



International Journal of Development and Sustainability

ISSN: 2186-8662 – www.isdsnet.com/ijds

Volume 6 Number 10 (2017): Pages 1448-1460

ISDS Article ID: IJDS17083001



Methodology in economics: An overview

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Abstract

The article investigates the main approaches in the field of economic methodology. There are two methodological trends that emerged under the philosophy of science: naturalistic and constructivist. The first originates from Aristotle's materialism, the second - from Plato's ideas. Naturalized approaches eliminates distinction between the "context of discovery" and the "context of justification". Constructivism related to cognitive methodological paradigm. It means that it is more sociological in nature, concerned with connections between individuals – with learning, inter-subjectivity, and social knowledge. Thus, the main methodological views on economic theory can, on the one hand, explain the economic life in all its dimensions - the micro - macro - and geo-economic levels, establish certain patterns and trends. On the other hand, using a variety of methods - logical, mathematical, statistical, computer models and programs, new phenomena and processes of local or global nature are explored. That creates conditions for accumulation of empirical and theoretical material that enriches the economic theory, generally shaping the economic science.

Keywords: Economic Methodology; Discourse; Philosophy of Science; Naturalism; Constructivism; Realism; Postmodernism; Methodological Individualism

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Cite this article as: Filipenko, A.S. (2017), "Methodology in economics: An overview", *International Journal of Development and Sustainability*, Vol. 6 No. 10, pp. 1448-1460.

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1. Introduction

There are two main views on methodology in the field of economics. The overwhelming majority of scholars implicitly believe in the feasibility and absolute need for methodology elaboration and its wide application in economics research. This includes, firstly, determination of the subject and method of economics, its ontological and epistemological dimensions; secondly, verification, testing and calibration of existing or new economic theories and models; thirdly, development of new knowledge, new theories, and models; and, finally, its use as a theoretical basis for interpreting empirical data of economic measurements. However, there is another belief suggesting that methodology is the prerogative of philosophy practiced by a small group of economists specialising in methodology. The author of this articles endorses the first position as the methodological principles, methods, tools, methodological culture, and methodological standards lead to the formation of a relatively homogeneous area of economic research, giving the opportunity to avoid the Tower of Babel effect under the diversification of economic knowledge, strengthening of interdisciplinary research, and developments of 'economic imperialism'.

1.1. The purpose of the article

The aim of this article is to analyze the nature of economic methodology and to investigate the scope of economics as a field of science. This means that economic methodology examines the basics and foundations that economists use to provide to 'why'-questions about the economy. For instance, economists use the shifts of demand and supply curves to answer the question of why prices change. Economic methodology attempts to understand the specific role that these relationships play in an explanation. Moreover, the article focuses on both descriptive and prescriptive approaches. Descriptive economic methodology aims to describe different types of economic research practices and their results. In philosophy of science, descriptive methodology is often referred to as positive methodology (from Latin 'positus' meaning 'put' or 'place'). Positive methodology is concerned with how science is actually practiced. Prescriptive economic methodology distinguishes between good and bad explanations in economics and concerns with how good explanations should be formulated. In philosophy of science, prescriptive methodology is referred to as normative methodology, and is concerned with how science should be practiced. And finally, we consider one of the most important questions in economic methodology, which is whether an explanation of the status and character of economics as a social science involves issues that are significantly different from those involved in explaining the status and character of the natural and physical sciences (Baumans and Davis, 2010).

2. Two concepts of the world view

How does methodological discourse in economics look like at the beginning of XXI century? Its content and paradigm depend on the general worldview or scientific outlook that provide interpretation for any natural or social phenomenon. Since Plato and Aristotle, the discussion on the ways and methods of human perception of the world is still underway. Plato argued that ideas and their mathematical expressions are primary in the

attempts to gain the insight into the universe. Views of Descartes, Leibniz supported the same standpoint. The modern Polish philosopher Zbigniew Krol states that “the sociological, economic, political, psychological and other factors are secondary. For this reason, in theory of knowledge creation, it is necessary to consider both basic and secondary levels. The basic level is determined by purely rational and ontological factors. This means that the scientific change in mathematics is a rational one and is based on objective conditions prior to every scientific theory” (Krol, 2015). Based on mathematical priorities, the model of axiomatic structure of the world and axiomatic methodology has become widespread. Patrick Suppes, a prominent scholar and advocate of this method suggests that “the axiomatic method has this old tradition. It was probably really first introduced in an important mathematical way by the ancient Greeks” (Herfeld, 2016).

Aristotle held an opposing view, defending a metaphysical concept based on the reflection of real events and processes at the level of philosophical abstractions. Bacon, Spinoza, Kant, and others also supported this approach. The philosophy of positivism followed this school of thought school at the turn of the XIX and XX century. Just facts and only facts (i.e. bare bones) were taken into account by the advocates of positivism in the twentieth century, neo-positivists and post-positivists.

3. Main methodological trends

3.1. Naturalism and constructivism

In general terms, two main methodological trends emerged under the philosophy of science: naturalistic and constructivist. The first originates from Aristotle’s materialism, the second takes root in Plato’s ideas. The British school of philosophy (Bacon, Locke, and Hume) formulated the basic principles of naturalistic methodology that were further elaborated by their followers. The naturalistic approach embraces the following six features. There are regularities or patterns in nature that are independent of the observer (that is, a Real World). These patterns can be experienced or observed, and these observations can be described objectively. Experiential statements can be tested empirically, according to the falsification principles and a corresponding theory of truth. It is possible to distinguish between value-laden and factual statements. Hence, the scientific project should be aimed at the general at the expense of the particular. Human knowledge is both singular and cumulative (Moses and Knutsen, 2012). Naturalistic approach to philosophy of science eliminates the distinction between the ‘context of discovery’ and the ‘context of justification’ in terms of Popper, Hempel and Kuhn, putting the actual process of discovery prior to the logic of justification and urging a thorough-going historical and empirical study of this process.

Constructivist methodology starts from the premise that there is an intimate and reciprocal connection between human subjects and the social world. According to Vernon Smith, “constructivism involves the use of the human mind for consciously shaping the human activity rules within the social and economic institutions” (Smith, 2008). Constructivists see beliefs and values as something that has to be explained and, therefore, crucial in shaping and determining reality. Constructivism posits that norms and values go beyond shaping actors’ interests – they in themselves constitute identities and hence interests. On the other hand,

constructivism relates to cognitive methodological approach. It means that it is sociological in nature and is concerned with connections between individuals, e.g. learning, inter-subjectivity, and social knowledge. The spotlight of constructivism is on the independent effect of norms on state behavior (Cohen, 2014).

In the post-modernistic doctrine, there are three constructivist logics: meaning, cognition, and uncertainty. In particular, the Knightian uncertainty, where the emphasis is on the social construct that informs agents and the communities of which they are part (Knight, 1921). This style of analysis makes discourse central to the economics narrative, and the position taken by the subject within that discourse then defines the subject's identity. Post-modern constructivist treat methodological norms as objects of power that determine the boundaries of possible speech and action (communication of Habermas discourse) and operate by exclusion of alternatives as much as by constitution of identities. Constructivism relates to Gadamer's hermeneutics, French deconstructionists and post-structuralists. In this way of approaching science, the context, i.e. the structure, or the discourse within which agents are situated, is decisively influential for the very 'thinkability' of options.

3.2. Scientific realism

The third methodological trend, i.e. scientific realism, is opposed to both naturalism and constructivism. However, it adopts some of their principles. The wide range of literature on this approach reveals differentiation in positioning of various schools of thought defining themselves as 'transcendental realists', 'relational realists', 'critical realists', and 'empirical realists'. Occasionally, scientific realism, tending to the naturalism by its ontological characteristics, e.g. it recognizes the existence of the real world independent of our experience, tries to represent itself as a synthesis of the two leading contemporary methodological trends, naturalism and constructivism.

Going back to the opening statements of the article, it can be argued that both qualitative and quantitative methodology are used in economics. The former is based on the philosophy of science, and, therefore, the philosophy of economics, the latter is grounded on mathematics, statistics, econometrics, and computer models. The application of only one of the methods in economic analysis is known as mono-model methodology. In our case, we are dealing with bimodal methodology, as defined by Kurt Dopfer (2011).

4. The philosophical background of economic methodology

Philosophy of economics is one of the important areas of philosophy of science that defines the general universal trends and patterns of economic development in the world based on broad philosophical categories.

The following five pillars of the philosophy of science have fundamental importance for the economic theory:

- 1- Objectives. What are the objectives of science and scientific theorizing? Is science primarily practical activity aimed at identifying useful generalizations, or should it be seeking explanations and finding the truth?

- 2- Explanation. What is the scientific explanation?
- 3- Theories. What are theories, models and laws? How do they relate to each other? How are they being discovered and structured?
- 4- Verification, induction and demarcation. How are scientific theories, models and laws verified and, hence, confirmed or refuted. How do standpoints and practices of scholars and professionals from other disciplines differ?
- 5- Do all branches of sciences answer always provide the same answers to these four questions? Is it possible to carry out research on human behaviour and institutions in the same way we study nature? (Hausman, 2008)
- 6- The answers to these and other similar questions are formulated from different ideological, philosophical, methodological positions. The underlying philosophical foundations of economics were put in place in ancient times by Plato and Aristotle, and were further promoted by medieval theologians and philosophers.

4.1. Philosophy of Economics

The schools of Modern philosophy in the UK and Continental Europe were the first to introduce the term 'Philosophy of Economics'. In particular, John Stuart Mill considered the philosophical problems of the economy in his "Principles of Political Economy with some of their Applications to Social Philosophy" (1848).

In 1904-1907, the German writer Fritz Berolzheimer (1869-1920) published his work «System der Rechts- und Wirtschaftsphilosophie». The works of Bentam, Fichte, Hegel, Foucault, and Heidegger deeply influenced the philosophical grounding of the economic development (Hoffmann, 2009).

When considering the philosophical roots of economy, three fundamental questions gain particular importance (Keizer, 2015):

- 1- How do we define the essence or nature of economic reality? The answer to this question is provided by economic ontology or ontology of economics.
- 2- How do we collect information about the economic reality or, in other words, which are the reliable sources of information about it? This issue is investigated by epistemology.
- 3- How do we structure the acquired information on the knowledge content and its practical application? The answer deals with the outline of the subject matter of methodology.

4.2. The discipline of philosophy of economics

A broad explanation involves interpretation of the philosophy of economics as a discipline that includes ontological, epistemological, and methodological aspects of the economy, i.e. the application of philosophical theory to economic reality. Other definitions of the philosophy of economics are rather close in meaning as well. Ontological, epistemological, methodological, axiological and logical dimensions are the cornerstones of philosophy of economics, the foundations that remove any possible reservations and limitations regarding the economy as a science. Historic and economic approach focuses on the historical origins of the philosophy of

economics, specifically emphasizing the primacy of economic and business ethics under the philosophical concepts from antiquity to the modern age (Hoffmann, 2009). A term "wirtschaftsphilosophie" (economic philosophy) established by German philosophers Fichte and Hegel, and their British counterparts Bentham and Mill, is widely applied in German literature. Economic philosophy purports the philosophy of economic life and economic thought worldwide. It is seen as part of social philosophy and gains rational justification in Descartes' time. Its historic version considers historical resources and sources of the philosophy and economy, taking into account the natural, human, and intellectual components.

One of the important components of the philosophy of economics is the philosophical verification of economic rationale. First, it is determined by the correlation between utility theory and individual choice theory. Second, it takes into account the assumption of selfishness or self-interest as a condition of the pure theory. Third, philosophers indicate that real psychological actors rely on actions that are far from pure theory of economic rationality. Fourth, more emphasis is put on the assumptions of the game theory. Finally, some philosophers analyze the economic rationality characteristics for real individuals by means of experiments. Economic ethics and ethical value in the economy are gaining vital importance in the philosophy of economics (Sen, 2009).

Thus, the philosophy of economics in the broad sense largely includes economic ontology, epistemology and methodology of economics, rational choice decision theory, game theory, ethical economy, and justice. In the narrow pragmatic sense, the Oxford Dictionary defines the philosophy of economics as an interaction of people, institutions (companies, countries) in their historical development with application in the study of game theory, linear and dynamic programming.

5. The history of economic methodology at a glance

The background of economic methodology was laid during a century between 1850s and 1950s. That period was marked by the works of James. S. Mill and of John. N. Keynes and his "The Scope and Method of Political Economy" (1891). It also includes the important contribution of Mises, Knight and Robbins, who were all adherents of the Austrian school. The distinguished work of L. Robbins «The Nature and Significance of Economic Science» (1932) and T. Hutchison's «The Significance and Basic Postulates of Economic Theory» (1938) followed suit. M. Friedman's publication "The Methodology of Positive Economics" (1953) became, to a certain extent, an encapsulating work of that period (Hausman, 2008).

One of the key provisions of the period is Lionel Robbins' definition of the economics as "the science which studies human behavior as a relationship between ends and scarce means which have alternative uses..." (Robbins, 2008).

The next important step in shaping the approach was a normative critique of the economics during the 1970s known as the Rise of Keynesianism. In response to this criticism, the provisions of the philosophy of science developed back in the 1950-60s had been applied.

The Formalist Revolution of the 1950s is considered to be a breakthrough in the history of economic methodology. A new level of mathematical science, which prospered since 1930s to 1970s, made the formalist revolution a real revolution. Mathematical Economics is now considered as a science due to its incontestability.

However, there were serious reservations against the dominance of mathematics in the economics insofar that that threatened to nullify the content of the subject of economics due to the loss of its fundamental essential features.

The immersion of the philosophy of science in the mid-1970s marked another breakthrough in the history of economists' methodological insight. One necessary condition for the introduction of philosophical experience was the diminishing, if not disappearing, role of the context where a methodological reflection occurs. Nowadays, economists hold implicit views primarily, under Karl Popper's principles. Imposing of such views was facilitated by the fact that the majority of economists preferred to reserve from participating in methodological discussions (Düppe, 2011).

However, in the early 1980s, economic methodology acquires its independent character. The first publications of historians and methodologists appeared in "Research in the History of Economic Thought and Methodology" journal in 1983. The "Economy and Philosophy" journal was established in 1985. The first results of these efforts to put economic methodology on professional realms brought fruit in the late 1980s, when Henry Woo and Dan Fusfeld founded The International Network for Economic Method (INEM).

Establishing of the economic methodology as a separate direction in economic science took place simultaneously with the immersion of increasing number of other theories. The economists now face not only the variety of economic theories and methods, but also theories of models, theories of causality, theories of explanation and others. The philosophical certainty, a certain rigidity of methodological framework contributed to drawing boundaries of economic methodology and its consolidation around Post-Keynesian school of thought whose representatives founded, in 1994, the Journal of Economic Methodology.

6. The key methodological views on economic theory

Economic methodology is the philosophy of science applied in the economy. Philosophy of science examines the nature of assumptions, types of causality, forms of explanations used in science, etc. Accordingly, economic methodology studies the nature of assumptions (idealizations), types of causality and forms of explanations used in economics (Baumans and Davis, 2010). Mark Blaug (2004) identifies methodology as "a study of concepts, theories and fundamental principles of considerations adopted in a particular science. The methodology of economics - he adds, - must be understood simply as a philosophy of science in its application to the economy".

The main methodological views on economic theory correspond to the three areas of the philosophy: positivism (Comte, Mill), neo-positivism (Carnap, Reichenbach), and post-positivism (Popper, Lakatos). John St. Mill's methodological principles relied on causal relationships and economic determinism. He used four methods in his research: experimental, in which scientific facts are fixed, consistent with the philosophy of

positivism principles; abstract, when all is due to one reason; direct deductive (considering a lot of reasons); and inverse- deductive, implying that empirically discovered historical laws are explained by human abilities.

Mill's inverses-deductive method partly resembles Bayes' conditional probability method, which is currently experiencing a true renaissance. Distinctive features of the Mill's Methodology include naturalism, descriptivism, and psychologism. Interdisciplinary approach takes into account the impact of political science, sociology, and ethics on the economy.

The foundations of methodological views of Alfred Marshall, a representative of late positivism, include: a synthesis of rationalism with empiricism, typical for the British school of philosophy; gradualist approach, according to which the opposing sides can be combined through a gradual step-by-step process; and identifying specific economic events that have monetary measurement.

At the neo-positivism stage, John N. Keynes used to express his own methodological position. In a letter to R. Harrod, he pointed that, firstly, economic theory is a branch of logic, way of thinking; secondly, advance in economic theory is almost entirely the gradual improvement of our choice; third, statistical studies are needed for both the forecast and verification of model relevance and validity; fourth, the purpose of the model is to separate acting relatively long or relatively unchanged factors from fleeting or changing ones to develop logical thinking and understand the processes that generate these factors in specific cases.

6.1. The Friedman's methodology in economics

Milton Friedman is one of most outstanding representatives of post- positivism in economic science. His methodological doctrine was formulated in his book "The Methodology of Positive Economics", where he begins his analysis with the reference to the work of Keynes "The Scope and Method of Political Economy", emphasizing that positive economics is called the "what is", and normative is referred to as the "what should be" economics.

The theory, according to Friedman, is composed of two elements - the "language" (logic and mathematics), which describes the systematic and organizational methods of argumentation and explanation; meaningful hypotheses, revealing abstract essential features of complex reality. Friedman describes the logics and mathematics as a tautology; Popper defines them as theoretical sciences that do not require verification or falsification. Thus, hypothesis ought to be verified to identify their compliance with economic realities. Verification consists of two interconnected stages: justification of the hypothesis concept and testing its effectiveness and accuracy.

Friedman attaches a great importance to these assumptions performing three essential functions (Friedman, 1953):

- describing and presenting a theory;
- facilitating an indirect test of the hypothesis by considering its implications;
- determining the specific conditions under which the theory can be effective.

Ultimately, the four principles of post-positivism are reflected in Friedman's methodology. First, it refers to the theoretical principles of relativity, where the facts are always theoretical characteristics. Second, the

falsification principle means, on the one hand that the conclusions of the theory are always verified by the facts, and, on the other hand, that facts cannot prove the theory, but can only reveal its inaccuracy (Duhem-Quine thesis). Thirdly, Popper's growth of scientific knowledge is applied. Fourth, the determining principle of comparable strength theory is applied in the context that the theory is most efficient when conclusions are most precise and the scope of action is the most extensive. Friedman's methodology is known as methodological instrumentalism, which is a form of positivism or conventionalism (Mulberg, 1995). Fritz Machlup's concept known as a limited methodological instrumentalism was also close. This approach is based on the use of a set of instruments that are not confirmed by the theory (assumptions, hypotheses, forecasts, etc.). In other words, it is seen as a methodological approach according to which all scientific theories and hypotheses are tools for developing the forecasts. However, some authors believe that methodological instrumentalism is more efficient and more suitable for solving short-term practical problems.

6.2. The Deweyan methodology in economics

Economic methodology developed by John Dewey is known as pragmatic instrumentalism. Its components include fallibilism, context-sensitivity, and anti-teleology. This methodology provides an opportunity for broad social engineering and economic planning. The link between economic pragmatism and methodology can be observed in three directions. First, essentially, pragmatism considerably combines scientific rationality and economic rationality. Second, pragmatic way of thinking belongs to the moral and social sciences, including economics, while many aspects of economic life are being developed on the basis of instrumental scientific rationality. Third, experimental rationality and experimental forms of life, as key concepts of pragmatism, tend to augment from antiquity to the industrial revolution, taking shape in the relationships of "the industrial revolution – economic progress", and "industrial rationality – scientific rationality" (Wade Hands, 2004).

Robert Solow and Oliver Williamson formulated the practical aspects of pragmatic methodology. Solow's methodology is built around its three underlying principles: keep it simple, get it right, and make it plausible. The "keeping it simple" (or Occam's razor) principle is accomplished by stripping away inessentials in order to focus on first order effect, i.e. the main case, after which other experiments, refinements and extensions can be introduced. The "getting it right" principle entails working out the logic, and "making it plausible» principle means to preserve contact with the phenomena and eschew fanciful constructions. O. Williamson added the fourth commandment: to derive refutable implications to which the relevant, and often micro-analytic, data are brought to bear (Williamson, 2009).

6.3. The four approaches to methodology

Nowadays, economic methodology distinguishes between four methodological approaches: methodological individualism, methodological holism, institutional individualism, methodological institutionalism.

Methodological individualism implies the explanation of social phenomena in terms of individual behaviour. The principles of methodological individualism are applied mainly in mainstream neoclassical economics, which is reflected in its basic postulates:

- the model of rational economic agent with stable preferences;
- the maximization principle, which determines the economic behaviour of market agents in accordance with the concept of subjective expected utility;
- the presence of competition between market agents;
- the possibility to achieve the market equilibrium.

According to methodological individualism, in terms of individual actions, economic events should be explained at both micro and macro levels. It refers to inflation, unemployment and other macroeconomic indicators and processes. Due to the fact that the latter requires a holistic, systemic approach, methodological holism principles are most effective for their analysis. Piet Keizer describes this approach as methodological collectivism (Keizer, 2015).

The principles of holism were first applied to studying economic agents in the first half of the twentieth century. Thus, attention was focused on integrated objects, such as groups, associations, corporations, government, supranational unions etc. Consequently, the first approach (methodological individualism) is preferred for the analysis of individual actions, whereas the second (holism) is applied to a variety of institutions. The rivalry between the two approaches caused the rise of the third trend in economic methodology, i.e. the institutional individualism. A distinctive feature of this method resides in the fact, that individuals do not act arbitrarily as in the case of methodological individualism, and their behaviour is determined by institutions.

The main characteristic of the institutional individualism is the explanation of human behaviour not by the means of rationality, as assumed in the neoclassical doctrine, but by the means of rules and regulations. There are three preconditions of effectiveness for this approach to methodology approach. First, only actors, not institutions, can care about their interests and goals. Second, formal and informal set of institutional rules, affecting the interaction between actors, ranks among the explicable variables. Third, significant institutional changes are always a result of independent and collective actions of certain subjects and are always carried out in a broad institutional framework.

Another institutional approach is known as methodological institutionalism. Its basic postulates are as follows:

- Rejection of social neutrality allegations of subjects' scientific knowledge and recognition of their deep involvement in the system of professional division of labour, internal scientific connections and relationships, status interests, informal hierarchies and networks;
- Understanding specific scientific approaches for specific institutions, that are embodied in the target groups and related agents, in their mutual trust and reputation capital, research strategies and conventions, the impact on ideology and public policy;
- Focus on the system of interaction between cognitive conflict and status interests of scientific fields' agents (Frolov, 2008). These preconditions closely interpret the essence of methodological institutionalism.

Generally, methodological institutionalism has holistic roots and involves the study of economic systems as integral structural units based on formal and informal rules (institutional individualism) and the explanation of economic phenomena in terms of operations and changes in institutional structures, including the scientific

community. Examples of methodological institutionalism are found in works of Karl Polanyi, where he goes beyond the traditional methodological attitude, considering the interaction of economic and non-economic institutions. Specifically, three types of relationships, i.e. reciprocity, redistribution and exchange, form the basis of modern research methodology of social and solidarity economy (Polanyi, 2002).

7. The mathematical views of economic methodology

The history of economic science and economic methodology particularly proves that elements of mathematics have always been present in economic research. To certify constant interrelationship and the interaction of these two important fundamental social sciences, it is enough to mention "The Economic Table" by Quesnay (1758), "Mathematical Principles of the Theory of Wealth" by Cournot (1835), "A system of Equations" and "General equilibrium theory" by Walras (1874, 1877), "Mathematical psychology" by F. Edgeworth (1881), the Marshall's applications of mathematics to economics (1890) and their numerous followers in the twentieth century, especially the post-war general equilibrium theories, including Arrow-Debre-McKenzie General Equilibrium Model (ADM) and The New Macroeconomic Consensus Model (NCM).

One of the key provisions of the methodology is to determine the relation between a theory, a model, and the real economic world. Most theories are capable of being c by several models, depending on how each factor is specified. Since theories can be trialled by several models, it is usually easier to test a model rather than a whole theory. If one model fails, the same theory may yield another model that would be more consistent with the data (Perri and Bellamy, 2012). Thus, the task of theory and methodology is to justify models that would adequately explain the real economic processes. The requirement that all theories must have economic content causes serious problem in connecting models to data. Generally, economists work using one of two models: econometrics reduced form models and chosen for more or less ad hoc reasons and fit to data. Theoretical model, in contrast, posits fundamental axioms within a set-up in which agents selfishly maximize utility like in the computational agent-based model (Farmer, 2013). In this regard, we refer to Hausman's premise that economic theory consists of microeconomics, macroeconomics and econometrics. This relationship is brightly shown in DSGE macroeconomic model, which refers to the micro-foundations of macroeconomics. DSGE model must be derived from microeconomic theory with an internal and external consistency. As Wren-Lewis suggests, it needs a third element, on top of internal and external consistency, i.e. complexity. Complexity, rather than empirical evidence alone, rules out complete or direct internal consistency, and instead internal consistency has to allow an appeal to additional off-model theory. Such modification of micro-foundations methodology, to allow off-model justifications for particular relationship, at first sight appears not to compromise the primacy of microeconomic theory over econometric consistency as the criterion for model admissibility (Wren-Lewis, 2011).

8. Conclusions

The history of economic thought has proved uneven development of methodological research. Mill's works initiated methodological exploration in mid-nineteenth century and led it until 1890s when the debate on the

"Metodenstreit" method between representatives of the Austrian school of marginal utility and the German historical school started. Then came forty years of methodological vacuum caused by the World War I, the economic crisis and the Great Depression of 1929-1933 when policy rather than methodology became the priority.

The revival of methodological studies began in the works of F. Knight, T. Hutchison and L. Robbins in 1930s. The results of methodological studies carried out by students of economics and application of mathematics in economics remained contradicting. Thus, in 1992, Frank Hahn due to his retirement as a professor of economics at Cambridge University addressed the students choosing a profession with the advice to avoid discussions of mathematics in economics like a plague and therefore give no thought to methodology (Backhouse, 2010). It should be noted that such statements are still underway, but they rather consider the dominance of mathematics in economics, on the one hand, and the formation of methodological paradigms, methodological discourse that are designed to confirm the status of economics as a science in the system of modern knowledge, on the other. The bimodal methodological discourse proposed in the paper is aimed at achieving this goal. Principles of philosophy define the subject matter of economics, its epistemological and ontological status based on the principles of demarcation, verification and falsification. Mathematical tools, applying the principle of corroboration, provide economic science with the necessary rigor and precision, mathematical logic and reasonableness of economic axioms and hypotheses.

The main limitation of contemporary methodology in economics consists in mono-modal application of either philosophical or mathematical approach. In order to minimize the risk of one-sided interpretation, a synergetic bimodal methodology should prevail in current economic research. Thus, the key methodological views on economic theory, on the one hand, can explain the developments of economic life in all its dimensions, at micro, macro, and geo-economic levels, by establishing certain patterns and trends. On the other hand, a variety of methods, including logical, mathematical, statistical, computer modelling and programs, is used to explore new phenomena and processes of local or global. This creates conditions for accumulation of empirical and theoretical material that enriches the economic theory, one of the main shapers of the economic science.

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