Objective Principles of Economics

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Abstract

Economists have the habit of solving the wrong problems. They speculate circumstantially about the behavior of agents and do not come to grips with the behavior of the monetary economy. This is the consequence of the methodological imperative that all explanations must run in terms of the actions and reactions of individuals. The critical point is that no way leads from the understanding of the interaction of the individuals to the understanding of the working of the economy as a whole. The solution consists in moving from subjective-behavioral axioms to objective-structural axioms, i.e. from past to future.

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1 Solving the wrong problem

> "The physicists were shocked at the assumptions the economists were making – that the test was not a match against reality, but whether the assumptions were the common currency of the field. I can just see Phil Anderson, laid back with a smile on his face, saying, 'You guys really *believe* that?'"
> The economists, backed into a corner, would reply, "Yeah, but this allows us to solve these problems. If you don't make these assumptions, then you can't do *anything*."
> And the physicists would come right back, "Yeah, but where does that get you – you are solving the wrong problem, if that's not reality." (Waldrop, 1993, p. 142), original emphasis

What happened in the 1990s at the Santa Fe Institute was not the first memorable strange encounter of economists and physicists/mathematicians. It is a déjà vu from the earliest days of standard economics.

> Walras approached Poincaré for his approval. ... But Poincaré was devoutly committed to applied mathematics and did not fail to notice that utility is a nonmeasurable magnitude. ... He also wondered about the premises of Walras's mathematics: It might be reasonable, as a first approximation, to regard men as completely self-interested, but the assumption of perfect foreknowledge "perhaps requires a certain reserve." (Porter, 1994, p. 154)

Science is a trial-and-error process. Economists have tried, but the standard approach has failed. This far, observers with an understanding of what science is all about are agreed.

> The economists of the twentieth century, by pushing the neoclassical model to its logical conclusions, and thereby illuminating the absurdities of the world which they had created, have made an invaluable contribution to the economics of the coming century ... (Stiglitz, 1991, p. 136)[1]

It is an additional indication that the shelves crack under the number of books with titles like: What went wrong with economics? The diagnoses, not surprisingly, differ widely. What, then, went actually wrong?

Here is the answer in the paradigmatic nutshell. Ask a representative economist: When will a blackberry picking boy stop picking and eating?, but do not tell him in

[1] See also (Hahn, 1981, p. 1036), (Blaug, 2001, p. 160), (Rosenberg, 1994, pp. 216-217), (Mirowski, 1995, p. 389)

advance that the answer should consist in a concrete number of minutes. He will come up with the following answer:

> Equilibrium is reached when at last his eagerness to play and his disinclination for the work of picking counterbalance the desire for eating. The satisfaction which he can get from picking fruit has arrived at its *maximum*: for up to that time every fresh picking has added more to his pleasure than it has taken away; and after that time any further picking would take away from his pleasure more than it would add. (Marshall, 1920, V.II.1), original emphasis

Marshall seems to have an explanation – the key words are equilibrium, satisfaction and maximum – but he cannot utter the number of minutes. In fact, what he says with so many words is that the boy stops picking and eating when he stops. Marshall has nothing concrete to say about the duration of the picking, but he asserts that it will end at the optimal moment. This is a tautological add-on that is compatible with any outcome. The empirical questions about the measurable picking time and the measurable quantity of berries are evaded. Nonentities abound. Pleasure is not measurable but we are told that it is at maximum. Here we are at the critical juncture. It is not about berries, of course, it is about method. The method cannot, in principle, yield any concrete conclusion. Surely, one can talk about an economic puzzle, but one cannot solve it. The moment Marshall's account is accepted as contribution to a scientific discourse, things go down the wrong track. And indeed, this is what happened. Standard economics is psycho-sociological filibuster without definitive results. It assumes three forms: vernacular, geometrical demonstrations, and formalist-school mathematics (Debreu, 1959, p. x). The form is of no great importance, the working of the economy remains unexplained under each description.

To be sure, no scientist ever has nor ever will accept this problem shift (Benetti and Cartelier, 1997, p. 204), (Mirowski, 1995, p. 357). Marshall's berry picker epitomizes the vacuousness of conventional economic explanation. From the berry picker episode the way leads straight to partial supply-demand-equilibrium and then to general equilibrium. Things do not improve on the way. From Jevons, Marshall, and Walras onwards economists have answered the wrong question (Hahn, 1980, p. 127). They and their successors have taken the role of the Ptolemeans in the unfolding history of economic thought.

There are, of course, economists who came up with the right conclusion.

> There is another alternative: to formulate a completely new research program and conceptual approach. As we have seen, this is often spoken of, but there is still no indication of what it might mean. (Ingrao and Israel, 1990, p. 362)
>
> Yet most economists neither seek alternative theories nor believe that they can be found. (Hausman, 1992, p. 248)

The incapacity to think of an alternative approach explains the secular stagnation of economics at the proto-scientific level (Quiggin, 2010). Ptolemean progress consists of putting just another epicycle on top of an already awkward construct.

2 The problem with savants

> These savants, as Galileo put it, first decided how the world should function in accordance with their preconceived principles. ... He openly criticized scientist and philosophers who accepted laws which conformed to their preconceived ideas as to how nature must behave. (Kline, 1982, p. 48)

A theory is a logical edifice built on premises. The premises relate to reality but are not in a simple correspondence determined by it. Premises are selected and formally laid down as foundational propositions or axioms. There are no rules or fixed criteria for the selection of axioms.

> What are the propositions which may reasonably be received without proof? That there must be some such propositions all are agreed, since there cannot be an infinite series of proof, a chain suspended from nothing. But to determine what these propositions are, is the *opus magnum* of the more recondite mental philosophy. (Mill, 2006, p. 746)

Yet there is no arbitrariness either. First, the set of axioms has to be consistent. Second, Occam's razor applies not only in physics but everywhere:

> No more cause of natural things should be admitted than are both true and sufficient to explain their phenomena. (Newton, 1999, p. 794)

Most important of all, outside pure mathematics a set of axioms must have testable implications.

> Whether an axiom is or is not valid can be ascertained either through direct experimentation or by verification through the result of observations, or, if such a thing is impossible, the correctness of the axiom can be judged through the indirect method of verifying the laws which proceed from the axiom by observation or experimentation. (Morishima, 1984, p. 53)

Simplicity and transparency are highly valued properties of foundational propositions because they are the most effective prophylaxis against the unnoticed introduction of additional and potentially unacceptable assumptions. The core premise of standard economics is not transparent but a hotbed of hidden assumptions.

> There is in economics, or at least among the overwhelming majority of its disciples, broad agreement as to what represents the corpus of their subject. This corpus revolves around the concept of maximizing behaviour, whether it be by the individual, firm or institution. (Blaug, 1990, p. 209)

The assumption of profit maximization, for one, necessitates a couple of further assumptions. And here serious problems arise. The firm must be formally endowed with a production function. This function must have very specific formal properties. One of them is decreasing returns. Thus, we start with a behavioral assumption and end with an assertion about the physical reality of production (cf. Mirowski, 1995, p. 328).

This, clearly, is methodologically inadmissible. Reality cannot be molded to make a behavioral assumption applicable. It is just the other way round, behavioral assumptions must take physical laws into account. This has profound consequences for theory building, to wit, it prohibits assumptions like foreknowledge or simultaneous adaptation, among others. It is widely known that economic models need not be realistic in the descriptive sense. Idealizations and simplifications are legitimate. This, however, does not imply that physical laws can be ignored or simplified away. An economic model that is not physically feasible is worthless. Most models are.

In order to be applicable, the profit maximization assumption presupposes decreasing returns. But increasing returns must not be ruled out *a priori*. They are real since Adam Smith's pin factory. It is an empirical question, not to be answered by introspection, in how many cases returns increase or decrease. Hence profit maximization cannot be accepted as a general behavioral maxim. If at all, it can work only under very special conditions. Claims of generality are therefore unwarranted. In the worst case, the conditions define an empty set.

Two things can happen vis-à-vis a conspicuous disharmony between theory and reality: either the set of foundational assumptions is adapted or the perception of reality. The probability of the first alternative is low, because 'a new idea is extremely difficult to think of' (Feynman, 1992, p. 172), the probability of the second alternative is correspondingly high.

> "So, Brian, what are you working on these days?" Arthur had given him the the two-word answer just to get started: "Increasing returns." And the economics department chairman, . . . , had stared at him with a kind of deadpan look. "But – we know increasing returns don't exist." "Besides," jumped in Rothenberg with a grin, "if they did, we'd have to outlaw them!" And then they'd laughed. (Waldrop, 1993, p. 18)

The problem with savants is that they habitually try to adapt reality to 'their preconceived principles' and that they laugh at the wrong things (Viner, 1963, p. 12).

3 The problem of getting off on the right foot

> By definition, the hard-core propositions are taken to be true and irrefutable by those who adhere to the program. "Taken to be true" means that the hard-core functions like axioms for a geometry, maintained for the duration of study of that geometry. (Weintraub, 1985, p. 147)

It is certainly in order that adherents to a program regard their premises as true and irrefutable and stick to them for the duration of their study. It cannot be otherwise and it makes no difference for the acceptance or nonacceptance of an approach. The only valid criteria for theory assessment are logical and material consistency (Klant, 1994, p. 31). Problems arise only with the adherence to assumptions that have lost most of their convincibility or have been refuted according to agreed upon rules. Then, loyalty to the chosen premises may gradually shade into dullness.

If there have ever been, then in the interim at least, there are no good reasons left for the conviction that the standard premises are true and irrefutable. Let us have a closer look on what the foundational propositions are. The following precis is sufficient for our present purposes.

> As with any Lakatosian research program, the neo-Walrasian program is characterized by its hard core, heuristics, and protective belts. Without asserting that the following characterization is definitive, I have argued that the program is organized around the following propositions: HC1 *economic agents have preferences over outcomes*; HC2 *agents individually optimize subject to constraints*; HC3 *agent choice is manifest in interrelated markets*; HC4 *agents have full relevant knowledge*; HC5 *observable outcomes are coordinated, and must be discussed with reference to equilibrium states.* (Weintraub, 1985, p. 147), original emphasis

Without a lengthy discussion of details we accept HC1 and HC3 and repudiate HC2, HC4, HC5 as premises, that is, we agree with the statement that the economic domain embraces many agents that display directed behavior in interrelated markets. This translates into the well known characterization of the economy as a complex adaptive system.

Now, it is inadmissible to put equilibrium with HC5 into the premises. If something like an equilibrium exists, which cannot be known at the beginning of the analysis, then it must emerge from the interactions of agents (Mirowski, 1989, p. 459). To put the result into the premises is known since antiquity as *petitio principii* and there is a methodological ban on it since then. Equilibrium cannot be declared as an entirely neutral solution of a system of equations because it implies a host of additional assumptions about the real world that are unacceptable. Moreover, it may turn out that the economy can only exist as either an expanding or contracting

system (like the universe) but not in some intermediate state that fits the metaphor of an equilibrium. This is rather probable.

Then we are left with the two behavioral assumptions HC2 and HC4. As we have seen above they are not elementary and involve too many hidden assumptions. Since homo economicus has been established as an analytical helper it has been proposed time and again to replace him with something more realistic. With this well-meant improvements one jumps too short and remains within the subjective-behavioral paradigm. The hard-core propositions HC1 to HC5 in turn follow from a methodological imperative.

> It is a touchstone of accepted economics that all explanations must run in terms of the actions and reactions of individuals. (Arrow, 1994, p. 1)

This prescription, which seems to be commonsensical with a view to the original purpose of economic activity, has to be repudiated for two reasons. The first one is philosophical, the second empirical.

On thorough reflection it turns out that nothing generally valid can be said about the actions and reactions of individuals except that human agency is original.

> The bifurcation of motion into two fundamentally different types, one for natural motions of non-living objects and another for acts of human volition ... is obviously related to the issue of free will, and demonstrates the strong tendency of scientists in all ages to exempt human behavior from the natural laws of physics, and to regard motions resulting from human actions as *original*, in the sense that they need not be attributed to other motions. (Brown, 2011, p. 211), original emphasis

As a matter of principle, human behavior is not caused but is itself the first cause of a chain of effects. This originality is not absolute but more or less intensively influenced or restricted by boundary conditions. We have on the one side the limiting case that human behavior is random for an outside observer and on the other side the limiting case that the boundary conditions are so numerous and tight that behavior becomes virtually deterministic. In the middle range, behavior may be described as a mixture of direction and randomness. The attempt to define, with arbitrary constraints and an arbitrary target function, a one-exit situation in order to make behavior definite has to be repudiated. Any behavioral outcome can be constructed as the result of a constrained optimization (Arnsperger and Varoufakis, 2006, pp. 9-10). As Popper has reminded us, a theory that can explain everything, explains nothing. With regard to behavior, constrained optimization is a pointless exercise.

It is possible and advisable to shelve the question about human behavior for a while. The crucial point is that no way leads from the understanding of the interaction of the individuals to the understanding of the working of the economy as a whole.

The pertinent example is game theory. In the original version of von Neumann and Morgenstern we have the strategic interaction of agents on the one hand and the given structure of payoffs on the other. The latter sum up to zero. This setup obviously begs the fundamental economic question where the payoffs in the economy, also known as profits, come from. The economic key questions are: What determines the magnitude of aggregate profits? Why is the sum normally greater zero? What determines the distribution of profits among firms? And, finally, how does aggregate profit develop over time? Game theory, which is preoccupied with the interactions of agents, cannot answer these questions.

> Rather surprisingly, therefore, the nature of profits remains something of a mystery in contemporary economics; indeed, in the realm of "advanced" theory – namely the perfectly competitive general equilibrium models – profits have disappeared altogether. This is clearly an unsatisfactory situation. It is, first of all, illogical at best to argue both that profits are the mainspring of the capitalist system and that they do not exist. And second, the disappearance of profits from theory has not been accompanied by a similar phenomenon in the real world, where, in fact, profits (and losses) live on. Surely the task of theory is to account for this appearance, not ignore it. (Obrinsky, 1981, p. 491)

It is pretty obvious that economic theory cannot be based on assumptions about the actions and reactions of individuals. These are interesting issues for psychology and sociology. Economics has to answer the question how the monetary economy works. Therefore, all questions about human behavior have to be relocated from the center to the periphery.

> . . . if we wish to place economic science upon a solid basis, we must make it completely independent of psychological assumptions and philosophical hypotheses. (Slutzky, quoted in Mirowski, 1995, p. 362)

By consequence, we have to move now from obsolete subjective-behavioral axioms to objective-structural axioms.

4 Objective principles

> Could all the phaenomena of nature be deduced from only thre [sic] or four general suppositions there might be great reason to allow those suppositions to be true. (Newton, quoted in Westfall, 2008, p. 642)

The formal foundations of theoretical economics must be nonbehavioral and epitomize the interdependence of the real and nominal variables that constitutes the monetary economy.

4.1 Axioms

The first three structural axioms relate to income, production, and expenditure in a period of arbitrary length. The period length is conveniently assumed to be the calendar year. Simplicity demands that we have for the beginning one world economy, one firm, and one product. Axiomatization is about ascertaining the *minimum* number of premises.

Total income of the household sector Y in period t is the sum of wage income, i.e. the product of wage rate W and working hours L, and distributed profit, i.e. the product of dividend D and the number of shares N. Nothing is implied at this stage about who owns the shares.

$$Y = WL + DN \quad |t \tag{1}$$

Output of the business sector O is the product of productivity R and working hours.

$$O = RL \quad |t \tag{2}$$

The productivity R depends on the underlying production process. The 2nd axiom should therefore not be misinterpreted as a linear production function; as a matter of fact, it tracks any production function.

Consumption expenditures C of the household sector is the product of price P and quantity bought X.

$$C = PX \quad |t \tag{3}$$

The axioms represent the pure consumption economy, that is, no investment, no foreign trade, and no government.

The period values of the axiomatic variables are formally connected by the familiar growth equation, which is added as the 4th axiom.

$$\begin{gathered} Z_t = Z_{t-1}\left(1+\dddot{Z}_t\right) \\ \text{with} \quad Z \leftarrow W, L, D, N, R, P, X, \ldots \end{gathered} \tag{4}$$

The path of the representative variable Z_t is then determined by the initial value Z_0 and the rates of change $\dddot{Z}_t$ for each period.

For a start it is assumed that the elementary axiomatic variables vary at random. This minimalistic assumption produces an evolving economy. The respective probability distributions of the change rates are given in general form by:

$$\begin{array}{cc} Pr\left(l_W \leq \dddot{W} \leq u_W\right) & Pr\left(l_R \leq \dddot{R} \leq u_R\right) \\ Pr\left(l_L \leq \ddot{L} \leq u_L\right) & Pr\left(l_P \leq \ddot{P} \leq u_P\right) \\ Pr\left(l_D \leq \ddot{D} \leq u_D\right) & Pr\left(l_X \leq \ddot{X} \leq u_X\right) \\ Pr\left(l_N \leq \ddot{N} \leq u_N\right) & |t. \end{array} \tag{5}$$

The four axioms, including (5), constitute a simulation. The simulation replaces the inoperative set of equations as analytical tool. There is no need at this early stage to discus the merits and demerits of different probability distributions, which, by the way, need not be fix over time. It is, of course, also possible to switch to a completely deterministic rate of change for any variable and any period. The structural formalism does not require a preliminary decision between determinism and indeterminism. If, for instance, the upper (u) and lower (l) bounds of the respective intervals are symmetrical around zero this produces a stationary economy as a limiting case of the growing economy.

The economic content of the four axioms is absolutely transparent: they constitute the evolving consumption economy. One point to mention is that total income in (1) is the sum of wage income and *distributed profit* and not of wage income and profit. As will become clear in the following, this distinction makes all the difference between good or bad economics.

4.2 Definitions

Income categories

Definitions are supplemented by connecting variables on the right-hand side of the identity sign that have already been introduced by the axioms. With (6) wage income Y_W and distributed profit Y_D is defined:

$$Y_W \equiv WL \qquad Y_D \equiv DN \quad |t. \tag{6}$$

Definitions add no new content to the set of axioms but determine the logical context of concepts. New variables are introduced with new axioms.

Key ratios

We define the sales ratio as:

$$\rho_X \equiv \frac{X}{O} \quad |t. \tag{7}$$

A sales ratio $\rho_X = 1$ indicates that the quantity bought/sold X and the quantity produced O are equal or, in other words, that the product market is cleared.

We define the expenditure ratio as:

$$\rho_E \equiv \frac{C}{Y} \quad |t. \tag{8}$$

An expenditure ratio $\rho_E = 1$ indicates that consumption expenditures C are equal to total income Y, in other words, that the household sector's budget is balanced.

Stock of money

Money follows consistently from the given axiom set. If income is higher than consumption expenditures the household sector's stock of money increases. The change in period t is defined as:

$$\Delta\bar{\mathsf{M}}_{\mathbf{H}} \doteq Y - C \doteq (1-\rho_E)\,Y \quad |t. \tag{9}$$

The alternative identity sign $\doteq$ indicates that the definition refers to the monetary sphere. An alternative wording of (9) is: depending on the actual expenditure ratio the change of the stock of money can either be positive or negative or zero.

The stock of money $\bar{\mathsf{M}}_{\mathbf{H}}$ at the end of an arbitrary number of periods $\bar{t}$ is defined as the numerical integral of the previous changes of the stock plus the initial endowment:

$$\bar{\mathsf{M}}_{\mathbf{H}t} \equiv \sum_{t=1}^{t} \Delta\bar{\mathsf{M}}_{\mathbf{H}t} + \bar{\mathsf{M}}_{\mathbf{H}0}. \tag{10}$$

The changes in the stock of money as seen from the business sector are symmetrical to those of the household sector:

$$\Delta\bar{\mathsf{M}}_{\mathbf{B}} \doteq C - Y \doteq (\rho_E - 1)\,Y \quad |t. \tag{11}$$

The business sector's stock of money at the end of an arbitrary number of periods is accordingly given by:

$$\bar{\mathsf{M}}_{\mathbf{B}t} \equiv \sum_{t=1}^{t} \Delta\bar{\mathsf{M}}_{\mathbf{B}t} + \bar{\mathsf{M}}_{\mathbf{B}0}. \tag{12}$$

The development of the stock of money follows without further assumptions from the axioms and is ultimately determined by variations of the elementary variables.

Quantity of money

In order to reduce the monetary phenomena to the essentials it is supposed that all financial transactions are carried out without costs by the central bank. The stock of money then takes the form of current deposits or current overdrafts. Initial endowments can be set to zero. Then, if the household sector owns current deposits according to (10) the current overdrafts of the business sector are of equal amount according to (12) and vice versa if the business sector owns current deposits. Money and credit are symmetrical. The current assets and liabilities of the central bank are equal by construction. From its perspective the quantity of money at the end of an arbitrary number of periods is given by the absolute value either from (10) or (12):

$$\bar{\mathsf{M}}_t \equiv \left| \sum_{t=1}^{t} \Delta \bar{\mathsf{M}}_t \right| \quad \text{with} \quad \bar{\mathsf{M}}_0 = 0. \tag{13}$$

While the stock of money can be either positive or negative the quantity of money is always positive. It is assumed at first that the central bank plays an *accommodative* role and simply supports the autonomous market transactions between the household and the business sector. For the time being, money is the *dependent* variable.

Monetary profit

Total profit consists of monetary and nonmonetary profit. Here we are at first concerned with monetary profit. Nonmonetary profit is treated at length in (2011).

The business sector's monetary profit/loss in period t is defined with (14) as the difference between the sales revenues – for the economy as a whole identical with consumption expenditure C – and costs – here identical with wage income Y_W:

$$Q_m \equiv C - Y_W \quad |t. \tag{14}$$

Because of (3) and (6) this is identical with:

$$Q_m \equiv PX - WL \quad |t. \tag{15}$$

This form is well-known from the theory of the firm.

The Profit Law

From (14) and (1) follows:

$$Q_m \equiv C - Y + Y_D \quad |t \tag{16}$$

or, using the definitions (7) and (8),

$$Q_m \equiv \left(\rho_E - \frac{1}{1+\rho_D}\right) Y$$
$$\text{with} \quad \rho_D \equiv \frac{Y_D}{Y_W} \quad |t. \tag{17}$$

The four equations (14) to (17) are formally equivalent and show profit under different perspectives. The Profit Law (17) tells us that total monetary profit is zero if $\rho_E = 1$ and $\rho_D = 0$. Profit or loss for the business sector as a whole depends on the expenditure and distributed profit ratio and nothing else. Total income is the scale factor.

The Profit Law holds, independently of the definition of property rights, in a capitalist as well as in a communist economy. There is nothing subjective, psychological, or political in it. The Profit Law expresses the pivotal structural property of the monetary economy, that is, of all actual economies.

Retained profit

Once profit has come into existence for the first time (that is: logically – a historical account is an entirely different matter) the business sector has the option to distribute or to retain it. This in turn has an effect on profit. This effect is captured by (16) but it is invisible in (14). Both equations, though, are formally equivalent.

Retained profit Q_{re} is defined for the business sector as a whole as the difference between profit and distributed profit in period t:

$$Q_{re} \equiv Q_m - Y_D \quad \Rightarrow \quad Q_{re} \equiv C - Y \quad |t. \tag{18}$$

Retained profit is, due to (16), equal to the difference of consumption expenditures and total income. As can be seen in comparison with (11), retained profit increases *uno actu* the business sector's stock of money at the central bank.

Monetary saving

The household sector's monetary saving is given as the difference of income and consumption expenditures (for nonmonetary saving see 2011):

$$S_m \equiv Y - C \quad |t. \tag{19}$$

In combination with (18) follows:

$$Q_{re} \equiv -S_m \quad |t. \tag{20}$$

Monetary saving and retained profit always move in opposite directions. This is the Special Complementarity. It says that the complementary notion to saving is negative retained profit; positive retained profit is the complementary of dissaving. There is no such thing as an equality of saving and investment in the consumption economy, nor, for that matter, in the investment economy (for details see 2013).

5 Market clearing

From (3), (7), and (8) follows the price as dependent variable:

$$P = \frac{\rho_E}{\rho_X} \frac{W}{R} \left(1 + \frac{Y_D}{Y_W}\right) \quad |t. \tag{21}$$

This is the general structural axiomatic law of supply and demand for the pure consumption economy with one firm (for the generalization see 2014). In brief, the price equation states that the market clearing price, i.e. $\rho_X = 1$, is equal to the product of the expenditure ratio, unit wage costs, and the distributed profit ratio. All changes of the wage rate, of the productivity, of the average expenditure ratio, and of the income distribution affect the market clearing price in the period under consideration. We refer to this formal property as *conditional* price flexibility because (21) involves no assumption about human behavior, only the purely formal condition $\rho_X = 1$. Eq. (21) replaces supply-demand-equilibrium.

Note that the quantity of money is *not* among the price determinants. This rules the commonplace quantity theory out. The structural axiomatic price formula is testable in principle.

With (21) the real wage is *uno actu* given as:

$$\begin{gathered} \frac{W}{P} = \frac{R}{\rho_E \left(1 + \rho_D\right)} \\ \text{if} \quad \rho_X = 1 \quad |t. \end{gathered} \tag{22}$$

The real wage is under the condition of product market clearing equal to the productivity R if distributed profit is zero, i.e. $\rho_D = 0$, and the expenditure ratio is unity, i.e. $\rho_E = 1$. In this limiting case, the wage income recipients get the whole product. If distributed profit is greater than zero and the expenditure ratio is greater than unity the real wage is less than the productivity. Under the condition of budget balancing and market clearing the real wage is determined by the production conditions and the income distribution.

The real wage is *not* determined by supply-demand-equilibrium in the labor market. The standard labor market theory is false. This conclusion follows in direct lineage from the objective structural axiom set.

6 No psycho-sociology of profit, please

The individual firm is blind to the structural relationships as defined with the axiom set. On the firm's level, profit is therefore subjectively interpreted as a reward for innovation or superior management skills or higher efficiency or toughness on wages or for risk taking or capitalizing on market imperfections or as the result of monopolistic practices or whatever else. These factors can play a role when it comes to the *distribution* of profits *between* firms and these phenomena become visible when similar firms of an industry are compared. Firms do not create profit, they redistribute it.

> The enterprise which has better management, better luck, superior resources, a better product, no competitors, and so on, is likely to make more profit than the enterprise without these advantages. Not much more can be said about the sources of particular profit without elaborating the obvious. (Murad, 1953, pp. 6-7)

The case is perfectly clear when there is only one firm. It is a matter of indifference whether the firm's management thinks that it needs profit to cover risks or to finance growth or whether it realizes the profit maximum or not. If consumption expenditures are equal to wage income, profit will invariably be zero, no matter what the agents want or plan. Hence there is no need to speculate about it. Profit for the business sector as a whole is a systemic property. Psychologism, as ever, explains nothing. Whether profit-making is considered as good or bad does not matter either. Moralizing, as ever, explains nothing. Profit is not determined by trivial psychology but by the Profit Law (17).

From the analysis of the pure consumption economy follows:

- The business sector's revenues can only be greater than costs if, in the simplest of all possible cases, consumption expenditures are greater than wage income.
- In order that profit comes into existence for the first time in the pure consumption economy the household sector must run a deficit at least in one period.
- Profit is, in the simplest case, determined by the increase and decrease of household sector's debt.

- Wage income is the factor remuneration of labor input L. Profit is not a factor income, neither is loss. Since capital is nonexistent in the pure consumption economy profit is not functionally attributable to capital.
- Profit has no real counterpart in the form of a piece of the output cake. Profit has a monetary counterpart.
- The existence and magnitude of overall profit does not depend on profit maximizing behavior of the business sector but solely on the relation of consumption expenditure to wage income.
- The value of output is, in the general case, different from the sum of factor incomes. This is the defining property of the monetary economy.

The fundamental error of value theory is to start from the *premise* that the value of the output of goods and services is always equal to the sum of factor incomes. This error can be traced back to Adam Smith (2008, pp. 50, 155).

Under the condition $C = Y$, profit Q_m is according to (16) numerically equal to distributed profit Y_D. The fundamental difference between the two variables does not catch the eye in this *limiting* case. The equality of profit and distributed profit is an implicit feature of equilibrium models. These have *no* counterpart in reality. In the real world holds $C \neq Y$, hence profit and distributed profit are *never* equal.

All models that are based on the common sense definition total income $\equiv$ wages + profits are fatally flawed because profit and distributed profit is not the same thing.

None of the foregoing conclusions, which are immediately relevant for economic policy, could ever be derived from the behavioral assumptions of utility or profit maximization. Structural axiomatization is palpably superior.

7 Conclusion

A theory is a logical edifice built on premises. The premises relate to reality but are not in a simple correspondence determined by it. Premises are selected and formally laid down as foundational propositions or axioms. Axioms and their logical implications determine the content of a theory.

Standard economics is based on indefensible premises which are in the present paper replaced by objective-structural axioms. With this, theoretical economics at long last advances from the proto-scientific stage to the scientific stage. A comparison of subjective and objective profit theories makes this abundantly clear.

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