 1a and Table 1b:

Table 1a.

SCHOOLS OF ECONOMIC THOUGHT AND KUHNIAN PARADIGMS		
Classical	*Neoclassical*	*Radical/ Post-Keynesian*
Gordon 1965	Coats 1969	Eichner and Kregel 1975
	Dow 1985	Dow 1985
	Gordon 1965	Sweezy 1971
	Miller 1993	Zweig 1971
	Ward 1972	

Table 1b

ECONOMIC THEORIES AS KUHNIAN PARADIGMS		
General Equilibrium	*Theory of the Firm*	*Consumption Function*
Coats 1969	Loasby 1971	Argyrous 1992
Dow 1981	Dobson 1994	

As was mentioned, the second important characteristic of the Kuhnian analysis is the emergence of a scientific revolution. There are historians who argued that Kuhnian- type revolution emerged in economics. More specifically, Coats (1969) after presenting the main propositions of a Kuhnian revolution pointed out that there was only one revolution in economics sharing Kuhnian features, that of the Keynesian Revolution. In another paper Coats (1972, 308-314), more strongly than Blaug (1972, 277) who conceived the marginal revolution as «a gradual transformation», recognized some Kuhnian elements of this revolution in economics.[1]

Ward also identifies the presence of scientific revolutions. He believes that Keynesianism constitutes a scientific revolution although not in the strict sense that Kuhn uses the expression. Furthermore, by using extensively the Kuhnian paradigm shift methodology, showed that another revolution in the 20th century was that of «the formalist revolution» (Ward, 1972, 40).[2] The view that Keynes' theory constitutes a "scientific revolution in the Kuhnian sense is shared by other economists apart from Ward. For instance, Winch (1969), Mehta (1974, 1979), Dillard (1978), Stanfield (1974), Leijonhufvud (1976) argue that the Keynesian revolution is a good example of a Kuhnian revolution in the field of economics. In the same spirit (although not with regard to the Keynesian revolution), O'Brien (1976, 103) considers that Kuhn's system is «for economists, a much more illuminating way of looking at their subject than that supplied by Popper». Then, he maintains (1976, 105) that the marginal revolution is a case of paradigm change from the classical economy. In the same spirit, but much more recently, Schabas implies that Jevons' ideas were revolutionary for economics and this can be explained in Kuhnian terms (Schabas, 1990, 5, 23).

More recently, the idea of a Kuhnian type explanation has reappeared in connection to Keynesian macroeconomics. In particular, McGovern (1995) argues that the failure to find Lakatosian novel facts in Keynesian macroeconomics must lead to the adoption of a Kuhnian type investigation. As is seen from Table 2 most of historians of economics identify the existence of the Keynesian revolution and secondly of the marginalist.

[1] On the other hand, Bronfenbrenner 1971 believed that the three revolutions in economics (1776, 1871, 1936) took place through a dialectical process and maintained that these revolutions could be identified only by modifying Kuhn's theory.

[2] Pernecky 1992, 131 argued that «the Kuhnian model is insufficient in providing an explanation for the Keynesian revolution because there is much overlap between the pre-Keynesian and Keynesian paradigms».

Table 2.

KUHNIAN REVOLUTIONS		
Keynesian	*Marginalist*	*Formalist*
Coats 1969	Coats 1972	Ward 1972
Dillard 1978	O'Brien1976	
Leijonhufvud 1976	Schabas, 1990	
McGovern 1995		
Mehta 1974, 1979		
Stanfield 1974		
Ward, 1972		
Winch 1969		

3. Criticisms of Kuhn

Apart from the positive influence of Kuhn, the application of his ideas to economics has also generated critical discussion and controversy. A significant number of economists were attracted to his views in late sixties, however, almost in the same period there were the first criticisms. There were two main lines of criticism: a) the vagueness of Kuhnian terminology; and b) its non-appropriateness for the explanation of economic progress. Let us see the first line of criticism.

The first general criticism has to do with what constitutes a Kuhnian paradigm or a revolution in economic thought. For instance, Stigler (1969) was one of the first economists to cast serious doubts on the applicability of Kuhn's schema in economics given the loose definition of the concept of paradigm. He criticized the imprecision of Kuhn's definition of the term paradigm and argued that this is an obstacle for its testing in economics. As he comments (1969, 225): «My main quarrel with Kuhn is over his failure to specify the nature of a paradigm in sufficient detail that his central thesis can be tested empirically». This has led a number of economists to find the terms not only vague but confusing for the understanding of the history of the discipline. For example, Blaug (1976, 149) maintains that term paradigm should be «banished from economic literature, unless surrounded by inverted commas». The same view is adopted by Redman (1993, 144) who believes that this terminology acts not to clarify but serves, rather, to obscure the issues. The imprecision and vagueness of this Kuhnian term has also been pointed out by Johnson (1983), and Glass and Johnson (1989, 164). It has to be noted though, that there are methodologists who do not think that vagueness is necessarily a negative characteristic (e.g., Dow 1985).

The second line of criticism of the Kuhnian approach is that it does not fit appropriately to the history of economic thought. For instance, M. Bronfenbrenner (1971) believes that Kuhn's ideas about

the destruction of a theory and its replacement by another one has not been the case in economics. Furthermore, he does not see the crisis of the discipline as a cause of the emergence of new theories. In the same spirit, Weintraub (1979) believes that Kuhn's account of scientific revolutions and the rise and fall of different paradigms, is not a correct way to approach the history of economic thought. Weintraub views the history of economics more as a continuing accumulation of knowledge. Glass and Johnson (1989, 112-170) after discussing orthodox and Marxist economics view economics as being characterized by competing research programmes rather than by one paradigm.

Hausman engages in a more substantial criticism. He states (1994, 199):

> Kuhn's account of disciplinary matrices provides a checklist of what to look for in examining the large-scale structures of economic theorizing, but the basic principles of microeconomics have a different status and role than do Kuhn's symbolic generalizations. Consequently, economics does not fit his schema very well.

An example of a symbolic generalization in economics is that agents are self-interested. However, selfish agents are fundamental in much of microeconomics but not in all of it (Hausman 1994, 198). In more general terms, Hausman (1992, 84) writes: «The basic claims of equilibrium theory are not quite symbolic generalizations in Kuhn's sense, because economists are not firmly committed to all of them».

From the above analysis, Table 3 presents the main categories of criticism exercised by historians of economic thought upon Kuhn's explanation in relation to economics.

Table 3.

CRITICISMS ON KUHN'S EXPLANATION	
Vagueness In terminology	*Non-appropriateness for economics*
Stigler 1969	Bronfenbrener 1971
Blaug 1976	Glass and Johnson 1989
Glass and Johnson 1989	Hausman 1992, 1994
Johnson 1983	Weintraub 1979
Redman 1993	

4. The Influence of Imre Lakatos

Many philosophers of science consider Lakatos's ideas as being rooted in Popperian concepts and especially in Popper's falsificationism. Popper's methodological views were and still are very influential among economists and this might be the main reason why the influence of Lakatos' methodology is much stronger among economists than Kuhn's (for a collection of papers discussing Popper's influence

on economics see de Marchi 1988). Lakatos' starting idea is that the unit of scientific achievements is not an isolated hypothesis but a scientific research program (MSRP). The 'hard core' of this programme is a framework of general hypotheses. This hard core would not be falsified by followers of that programme. The protective belt which surrounds it, contains hypotheses, and observation statements which may be falsified. The 'negative heuristics' is the condition that the hard core of the programme remains unchanged. The 'positive heuristics' consists of a set of suggestions which develop the refutable variants of the research programme. The idea of scientific progress lies in the replacement of degenerating MSRP by new progressive one. The new programme provides for future research and leads to the discovery of novel phenomena. (for a much more detailed presentation of Lakatos' ideas see Lakatos 1978 and Redman 1993).

Many historians of economics have accepted Lakatos' views as important conceptual tools for understanding the growth of economic knowledge.[1] De Marchi 1991, 15, defending the Lakatosian progress type in economics, argued that such a theory is a useful framework for the understanding of the development of economic ideas. Backhouse 1994, 188 believes that Lakatos provides a valuable starting point for understanding the growth of economic knowledge.

Given the greater popularity of Lakatosian views, one can find much more applications of Lakatos' views in economic literature. Such applications took place in two different areas in economics. The first is related with the various schools or realms of thought in economics and the other with specific economic theories. We shall present such attempts in the following pages starting from the schools of economic thought.

It is widely accepted that the first application of Lakatos' ideas to economics can be found in S. Latsis' (1976) work. Latsis identified hard core propositions and positive heuristics in the scientific programme of neoclassical economics. Similarly, Remenyi (1979) extended Latsis' work by introducing much more specific characteristics of the hard core and by providing additional positive heuristics. The traditional schools of economic thought have also been identified as Lakatosian SRP. For instance, O'Brien 1976, 107-109 thinks that the Lakatosian programme fits rather well with the Smithian SRP, having a hard core and positive heuristics, although it was eventually proved a degenerating

[1] The significant influence of Lakatosian views can also be seen from their popularity among many econometricians. For instance, HENDRY 1993 appeals to Lakatos' ideas in order to support his econometric methodology.

one. Similarly, R. Fisher (1986) discusses the marginalist school from the viewpoint of a Lakatosian research programme.[1]

Blaug 1975, 400, 412-414 explores Lakatos' ideas in relation to the history of economic thought arguing that the Keynesian research programme is a real Lakatosian one. He also uses the Lakatosian framework for explaining the quick and wide acceptance of Keynesian ideas.[2] Hands (1985) by counter-arguing that the Keynesian programme is not progressive in the strict sense of Lakatos, forced Blaug to respond and to show (1990) that such a programme is rather progressive since such a program could predict some novel facts (Blaug, 1990, 97, 101; 1991, 503-504).[3] In the same spirit, Lipsey (1981) argued that Keynesian macroeconomics is still a progressive research programme which provides strong predictions with good track record.

As in the case of Kuhn, alternative schools have been recognized in Lakatosian terms. A. W. Coats 1976, 49-50 identified the Institutional school as another Lakatosian programme in economics describing five hard core propositions and four positive heuristics. Blaug in a paper (1983), argued that the programme of radical economics, although less coherent than the neoclassical one, can also be identified as a Lakatosian SRP. Brown (1981) after presenting the hard core propositions of the Keynesian school of thought, described the main ingredients of a post-Keynesian research program. Another MSRP has been identified by Rizzo (1982) and Langlois (1982) with reference to an alternative economic approach, namely the Austrian School of economics. Rizzo and Langlois described an Austrian programme in the Lakatosian lines having five hard core propositions and three positive heuristics. Nightingale (1994) tried to trace a Lakatosian program in the recent approach of evolutionary economics. He describes its five hard core propositions, its protective belt content and its positive heuristics. Moreover, he believes that this programme is richer than the neoclassical research programme «with more content to its positive heuristic, a less prescriptive hard core, and capable of accepting a wider range of auxiliary assumptions within its protective belt for purpose of using it for scientific investigations» (1994, 248). The main points of the above discussion are presented in Table 4:

[1] ROSENBERG 1986, 138 believes that the methodology of scientific research programmes «is useful for understanding the rise of marginalism, the Keynesian revolution and the rational expectations counter-revolution».

[2] For an argument against Blaug's interpretation see FAWUNDU 1991.

[3] This argument was criticized by Caldwell (1991, 101-20).

Table 4.

LAKATOSIAN SRP ON SCHOOLS OF THOUGHT				
Classical	*Marginalist*	*Neoclassical*	*Keynesian*	*Austrian*
O'Brien 1976	Fisher 1986	Latsis 1976 Remenyi 1979	Blaug 1975 1990 1991 Brown 1981 Lipsey 1981	Rizzo1982 Langlois 1982

Institutional	*Radical*	*Post-Keynesian*	*Evolutionary*	*General*
Coats 1976	Blaug 1983	Brown 1981	Nightingale 1994	de Marchi 1991 Backhouse 1994

As we mentioned, Lakatos approach is also used by the historians of economics to explain the development of specific theories. More specifically, Latsis 1972, 208-212 by employing the key Popperian term of «situational determinism», identified a Lakatosian scientific research programme in economics in the Neoclassical theory of the firm. More specifically, he stressed that both the theories of perfect competition and monopolistic competition form parts of the same dominant research programme «with one identifiable hard core, one protective belt and one positive heuristic» (1972, 208). He also suggested that this «neoclassical programme was degenerating» (*ibidem*, 234). Similarly, de Marchi (1976) finds clear indications of a SRP in international trade theory which is based on the work of Ohlin, Lerner and Samuelson.[1] In the same line, Bensel and Elmslie (1992) argue that the generalization of Heckscher- Ohlin- Samuelson which incorporates monopolistic competition, qualifies as a progressive Lakatosian research programme.[2] McGovern (1994) has shown that the modern international trade theory has progressed in a Lakatosian manner.

Blaug (1976) argued that the human capital theory is developing in a SRP fashion. In subsequent work, Blaug 1980, 224-239 reaffirmed that the neoclassical theory of human capital has the basic ingredients of the Lakatosian programme. He held that human capital theory started with the work of T. Schultz in the 1960's and continued with G. Becker. The hard core of this subprogramme according to Blaug, is defined as: «People spend on themselves in diverse ways not only

[1] Robbins 1979, 51-52 agrees that the Lakatosian process could be applied in the observations of Latsis and de Marchi but also in other episodes of the history of economic thought. However, he questioned the applicability of such approach «to the development of branches of more general theory», such as the theories of value and distribution, and of economic growth (*ibidem*, 52).

[2] Hands 1985, 120-1 argued that such a programme is coming closer to «a legitimate Lakatosian rational reconstruction of a particular step in the development of an economic research program».

for the sake of the present enjoyment but also for the sake of future benefits». (Blaug 1980, 225). The protective belt of the human capital research programme is made of the various human capital theories (Blaug 1980, 224-239).

Coats 1976, 53-4 identified the marginal utility explanation of value as a Lakatosian programme consisting of eight hard core propositions, and five positive heuristics. Wong 1978, 1-3 has argued that there is a Samuelsonian programme of revealed preference theory and shows it to run in a Popperian rational reconstruction approach. Cross (1982) by making some adjustments in the Lakatosian process, shows that the development of monetarism could be explained in the same terms. More specifically, he argues (1982, 336-337) that from 1953 until 1973 the monetarist approach exhibited increased empirical content, but from 1973 until 1981 it experienced empirical and theoretical degeneration. In a similar tone, Maddock (1984, 1991) maintained that the rational expectations macroeconomic program had developed in a Lakatosian fashion, starting at the mid 1970s and running until today.[1] Moreover, Backhouse (1991) maintained that a modified Lakatosian programme holds for modern macroeconomics. In a subsequent work (1992), he suggested not to abandon Lakatos in economics but to adopt a modified MSRP "to allow for greater variety of types of research programme, retaining its appraisal criterion intact" (1992, 32).[2]

Fulton's (1984) paper was an early attempt to review some attempts at the application of Lakatos' methodology of SRP. He argued that notion of MSRP should be applied to individual economic theories and not to the entire discipline. Then, he fitted a Lakatosian programme to neoclassical production theory (1984, 195-201) showing its presuppositions, the content of the hard core beginning in 1880s and 1990s by J. B. Clark, Wicksteed, Wicksell, Walras, Marshall, and others and having as its second stage the Hicksian theory of wages and as its third stage Robinson's critique of the theory of capital. According to Fulton, Neoclassical production theory consists of three hard core propositions and four positive heuristics.

Weintraub (1985a, 25-26; 1985b, 108-113) applies Lakatosian thinking to the development of the general equilibrium analysis. He identifies the hard core of this programme as well as some positive and negative heuristics. Then, he argued that the general equilibrium theory

[1] KLAMER 1984, 286 in the New Classical economics or the rational expectation approach recognized an «analysis resembling Lakatos' positive heuristics».

[2] JANSSEN 1991, 697 examining the microfoundations and the modern macroeconomic 'schools' argued that neither monetarism nor Keynesianism shared wide or narrow Lakatosian ingredients.

of the Neo-Walrasian type exhibits the main Lakatosian properties. In another paper (1988, 214-215) he additionally claimed that this program is empirically progressive in the Lakatosian sense and presented its six hard core propositions, two positive heuristics and three negative heuristics.[1]

Vint (1994) used the Lakatosian methodology to show that the classical wage fund theory «had a period of genesis, a period of successful existence and a period of degeneration, refuting and abandonment» (1994, 5). Thus, he claimed that the «Lakatosian framework can provide the points of departure and analytical tools with which to approach many questions in the history of economics in general, and the history of classical wage theory in particular» (1994, 29). He found, explained and documented some specific hard core propositions in this theory (1994, 41-42).

From the above Lakatosian SRP implications on various specific economic theories we can compose the following table:

Table 5.

LAKATOSIAN SRP ON ECONOMIC THEORIES				
Wage Fund	*Intern. Trade*	*Human Capital*	*Marginal Utility*	*Th. of the Firm*
Vint, 1999	de Marchi 1976 Bensel and Elmslie 1992 McGovern 1994	Blaug 1976, 1980,	Coats 1976 Wong 1978	Latsis 1972

General Equilibrium	*Production Function*	*Monetarism*	*Rational Expectations*
Weintraub 1985a, 1985b, 1988	Fulton 1984	Cross 1982	Maddock 1984, 1991 Backhouse 1991

5. Criticisms of Lakatos

As far as Lakatosian ideas are concerned, one can argue that given that his views have had much more influence among economists, one can also find more detailed criticisms over the application of Lakatosian ideas to the growth of economic knowledge. The more general criticism is similar to the one applied to Kuhn and refers to the fact that Lakatos' ideas developed with main reference to Physics. Thus, many economists such as Leijonhufvud (1976) and Hutchison (1976) believe that the differences between the two disciplines are many and significant. This renders the application of Lakatosian methodology

[1] Salanti 1991 and Backhouse 1993 criticized Weintraub's argument about the significance of the programme of general equilibrium and its relevance with the Lakatosian methodology. Similarly, Janssen commented (1991, 698-699) that the «general Equilibrium analysis» a wider programme than the Neo-Walrasian explored by Weintraub, has no positive or negative heuristics.

to economics extremely problematic. Apart from the general criticism, there have been specific attacks concerning the Lakatosian explanation for the advancement of economic science: a) looseness in hard core propositions; b) vagueness in terminology; c) non-appropriateness for explaining the advancement of economics, d) problems of empirical testing and e) justification for the status quo.

Let us see now some of the main criticisms starting with Maki (1980) who argued that the Lakatosian concept of «hard core» is too narrow to be applied to economics. Similarly, Hoover (1991) argues that the new classical economics cannot be characterized in terms of an invariant set of hard core assumptions. Another example of relevant criticism is taken by Hausman (1994) in regard to Weintraub's (1985a, b) application of Lakatos to general equilibrium theory. Hausman (1992, 88; 1994, 204) argued that some hard core propositions of general equilibrium theory have also been accepted by members of alternative schools like Marxian and Institutionalist economists. Furthermore, the hard core cannot include the assertion that preferences are complete or transitive, because there are Neo-Walrasian explanations which involve incomplete or intransitive preferences.

In regard to the second kind of criticism, some historians have attacked the Lakatosian framework in the same terms as in the case of Kuhn. Redman (1993), for instance, cites works by economists who use Lakatosian terms. As she shows (1993, 144-145) it seems that there is confusion regarding the use of the term «research programme». Even supporters of the Lakatosian approach admit that there is still some confusion among economists as to the usage and precise meaning of these terms (see, e.g., Glass and Johnson 1989, and Hands 1993, 69).

The third line of criticism focuses on the view that the adoption of Lakatosian methodology does not adequately explain the advancement of economics. More specifically, Hands (1984) argued that since economics lack «crucial experiments», the Lakatosian growth of economic knowledge process dos not fit well. Given this, he later (1985) argues that a modified version of MSRP is needed. In the same paper, he also argued against Blaug's attempts in analysing a Keynesian MSRP and against Weintraub for presenting a neo-Walrasian programme. More specifically, Hands believes that the criterion of factual novelty was too rigid to be applied to economics (Hands 1985, 7). For instance, the success of Keynesian economics was not due to its empirical content but on other social factors. Many of the facts that Keynes predicted were already used in the construction of the theory (Hands, 1985, 9). The same view is supported by Caldwell who thinks that

some of the facts that Keynes had predicted were false (Caldwell, 1991, 101). In a subsequent paper (1990, 70), Hands restates his view that the Lakatosian type of scientific progress to be too narrow to be fitted in economics. He also re-emphasized the weakness of economics to predict novel facts, a criterion held by Lakatos as an important one in appraising rival scientific programmes (1990, 78).[1]

Another line of criticism of Lakatosian ideas has to do with the empirical testing of theories. It has been argued that economists were very successful in producing theoretical but not empirical criticism of theories (De Marchi 1991, 15-17). This means that non-empirical criticism has proved to be much more effective than empirical criticism. Lakatos' emphasis on predicting and confirming facts proved too narrow for the scope of criticism in economics (see also Shearmur 1991, 42).

Finally, a number of authors have claimed that Lakatosian views have served as a justification for dominant theories. Hands (1993, 68), for instance, maintains that Lakatosian ideas appeal more to economists because they are «softer» than Popperian falsification and also because they can be employed to defend the existing theories and practices of economics. In the same spirit, Mirowski (1987, 296) asserts that Lakatosian methods serve basically as a justification of the current scientific status quo. Support for the same argument is also provided by de Marchi (1991). Closer to this view is Backhouse's idea that economists found Lakatos attractive because the appraisal criterion he used was already, perhaps for very good reasons, well established (Backhouse 1994, 181).[2]

Although Lakatos' approach seems to have been the most popular among economists, there are signs that a growing number start to have serious reservations. For instance, there have been specific criticisms of the Lakatosian approach in a volume edited by de Marchi and Blaug (1991) in which a number of theorists expressed doubts concerning its application to specific subfields. Some of the criticisms of this volume are the following: Bianchi and Moulin (1991) argue that the Lakatosian approach has failed to capture the insights from game theory; Morgan (1991) believes that it has failed to account for the decline of process analysis of econometrics; Kim (1991) argues that it has failed to solve the Duhem-Quine dilemma. In more general terms, Steedman (1991) argues that Lakatosian methodology is not

[1] However Blaug 1990, 504, contrary to Hands, insisted that «Lakatos was quite right to highlight the prediction of novel facts» as necessary ingredient of a 'better' programme.

[2] It has been argued recently that Kuhnian ideas have also provided a shield against criticism for mainstream economics (see Fullbrook 2003).

very useful in trying to understand the relationships between different economic theories. In the same spirit, Salanti (1994) maintains that economic methodologists are increasingly dissatisfied with the Lakatosian criteria of theory appraisal. Although as he observes, historians of economic thought continue to employ Lakatosian categories.

The recapitulation of all the above criticism exercised upon the Lakatosian explanation is shown in Table 6.

Table 6.

CRITICISMS OF LAKATOSIAN EXPLANATIONS		
Looseness of Hard Core	*Vagueness of Terminology*	*Non-appropriateness for Economics*
Hausman 1992, 1994 Hoover 1992 Maki 1980	Hands 1993 Glass and Johnson 1989 Redman 1993	Caldwel, 1991 Hands 1984, 1985, 1990 Salanti 1994 Steedman 1991

"Justification" for current status quo	*Problems of Empirical Testing*	*Specific Criticisms*
Backhouse 1994 de Marchi 1991 Hands 1993 Mirowski 1987	de Marchi 1991 Shearmur 1991	Bianchi and Moulin 1991 de Marchi and Blaug 1991 Kim 1991 Morgan 1991

6. Concluding Comments

The starting point of this work was the influence of the scientific philosophies of Kuhn and Lakatos in economic thought and the main criticisms of the application of their ideas to economics. Although the discussion was by no means exhaustive, it enables us to make some general observations. The first general observation is that the influence of Lakatos seems to be much stronger among economists than that of Kuhn's. Chronologically, Kuhn's ideas were introduced first in economics in the late 60s and early 70s. In the first few years the Kuhnian influence was stronger but it progressively declined. The Lakatosian influence appeared later but as it was pointed out, it was stronger. The Lakatosian influence also diminished with time.

The second observation has to do with the appeal of the notion of Kuhnian paradigm. It seems that a limited number of economists recognized the Classical and the Neoclassical schools of thought as paradigms, but the application of this notion to individual economic theories like the theory of the firm or general equilibrium theory was stronger. More popular among economists was the use of the idea of Kuhnian scientific revolutions. In particular, the concept of Kuhnian

revolution with reference to the Keynesian revolution has been supported by many economists. The third point concerns the thrust of the critical attitudes towards Kuhn's views. The vagueness of Kuhnian terminology and also the appropriateness of Kuhn's schema for the evolution of economic thought were the two main criticisms.

The application of the Lakatosian notion of scientific research programmes to economics was the next observation of the discussion. A number of SRP in economics have been identified like classical, marginalist, Keynesian, Austrian and other. Furthermore, there are numerous examples of individual economic theories which have been interpreted as Lakatosian SRPS. Human capital theory, the theory of the firm, general equilibrium theory and rational expectations theory are some of these examples. As far as the criticism of Lakatosian applications to economics are concerned, the main lines were similar to the ones that we saw in the discussion of Kuhn. In particular, economists were focusing on the vagueness of Lakatosian terminology and also the appropriateness for economics. However, there were three additional lines of criticisms. The first had to do with the basic Lakatosian notion of the hard core. A number of economists seem to believe that this notion is too loose to be applied to economics. The second criticism had to do with the problematic nature of empirical testing in economics. The third line of criticism was more cynical in the sense that some economists thought that the Lakatosian framework served only as a defense of dominant economic theories.

One can argue that in spite of the criticisms the ideas of Kuhn and Lakatos have had positive effects. The most important effect was the stimulus that these ideas gave to the study of the growth of economic knowledge. Indeed, there has been a proliferation of economic literature dealing with the structure of economic theories. Attempts to combine the two theories in order to synthesize a new one which might fit better to economics, is another example of positive effects (e.g. Goodwin, 1980). Furthermore, one can observe some recent trends to draw from other more modern philosophers of science (for instance, Pheby 1988 attempts to draw from the work of L. Laudan). This leads to the important issue of the appropriateness of scientific philosophies for economic thought. Some authors believe that economists have the habit of attaching to philosophy of science with a time lag (Rosenberg 1986, 136). As Redman states (1993, 143): «…the fascination with Popper, then Kuhn, and finally Lakatos represents a simple chronological succession that lags the developments in the philosophy of science». Our discussion and the recent interest with the work of more modern philosophers of science supports the above view.

Furthermore, given that Kuhn's and Lakatos' ideas were initially embraced but subsequently criticized by many economists, our discussion also supports the emerging view among historians of economics and economic methodologists, that ideas imported from the philosophy of the Natural sciences seem to be inadequate and rather limiting for economic thought (for a review see Zouboulakis 2001). Thus, it can be argued that other alternative models of scientific evaluation might be more appropriate for the case of economics. The Science Studies approach, the Sociology of Scientific Knowledge and Cultural history are examples of alternative approaches which are gaining acceptance among economists as modes of historical reconstruction (see, for instance, Amariglio 1988; Maki 1992; Backhouse 1997; Weintraub, 1999; Hands 1997, 2001).

It seems that the followers of the Kuhnian and Lakatosian explanations in economics could not respond in a convincing way to the number of criticisms that we saw. Thus, economic methodologists have started to move away from such explanations. This is also supported by the fact that in the last few years, the interest of historians of economic thought and methodologists, concerning the ideas of Kuhn and Lakatos has greatly diminished. However, as was observed, a large number of practicing economists continue to use the basic outlines of these two philosophies of science. One can interpreter this, as an example of persistence to a given theoretical framework or «mupsimus» as J. Robinson has termed this phenomenon. Theories of science which emphasize the role of historical, sociopolitical and cultural factors might offer explanations for this persistence (i.e. Bloor, 1983). Furthermore, «mupsimus» to certain economic theories has been analysed by a number of authors (see, for instance, Hill and Rouse 1977, Arouh 1987). The reluctance of many practicing economists to abandon doubtful methodological approaches might be another recent case of mupsimus in the field of economics.

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