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The Three Fatal Mistakes of Yesterday Economics: Profit, $I=S$, Employment

Egmont Kakarot-Handtke*

Abstract

Axiomatization is the prime task of theoretical economics. Without correct axioms, no correct theory. Without correct theory, no understanding of how the economy works. Without empirically corroborated understanding, no useful economic policy advice. Yet, much more important than any political reputation of economics is indeed: without correct axioms, no acceptance as science. There is no way around it, neither for Orthodoxy nor for Heterodoxy. The conceptual consequence of this paper is to discard the subjective-behavioral axioms and to take objective-structural axioms as the formal point of departure. This enables the rectification of the most fatal analytical mistakes of conventional economics.

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1 Proud of what?

Like mathematics and physics, economics is proud of having an axiomatic foundation, and rightly so. (Helbing, 2013, p. 4)

Axiomatization is the prime task of theoretical economics. Without correct axioms, no correct theory. Without correct theory, no understanding of how the monetary economy works. Without empirically corroborated understanding, no useful economic policy advice. Yet, much more important than any political reputation of economics is indeed: without correct axioms, no acceptance as science. There is no way around it, neither for Orthodoxy nor for Heterodoxy.

An axiomatic foundation is indispensable, yet it is not sufficient to define a set of axioms just to have something to be proud of. The selection of axioms is crucial. As Slutsky put it:

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

This is exactly the point where things went awry. Standard economics rests on behavioral assumptions that are formally expressed as axioms (Debreu, 1959; Arrow and Hahn, 1991; McKenzie, 2008). The gross methodological aberration is not axiomatization but behavioral axiomatization (for details see 2014). The subject matter of theoretical economics is no other than the objective structural relationships that determine the evolution of the economic system. Human behavior is a side-show. For social scientists this is almost impossible to realize and to accept. Given their track record, the opinions of social scientists, however, carry not much weight.

The conceptual consequence of the present paper is to discard the subjective-behavioral axioms and to take objective-structural axioms as the formal point of departure.

In the following, Section 2 first provides the new formal foundations with the set of three structural axioms. These minimalistic premises represent the pure consumption economy. In Section 3 the elementary Profit Law is derived. Profit is the pivotal concept for the analysis of how the economy works. Virtually all depends on the correct profit theory. Then, in Section 4, the relationship between profit, distributed profit, investment and saving is established in full generality. It turns out that there is neither a necessity nor a tendency for business investment and household saving to equalize. In Section 5 the employment equation for the investment economy is derived. This yields the determinants of employment and their interrelations. Among other things it is shown that, for compelling systemic reasons, overall wage reduction has been one of the worst proposals to achieve full employment. Section 6 concludes.

2 The correct formal foundations of theoretical economics

In theoretical economics, human beings have to be moved from the center to the analytical periphery. This amounts to a *decoupling* of behavioral assumptions and the axiomatic method. Economics is entirely different from psychology and sociology and cannot be based on any specific behavioral assumption. We therefore advance in one great leap from the conventional subjective-behavioral approach to the objective-structural paradigm. Behavioral axioms and structural axioms are incommensurable, there is no synthesis and no logical path between them. A decision has to be made. The selection of axioms determines analytical success or failure.

2.1 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.

$$Y = WL + DN \quad (1)$$

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

$$O = RL \quad (2)$$

The productivity R depends on the underlying production process. The 2nd axiom should therefore not be misinterpreted as a linear production function.

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

$$C = PX \quad (3)$$

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

The points to notice are: assumptions like equilibrium, perfect competition, decreasing returns, optimization, etc. are not taken into the premises. The first three axioms constitute the *objective minimum*. In this minimum there is no place for behavioral

assumptions or nonentities like utility. And, secondly, total income in (1) is the sum of wage income and *distributed profit* and not of wage income and profit. The distinction between profit and distributed profit is vital. The familiar approaches fail already at this elementary analytical task.

Can we be sure that the axioms are true? No. We cannot be sure that they are false either. There is no such thing as self-evidence. Common sense and intuition, too, provide no valid criteria. Skepticism is an ineffective nuisance. Credibility is an arbitrary and misleading social criterion. To find out what axioms are worth they have to be applied. As Newton put it:

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. (quoted in Westfall, 2008, p. 642)

The same holds, of course, for economic phenomena. The initial acceptance of axioms is always tentative. All depends on whether the deductions find their exact counterpart in the real world. In this case the axioms are corroborated to the highest possible degree. There is no shortcut to assess a set of axioms.

2.2 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 (4) wage income Y_W and distributed profit Y_D is defined:

$$Y_W \equiv WL \quad Y_D \equiv DN. \quad (4)$$

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:

$$\rho_X \equiv \frac{X}{O}. \quad (5)$$

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:

$$\rho_E \equiv \frac{C}{Y}. \quad (6)$$

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.

We define the factor cost ratio as:

$$\rho_F \equiv \frac{W}{PR}. \quad (7)$$

A factor cost ratio $\rho_F = 1$ indicates that the nominal value of one hour's labor input W is equal to the value of output PR which implies that profit per hour, respectively per unit of output, is zero.

We define the distributed profit ratio as:

$$\rho_D \equiv \frac{DN}{WL}. \quad (8)$$

The distributed profit ratio may, for instance, assume a value between zero and 10 percent.

3 The profit theory is false since Adam Smith

Total profit consists of monetary and nonmonetary profit. Here we are at first concerned with monetary profit. Nonmonetary profit is treated at length in (2012).

The business sector's monetary profit/loss in period t is defined with (9) 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 :

$$Q_m \equiv C - Y_W. \quad (9)$$

Because of (3) and (4) this is identical with:

$$Q_m \equiv PX - WL. \quad (10)$$

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

The Profit Law

From (9) and (1) follows:

$$Q_m \equiv C - Y + Y_D \quad (11)$$

or, using the definitions (6) and (8),

$$Q_m \equiv \left(\rho_E - \frac{1}{1 + \rho_D} \right) Y. \quad (12)$$

The four equations (9) to (12) are formally equivalent and show profit under different perspectives. The Profit Law (12) tells us that total monetary profit is zero if $\rho_E = 1$ and $\rho_D = 0$. This special configuration is reminiscent of Walras's perfect competition equilibrium. In general, profit or loss for the business sector as a whole depends on the expenditure and distributed profit ratio and nothing else. Total income Y is the scale factor. There are no 'forces' that push or pull the economy towards zero profit. To the contrary, in each period holds infallibly $\rho_E \neq 1$ and $\rho_D \geq 0$. There is no such thing as a zero profit economy, neither in the short run nor in the long run, neither ex ante nor ex post; total zero profit is an *analytical* limiting case, not more, not less.

If the business sector consists of more than one firm total profit is distributed among the firms in the process of competition. On the level of individual firms additional profit determining factors come into play like innovation, wage cutting, risk taking, etcetera. These subjective factors are different and independent from those that determine total profit. And, most important, these subjective factors cannot explain total profit.

It is a unique fact of the history of economic thought that neither Classical, nor Walrasian, nor Marshallian, nor Keynesian, nor Marxian, nor Institutionalist, nor Monetary Economist, nor Austrian, nor Sraffian, nor Evolutionist, nor Game theorist, nor Econophysicist ever came to grips with profit.

Whatever may be the usefulness of these ... theoretical constructs, they cannot be said to throw any light on the profit issue; surely, therefore, they fail to capture the essence of a capitalist market economy. (Obrinsky, 1981, p. 495)

When the profit theory is false the rest of a comprehensive approach is immediately open to serious doubt. The first mistake of all variants of subjective-behavioral economics is that they 'fail to capture the essence.' Therefore, they have nothing enlightening to say about the economy we happen to live in. The correct profit theory presupposes a correct axiomatic basis. The crucial point is that profit for the economy as a whole cannot be derived from behavioral axioms. As far as one can see, solely structural axiomatization is up to the task.

Monetary saving

The household sector's monetary saving is given as the difference of income and consumption expenditures (for nonmonetary saving see 2012):

$$S_m \equiv Y - C. \quad (13)$$

From (11) and (13) follows an alternative formulation of profit:

$$Q_m \equiv Y_D - S_m. \quad (14)$$

Monetary profit in period t depends on the difference between distributed profit and monetary saving. Distributed profit may depend on profits of previous periods. In the limiting case of zero saving, profit is always equal to distributed profit.

On the other hand, for the limiting case of zero distributed profit it follows as a corollary of definition (14):

$$Q_m \doteq -S_m \quad (15)$$

if $Y_D = 0$.

In this case, the complementary notion to saving is loss; 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 as we shall see in the next section.

The alternative equal sign \doteq is introduced to make it clear that (15) is neither an axiom nor a definition but a corollary, that is, a logical implication of a definition.

4 Saving has never been equal to investment and never will be

Having clarified the structural properties of the pure consumption economy we are now ready to include investment expenditure. The investment process consists of different stages, beginning with planning and financing and ending with cashing in the scrap value (for details see 2011). Here we consider only the first stage of the process. The productivity effect of investment and depreciation as an element of costs is not of interest in the present context. Depreciation affects nonmonetary profit.

Based on the differentiated formalism it is assumed that the investment goods industry, which consists of one firm, produces $O_I = X_I$ units of an investment good, which is bought by the consumption good industry to be used for the production

of consumption goods in future periods. The households buy but the output of the consumption good industry. From (9) then follows for the monetary profit of the consumption and investment good industry, respectively:

$$\begin{aligned} Q_{mC} &\equiv C - Y_{WC} \\ Q_{mI} &\equiv I - Y_{WI}. \end{aligned} \tag{16}$$

Total monetary profit, defined as the sum of both industries, is then given by the sum of consumption expenditure and investment expenditure minus wage income which is here expressed, using (1), as the difference of total income minus distributed profit:

$$\begin{aligned} Q_m &\equiv C + I - (Y - Y_D) \\ \text{with } Y_W &\equiv Y_{WC} + Y_{WI}. \end{aligned} \tag{17}$$

From this and the definition of monetary saving (13) follows:

$$Q_m \equiv Y_D + I - S_m. \tag{18}$$

Higher total monetary profit on the one side demand as a corollary, i.e. as a logical implication of the definition itself, higher investment expenditure and distributed profit and lower saving on the other side. For the limiting case $I = 0$ eq. (18) reduces to (14).

If it happens that the household sector's saving is equal to the business sector's investment expenditures then, as a corollary, profit is equal to distributed profit. In reality, though, we can observe that profit and distributed profit are *never* equal and correspondingly household saving and business investment are not equal either. This relationships that are embodied in (18) have been derived by Allais (1993, p. 69) on an entirely different route – a fine example of mutual corroboration.

If it happens that distributed profit is zero, then profit is equal to the difference of investment and saving. If saving and investment happen to be equal, then profit is zero. The fact that profit and distributed profit are always different from zero in the real world can be taken as an *empirical* proof of the logically equivalent inequality of household saving and business investment.

If it happens that saving is equal to distributed profit, then profit is equal to investment expenditures (cf. Minsky, 2008, p. 161).

Seen from the vantage point of the structural axiom set the equality of saving and investment implies that either profit is equal to distributed profit or that both are zero. Neither configuration has a counterpart in the real world. The great $I = S/I \equiv S$ debate in the 1930s, with Keynes and Hicks as prominent figures, which ended with

the assertion that saving is equal to investment either in equilibrium or by definition cannot be seen other in retrospect than as the most deterrent example of conceptual confusion in the history of economic argument.

There are still economist who present models that apply $I = S/I \equiv S$. These models and modelers are out of logic and therefore out of science.

5 Unemployment is always and everywhere the natural outcome of the systemic wage-price relation

The structural axioms are free of any assumptions about causality or functional dependency. We now explicitly add the assumption that employment is the dependent variable in an economy that is composed of a consumption good producing firm and an investment good producing firm.

The differentiated structural axiom set follows from (1) to (3) and is given by:

$$Y = W_C L_C + W_I L_I + \underbrace{D_C N_C + D_I N_I}_{\equiv Y_D}. \quad (19)$$

$$\begin{aligned} O_C &= R_C L_C \\ O_I &= R_I L_I. \end{aligned} \quad (20)$$

$$\begin{aligned} C &= P_C X_C \\ I &= P_I X_I. \end{aligned} \quad (21)$$

Total employment in the investment economy is given by $L = L_C + L_I$. From the differentiated axiom set above follows with the help of (5), (6) and (7) the structural employment function under the conditions of (i) equal (average) wage rates in both firms and (ii) market clearing in the consumption and investment good market as:

$$L = \underbrace{\frac{1}{1 - \rho_E \rho_{FC}}}_{\text{structural multiplier}} \left(\frac{I}{P_I R_I} + \frac{\rho_E Y_D}{P_C R_C} \right) \quad (22)$$

$$\text{if } W_C = W_I = W, \rho_{XC} = 1, \rho_{XI} = 1 \quad \text{with} \quad \rho_{FC} = \frac{W}{P_C R_C}.$$

Total employment depends on effective demand, which is represented by the expenditure ratio ρ_E , investment expenditure I , and spending out of distributed profit $\rho_E Y_D$ on the one hand and wage rate, prices, and productivities on the other. The quotient of wage rate, price, and productivity for the consumption good industry is referred to as factor cost ratio ρ_{FC} . Both, the consumption good market and

the investment good market are cleared, i.e. $\rho_{XC} = 1$, $\rho_{XI} = 1$. Whether the labor market is cleared or not depends on the configuration that is given on the right hand side of (22). The conventional idea is that a falling wage rate is sufficient to clear the labor market.

The alternative formulation of the employment function (22)

$$L = \frac{1}{1 - \rho_E \rho_{FC}} (\rho_{FI} I + \rho_E \rho_{FC} Y_D) \frac{1}{W} \quad (23)$$

$$\text{if } W_C = W_I = W, \rho_{XC} = 1, \rho_{XI} = 1$$

brings the crucial role of the factor cost ratio to the fore. It should be noted in passing that there is a unique relationship between the factor cost ratio and the profit ratio, and it can be shown that the equalization of the factor cost ratios ρ_{FC}, ρ_{FI} amounts to an equalization of profit ratios among the two firms. In principle, full employment is attainable, all other things given, by a fine-tuning of the factor cost ratio. This fine-tuning is not brought about by the invisible hand.

The employment function, which is entirely free of any behavioral assumptions, asserts in detail (all other variables fix in each case):

- A general increase of the wage rate $W = W_C = W_I$ increases the factor cost ratio ρ_{FC} in (22) and effects a *higher* employment. This systemic property follows in direct lineage from the axioms and the condition of product market clearing. It goes without saying that this rectified relationship between wage rate and employment is almost certainly beyond the comprehension of the marginalistic supply-demand-equilibrium mindset. There is no need, though, to discuss much about contradicting assertions because eq. (22) is testable. Therefore, an *experimentum crucis* that settles the matter is possible in principle. There cannot be much doubt about the outcome.
- Price increases lead to *lower* employment. This explains stagflation.
- An increase of the expenditure ratio (a decrease of the saving ratio) leads to higher employment. This we know already from Keynes. Notice should be taken that the saving ratio is formally different from the marginal propensity to save. This, however, is not of great importance in the present context.
- An increase of investment expenditures leads to higher employment. However, the structural axiomatic employment multiplier is more sophisticated than the Keynesian multiplier which depends on the consumption function. This function is not applied in the structural axiomatic context. There is, though, a simple formal relationship between the expenditure ratio and the consumption function.
- Productivity increases lead to lower employment.

- An increase of distributed profit Y_D exerts a positive influence on employment according to (22) and on profit according to (18).
- Price inflation and wage inflation have *opposite* effects on employment. If price inflation is stronger than wage inflation unemployment increases and vice versa.
- As the difference in the denominator of the structural multiplier approaches zero employment goes (formally) off to infinity. This singularity is a property of the economy as given by the structural axiom set. It means in other words that full employment is attainable in principle. In the final analysis, the interplay of the expenditure ratio and the factor cost ratio is decisive.
- A singularity is the very opposite of an equilibrium. Equilibrium is a nonentity.

The price mechanism functions properly if the factor cost ratio ρ_{FC} increases as long as there is unemployment. This presupposes an increase of the wage rate or a decrease of the price P_C . There is no indication that one or both changes happen spontaneously. To the contrary. If the wage rate is perfectly flexible and falls if there is unemployment as assumed by conventional approaches then unemployment *increases*. There is a positive feedback in the market system and this means that there is no such thing as a full employment equilibrium even if the wage rate is perfectly flexible. This idea has been empirically refuted once and for all by the Great Depression. Nevertheless, a lot of economists have either not taken notice or lack any intuition of how the market economy works.

The conventional idea of the working of the market system as it follows from behavioral assumptions has been neatly summarized in this big picture:

Thus wages (and employment) were determined by labor supply and demand; interest rates (and savings) were determined by the supply of savings and the demand for funds to finance investment; and the general level of prices (and money balances) were determined by money supply and demand relations. In any of these cases, a denial that prices clear the market in reality would have been tantamount to abandonment of the explanatory paradigm, so that economic analysis would then have little to say. (Woodford, 1999, p. 6)

From the structural axiomatic analysis follows that each single element of this big supply-demand-equilibrium picture is mistaken and that the conventional explanatory paradigm indeed has little to say.

6 Conclusion

Conventional approaches are based on indefensible subjective-behavioral axioms which are in the present paper replaced by objective-structural axioms. The new formal foundations are perfectly transparent, the logical implications are testable in principle.

The main results of the structural axiomatic analysis are:

- The orthodox supply-demand-equilibrium approach implies a logically defective profit theory. It is a remarkable fact of the history of economic thought that the profit theory is false since Adam Smith.
- The household sector's monetary saving has never been equal to the business sector's investment and will never be – neither ex ante nor ex post.
- Unemployment is always and everywhere the natural outcome of the systemic wage-price relation. The problem is not located in human behavior, wage stickiness in particular, but in the structural properties of the market system.

Lacking correct axioms, conventional profit-, investment-, and employment theory cannot explain the chief characteristics of the monetary economy. It is the structural-axiomatic paradigm that is up to the task. As far as one can see, there is no serious alternative.

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