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Abstract

Krugman has recently revitalized IS-LM with a number of succinct analytical pieces on his blog. The reverberations were remarkable. Economists, however, are known often not grasp the full content of their own and, *a fortiori*, of others' models. This happened to Keynes in the days of high theory and to Krugman in these days. Keynes applied a defect formalism, which is here replaced by objective-structural axioms. This yields the correct relationship between retained profit, saving, and investment which in turn makes it clear after the event that the IS-part of the IS-LM construct never could bear any substantive theoretical load.

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Keywords new framework of concepts; structure-centric; axiom set; Hicks; Allais

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1 Keynes's inauspicious kick-off

But Keynes, too, sometimes gave the impression of not having fully grasped the logic of his own system. (Laidler, 1999, p. 281)

Krugman has recently revitalized IS-LM with a number of succinct analytical pieces on his blog (2011b; 2011a; 2013a; 2013b). The reverberations, measured in qualified comments, were remarkable. Economists, however, are known often not grasp the full content of their own and, *a fortiori*, of others' models. This happened to Keynes in the days of high theory and, as will progressively become clear, to Krugman in these days.

1.1 Common non-sense

In the early thirties he [Keynes] confessed to Roy Harrod that he was "returning to an age-long tradition of common sense." (Coates, 2007, p. 11)

It took the physicists quite a long time to sort out fundamental concepts like velocity, acceleration, mass, momentum, or force (Mirowski, 1995, pp. 11-22). Newton, the archetype of a scientist for the early economists, Smith and Walras in particular, first defined the basic concepts by giving them a precise meaning that was quite different from the woolly everyday usage (1999, pp. 403-415).

In marked contrast, Keynes related his definition of income expressly to 'the practices of the Income Tax Commissioners.' He was in grave doubt whether 'it might be better to employ the term *windfalls* for what I call *profits*.' But he was quite sure that 'saving and investment are, necessarily and by definition, equal – which after all, is in full harmony with common sense and the common usage of the world.' (Keynes, quoted in Coates, 2007, pp. 93, 91, original emphasis)

Keynes had no clear idea of the fundamental economic concepts income and profit, and he knew it.

His *Collected Writings* show that he wrestled to solve the Profit Puzzle up till the semi-final versions of his *GT* but in the end he gave up and discarded the draft chapter dealing with it. (Tómasson and Bezemer, 2010, pp. 12-13, 16)

The explicit formal groundwork of the *General Theory* consisted in the main of two equations ($Y = C + I$, $S = Y - C$ thus $I = S$; 1973, p. 63).

Let us mean by current *income* the value of current output, ... If we define Savings as the excess of income during a period over expenditure

on consumption during that period, it follows that Savings are exactly equal to the value of output added to accumulated wealth, i.e. to Investment. (Keynes, 1933, p. 699), original emphasis

Keynes's *provisional* (O'Donnell, 1997, p. 158) formal basis is too small and contains quite a number of tacit assumptions. Note that already the first sentence of the quote is unacceptable, as we shall see presently.

Whatever the merits of the *General Theory* may be under a broader perspective, the foundational economic concepts income and profit, and by consequence saving, are ill-defined. In comparison, Keynes' angle of analytical attack is like Newton doing physics without clear idea of mass and force.

1.2 Right, wrong, or both?

What a tricky business this all is! In his *Treatise on Money*, Mr. Keynes told the world that savings and investment are only equal in conditions of equilibrium; that an excess of investment over saving means rising prices, and vice versa. In his *General Theory*, he told us that saving and investment are always equal, and that this is a mere identity or truism, without significance for the determination of prices. As far as I can make out, there are relevant and important senses in which all these statements are each of them right and each of them wrong. (Hicks, 1939, p. 184)

Hicks saw quite clearly that there was some logical ambiguity in Keynes's treatment of saving and investment. This ambiguity was later on discursively resolved by introducing the distinctions between ex ante–ex post respectively identity–equality. With this, the representative economist was content, and thus the matter was settled.

In his suggested interpretation, which finally yielded the IS-LM model, Hicks first of all raised the level of formalization and enlarged the basis (1937). He employed traditional concepts like the Cambridge Quantity equation, the equality of marginal product and price, and made income directly dependent on the quantity of money. On the other hand he employed Keynes's concept of liquidity preference and made saving dependent on income, thus integrating the multiplier. To establish equilibrium in all markets, Hicks defined Investment=Saving (1937, p. 149). In this he was faithful to Keynes's formalism.

The two main points of critique of Hicks's approach were that IS-LM is not a valid representation of the *General Theory* (Cencini, 2003, p. 295) and that it is an oversimplification with little practical relevance. This, and a lot of minor formal criticism, did not impede the model's unparalleled popularity.

Hicks, of course, precluded the most obvious objections in the usual way with a list of disclaimers. Profit was not mentioned once in the whole paper but it was admitted that the treatment of income left something to desire.

In particular, the concept of "Income" is worked monstrously hard; most of our curves are not really determinate unless something is said about the distribution of Income as well as its magnitude. (Hicks, 1937, p. 158)

1.3 To end confusion

Throughout the 1920s and 1930s the focus was increasingly on the role of the equality of saving and investment, but the semantic squabbles that dominated much of the debate (the distinctions between "ex ante," and "ex post," "planned" and "realized" saving and investment, the discussion of whether the equality of saving and investment was an identity or an equilibrium condition) reflected a deeper confusion. (Blanchard, 2000, p. 1378)

Standard economics rests on behavioral assumptions that are formally expressed as axioms. Axioms are indispensable to build up a theory that epitomizes formal and material consistency. The fatal flaw of the standard approach is that human behavior and axiomatization are disjunct. The conceptual consequence of the present paper is to discard the subjective-behavioral axioms, Keynes's formal torso, and Hicks's set of equations and to take objective-structural axioms as the formal point of departure.

To first of all counter the untenable mutism of run-of-the-mill models, Section 2 is a straightforward graphical reminder that profit is the pivotal concept in economics. Section 3 then provides the new formal foundations with the set of four structural axioms. These represent the pure consumption economy as the most elementary economic configuration. In Section 4 the formalism is extended to the investment economy. This yields the correct relationship between retained profit, saving and investment. This general relationship makes it clear after the event that the IS-part of the IS-LM construct never could bear any substantive theoretical load. Section 5 concludes.

2 It's all about profit, except in economic models

As Keynes argued, the sole goal of capitalist production from the perspective of capitalists is "to end up with more money than it started with." (Wray, 1991, p. 962)

Every economist readily confirms that the market system is about profit. However, profit seldom makes an explicit appearance in the models. To recall, Walras's original model is a zero profit economy. The most popular definition is, in the orthodox as well as in the heterodox camp, total income = wages plus profits (Keen,

2011, p. 366). This definition seems to be plain common sense, yet, like most common sense since Aristotle, it is false. The following straightforward graphical demonstration makes this abundantly clear.

2.1 Zero profit as the base line

Figure 1 shows the simplest possible configuration of the pure consumption economy. This absolute formal minimum cannot be outmatched.

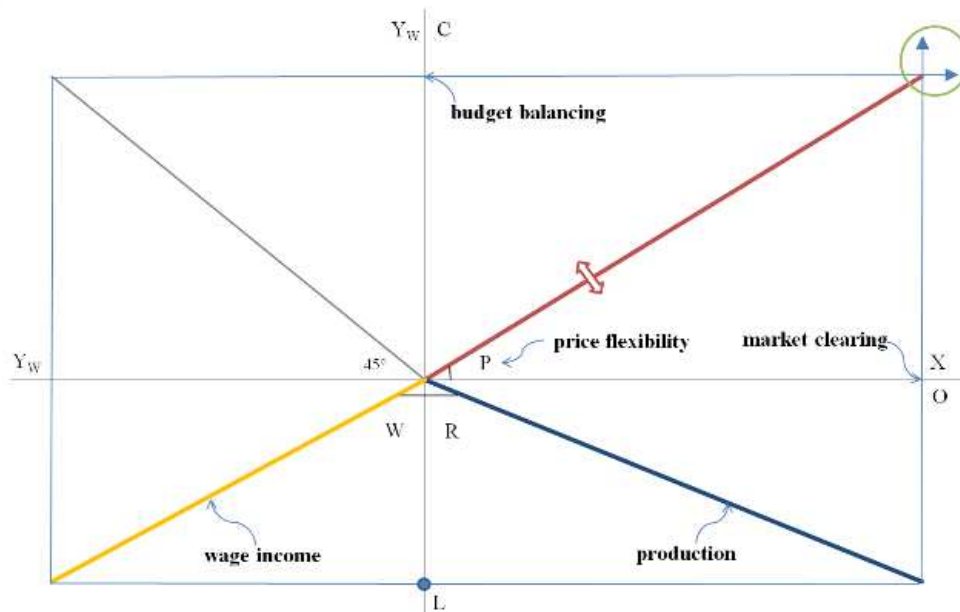


Figure 1: The price in the pure consumption economy in period $t = 1$ is objectively determined by the conditions of market clearing and budget balancing. Legend: P price, L employment, W wage rate, Y_W wage income, C consumption expenditure, R productivity, O output, X quantity bought/sold

At any given level of employment L , the wage income Y_W that is generated in the consolidated business sector follows by multiplication with the (average) wage rate W . On the real side output follows by multiplication with the productivity. Finally, the price follows as the dependent variable under the conditions of budget balancing, i.e. $C = Y_W$, and market clearing, i.e. $X = O$. Note that the ray in the southeastern quadrant is *not* a linear production function; the ray tracks *any* underlying production function. The same holds for the distribution of wage incomes in the southwestern quadrant. All those details are not needed at the moment.

It can be directly read off from the 4-quadrant scheme that the real wage $\frac{W}{P}$ is always equal to the productivity R , that is, labor gets the whole product. If the wage rate is lowered, the market clearing price falls. If the number of working hours is increased the price remains constant, provided productivity does not change. If productivity

decreases the price rises. In any case, labor gets the whole product and profit is zero, or in Walras's terms, there is 'ni bénéfice ni perte', neither profit nor loss.

The consensus to date has been that it is mathematically impossible for capitalists in the aggregate to make profits. (Keen, 2010, p. 2)

There is also explicit assent from economic methodology.

... since it is impossible to have an economy where everyone is making profits. Aggregate profit for an entire (closed) economy must be zero, hence if any firm is making profits, some other firm must be making losses. (Boland, 1992, p. 80)

The weak spot in the otherwise impeccable zero-profit argument is that aggregate profit has been greater than zero for most of the time in most of the known market economies up to the present.

2.2 The emergence of profit/loss

There exists no such thing as an immutable law of budget balancing in the *same* period. As a matter of fact, the budget is *never* balanced. Logically, we have three possible cases in the next period: $C_2 < Y_{W2}$, $C_2 = Y_{W2}$, $C_2 > Y_{W2}$. The first case means loss, the second zero profit, and the third profit. Figure 2 shows an example for the third case.

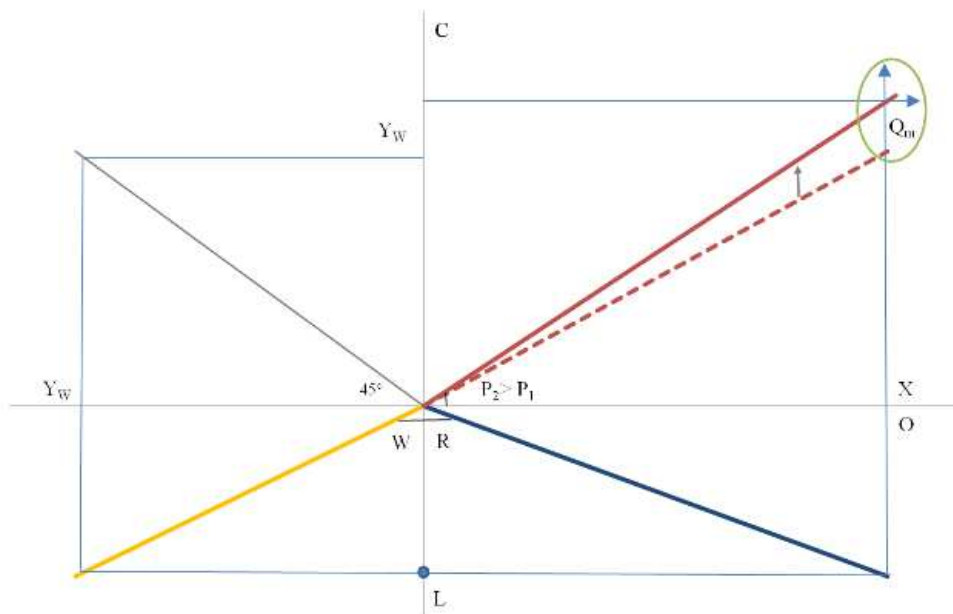


Figure 2: Monetary profit in period $t = 2$ is objectively determined by the difference between consumption expenditure and wage income under the condition of market clearing

In the pure consumption economy, profit can at first only be greater than zero if consumption expenditure is greater than wage income. This configuration has historically been realized in various ways, the ordinary way is that the household sector takes up credit from the banking industry (for details see 2013b, Sec. 18). One pertinent example is the purchase of long-lived consumption goods like family homes on credit. The relation between credit expansion of the household sector and profit for the business sector is measurable in principle (Keen, 2011, pp. 337-353).

In the case of Figure 2 monetary profit is given as $Q_{m2} \equiv C_2 - Y_{W2}$ in the northeastern quadrant. Profit takes the form of money in the bank and remains in the business sector in the period under consideration, i.e. profit is retained. Monetary as well as retained profit are measurable with an accuracy of two decimal digits.

2.3 No psychologism

The individual firm is blind to the structural relationships as shown in Figure 2. 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 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.

From the elementary graphical analysis 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. 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 expenditure ratio of the household sector.
- 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 first sentence of Keynes quote on page 3 is therefore unacceptable.

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. Ultimately, this error can be traced back to Adam Smith (2008, pp. 50, 155).

3 That little apparatus

To Senior belongs the signal honor of having been the first to make the attempt to state, consciously and explicitly, the postulates that are necessary and sufficient in order to build up . . . that little analytic apparatus commonly known as economic theory, or to put it differently, to provide for it an axiomatic basis. (Schumpeter, 1994, p. 575)

Contrary to the intuition of the psycho-sociological mindset, the formal foundations of theoretical economics must be nonbehavioral and epitomize the interdependence of the real and nominal variables that constitutes the monetary economy.

3.1 Starting afresh from scratch

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.

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

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

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

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 .

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

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.

$$Z_t = Z_{t-1} \left(1 + \ddot{Z}_t \right) \quad (4)$$

with $Z \leftarrow W, L, D, N, R, P, X, \dots$

The path of the representative variable Z_t is then determined by the initial value Z_0 and the rates of change \ddot{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:

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

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 discuss the merits and demerits of different probability distributions, which, by the way, need not be fixed 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 drifting or stationary economy as a limiting case of the growing economy.

The economic content of the four axioms is absolutely transparent. 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. This distinction makes all the difference between good or bad economics. Keynes, among many others (see 2013a), got it wrong.

Thus the factor cost and the entrepreneur's profit make up, between them, what we shall define as the *total income* resulting from the employment given by the entrepreneur. (Keynes, 1973, p. 23), original emphasis

It is decisive to be fully aware of what is admitted to the structural axiom set – the pure *objective* minimum – and what is left outside. Not admitted are the representative economist's Easterbunnies: utility, optimization, rational expectation, and equilibrium. The first rule of theory design says: never put a behavioral assumption into the premises. Why? Because this cannot lead to much more than to a gossip model of the world. The chief characteristic of the gossip model is that 'nothing is clear and everything is possible' (Keynes, 1973, p. 292). This, though, is what makes it irresistible to the psycho-sociological mindset. In his *Dialogue Concerning the Two Chief World Systems*, Galilei gave this character a name that echoes through all times. It is Simplicio.

3.2 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:

$$Y_W \equiv WL \quad Y_D \equiv DN \quad |t. \quad (6)$$

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

Given the paths of the elementary variables, the development of the composed variables is also determined. From the random paths of employment L and wage rate W follows the path of wage income Y_W . Likewise follows from the paths of dividend D and number of shares N the path of distributed profit Y_D . From the 1st axiom then follows the random path of total income Y .

Ratios

We define the sales ratio as:

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

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:

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

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:

$$\Delta \bar{M}_H \doteq Y - C \doteq (1 - \rho_E)Y \quad |t. \quad (9)$$

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{M}_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:

$$\bar{M}_H \equiv \sum_{t=1}^{\bar{t}} \Delta \bar{M}_H + \bar{M}_{H0}. \quad (10)$$

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

$$\Delta \bar{M}_B \doteq C - Y \doteq (\rho_E - 1)Y \quad |t. \quad (11)$$

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

$$\bar{M}_B \equiv \sum_{t=1}^{\bar{t}} \Delta \bar{M}_B + \bar{M}_{B0}. \quad (12)$$

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):

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

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 (for transaction money and further details see 2011a; 2011b).

Leaving out details

The stock of overdrafts is the *initial* form of financial liabilities and can be replaced at any time by other forms, for instance longer term mortgage loans. In other words, overdrafts represent here the complete portfolio of household sector's debt. The structure of this portfolio is certainly influenced by the varying structure of short term and long term interest rates. At the moment we are not interested in the composition of this portfolio.

The stock of deposits is the *initial* form of the household sector's portfolio of financial assets. Deposits can be replaced at any time by other forms, for example longer term savings accounts. In the following, the endless variety of forms is ignored and we deal exclusively with plain deposits and overdrafts. The rate of interest is left out for the moment.

The household sector can freely switch from a positive stock of money (=deposits) to a negative stock of money (=overdrafts). The household sector's stock is at any time exactly mirrored by the business sector's stock. The development of the stocks depends alone on the overall expenditure ratio ρ_E if the household sector consists of a uniform population of agents who either save or dissave. If the population is composed of both savers and dissavers things are different (for details see 2014).

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 (2012).

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 :

$$Q_m \equiv C - Y_W \quad |t. \quad (14)$$

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

$$Q_m \equiv PX - WL \quad |t. \quad (15)$$

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

The Profit Law

From (14) and (1) follows:

$$Q_m \equiv C - Y + Y_D \quad |t \quad (16)$$

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

$$Q_m \equiv \left(\rho_E - \frac{1}{1 + \rho_D} \right) Y \quad (17)$$

with $\rho_D \equiv \frac{Y_D}{Y_W} \quad |t.$

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.

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 :

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

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 2012):

$$S_m \equiv Y - C \quad |t. \quad (19)$$

In combination with (18) follows:

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

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.

4 The investment economy

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 2011c). Here we consider only that part of the process that is relevant for the IS-LM discussion.

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 goods industry to be used for the production of consumption goods in future periods. The households buy but the output of the consumption goods industry. From (14) then follows for the financial profit of the consumption and investment goods industry, respectively:

$$\begin{aligned} Q_{mC} &\equiv C - Y_{WC} \\ Q_{mI} &\equiv I - Y_{WI} \end{aligned} \quad |t. \quad (21)$$

Total financial 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:

$$Q_m \equiv C + I - (Y - Y_D) \quad (22)$$

$$\text{with } Y_W \equiv Y_{WC} + Y_{WI} \quad |t.$$

From this and the definition of monetary saving (19) follows:

$$Q_m \equiv I - S_m + Y_D \quad |t. \quad (23)$$

Higher total monetary profits on the one side demand as a corollary, i.e. as a logical implication of the definition itself, higher investment expenditure and distributed profits and lower saving on the other side. By finally applying the definition of retained profit (19) the General Complementarity follows:¹

$$Q_{re} \equiv I - S_m \quad |t. \quad (24)$$

This equation is the extension of (20). If retained profit Q_{re} is zero, that is, if profit and distributed profit happen to be equal in (18), then, as a corollary, investment expenditure and household saving in (24) must be equal too. Vice versa, if it happens that household saving is equal to investment expenditure then, as a corollary, profit and distributed profit must be equal too. In reality, though, profit and distributed profit are *never* equal and correspondingly household saving and investment are not equal either. The fact that retained profit is 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.

Allais has definitively settled the IS-debate of the 1930s in 1993. Since then, all models, including IS-LM, that have been built and are still being built on the arguments of (Hicks, 1939, pp. 181-184), (Ohlin, 1937), (Lutz, 1938), (Lerner, 1938), (Keynes, 1973, p. 63), (Kalecki, 1987, p. 138), (Minsky, 2008, pp. 162-164) and others have to be regarded either as limiting cases or as formally deficient. The inclusion of expectations into the original IS-LM framework (King, 1993) does not remove the underlying formal defect. Remarkably, Post-Keynesians never displayed an uneasy sense of the deeper inconsistency (Cencini, 2003, p. 319) but criticized

¹ This equation is not entirely new, see (Robinson, 1956, p. 402), (Lavoie, 1992, p. 159 eq. (4.3)), (Allais, 1993, p. 69), (Godley and Lavoie, 2007, p. 37 fn. 9). But only Allais clearly stated the implications: “Autrement dit l’investissement n’est pas égal à l’épargne spontanée, mais à l’épargne spontanée augmenté du revenu non distribué des entreprises . . .” Roughly: “In other words, investment expenditure is not equal to spontaneous saving but to spontaneous saving augmented by the business sector’s retained profit . . .” With a winning margin of twenty years Allais deserves all honors.

first and foremost the neoclassical bastardization of Keynes's ideas. To be quite clear, Keynes and Hicks shared the same error; there is nothing to choose.

Note well that the long-standing IS-debate is not a question of the freedom of definition but of the consistency of foundational concepts.

The only way to arrive at coherent languages is to set up axiomatic systems implicitly defining the basic concepts. (Schmiechen, 2009, p. 344)

IS-LM is, and always has been, incoherent. This made it, and still makes it, the congenial tool for confused confusers.

5 Conclusion

It cannot be denied that *something* went wrong along the way from IS-LM to AS-AD; but one should ask *precisely what* went wrong and *why* it went wrong. (Barens, 1997, p. 90), original emphasis

Aggregate profit, then, arises when net investment (including net government expenditures) exceeds saving out of contractual incomes – a proposition put forward by J. M. Keynes in *A Treatise on Money* but never integrated into the theory of profit either by himself or other writers on the subject. (Murad, 1953, pp. 9-10)

Economics has to be done in a fundamentally new way. Krugman's recent discussion of IS-LM only reinforces the necessity.

The standard approach is based on indefensible premises which are in the present paper replaced by objective-structural axioms. The main result of the structural axiomatic assessment of IS-LM is: IS-LM is an unserviceable tool, but a superior alternative has not been developed since Keynes messed up the profit theory.

Middle-of-the-road economists are clueless, but one has to be careful to spell this out.

Look, IS-LM could be all wrong; but I am accurately reflecting the way that model works. And while I am not infallible, I have done a lot of economic modeling in my time; if you think that I've made an elementary logical error, you might want to check your reasoning very carefully before going with it. (Krugman, 2013a)

With all demanded care, then, the elementary lapse consists in swallowing $I=S$ without the slightest logical hiccup in the first place and then needing twenty years to catch up with the rigorous reasoning of Allais.

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