

## CHRISTOPHER A. SIMS

### Macroeconomics and Reality

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Two main ideas derive from a careful reading of the *Macroeconomics and Reality* study. The former one targets the appropriate nature of the methods used in macroeconomics and how they report to the economic reality. In this direction, Sims' opinion looks radical. The *mentions of the macroeconomic models (variables and equations) should rely on a set of data (empirical approach) or an analytical relation among different variables (theoretical approach)*. Sims explicitly excludes the mentions derived from purely statistical and econometric restrictions or other simplifying presumptions.

The latter has a methodological reasoning. Sims considers that the *unrestricted use of the VAR<sup>1</sup> type models provides superior opportunities of understanding the empirical relations among the macroeconomic variables, compared to the structural models*. Its objective is thus to determine a *coherent and realistic methodology* that will correctly interpret the *empiric relations among the macroeconomic variables*.

In compliance to this idea, the study focuses around two main parts:

- the *analysis of the flaws in the structural models*;
- the *introduction and exemplification of an alternative* that has the potential to overcome the issues that are specific to the structural models.

The flaws in the structural models come from three sources:

- *The imposition of unrealistic restrictions, purely statistical and econometric*, without any empirical or theoretical reasoning: the equation should include *orthogonal error terms*: the *coefficient of the endogenous variables matrix* should be triangular.

– *The inability of the structural models to manage the dynamic relations among the macroeconomics variables*. The dynamic relations are reflected by the presence of the dependent variables that emerge after the independent variables or by the existence of the inter-temporal correlations among the error term<sup>2</sup>. The structural models *imply* that such temporal distances are very well known prior to specifying the model. In reality, the model could be used just to measure the temporal distance between the times when the independent and the dependent

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<sup>1</sup> Vector Autoregressions notion (VARs) is found in the special literature from our country under many forms such as: VAR processes, VAR type models or autoregression models. In our review we will use the VAR type models.

<sup>2</sup>  $e_{t-K}$  error term of the K year is calculated using  $e_{t-K}$ , error term of the year t-K.

variables occur. For Sims, such presuppositions are unrealistic and, implicitly, inadmissible for defining the macroeconomic model.

– *Difficulties related to handling the future values of variables.* Even if Sims accepts the necessity of including a rational behaviour into the macroeconomics models that will derive rational expectancies or forecasting, he opposes to the practices that reduce this principle to *distributed lag* type models.

In the light of the flaws in the structural models, Sims suggests for the second part of the study *an alternative for understanding the empirical relations among the macroeconomics variables*. Particularly speaking, the author supports the idea that the macro-models with a large number of variables should be analyzed:

– *without any restrictions or unrealistic presuppositions* about the temporal distance between the variables occurrence;

– *in a reduced form* and

– *handling all the variables as endogenous.*

For Sims, the use of the VAR models represents the practical solution that meets the exigencies above. The rest of the study exemplifies the use of the VAR type models to analyze the temporal series for six types of data – *the monetary offer, real GDP, unemployment, salaries, prices level and the level of import prices*. Sims' empirical study concentrates on the results but mainly on how the use of the VAR models (non-restricted) solves the flaws of the structural models.

The ideas herein turn Sims' study into an important contribution, both from the *epistemic and methodologic* perspectives. These two angles are examined in detail further on.

*Macroeconomics and Reality* fulfils the requirements imposed by a highly regarded international publication as **Econometrica**. This occurs thanks to the fact that the article transcends the logic of a simple research study, as it is an innovative article (methodologically speaking), whose purpose is to re-establish the macroeconomics practices on relatively new conceptual bases.

Thus, the abstract and the introduction describe the problem in a concentrated form and anticipate the results. Browsing the literature becomes more necessary as the problems in the study target the whole research direction and philosophy, not only the usual unbeaten path. Likewise, the references are completely listed at the end of the article and properly numbered.

The two major objectives of the articles are clearly presented in the introductory paragraphs:

– the argumentation of the idea that the restrictions imposed for identifying the variables and the equations within the structural models are not essential for building a model;

– the presentation and the exemplification of an alternative approach of specifying and identifying a macroeconomic model.

Both objectives have been reached.

The study has a *logic exposition, clear and easy to be followed*. Its logic nature derives from a classical approach of the problem, where the author firstly identifies the issues related to the previous literature, the *flaws in the structural models* and then he provides practical solutions – the *non-restricted use of the VAR type models*. The simplicity of arguments structuring, the paragraphs' ordering are the ones responsible for the manuscript clarity.

*Macroeconomics and Reality* contributes to the literature development in two separate directions. Formerly, as for the science philosophy, Sims includes himself into the category of the authors who are concerned with *empirical and/or theoretical reasons* in defining the macroeconomics models and not only with *purely statistical and econometric* ones. Sims contribution (1980) may be better judged in the light of the previous similar works. Keuzenkamp (2000) considers that the best predecessor of Sims is Liu (1960). The last one thought that the macroeconomic models imposed numerous restrictions, where many of them were the result of statistical definitions and did not originate in a *theory* about the economic reality and the way it operated. Liu's main idea (1960) is that, as long as the purpose of an economic model is prediction and forecasting, the researcher should concentrate upon the *reduced* models, which do not specify other variables than the ones derived from theory. Before Sims (1980), Liu's ideas did not seem to have an immediate impact in the literature. *Macroeconomics and reality* thus brings back many of Liu's ideas, but also a great deal of originality in terms of his ideas statistical operationalization. The non-restricted use of VARs is the latter direction for Sims' contribution, which proves in fact its novelty.

The innovative elements of the article are the original ones. Per our opinion, the *Macroeconomics and Reality* article may be classified in the category of the studies that combine *consecrated techniques of analysis*. As said earlier, Sims' project or vision does not aim to methodologically revolutionize the macroeconomics science, but rather to settle it on solid epistemic bases.

This is why Sims' purpose is to use the methodological tools already in use, in order to grasp the epistemic subtleties of his project.

As a matter of fact, after circa 15 years, Sims was explaining his methodological ideas in another famous article, *Macroeconomics and Methodology* (1996). In other words, without being too methodological, *Macroeconomics and Reality* uses already consecrated techniques (e.g. VAR – vector auto-regression) in order to support and demonstrate ideas that are more important and logical compared to the methodological ones, i.e. *epistemic* – ideas that express the way how the econometric techniques grasp (or not) the subtleties of the economic realities.

In our opinion, the relevance of the study methods derives from the possibility of their use or implementation in the *decision-making act* and

*establishing the macro- or micro-economic policies.* On the other hand, the *quality* of the methods is given by the ability of the model to provide *solid* and trustworthy results. We will give below a short analysis of the two aspects.

Generally speaking, an econometric model may be used within the decision-making process or establishing the macroeconomic policies in at least two ways: (a) the use of the model for forecasting and (b) the use of the model to handle certain macroeconomic variables. In other words, a model can have at least two functions: a *forecasting* function and a *control* function.

The *forecasting function* involves not only the study of the *statistical association* between two variables (the dependent and the independent variables) but also the prediction of the former one based on the values of the latter. The *control function* goes beyond the statistical association and implies the existence of a *causality relation* between the two variables. Thus, if  $x$  causes  $y$ , then variable  $y$  may be handled by *controlling* its cause, or the variable  $x$ .

Sims' study (1980) exclusively refers to the forecasting function of the macroeconomic models; his paper is as explicit as relevant for the decisional process and of the one that sets up the economic policies: *as long as an econometric model is being used from forecasting reasons, then the model has to use a reduced form, which only utilizes independent variables, data-determined or derived from the theory underlying the model.* The specifications that result from statistical and econometric compromises are not admitted. As earlier said, the same idea had been suggested two decades before by Liu (1960). The merit attributed to Sims is that he has recommended the combination of certain traditional methods (eg., auto-regression vector) and their use in a special way (eg., with no unrealistic restrictions), in order to avoid any issues related to the statistical stiffness (for eg., the issues that are linked to the variables dynamics). Hence, from the solid nature of the results we will have the *quality* of the Sims' methods. Him and his study are granted with consideration since he has supported a subtle and demanding epistemic position, such as the *determination of the macroeconomic model in an empirical or theoretical manner, with no technical simplifying and fully unrealistic technical compromises.* And his advantage is that the staging of this idea enjoys a *rigorous methodological manner* but still traditional, which does not involve but the skilful use of the already known econometric techniques.

In a nutshell, *Macroeconomics and Reality* represents the classic example of a study that excels both in the *relevance of the presented idea* and also in terms of the *methodological consistency.* We do not think that we exaggerate by saying that only a few authors and studies in the field have ever reached such excellence standards.

As far as the organization, presentation, grammar and style, they are all impeccable and suitable for the exigency criteria formulated by **Econometrica**

editors. From the perspective of language, we notice two essential aspects. Formerly, we think that the language is appropriately used. Sims' ability to optimally combine the *technical language* (absolutely necessary to avoid ambiguities) with the *usual language* that makes the reading easier and the manuscript more legible and, thus, more accessible. The short and precise sentences also contribute to the improvement of the text accessibility and understanding. Latterly, we should notice the regular use of the sophisticated mathematical tools. Thus, the author does not spare anything in terms of notation and formulas. This decision has been made in light of the tensions between the number of potential readers and the message accuracy. Apparently, Sims' decision to sacrifice the interest of the non-specialist readers to favour the *accuracy, precision and validity of the scientific message*. But Sims does not overdo this language, as most of his ideas are expressed in a clear and simple English, which does not exclude but address to both the expert and the non-specialist. Even if the expert is privileged, the message can be still understood by an outsider, as the paper does not require a prior knowledge of the methodological subtleties, but a minimum in terms of empirical-type research.

As a conclusion, our overall opinion is that the presentation, grammar and style in the *Macroeconomics and Reality* study do not reach extremes. Subject to purely economic thinking, Sims seems to have found the *balance* between the complexity (which gives the accuracy to the text) and the language simplicity (which makes the paper accessible to a wider range of readers). It is worthwhile mentioning that this balance will be lost in the 1996 article, *Macroeconomics and Methodology*; here, Sims completely drops the mathematical models to more clearly and precisely explain to a larger number of readers the subtleties of the relation between the *economic reality, theory and methodology*.

At first, we notice the absence of the key words – easy to explain as **Econometrica** does not have the habit in enumerating the key words. The title of the study includes two terms (*macroeconomics* and *reality*) – even if they do not have a technical equivalent, they anticipate the content of the article – the *link between the macroeconomics and the economic reality under study*.

Another observation, quite interesting from the deontology perspective, is in Keuzenkamp (2000). This one states that the title of *Macroeconomics and Reality* originates in the chapter 5 of Robbins' paper (1932) *Economic Fluctuations and Reality*; this paper is surprisingly absent from Sims' references list (1980). The reason would be that Sims' vision goes further than Robbins'. Thus, Keuzenkamp (2000) states that, while Robbins is a full sceptical being, rejecting the econometry in its entirety, Sims (1980) denies the econometric practices of his time but, instead, suggests a remedy. Thus, besides the similarities in the title (which Sims might have used on purpose), the two studies are completely different.

On the other hand, the impression left by Sims' manuscript (1980) is that of a deeply deontologic paper, where the contributions of the before authors are acknowledged and explicitly mentioned both in the text and in the references list at the end of the study. As a matter of fact, such attitude is characteristic to the greatest research schools and University of Minnesota (Sims was teaching there) could not be an exception from the rule.

As for the constructive suggestions for improving the article, the limited relevant experience in research in general and macroeconomics in particular will obviously stop us from formulating concise and pertinent recommendations. Studies like Runkel's (1987) is one of them. We somehow dare to suggest that lack of concession vis-à-vis the use of the mathematical tools will reduce the number of possible readers.

We consider that a *softer* version of the article, where ideas get a less formal presentation would be more useful for training the young PhD candidates. Even if we are aware that the mathematical tools are required to provide the precision and accuracy of the scientific side, we believe that a less formal version would better help the young researchers. Such an approach would give a simple and clear representation about the *empirical research*, about the *identifying of a macroeconomic model* and, lastly, about the subtleties in the relation among *reality, data, theory and method*.

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