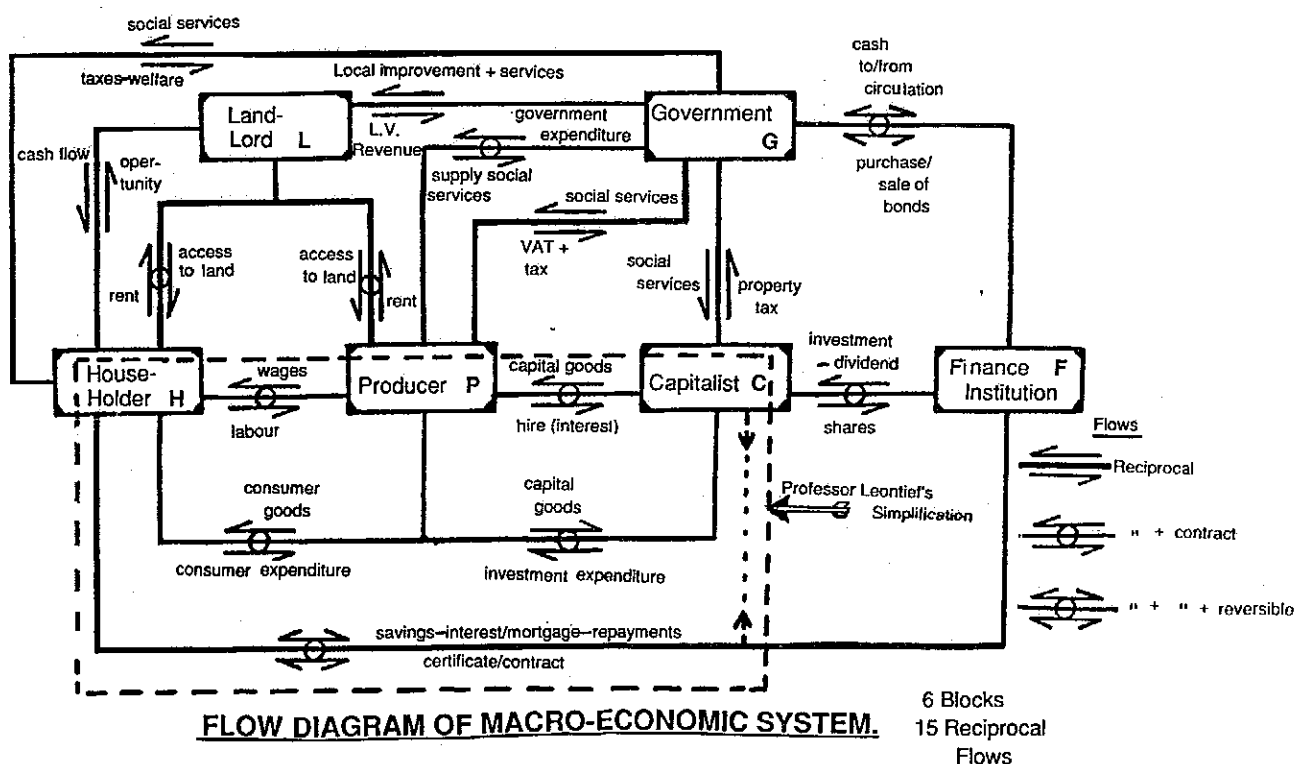


A Macro-Economic Model By DAVID CHESTER (Petach Tikva, Israel)

It is a curious fact of nature that whenever we begin a train of thought we are bound to model the subject of these thoughts in our mind's eye. Usually, for simple subjects, this technique is successful and the ensuing conversation is satisfactory. But with more complex subjects, the model that each person builds for himself will be different, less distinct and tend to mutate so that the resulting communication will eventually break down. These kinds of difficulties are frequently experienced by technical people due to the nature of their subject matter. They overcome this obstacle by visual modelling that commonly takes the form of sketches and diagrams.

This difficulty exists in economics, too, which is justly regarded as a complex subject. Examination of current text-books in economics and macro-economics show an amazing dearth in the genuine use of such aids to identify and describe the structure of the system. The block and flow diagram below is intended to model the general closed* macro-economic system that I reckon we should envisage here. Space does not permit a list of definitions or a description of the many considerations and assumptions that led to this particular model or of much of what can be derived from it, although it is well worth careful study for these implications.



The following fundamental topics contain the essence of this approach:

1. We are dealing with aggregate or average properties and characteristics of the various parts of the system. This is associated with omission of certain details but permits the idealization mentioned below.
2. The 6 blocks contain entities that embody only the major characteristics or idealized functions of the elements of the macro-economic system. For example, an actual "producer" includes in his make-up a proportion of "capitalist", "land-lord" and other entities. (Rules that specify these "recipes" can readily be

*i.e., without international trading or currency exchange.

constructed using matrix mathematics.) But we choose to accentuate the entities as "ideals" for clear identification and understanding of their basic relationships.

3. Between the 6 blocks there are 15 mutual or reciprocal flows. For each, money passes in one direction in return for a goods item, service, document or other worthwhile provision. Two of the flows to the "financial institution" are reversible, all of the others are possible only in the directions indicated.

4. 10 of the 15 mutual flows are the result of contractual agreement between the entities. It is the other 5 flows that are particularly of interest with respect to ethics, government and society and the practice of law and order.

The simple input/output calculations for the manufacturer that were described in my previous article ("The Need for Precision," GJ No. 54) can be determined by using the area in this diagram that is enclosed by the dotted line. This implies:

a) There also exists a set of equations that can be obtained from the full diagram, which will provide a numerical analysis of the whole system.

b) We can now easily appreciate the simplification adopted by Prof. Wassily Leontief in his treatment of macro-econometrics, in the article in Scientific American of June 1985 (mentioned in my previous article).

For an institution that has stated its aims to include education in economics, this method of visualization has great value and it should be incorporated into our Georgist teaching techniques. Discussion of the model is invited.

(My thanks to Oscar B. Johannsen for pointing out in GJ No. 55 the error in equation 2 in my GJ No. 54 article. In the last equation in that article, an additional error resulted in a "D" being printed instead of a "p". - D.C.)