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## **Making Macroeconomics a More Exact Science**

By David Chester

Macroeconomics today is treated inexactly within the humanities, because at a first look it appears to be a very complex and easily confused matter. But this does not give it fair justice, because we should be trying to find an approach to the topic and examine it in a better way that avoids these problems of complexity and confusion. Suppose we ask ourselves the question: how many different kinds of financial (business) transaction occur within our society? Then the simple and direct answer shows that that only a limited number of them are possible or necessary.

Although our sociological system comprises of many millions of participants, to properly answer this question we should be ready to consider the averages of the various kinds of activities (no matter who performs them), and simultaneously to idealize these activities so that they fall into a number of commonly shared ones. This employs some general terms for expressing the various types of these transactions, into what becomes a relatively small number of operations. Here, each activity is found to apply between a particular pair of agents—each one having individual properties. Then to cover the whole sociological system of a country, the author finds that it requires only 19 kinds of exchanges of the goods, services, access rights, taxes, credit, investment, valuable legal documents, etc., verses the mutual opposing flows of money. Also these flows need to pass between only 6 different types of representative agents.

The analysis that led to this initially unexpected result was prepared by me, the author, and it may be found in my working paper available on the internet as *Einstein's Criterion Applied to Logical Macroeconomics Modeling* (SSRN 2865571). In this model these 19 double flows of money verses goods, etc., are shown to pass between the 6 kinds of role-playing entities. Of course, there are a number of different configurations that are possible for this type of simplification, but if one tries to eliminate all the unnecessary complications and sticks to the more basic activities, then these particular quantities and flows provide the most concise result, which is presentable in a comprehensive and seamless manner, and one that is suitable for further analysis of the whole system.

Surprisingly, past representation of our sociological system by this kind of an interpretation model has neither been properly derived nor presented before. Previously, other partial versions have been modeled (using up to 4 agents, as by Professor Hudson), but they are inexact due to their being over-simplified. Alternatively, in the case of econometrics, the representations are far too complicated and almost impossible for students to follow. These two reasons of over-simplification and of over-complexity are why this non-scientific confusion is created by many economists and explains their failure to obtain a good understanding about how the whole system works.

The model being described here in this paper is unique, in being the first to include, along with some additional aspects, all the 3 factors of production, in Adam Smith's *Wealth of Nations* of 1776. These factors are Land, Labor and Capital, along with their returns of Ground-Rent,

Wages and Interest/Dividends, respectively. All of them are all included in the model, as a diagram in the paper.

Economics' historians will recall, as originally explained by Adam Smith and David Ricardo, that there are prescribed independent functions of the land-owners and the capitalists. The land-owners speculate in the land-values and rent it to tenants, whilst the capitalists are actually the owners/managers of the durable capital goods used in industry. These items may be hired out for use. Regrettably, for political reasons, these 2 different functions were deliberately combined by John Bates Clark and company about 1900, resulting in the later neglect of their different influences on our sociological system-- the terms landlord and capitalist becoming virtually synonymous along with the expression for property as real-estate.

The diagram of this model is in my paper (noted above). A mention of the related teaching process is also provided in my short working paper *A Mechanical Model for Teaching Macroeconomics* (SSRN 2600103). With this model in its different forms, the various parts and activities of the Big Picture of our sociological system can be properly identified and defined. Subsequently by analysis, the way our sociological system works can then be properly seen, calculated and illustrated.

This analysis is introduced by the mathematics and logic that was devised by Nobel Laureate Wassily W. Leontief, when he invented the important "Input-Output" matrix methodology (that he originally applied only to the production sector). This short-hand method of modeling the whole system replaces the above-mentioned block-and-flow diagram. It enables one to really get to grips with what is going-

on within our sociological system. Subsequently it will be found that it is the topology of the matrix which actually provides the key to this. The logic and math are not hard and is suitable for high-school students, who have been shown the basic properties of square matrices.

By this technique it is comparatively easy to introduce a change to a preset sociological system that is theoretically in equilibrium (even though we know that this ideal is never actually attained--it simply being a convenient way to begin the study). This change creates an imbalance and we need to regain equilibrium again. Thus, sudden changes or policy decisions may be simulated and the effects of them determined, which will point the way to what policy is best. In my book about it, (see below) three changes associated with taxation are investigated in hand-worked numerical examples. In fact when I first worked it out, the irrefutable logical results were a surprise, even to me!

Developments of these ideas about making our subject more truly scientific (thereby avoiding the past pseudo-science being taught at universities), may be found in my recent book *Consequential Macroeconomics—Rationalizing About How Our Social System Works*. Please write to me at [chesterdh@hotmail.com](mailto:chesterdh@hotmail.com) for a free e-copy of this 310 page book and for additional information.