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Research Article

A Critical Appraisal of Lakatos's Methodology of Scientific Research Programmes in Economics

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Abstract: This paper examines the contribution ofImre Lakatos's Methodology of Scientific Research Programmes (MSRP) to economic methodology. Lakatos proposed that scientific progress occurs through competing research programmes consisting of ahard core of fundamental assumptions and aprotective belt of auxiliary hypotheses. The study explores key concepts of MSRP, including positive and negative heuristics, progressive and degenerative research programmes, problem shifts, and the role of anomalies in scientific development. It highlights how economists have applied Lakatos's framework to analyze major schools of thought such as neoclassical, Keynesian, and Monetarist economics. The paper argues that Lakatos's methodology provides a useful structure for understanding the evolution, evaluation, and continuity of economic theories by emphasizing theoretical development, empirical testing, and the generation of novel predictions. Although the approach has faced criticism regarding the identification of hard cores and the measurement of scientific progress in economics, it remains influential in assessing the strengths and weaknesses of competing economic research programmes. Overall, the Lakatosian framework offers valuable insights into the dynamics of theory development and methodological appraisal within economics.

Keywords: (Lakatos,Scientific Research Programmes, Economics, Scientific Progress, Economic Methodology).

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1. Introduction

Imre Lakatos (1922-1974) was one of the modern philosophers of science and mathematics. His main contribution to philosophy was the development of the concept of methodology of scientific research programmes and the use of this methodology in the rational reconstruction of science. The methodology of scientific research programmes is a collection of papers published over time expressing a radical review of Popper's demarcation criterion between science and non-science, leading to a new theory of scientific rationality. Lakatos's Philosophy of Science endorsed by a number of economists in 1970. This research programme was discussed in 1974 in Greece is called Nafplion Colloquium. It has two dimensions of discussion: Historical and Philosophical. In historical, it attempts to reconstruct some particular episode in the history of economic thought along Lakatosian lines. For a science historian, the reconstruction proposed by Lakatos is attractive and explains the revolution of science to a level that has not been achieved before. Reconstruction of science much closer to truth. In Philosophical, it attempts to appraise Lakatos's Methodology of Scientific Research Programmes (MSRP) as a economic methodology and compare to other philosophies (Backhouse, 1994).

The notion of a research programme emphasizes the continuity and unity of theories over time. Research programme is dynamics; how they appear develops, matures, degenerates and then replaced by other better research programmes. Lakatos's MSRP is scientific progress occurs through a process of continuous improvement and refinement of existing research programmes rather than through the sudden emergence of entirely new

paradigms. The strength of Scientific Research Programmes (SRP) is determined by its ability of generate novel predictions and explanations that are subsequently verified by empirical evidence. Lakatos argues that scientists will not abandon a theory because it conflicts with realities. They will develop an auxiliary hypothesis that explains the abnormal case or if the exceptions can not be explained they will be ruled out and scientists will attract attention to different questions. Science is not simply trial and error it is a series of conjectures and refutations. All theories in this sense, are born refuted and die refuted. The MSRP is that scientific progress is driven by the competition between scientific research programmes which consist of hard core and protective belt. Lakatos proposed the demarcation criteria of pseudoscience, it fails to move any novel predictions of previously unknown phenomenon or the predictions were mostly falsified in contrast with scientific theories, which predict novel facts. Progressive research programs are centered on the notion of an empirical knowledge foundation where new theories and methods lead to novel factual discoveries. Moreover, the overwhelming preference for descriptive methods indicates clear sign of a degenerative research programmes (Hands, 19856).

Lakatos proposes a modification of Popper's criterion, which he calls "sophisticated methodological falsificationism" From this perspective, the delimitation criterion should apply not to a hypothesis or to an isolated theory, but rather to a whole research programme Sophisticated falsificationism thus changes the question of how the theories are evaluated to the question of how to evaluate the series of theories. It is not an isolated theory, but only a series of theories that can be considered to be scientific or non-scientific: the application of the term scientific to a single theory is a misconduct. But the problem of sophisticated falsification lies precisely in the multitude of theories considered. In the case of two incompatible theories, we have to go back to the conventional aspects of methodological falsificationism or to the incontestable hypotheses of dogmatic falsificationism to make a choice. Using new corroborated facts involves a clear delimitation between observational and theoretical terms. with conventional decisions on what constitutes basic knowledge (Lakatos, 1970).

The Lakatosian categories of hard cores, protective belts and positive and negative heuristics made sense to economists, especially neoclassical economists, when they thought about their discipline. Hard core elements are protected, there is also obviously a tremendous amount of empirical work within economics, and it is natural to characterize such work as lying in a protective belt around the hard core assumptions. Lakatos claimed that scientists often seek confirmations rather than falsifications, that crucial tests are rare and instant rationality unavailable, and that appraisal of a programme's progressivity is only possible over long periods of time.

1.1 Statement Of The Problem

Economic theories are regularly revised and improved when new evidence and economic changes occur. Many traditional scientific methods evaluate theories separately, but they do not clearly explain how different schools of economic thought develop and change over time. Imre Lakatos's Methodology of Scientific Research Programmes (MSRP) provides a different approach by explaining scientific progress through research programmes that consist of a hard core of basic assumptions and a protective belt of supporting hypotheses.Although Lakatos's methodology has been widely used in economics, there is still debate about how effective it is in evaluating economic theories. It is not always clear how the concepts of hard core, protective belt, positive and negative heuristics, and progressive and degenerative research programmes can be applied to major economic schools such as Keynesianism and Monetarism. In addition, the strengths

and weaknesses of Lakatos's methodology in assessing scientific progress in economics remain an important issue for discussion.

Therefore, this study aims to examine Lakatos's Methodology of Scientific Research Programmes and evaluate its contribution to economic methodology. The study focuses on its applicability, usefulness, strengths, and limitations in understanding the development and evaluation of economic theories.

1.2 Objectives of the study

This study is to find out theCritical Appraisal of Lakatos's Methodology of Scientific Research Programmes (MSRP) in Economics, which are as follows:

1. To examine the key concepts of Lakatos's Methodology of Scientific Research Programmes, including the hard core, protective belt, and heuristics.
2. To analyze the application of Lakatos's methodology in evaluating major economic research programmes such as Keynesian and Monetarist economics.
3. To assess the strengths and limitations of Lakatos's methodology as a framework for understanding scientific progress and theory development in economics

1.3 Research Questions

This study has been based on the following research questions:

1. How effective is Lakatos's Methodology of Scientific Research Programmes in evaluating the progress of competing economic theories?
2. To what extent do the concepts of hard core and protective belt explain the development of Keynesian and Monetarist economic research programmes?
3. How can Lakatos's distinction between progressive and degenerative research programmes be applied to contemporary economic thought?
4. What are the major strengths and limitations of applying Lakatos's philosophy of science to economic methodology?

1.4 Research Methodology

This study adopted a qualitative and descriptive research methodology based on a documentary and literature review approach. The research relied on secondary data obtained from books, journal articles, scholarly publications, and writings on Imre Lakatos's Methodology of Scientific Research Programmes (MSRP) and its application in economics. The study analyzed key concepts such as the hard core, protective belt, positive and negative heuristics, progressive and degenerative research programmes, and their relevance to economic theory. Furthermore, comparative analysis was used to examine how Lakatos's framework has been applied to economic schools of thought, particularly Keynesian and Monetarist research programmes. The findings were interpreted through conceptual and analytical examination of existing literature to assess the contributions, strengths, and limitations of Lakatos's methodology in economics.

1.5 Limitations of the Study

This study has some limitations, which are following as:

- The study relies solely on secondary data.
- It is limited to conceptual and literature-based analysis.
- Only selected economic research programmes are examined.
- Interpretation of Lakatosian concepts will be subjective.

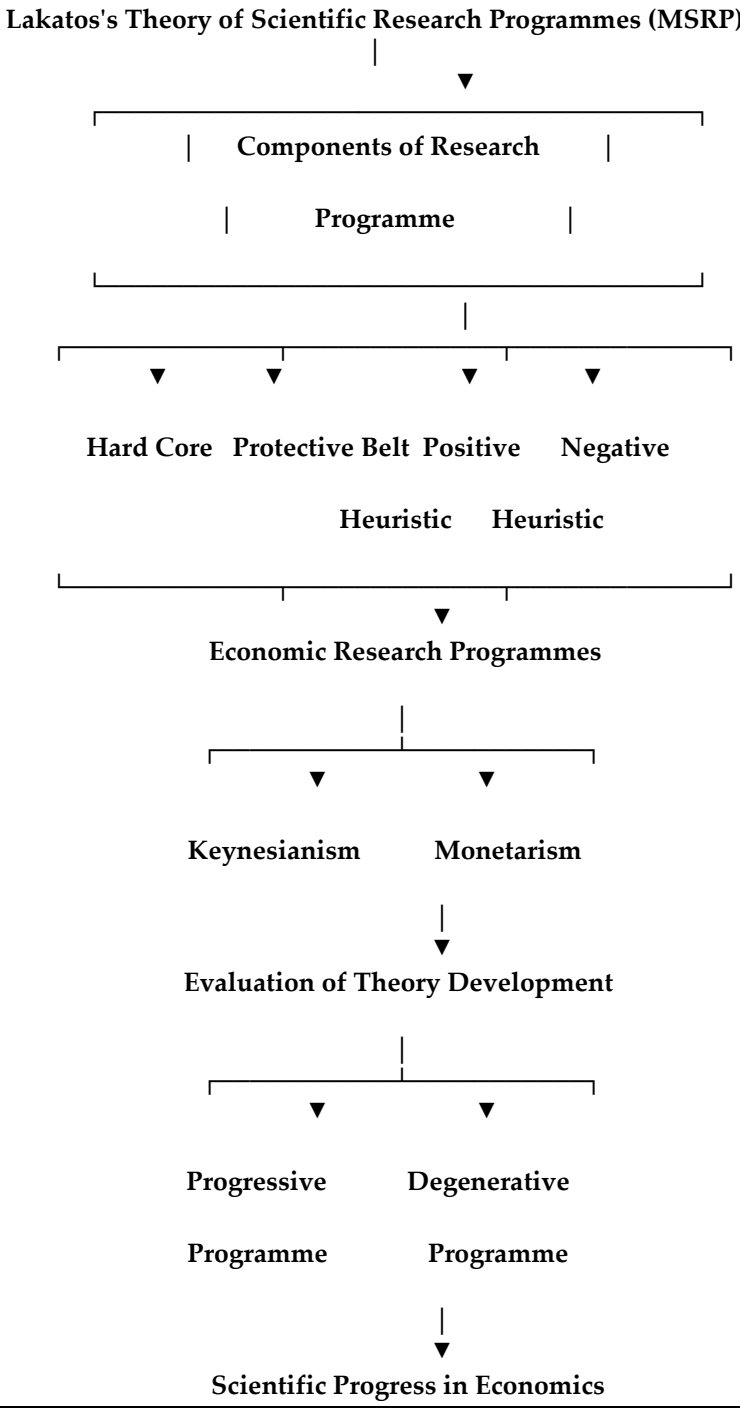
1.6 Theoretical Framework

The study is grounded in the theory developed by Imre Lakatos, which argues that scientific knowledge advances through competing research programmes rather than isolated theories. According to Lakatos, every research programme consists of:

1. **Hard Core** – the fundamental assumptions that are protected from direct falsification.

2. **Protective Belt** – auxiliary hypotheses that can be modified to defend the hard core.
3. **Positive Heuristic** – guidelines that direct researchers toward productive lines of inquiry.
4. **Negative Heuristic** – rules that prevent researchers from challenging the hard core directly.
5. **Progressive and Degenerative Problem Shifts** – criteria used to evaluate whether a research programme is advancing scientific knowledge or merely adjusting to anomalies.

The theory is applied to economics by examining how economic schools of thought such as Keynesianism and Monetarism operate as research programmes. Their core assumptions (hard core), supporting hypotheses (protective belt), and ability to generate novel predictions determine whether they are progressive or degenerative research programmes.



1.7 Ethical Considerations

This study adhered to established academic and research ethics throughout the research process. Since the research was based entirely on secondary data obtained from published books, journal articles, and scholarly sources, no human participants were involved and no personal data were collected.Ethical considerations for this study included ensuring academic honesty,proper citation of all sources, respect for intellectual property rights, objective interpretation of literature, and avoidance of plagiarism and misrepresentation.

2. Discussion/Analysis

In this section discussing the Lakatos Methodology of Scientific Research Programmes in different sections and presenting the Lakatos research programmes in the economics perspectives:

2.1 Scientific research programmes:

In Lakatos scheme, scientists engaged in practice of any science are operating within a research programme. A scientific research programme is characterised by a hard core and a protective belt of assumptions and at any point a programme is apparently progressive stagnant or degenerating. The hard core is the unfalsifiable central tenets, the core assumptions upon which all work within the programme is based. Hard Core consists of the non-deniable factors that are determined by the community of scientists' traditions. It is a metaphysical factor, consists of belief. Shortly, hard core is a set of axioms. In economics, hard core is the assumptions of rational economic individual. Hard core is not change in research program, because if the hard core changes than the research program will also change. Therefore, since all activities are going to be performed based on this hard core. The protective belt consists of a number of auxiliary hypotheses that support the hard core. In lakatos, hard core cannot change so easily but the protective belt is more elastic, it is possible to replace some theories by others. The protective belt comprises the surrounding set of assumptions that are ultimately subject to negotiation and amendment in the light of work carried out in the programme or as a result of discoveries made elsewhere that conflict with the operating principles of the programme. The research programme is in itself a constructive enterprise, seeking to discover novel phenomena and develop the theoretical framework through a sophistication of the protective belt. The methodological rules that outline the direction of a research programme are of two sorts, The negative heuristic informs the members of which paths of research to avoid and the positive beuristic informs them of the paths to pursue.

The scientific theories cannot be justified or made probable by accumulating confirming evidence. Experience serves chiefly to test and potentially falsify theories. Rational science advances through bold conjectures, severe criticism, and the elimination of error, rather than through inductive support or appeals to probabilistic intuitions (Popper, 19680.

2.1.1 Positive heuristic

Lakatos points out that a research programme will always be faced by anomalies as yet unexplained. However one should not presuppose that puzzle solving (the resolution of anomalies) is a random affair nor that the construction and manipulation of the protective belt is spontaneous rather Lakatos suggests there is order in these activities. The order is usually decided in the theoretician's cabinet independently of the known anomalies. Few theoretical scientists engaged in a research programme pay undue attention to refutations. They have a long term research policy that anticipates these refutations. This

research policy, or order of research, is set out in more or less detail in the positive heuristic of the research programme (Lakatos, 1970 p. 1351).

Newton's work again provides an example of the positive heuristic of research programmes Lakatos claims that the subsequent developments in Newton's programme were all foreseeable at the time Newton developed his first naive model. It is essential Lakatos maintains to think of developments in research programmes as models (of increasing sophistication). A model is a set of initial conditions that one knows is bound to be replaced, the positive heuristic provides the key to foreseeing more or less, how these initial conditions will be superseded. This shows once more how irrelevant refutations of any specific variant are in a research programme. their existence is fully expected, the positive heuristic is there as the strategy both for predicting (producing) and digesting them (Lakatos, 1970).

2.1.2 Negative Heuristics

Lakatos maintains that all scientific research programmes may be characterised by their hard core. The negative heuristic involves the articulation of this hard core and the deflection of research interests away from it. The negative heuristic protects the hard core by demanding ingenuity in the construction of auxiliary hypotheses that form a protective belt around the core. All research activity aimed at the core must be directed to the belt of auxiliary hypotheses. This protective belt comes under scrutiny and is adjusted to maintain the integrity of the core. The success of a research programme then depends on these changes in the protective belt resulting in progressive problemshifts. By way of example. Lakatos cites Newtonian theory that he regards as a classic example of a successful research programme.

In Newton's programme the negative heuristic bids us to direct the modus tollens from Newton's three laws of dynamics to his law of gravitation. This core is irrefutable by the methodological decision of its protagonists anomalies must lead to changes only in the protective belt of auxiliary observational hypotheses and initial conditions (Lakatos, 1970).

2.1.3 Progressive and Degenerative

A further and important contrast Lakatos develops is the distinction between progressive and degenerative research programmes. Progressive ones are of a rational and desirable type, whilst the degenerative ones are of an irrational and unscientific type. Degenerative research programmes are characterised by never ending and ad-hoc modifications of the protective belt while the hard core is not solving new problems anymore and rather encounters substantive problems itself. A progressive programme on the other hand is characterised by developing and refining the programme's central idea (hard core) using the problem solving techniques specific to the respective research programme (Lakatos calls this set of techniques the heuristic of the programme).

2.1.4 Problemshifts

Lakatos refers to problemshifts when examining the progress or degeneration of research programmes. A problemshift is a shift in theory due to anomalies that raise problems. While a programme continues to develop its positive heuristic successfully without compromising its hard core and is similarly able to account for discoveries that are external to the programme. It is said to be a progressive programme. When it ceases to produce novel phenomena and has to content itself with amendments to its protective belt of assumptions in the light of external developments. It is stagnating and when such external developments fundamentally challenge the hard core without the programme answering through novel discoveries then it is said to be a degenerating research programme.

The concept of problemshift emerges from Lakatos' analysis of the debate between naive and sophisticated methodological falsificationists. Taking up Popper's banner, Lakatos argues that, like the conventionalists Popper agrees that theories and factual propositions can always be made compatible by the addition of auxiliary hypotheses to the theory. However, Popper demands that one distinguish between scientific and pseudoscientific adjustments that are synonymous to rational and irrational developments of theory. Popper, somewhat vaguely maintains that auxiliary hypotheses that do not satisfy well defined conditions (ad hoc hypotheses as he calls them) do not represent progress. Lakatos tries to articulate what constitutes admissible criteria for auxiliary hypotheses and thereby shifts the analysis away from a single theory to a series of theories. The serial nature of theories being the only way a sophisticated methodological falsificationist can determine the falsification of a theory. Lakatos sees a progressive problemshift as one where a problemshift is both theoretically and empirically progressive. Where this is not the case the problemshift is degenerative. A series of theories will be theoretically progressive if each new theory has some excess empirical content over its predecessor. Excess empirical content means that the new theory predicts some novel, hitherto unexpected fact. Similarly an empirically progressive problemshift is characterised by the corroboration of excess empirical content, that is, each new theory leads to the actual discovery of a new fact (Lakatos, 1971).

2.1.5 Anomalies

Anomalies have only retrospective importance at the progressive stage. It is at the degenerating stage that anomalies achieve more prominence. Once the reformulation of a theory results in no new testable predictions, the programme starts to degenerate. Ad hoc adjustments are made to account for observed phenomena that conflict with the predictions of the theory. When observations, external to the programme are cited against it, these too are usually accounted for by ad hoc adjustments or ignored altogether as irrelevant due to incompatible theoretical perspectives (all observation being theory dependent). According to my methodology the great scientific achievements are research programmes that can be evaluated in terms of progressive and degenerating problemshifts and scientific revolutions consisting of one research programme superseding (overtaking in progress) another This methodology offers a new rational reconstruction of science (Lakatos, 1975).

2.2 Lakatos MSRP and Economics

Economists have produced an extensive literature using the Lakatosian categories to reconstruct various parts of the history of economic thought. Most of this literature focuses on a particular research programme in economic theory (past or present) and tries to isolate the hard core, the positive and negative heuristics, and the type of theoretical activity occurring in the protective belt. Such work usually results in a positive or negative Lakatosian appraisal of the progressivity of the particular economic research programme. Examples of these reconstructions range widely over various topics in the history of economic thought.

The MSRP includes programs with a structure (hard core, protective belt, heuristics), which is appraised mainly in terms of excess of empirical content and the latter Methodology of Historiographical Research Programmes (MHRP) introduces a straightforward historical view.The methodologies including the methodology of research programs are appraised in historiographical terms. Therefore, MSRP and MHRP are clearly on a different level: MSRP deals with programs, whereas MHRP works on methodologies. Lakatos's MHRP involves the following four stages: (1) Obtain agreement on a list of successful scientific achievements. (2)Provide a history of these

scientific achievements as though they had developed in accordance with the methodology one is trying to appraise what Lakatos calls a rational reconstruction of the history. (3) Compare this rational reconstruction with the actual history. (4) If the two histories are very different conclude that the methodology is inappropriate that it is incompatible with the decisions made by practising scientists. This is based on the assumption that an acceptable definition of science (methodology) must reconstruct the acknowledgedly best gambits as scientific (Lakatos 1971).

Lakatos suggests one should look for in the history of economics has helped guide a number of important historical studies. Certainly this historical research has drawn attention to the metaphysical hard core of certain economic research programmes and it has motivated enquiry into the important methodological question of the relationship between empirical and theoretical work in economics that is between econometrics and economic theory. What the MSRP does not provide is an appropriate model for the acceptance or rejection of economic theories. Lakatos's MSRP may constitute methodological progress over falsificationism, but it still fails to provide economists with an acceptable criterion for theory choice (or progressive problem shifts). This is particularly telling for Popper since the Lakatosian fit seems to be poorest where older Popperian parts were used with the least modification.

Appraisal and structure are two elements intimately connected in the methodology of research programs. In fact, when Lakatos presents his categories, he makes it explicit that the hard core of the program has to be abandoned when the program ceases to anticipate novel facts (Lakatos. 1970). It seems clear that prediction of novel facts has a relevant role for many economists interested in methodology. There is the very well-known case of Friedman, who considers both temporal novelty and the heuristic novelty (Friedman, 1953). Here is also the quite different case of the econometrician David Hendry, who though he disagrees profoundly with Friedman on economic theory and on the way in which empirical research in economics should be conducted. Hendry accepts the key role played by predicting novel facts, going so far as to make it the basis for what he calls, using explicitly Lakatosian terminology, a progressive research strategy (Backhouse, 1997).

For Latsis, the "hard core" of the neoclassical theory of the firm is constituted by four elements:(a) profit maximization, (b) perfect knowledge, (c) independence of decision, and (d) perfect market. The auxiliary assumptions protective belt of the perfectly competitive model are (i) product homogeneity, (ii) large numbers, and (iii) free entry and exit. The positive heuristics involves the analysis of both equilibrium conditions and comparative statistics The program gives a key role to the motivational assumptions and considers maximizing profits as the overriding goal of the decision makers. Therefore, Latsis sees the hard core from the point of view of theory assumptions rather than from the perspective of prediction and novel facts. which seems more in tune with Lakatos's methodology. He argues that the difficulties of testing, or falsifying, are generally incomparably greater in economics than in physics. In the social sciences the ratio of conjectures to refutations the plethora of conjectures and the paucity of refutations is significantly higher.

In Lakatos's methodology, there were many attempts to use his approach to analyze research programs, the mainstream tendency since Adam Smith, demand theory, production theory. theory of the firm, general equilibrium theory, human capital theory, the new economics of the family, Malthusian economics, Marxian economics, marginalist economics, Keynesian economics, monetarist economics, behavioral economics, new classical economics, Austrian economics, and so on. Many of these characterizations of

research programs have been developed by Blaug in different places, starting from "Kuhn versus Lakatos; or. Paradigms versus Research Programmes in the History of Economics" (Blaug, 1976).

Weintraub sees economics as dominated by the Neo-Walrasian research program, whose hard core (HC) consists of six propositions: HC1, there exist economic agents; HC2, agents have preferences over outcomes; HC3, agents independently optimize subject to constraints; HC4, choices are made in interrelated markets; HC5, agents have relevant knowledge; and HC6, observable economic outcomes are coordinated, so they must be discussed with reference to equilibrium states. He also claimed that the positive heuristics (PH) of the program were PH1, go forth and construct theories in which agents optimize, and PH2, construct theories that make predictions about equilibrium states. In addition, he specifies the negative beuristics (NH): NH1, do not construct theories in which irrational behavior plays any role; NH2, do not construct theories in which equilibrium has no meaning; and NH3, do not test hard core propositions (Weintraub, 1985).

It is difficult to see how the last of these (do not test hard core propositions) could be done, because the hard core for Lakatos is not a set of propositions but rather a system that works as a whole For example, in Newtonian science the three laws of mechanics and the law of gravitation constitute the hard core of the Newtonian program, and this hard core is tenaciously protected from refutation by a vast protective belt of auxiliary hypotheses (Lakatos, 1974).

A key moment in the decline of Lakatos's influence on economic methodology occurred at the Capri conference in 1989. Many economists interested in economic methodology (Backhouse. Blaug. Caldwell. Hamminga, Hands (1991a). Hoover [1991]. Klappholz (1991). Maki de Marchi, Mirowski, Morgan [1991]. Shearmur [1991]. Smith, Weintraub, etc.) met there. The over all view, as can be seen in the book Appraising Economic Theories (de Marchi and Blaug 1991), was dismissive toward Lakatos's methodology, from 17 papers presented in the congress, only five were clearly positive toward the value of the methodology of research programs.

Blaug summarizes in two points the main objections to Lakatos in Capri: (a) there is no way of establishing the hard core of any research program in economics that would receive the universal assent of all the proponents of that scientific research program, and (b) measuring scientific progress by an empirical yardstick, such as the prediction of novel facts, is inappropriate to a social science like economics (Blaug, 1991).

economists find Lakatosian methodology attractive because it provides a way of defending what they do. This arises from the nature of economic theorizing as it exists in the mainstream of economics today. Economic theory is dominated by the attempt to explain a variety of economic phenomena on the basis of a very limited range of behavioural assumptions. Explaining a phenomenon involves demonstrating how it follows from the assumption of rational behaviour, any other assumption being viewed as ad hoc for agents ought to behave rationally. Furthermore, given that assumptions can rarely be tested directly (experimental work being both problematic and in its infancy, and econometric testing frequently being inconclusive) the only option open to economists wishing to test theories is to derive further predictions which can be compared with other evidence. Thus when economists defend theories on the grounds that they work, what they usually have in mind is the prediction of novel facts in the sense of facts which were not used in the construction of the theory (Hands, 1991).

The main aim of economics is the provision of guidance to policy makers, prediction must be an important goal. Economics should accordingly be appraised at least in part according to its ability to predict. A merit of work in the Lakatosian tradition is that some of it distinguishes between different types of prediction. These distinctions arise through asking what is meant by novelty. Novel facts might mean, for example, facts of which no one was aware when the predictions were made: facts unknown to the person making the prediction, facts not used in making the prediction, or one of a number of other things. It can be argued that cach of these types of prediction has a different significance (Backhouse, 1994).

Mainstream economics share with the methodology of research programs some key points in the vision of science: (1) science is rational and objective, and explanatory theories and evidence for them are both capable of being intersubjectively criticized; (2) rationality is measured in the form of progress, as judged by excess content (the economists look for a theory that explains or predicts more than its rivals); (3) rational progress also points to the way scientists actually behave (the economists look at predictions and may leave the structure and explanatory power of rival theories obscure); (4) the unit of appraisal of rational progress is the research program (the economists adopt the notion of untouchable guiding principles that shape the coherent research strategies); and (5) within the research program, the theoretical realm has the primary role for the advance of science (Marchi, 1991).

The knowledge advances not through the accumulation of verified facts but through critical debate, the testing of theories, and the correction of errors. The essays collectively challenge simplistic views of scientific method and highlight the historical development of science. While contributors disagree on important issues, they share the view that rational criticism, rather than certainty or induction, is the primary engine of intellectual and scientific progress (Musgrave, 1968).

The knowledge advances through bold conjectures subjected to rigorous attempts at refutation. Scientific theories can never be finally verified; they remain provisional and gain credibility only by surviving severe criticism and testing. Progress depends on openness to error, intellectual humility, and continuous critical debate. By replacing certainty with fallibilism, Karl Popper presents science and rational inquiry as ongoing processes of learning, correction, and improvement today (Popper, 1969).

Within philosophy of economics there are several positions that might be considered convergent in the point of prediction of novel facts as an unnecessary condition for scientific progress. They include at least the following methodological viewpoints: (a) new tendencies in favor of pluralism in economic methodology (Davis 2007); (b) the perspective of traditional critics of Lakatos's MSRP, such as Daniel Hausman (1993, 151); (c) economists who once were philosophically oriented toward Lakatos and become increasingly more critical of his views, such as Hands (2001, 112–13, 286–96); (d) the conception that recognizes the criticisms to Lakatos's prediction of novel facts in economics (Mäki 2008, 414) and proposed to reinterpret it without knowing the exact relevance of this methodological proposal (415); and (e) economists who although sympathetic toward Lakatos's criteria of appraisal do not stateprediction of novel facts as a necessary condition for having economics as a science (Brzezinski and Dzielinski 2009).
The prediction of novel facts is possibly the most important aspect of Lakatos's legacy regarding the three aspects of aim, process, and result of scientific research programs. For Backhouse, there are at least three reasons of its importance: (i) the criterion of prediction of novel facts fits very closely with how economists think of what they are doing; (ii) prediction is an appraisal criterion that will not go away (it is also an important element

for policy); and (iii) predicting novel facts (such as facts that the theory was not designated to predict) is especially relevant in a discipline in which controlled experiment is not possible (McCloskey, 1994).

In recent years, economic methodology has increasingly moved away from Lakatos's emphasis on predicting novel facts. This shift is particularly evident among scholars concerned with philosophical and methodological issues, while practicing economists have generally been less influenced by it. Despite this trend, the development of economic theory still requires the generation of new predictions. These predictions should be more precise, reliable, and empirically grounded than those of the past, and they should be capable of addressing practical economic challenges such as unemployment, budget deficits, and other policy-related problems.

2.3 Compare Hard Core and Auxiliary Hypotheses to Keynesian and Monetarist

For example, let's consider the Keynesian and Monetarist research programs in economics.The Keynesian program influenced by the work of John Maynard Keynes, emphasizes the role of government intervention to stabilize the economy and reduce unemployment. Its hard core assumptions include the importance of aggregate demand, the existence of short term price rigidities, and the possibility of market failures. Within the Keynesian program, researchers develop auxiliary hypothesis and models to make predictions and test their core assumptions. For instance, they may propose fiscal policies, such as increased government spending or tax cuts, to stimulate aggregate demand during economic downturns. These auxiliary hypothesis and policy recommendations are subject to empirical testing and evaluation.

On the other hand, the Monetarist research program, associated with economists like Milton Friedman, emphasizes the role of monetary factors in influencing economic outcomes. Its hard core assumptions include the importance of money supply and its impact on inflation and economic growth. Researchers within the Monetarist program develop auxiliary hypothesis and models that focus on the relationship between money supply, interest rates, and macroeconomic variables. For instance, they may propose that controlling the growth rate of the money supply can help stabilize the economy and curb inflation. These auxiliary hypotheses are subject to empirical testing and evaluation.

According to economist A. W. Coats, who considered the research program of Demand Analysis in the view of Neo-classical, the hard core and positive heuristics of the research program of Demand Analysis is:

- The basic assumptions are simple and permanent.
- Consumer maximizes his/ her utility.
- Consumer has a budget constraint.
- Consumer have unlimited needs.
- Applies law of diminishing marginal utility.
- Consumer has full information about the prices of goods and services.
- Individual's choices are independed from each other.
- Rational calculation will be made for alternative uses.

Positive heuristics of the research program of Demand Analysis is:

- Constructing static models.
- Minimize the number of axioms.
- Developing general theories.
- Focusing on prices and value of exchanges.

- Reinterpreting the theories in order to eliminate the differences between the assumptions and the realities.

3. Conclusion

This study examined Imre Lakatos's Methodology of Scientific Research Programmes (MSRP) and its contribution to economic methodology. The analysis demonstrated that Lakatos provides a valuable framework for understanding the development and evaluation of economic theories through the concepts of the hard core, protective belt, positive and negative heuristics, and the distinction between progressive and degenerative research programmes. Unlike approaches that evaluate theories in isolation, Lakatos emphasizes the evolution of entire research programmes and their capacity to generate novel predictions and explanations.The study further showed that Lakatos's methodology has been widely applied in economics to analyze and assess competing schools of thought, including Keynesian, Monetarist, and Neoclassical economics. By focusing on the continuity and development of theoretical frameworks, the methodology offers a systematic means of explaining how economic theories adapt to empirical challenges while maintaining their fundamental assumptions.

However, the study also highlighted several limitations of the Lakatosian approach. The identification of a research programme's hard core is often subject to interpretation, and the criterion of scientific progress through novel predictions can be difficult to apply in the complex and dynamic context of economic phenomena. Despite these challenges, Lakatos's framework remains influential because it encourages critical evaluation, theoretical refinement, and methodological pluralism within economics.Lakatos's Methodology of Scientific Research Programmes provides a significant contribution to economic methodology by offering a coherent framework for analyzing the growth, competition, and appraisal of economic theories. Its emphasis on scientific progress, theoretical development, and empirical evaluation continues to provide valuable insights into the advancement of economic knowledge and the assessment of competing research traditions.

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