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# Theoretical and Methodological Context of (Post)-Modern Econometrics and Competing Philosophical Discourses for Policy Prescription

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## Abstract

*This research article was championed as a way of providing discourses pertaining to the concept of "Critical Realism (CR)" approach, which is amongst many other forms of competing postmodern philosophical concepts for the engagement of dialogical discourses in the area of established econometric methodologies for effective policy prescription in the economic science discipline. On the the whole, there is no doubt surrounding the value of empirical endeavours in econometrics to address real world economic problems, but equally so, the heavy weighted use and reliance on mathematical contents as a way of justifying its scientific base seemed to be loosing traction of the intended focus of economics when it comes to confronting real world problems in the domain of social interaction. In this vein, the construction of mixed methods discourse(s), which favour that of CR philosophy is hereby suggested in this article as a way forward in confronting with issues raised by critics of mainstream economics and other professionals in the postmodern era.*

**Keywords:** *Theoretical, Methodological Intervention, Postmodern, Critical Realism, Econometrics*

**Jel Classification:** *A12, B50, C18*

## 1. Introduction

Economic science research has proved its existence by making use of myriad of (empirically oriented) methodologies to validate existing theories. The use of econometrics as a sub-discipline in mainstream economics to address complex models has being in existence for decades (Hoover, 2005 and Le Gall, 2007), while that of the less favoured and non-mathematical methodologies like critical realism continue to find its niche in influencing its existentiality, more so relevant for policy formulation. It is without doubt that Econometrics is seen as a very

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<sup>1</sup> Disclaimer: Views expressed in this article are those of the author and do not reflect that of the aforementioned institutions.

relevant area in the field of economic science to help bring its scientific credence to the fore of critical discourse(s) about its relevance for policy formulation.

(Empirical) Econometrics is an embracement of mathematics, statistics and economic theories to help shape human thoughts in the direction of simulating realities of real world economy through models. As emphasised by Hendry (2003: 4), econometrics has carved itself around the notion of models which are quantitative linkages for observed data series, with four perceived roles in economics: firstly, it seem to provide the platform through its available technology means for summarising data amongst myriad of information available by the practicing researcher for utilisation in supporting sound economic judgement for policy analysis. Secondly, it provide the means for interpreting empirical information, and which in many cases is based on rational judgements. Thirdly, given the existence of competing theories, empirical econometrics provide the means through which model analysis can allow sound judgments to be made. Fourthly, it provide the means for the accumulation and development of knowledge through its power of forecasting events from economic phenomenon, and which Hendry (ibid) referred to as "**raison d'être**".

The rationale for this study is to provide critical discourses around theoretical and methodological contexts of econometrics study, with a view of applying post(modern) (philosophical) thinking as option for incorporating varied methods in the delivery of effective policy judgements. Having addressed the introductory background to empirical econometric research, subsequent sections have sought to cover discourses on: the historical development and theoretical base of modern econometrics, econometric modelling and analysis, scientific basis for influencing policy decisions, critical realism and justification as a competing methodology, and finally conclusion.

## **2. Historical Development and theoretical base in Econometrics**

Econometrics as a sub-discipline in the field of empirical economics has been in existence for decades, more so since 1910; a coinage developed by Paweł Ciompa, who was also a Polish economist (Samuelson et al, 1954). Popular contributors to the discipline include Jan Tinbergen, a Dutch economist and compatriot Ragnar Frisch, a Norwegian economist who made immense contribution to the development of dynamic modelling, now famously considered for addressing economic processes (Magnus and Morgan, 1987). Econometrics is highly hinged on economic theory, and it seeks to utilise statistical and mathematical concepts to support real world model construction of historical data, with possible consideration for predicting future events.

The basic and most popular form of econometric analysis is still done through linear regression, even with the advent of information technology platform like EVIEWS, STATA, etc which can

be performed through use of two variables (dependent and independent) and in the most complex cases, multiple variables to determine simultaneous occurrences. A simple illustration of this is found below with the household expenditure expression, considered highly depends on income:

$$y_i = \alpha + \beta x_i + \epsilon_i$$

Where,  $y_i$  denote expenditure,  $x_i$  is the income factor,  $\alpha$  and  $\beta$  are parameters, respectively described as intercept and slope, and finally,  $\epsilon_i$  is the random factor, which is based on the exogenous influence of occurrences that may impact on the stability of the cetera paria condition of a family not being capable or incapable of addressing basic expenditure requirements. The idea of the sort of regression equation expressed here emerged as a result of the work of Francis Galton (1811-1911), whom Pollock referred to as a Victorian man of science (Galton, 1886 and Pollock, 2014).

### **3. The Modern Econometric Modelling and Analysis**

Modern econometric modelling and analysis seem to have made great strides in terms of its focus, but with emphasis on the mathematical / statistical contents as championed by its forefathers like Milton Friedman (Cord and Hammond, 2016), but as critiques are being raised about its approach to addressing real world challenges, so too is the effort made towards the need for embracing social and extraneous components into model construction. This is quite true as expressed in "Dynamic Stochastic General Equilibrium (DSGE) and also Computable General Equilibrium (CGE) models which also account for social factors affecting an entire economic system.

In as much as models and more so econometric methodologies are not truly representative of an entire economic system, they provided ground work for epistemological enquiries about the nature and consideration towards addressing the way forward in developing real world models. Postmodern econometric discourses is making it possible for economists to listen and where possible adapt their approaches as a way of enabling model reconstruction and developments in the most positive way that support effective policy prescription.

### **4. Scientific Base for Influencing Policy Decision(s)**

Empirical investigation which support the work of scientific act of falsification is evidenced throughout econometric research endeavours in economic policy formulation. In institutions like Central Banks, policies relating to price stability and exchange rate pass-through for example, economic modellers are continually engaged in making use of designatory scientific platforms like EViews, STATA, SAS and many more to iterate around data to justify their efforts in

support of policy formulation (Jackson. 2018a, 2018b, Jackson et al, 2018 and Bangura et al, 2012).

In as much as many postmodern critics like Blaug (1977) may not totally support the mechanistic use of quantitative approach applied by economists to approach realities in life (on account of their shortcomings in addressing social problems), one may also view efforts of professionals as a step in the right direction in practical discourses relating to both theoretical and methodological mix in understanding the complex nature of the social world. The development and expansion of experimental research as a sub-discipline in mainstream economic may be of great value to many of the critics views of the heavy usage of mathematical approach by economist to address practical problems (Karlan, 2015). In this vein, it is possible that much needed concerns around theoretical application of economic concepts in different economic systems may no longer be seen as problematic outcomes as experimentations may allow dialogue to be established.

## **5. Critical Realism and Justification as a Competing Methodology**

Here in this section, discourses is meant to address the case for '*Critical Realism*' as a complementary methodology / philosophical paradigm to already established ones used in econometric studies. Developed by Maxwell and Mittapalli (2010), advanced critical discussion in human ontological quest for (provisional) knowledge, with diverse scope in support of human reality (Popper, 1963).

Practicing (modern) Economist like Boland (n/d) has for some years given his views on the methodology of critical realism, which in reality is considered very much needed to address dismal criticisms levied on the '*pseudo / non-scientific*' state of economic Science. The work of critical realists is one that is based on the application of things as they happen in the real world as opposed to that which is dogmatically provided by empirical outcomes; in this view, such outcome(s) from empirical works can somehow present subjective view of things, simply on the grounds that information would have been skewed towards a particular way of thinking. As explained by Zachariadis et al (2013: 2), Critical Realism (CR) typically based on the writings of Bhaskar (1975, 1978, 1998) and others like Archer et al (1998), Fleetwood (1999) and Lawson (1997), embraces various methodological approaches from different philosophical positions by taking “ *a critical stance towards the necessity and validity of current social arrangements*” without following “ *the extant paradigms’ assumptions at face value* (Mingers 2001: 248)” .

### **5.1. Implications for Policy Prescription in Postmodern Econometric Studies**

Critical realism (CR) by its philosophy, seemed quite different from other forms of (competing) postmodern thoughts on research practices; emphasis on CR is believed to add value in the ontological direction of postmodern development in econometrics, which also addresses gaps in the realities of policy prescription as dictated by current positivist / empiricist practices. Current methodological space in practical econometrics through its high powered mathematical intuition does not give enough scope for methodological mix in the ability of professionals within the wider discipline of economics (traditional economists and Heterodox economists) to address unique space in the future direction, which according to Mongers (2004) is thought to be lying between empiricism and interpretivism approach, a supposedly good means to support objective discourses needed for effective policy prescription. The benefit of CR in this study is its power to create objectivity of thinking which neither diminish existing positivist works in econometrics, but rather create the possibility for a different way of viewing existing concepts in addressing the realities of human existence in society. As addressed in a study on triangulation by Jackson (forthcoming), the entrance of CR in the realm of current dominance of quantitative model interpretation in the discipline of economics will create an opportunity for the embracement of other professional views on how they perceived the world when it comes to dealing with practicalities of policy implementation, which is neither dominated by empiricist practice nor that of invalidated qualitative views of opposing professionals.

Critical Realism (CR) is not defined by any particular form of methodology (invariably, not a methodology); it create a stance on meta-theoretical position, a form of reflexive philosophical position supposedly concerned with the provision of philosophically informed account of science and social science, which helps informed the development of empirical investigations. Ontological space in CR study is assumed be stratified into three domain: *the real, the actual, and the empirical* (Bhaskar 1975, 1978 and Zachariadis et al, 2013). This is an embracing feature that brings practitioners into seeing the world in its reality (featuring structures, and mechanisms with enduring properties), while also ensuring events are generated by the structures and mechanisms, which then result into an observable or experimental phenomena. This trending synthesis in CR study can be viewed as causal mechanism that enables different events to interact without diminishing the value that the other brings to the fore of enhancing practitioners view of the world, particularly when it is intended to impact positively in policy implementation.

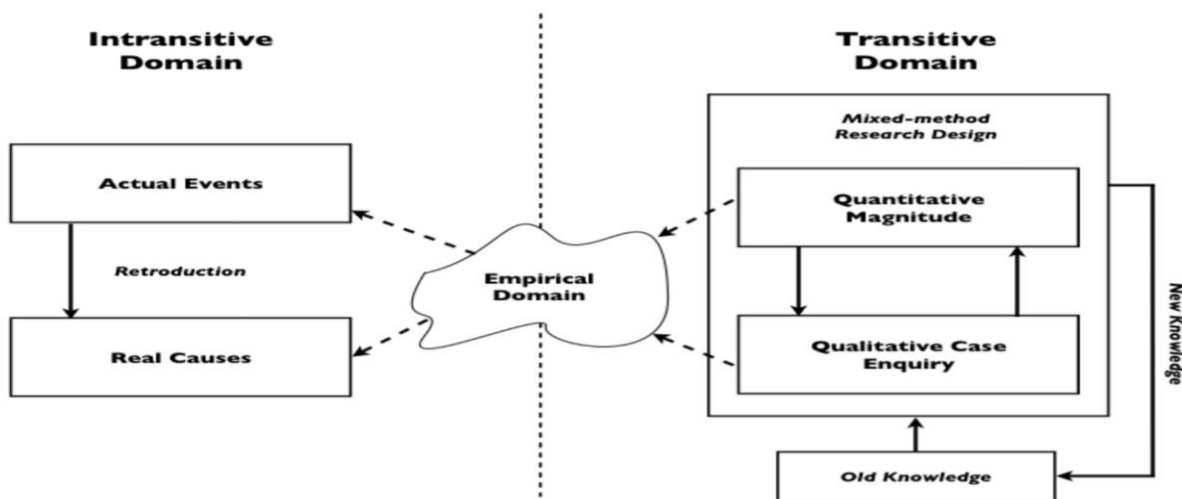
## **5.2. Mixed Methods Intervention for Effective Policy Analysis**

As addressed by Jackson (2017 and forthcoming), mixed methods approach is a very important element in the way forward for dynamic policy intervention in the economic science discipline, and particularly that which may seek to (positively) influence policy formulation in an entire economic system. Economics attachment to being more scientific seem to have lagged in terms of been truly realistic about its humanistic root in addressing dynamic events that impact on

welfare (Robbin's, 1932). The notion of retrodution is more so relevant here, which also makes it possible to address validity as perceived between quantitative and qualitative studies.

As extracted from Zachariadis et al (2013), the concept of "*Retrodution allows researchers to move between the knowledge of empirical phenomena as expressed through events to the creation of explanations (or hypothesizing) in ways that hold “ontological depth” and can potentially give some indications on the existence of unobservable entities (Downward and Mearman 2006)*". This allows things to be seen more open with critical views on how things are perceived with or without the interaction of mechanisms as witnessed here.

**Figure 1: Retrodution Approach of Critical Realism in Knowledge Exploration**



**Source: Zachariadis et al, 2013**

Figure 1 above provide the basis for the relevance of reduction approach as applied to critical realism in the application of effective policy prescription in econometric methodology studies. Many (heterodox) researchers, both practicing economists and real world practitioners (Downward and Mearman 2006; McEvoy and Richards 2006; Mingers 2004 and 2005; Mingers and Gill 1997; Wynn and Williams 2012) have argued in favour of the retrodutionist approach, which create a blend between qualitative and quantitative approach in a bid to hypothesise the generation of events (researchers) experienced in pursuit of ontological journey. As illustrated in Figure 1, the Transitive Domain seem to be the dominating force through which knowledge is addressed, but its link with the Intransitive Domain, typified by actual events and the retrodution approach makes it possible for blend of approaches to be considered in a bid to addressing effective outcomes, particularly in situations connected with policy implementation that requires not only that of empirical outcome, but also some constructive intetpretivist view of real life problems.

As outlined in Figure 1, retrodutionist approach does have implications for areas connected with validity of outcomes, and based on mixed methods literature (Creswell and Clark 2007; Venkatesh et al. 2013), there is possibility that this can be addressed more easily through a review of CR philosophy. According to Venkatesh et al (2013), also expressed in Zachariadis et al (2013), validity can be categorised into three distinct classes, which are somehow commonly used in quantitative and qualitative research designs; these typically include "*design validity, measurement (or analytical) validity, and inferential validity*".

Given the nature of the discourse, which involve mixed-methods philosophy, quantitative research approach to design validity broadly refers to internal (typically, the correlation of observable causation) and external (which is based on the generaliability of results) validity. Measurement validity on the other hand, is associated with data reliability (an area related to measurement error) and construct validity, typically describes the intended purpose for which variables selected have been measure. Last but not least is inferential validity; this relates to statistical conclusions and their sufficiency in supporting valid inferences.

Validity concept in qualitative research seem to have taken a more agreed view about its relevance to common scientific body of knowledge (Denzin and Lincoln 1994: Venkatesh et al. 2013). This then makes it possible for pro-qualitative researchers to pursued similar venture(s) in terms of established common terminologies and definitions for validity, which then focused on the designed and execution (design validity) of qualitative study approach; accuracy of data collection and analysis, in a bid to achieving dependable, consistent, and plausible findings (an attribute of analytical validity); and, last but not least, an assessment of the overall quality of interpretation and inferences, which is akin to inferential validity (Zachariadis et al, 2013).

In as much as Econometrics seeks to address problems through complex mathematics model construction, for once, it is worthwhile that consideration is given to a reflection in the real world of their existence; in this case, the reality of having to deal with the vagaries of human actions is never held constant, despite the assumption of Ceteris Paribus assumption (Jackson, 2017a). In this vein, one may think that a reflection on Schoonenboom (2017: 1) three existing paradigms for mixed methods research, namely "*dialectic stance, critical realism, and pragmatism*", with their characteristics and limitations should be addressed.

This can also be linked to Arrow's (1986: 5394) critic on his article titled: "*Rationality of Self and Others in an Economic System*"; this addresses lots of critical concerns particular to methodology of economics in general and its sub-set, econometrics and one of such area is concerned with the '*Rational Expectation Theory*' which is more about a stochastic form of perfect foresight. In as much as these views are considered modern with critics also made by Merton (1957), whose critique was raised around the self-fulfilling promise of forecast



methodology by econometricians. Such criticism is also being championed by post-modern critics like Boland (n/d).

## **Conclusion**

In view of the discussion that has emanated from this work, it is worthwhile to note that the works of empirical economics (through its machinery of econometrics) is still highly valued by both traditional and heterodox economists and also, critical policy oriented researchers. The unidirectional approach (empiricist / positivist inclination) that had long been practiced to prove the scientific space of economics is the challenge of its critics (Boland, n/d; Kirman, 1992; Klamer and McCloskey, 1989).

While it is still viewed as necessary to embrace empirical research as part of the subject matter of economics to maintain its scientific tradition, the new era of postmodern tradition have willingly embraced it, but also advocating research connection with the real world (reference to Figure 1). With this, CR as presented here on a competing research paradigm is no enemy to established empirical research work as already pursued in the field of econometrics study, which recognises mixture of qualitative and quantitative approaches, but also ensuring that continuous dialogue remain part of researchers journey, which invariably is sure to bring credibility to research outputs needed for policy formulation in the profession.

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