

# “Finding Equilibrium”—Losing Economics Comment on the Book *Finding Equilibrium* by Düppe, T. and Weintraub, E. R.\*

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## Introduction

The main achievement of modern General Equilibrium Theory (GET) is the proof of equilibrium’s existence. “The proof of general equilibrium is the crowning achievement of mathematical economics” [1] [2]. One of the authors of “Finding Equilibrium”, Weintraub Roy, published three books [3]-[5] and many papers over 30 years, to demonstrate and convince economists that economics were becoming a mathematical science and “These proofs became highly influential” ([5], p. xii). It might be that the proof of the equilibrium existence is a mathematical achievement, but the question is whether these proofs are harmonious with the economic situation in reality.

The classics (Smith, Ricardo, and Marx) and Walras stated that theory has to be as close to economic reality as possible. It is clear that theory cannot be a replica of real world. Hence, there will always be some assumptions, due to simplification, which bring about theory that exists in a relevant real-world conceptual framework. Walras’s economic theory, despite some of its assumptions (free competition, uniformity of prices for commodities and factors, fixed coefficients of production and so on), was relevant in his time. Because his economic theory was characterized by a genuine linkage between micro (individual) economics and macro (whole) economics, the positiveness of all prices, unemployment (voluntary) of service and so on. At the same time, Walras indicated that imperfect competition (e.g., monopoly), price and wage discrimination, international trade and an increased public sector also characterized the modern real world.

Scientific approach is also characterized by evolutionary approach. The evolutionary approach means compatibility between progress of human society and economic theory. This means that paradigms must be replaced accordance with changes in economics, such that there has to be compatibility between them.

Instead of gradually updating the Walrasian assumptions and extending his theory by introducing mixed (free and imperfect) competition, price discrimination and international trade and taxation, modern general equilibrium theory has retained almost all of Walras’s assumptions. Moreover, it introduced an additional unrealistic

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assumption (*vide infra*); but in this case, such a theory contradicts reality. Therefore, the proof of the existence of equilibrium's state is considered as the main achievement of modern GET, as it was mentioned above, is not useful and meaningless. In addition, modern scholars have been stating that the above-mentioned contradiction between theory and reality is inherited from the Classics and Walras. But this statement has no real basis [6]-[8]. Modern mathematical models of economics and financial sectors are generally separated and are very complicated but majority of them are weakly connected with reality, especially modern general equilibrium theory [9]-[12].

So, instead of gradually updating some of the Walrasian old-fashion assumptions by new ones that are compatible with contemporary economics, modern general equilibrium theory has been rediscovering and using almost all of Walras's assumptions; moreover, new, unrealistic assumptions were introduced, making modern economic theory incompatible to reality. Post-Walras's economists ignore Walras's less known assumptions and blame him for disregarding the problem of equilibrium existence, uniqueness, stability and comparative static. Therefore, their main objective since the beginning of the 20<sup>th</sup> century was the rigorous proof of equilibrium existence. However, this proof was based on unrealistic assumptions and along the road *the goal of economics was lost*. The nine crucial, unrealistic assumptions will be considered and will illustrate that not only is modern general equilibrium theory irrelevant to real economics, but that it is also far removed from Walras's general equilibrium theory.

1) *Price of several goods and services might be equal to zero and even might be negative.*

Post-Walras's authors misunderstood Walras's method of equilibrium establishment, namely that Walras used two macro model (equilibrium and disequilibrium) and demonstrated how disequilibrium model is transformed into equilibrium model by iterative process (*tâtonnement*) if it exists and by this achieve the solution; blamed him as if he considered only equilibrium model, characterized by equations system with equality [13]-[17]. Therefore, they substituted the effective supply of factors by their available quantities and the cost of production by the given selling prices of commodities in the Walras's equations of quantities of services and of prices of commodities, respectively. Then, the demand quantities for services by sectors of production and prices of services became unknowns.

Yet, the proofing of equilibrium existence is based on two unrealistic assumptions: first, *free good conception (non-classical)*.

This assumption tells us that when there is an excess supply of a service (a product), *i.e.*, an unused part of the service (the good), it is called "free good" (mockery to the Classical free goods conception) and its price equals zero. In other words, in equilibrium, if a certain service is not fully employed, then its price is zero. For example, if unemployment exists, then wages should be equal to zero [8] [18] [19]. But in this case, such a theory contradicts reality (*vide infra*).

Free goods rule (conception) (non-classical) is based on the replacement of the cause (good is being in abundance without any expenditures—like the goods of Nature) by the effect (its price is equal to zero). According to this conception, together with other assumptions, the equilibrium price of some goods and services, specifically when these are in excess supply, is equal to zero. For example, in an equilibrium situation, with high unemployment, wages have to be equal to zero. However, such wages contradict the real facts of economics. Therefore, the modern general equilibrium theory is inapplicable to the real world, and its main achievement of proving the equilibrium existence, once it is based on these assumptions, becomes completely not useful and meaningless.

It must be stressed that the same situation is observed to Keynes's investment multiplier [11] [20] [21]. The Keynesian multiplier is based on the substitution of the cause (the national income) by the effect (investment). By Keynes's definition, the multiplier must mean that an increment of the investment in a certain time would yield an increasing income by the multiple it of multiplier, in the future. Yet, the rate of the multiplier depends on the marginal propensity to invest (or the marginal propensity to consume) and the lower (or higher) the latter, the higher the multiplier. Consequently, in order to *increase income, it is better to consume than to save. So individuals were encouraged to spend on consumption and not save*. Therefore, for the last twenty years, the average propensity to invest in the United States was decreased and reached 0.04, which means that the multiplier have to be equal to 25. *This is unreal (!)*; and this is one of crucial reasons of the contemporary financial-economic crisis [20] [21].

Second, "Walras' Law", formulated by post-Walras's economists, is one of the crucial assumptions of the MGET and differs essentially from Walras's original laws [19]. Moreover, it is an intermediate stage of Wa-

Walras's own laws. The "Walras' Law", unfortunately, has replaced Walras's original laws, subsequently; the latter have become relatively unknown and abandoned [22]. *The thought of an "alternate" to Newton's laws coexisting with the original is ludicrous, yet in economics such anomalies are common place.*

The results of the solution of such equations system by the tools of mathematics are that some prices of services might be zero and even negative [23] [24]. Some economists accepted that prices might be zero but disagreed that the price might be negative. Therefore, in order to eliminate such possibilities, the equality was replaced by inequality. Unfortunately, this replacement caused another difficulty, and it yielded the following unrealistic assumption. Whilst, according to Walras's approach, all prices are strictly positive.

2) *Measurement of prices.*

In modern GET measurement of prices is unclear, because those prices are obtained by the model's solution directly, and not determined by means of the *given framework* of demand function for goods and supply functions of services where prices are measured in *numéraire* (money commodity) as in Walras's Theory. Moreover, prices might reach any magnitude, and some prices might be zero. Therefore, prices in the Arrow-Debreu model do not have any connection to current prices. Moreover, it was recently suggested that shadow prices (Lagrange multipliers) have been using as prices even for practical applications of input-output analysis ([25], p. 15). Such statements mean a regression of economic science at least fifty years.

3) *All economic agents (consumers and producers) are concentrated in one whole model.*

This type of model, when all economical agents are included (comprised) in one model, differs from Walras's model where each economic agent (consumers and producers) solves his economic problems individually (separately), depending only on his personal goals (maximum utility, or maximum profits, and so on) by micro model; afterward, the adjustment between these individual solutions occurs by the macro model. In other words, the process is divided into two stages: individual activities and the adjustment between them, *i.e.*, establishment of equilibrium. It must be stressed that this approach is based on real economics and therefore, there is a natural integration between microeconomics and macroeconomics. In the case, when all agents included in one model, the solution of individuals' economic problems and their adjustment (equilibrium establishment) has simultaneously occurred. This approach has two problematic issues: firstly, since models of all individuals are solved together, it is natural that an interpersonal comparison of their goals (utilities) occurs; secondly and most importantly, such model has huge dimensions, which makes its practical realization (solution) impossible even by means of the modern superpower computer.

4) *Unemployment.*

*The modern general equilibrium theory is not able to discuss problems of employment-unemployment, because that the excess demand (supply) for goods and services is determined as a difference between the final endowment and the initial (available) endowment.*

Such determination of the excess demand (supply) has some negative consequences from the point of economics. First, the demand and supply are not directly determined; therefore, there is illusion that as if the whole available quantity of commodities and services are traded. Consequently, second, it is not clear what part of commodities and services is actually traded and what part is not traded, that is, what part is unemployed (unsold). Finally, despite of that the excess demand is sometimes determined as a function of prices, the original linkage between prices and quantities is destroyed.

While, in Walras's approach, *there might be voluntary unemployment; moreover, according to Walras's approach it also might be considered as "forced unemployment"*.

5) *There is only one type of money—fiat money.*

In the modern general equilibrium theory, money either disappeared or is considered in very simplified form with unrealistic assumptions. Classics, who considered money theory as an essential and inseparable part from economic theory, have discussed their reciprocal influence. One of Walras's major and unique contributions is the integration of his money theory into his general equilibrium theory which enabled him to consider the real economic and financial sector as one integrated system [26]-[28].

Majority of economists since Pareto, unfortunately, misunderstood and misinterpreted Walras's general equilibrium theory, especially, theory of money, and have been claiming that Walras's theory is both incomplete and even wrong [8], or that the problem of money is not discussed by him at all. Economists, who realized that Walras discussed the problem of money in his theory, are claiming that he failed in the integration of money in his general equilibrium theory. Therefore, they have been attempting to reconstruct and rewrite it. Moreover, from the very beginning, Walras's money theory is simply ignored.

Crucial attribute of Walras's money theory, which was completely misunderstood and was absolutely given up, yields serious confusion: it is the fact that Walras as well as Smith considered two types of money: money as a medium of exchange, a measure of value and store of value where the money commodity (*numéraire*) has to be served and money for circulation where either the money commodity (*numéraire*) or fiat money might be served. Thus, there are two different prices for the money commodity: 1) when money commodity is used as a measure of value, its price equals to one; 2) when money commodity is used in circulation, its price equals to the rate of interest.

In contrast, in the works of most post-Walras's economists, the economic and financial sectors are separated, and their authors have been claiming that money commodity (*numéraire*) is not money ([29], p. 3).

Therefore, is not accidental that post-Walras's money theory is generally considered one type of money—fiat money. So, from the seventies, the majority of countries of the world used a fiat money as standard money; fiat money replaced the money commodity and had to fulfill all four functions of money. But this is opposite with the principal statement of classical money theory that only money commodity have to serve as a measure of value, and fiat money has to be only used in circulation. Moreover, the quantity of fiat money must be regularized by the quantity of the money commodity.

The replacement of the money commodity by the fiat money has yielded several undesirable phenomena, predecessors of the financial bubbles. First, because the fiat money has no objective value, economics is managed without valuating of goods and services. Second, because there is only one type of money, namely fiat money, there is only one price—the rate of interest and the price of the money commodity is absent. Therefore, this is another reason why fiat money cannot be served as a measure of value. Third, there are no obstacles and no limit to printing paper money [18] [20] [21].

Walras emphasized the specific role of money in distortion of general equilibrium because that changing of price of money impacts directly on prices of almost all products and services. Hence, changing price of money yields changing prices of products and the result is a disorder of equilibrium, *i.e.*, economic crisis. In the case of deep crises, Walras recommended that the State should intervene and regulate the quantity of money [28].

#### 6) *Saving and Investment.*

Modern GET does not discuss the issue of saving and investment at all, while Walras discussed this issue in detail in his third economy, "Capital Formation and Credit".

#### 7) *Cost of production.*

One of central conditions of equilibrium is equality between the selling prices of goods and its cost of production (supply price) in the Arrow-Debreu approach cannot be kept, because the cost of the production of goods is directly not determined; because of this, it is important that not only the price of some goods might be equal to zero, but also the price of some services might be zero. While, according to Walras's approach, this condition of equilibrium is established by iterative process (*tâtonnement*) between cost of production and selling prices of goods.

#### 8) *Utility function.*

The utility function for each household is described as a function of all goods and all services in one function simultaneously, which is problematic if not impossible from the point of real economics. This is opposite to Walras's approach where utility function is described for each good separately.

#### 9) *Circulation capital, products and money.*

The problems of circulation capital, products and money are not discussed by the modern GET; while, Walras realized the property of money, as a service, entirely in the last economy, Circulation and Money, where money is also used as a service of circulation. This means that in the calculation, in the equation of the cost of production of the produced goods, the price of a certain product used as a circulation capital is determined as a price of product in question multiple a price of money's service, the rate of interest.

So, three crucial fundamental differences between Walras's and modern economists' approaches were discussed and demonstrating the latter to be incompatible with hypothetical economics whilst the first applies well to its era's reality.

First, Classics assumed that the theory have to be close to reality but never be its copy. For example, Walras stated that in reality, general economic equilibrium can never be achieved but his theory illustrates how it might be established. On the other hand, modern authors have not merely assumed that theory may diverge from reality, they've taken it to the extreme: "the more significant the theory, the more unrealistic assumptions". In the paper nine unrealistic and incorrect assumptions are considered.

Second, using of mathematics in economic theory, Walras was the first who used mathematics to describe interdependence among various parts of whole economy. His use of mathematics is both effective and impressive, and is based on the latest achievements of his time while trying to explore a new direction. This is opposite of the modern mathematician economists asserting that Walras's mathematics is "primitive, clumsy, dubious, and even incorrect".

Whilst, modern mathematical models of economics and financial sectors are very complicated, however, the majority of them weakly connected with reality. It was shown that modern general equilibrium theory (Arrow-Debreu) used several unrealistic assumptions; hence, its incompatibility with reality is clear.

Finally and perhaps most importantly, the "Walras' Law", formulated by post-Walras's economists, is one of the crucial assumptions of the MGET and differs essentially from Walras's original laws. Moreover, it is an intermediate stage of Walras's own laws. The "Walras' Law", unfortunately, has replaced Walras's original laws; hence, the latter have become relatively unknown and abandoned. *The thought of an "alternate" to Newton's laws coexisting with the original is ludicrous, yet in economics such anomalies are common place.*

To sum up, the modern economic theory, based even if on one of above mentioned unrealistic assumptions, is incompatible with reality; hence, its applicability is doubtful, though from the point of view of used mathematics it might be indeed remarkable achievement. In practice, several unrealistic assumptions are simultaneously used by the modern economic theory for the serious issues. Therefore, we can conclude that the Arrow-Debreu general equilibrium model is irrelevant to real contemporary economic life.

Finally, tremendous intellects sources of several generations of economists with enormous financial outlay have been wasted for more than 100 years on the subject that is not useful and meaningless for practical recommendations.

So, the time to wake up!

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