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# The Wondrous Effortlessness of Unifying Circuit-, Money-, Price- and Distribution Theory

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## Abstract

When anything goes and nothing fits together this can be euphemized as pluralism, blossoming with fresh ideas. Lacking a common fixed point, discussions between various schools of economic thought actually amount to a repetition of contradicting views with more refined arguments. It seems impossible to find an intersection of the different approaches. Yet there must exist one because the subject matter is the same. The difference of perspectives is due to self-chosen fundamental assumptions. What is called for is a minimalist common set of assumptions. The present paper submits three structural axioms as an open formal platform.

**JEL** B41, E00, E10, E20, E25, E30, E40,

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... , before accepting the conclusions of any economist's model as applicable to the real world, the careful student should always examine and be prepared to criticize the applicability of the fundamental postulates of the model; for, in the absence of any mistake in logic, the axioms of the model determine its conclusions. (Davidson, 2002, p. 41)

From the history of economic methodology (Stigum, 1991, p. 4) and from actual practice follows: One cannot *not* axiomatize. The crucial question is not axiomatization per se, which of course can be serious or lackadaisical, but the real world content of axioms which is not guaranteed by simply applying the method<sup>1</sup>. Axioms can be empirically vacuous. In pure mathematics they are vacuous as a matter of principle; in theoretical economics, to the contrary (pace Debreu, 1959, p. x), they must not, because economics is located '... somewhere on the intersection between pure and applied axiomatic systems' (Rosenberg, 1994, p. 230).

The general thesis of the present paper is that human behavior does not yield to the axiomatic method, yet the axiomatization of the money economy's fundamental structure is feasible. By choosing objective structural relationships as axioms behavioral hypotheses are not ruled out. On the contrary, the structural axiom set is open to *any* behavioral assumption and not restricted to the standard optimization calculus.

The claim of generality entails that it should be possible to consistently integrate the major sub-fields of theoretical economics by deriving them from a common formal core.

The following inquiry has four parts. The formal ground is prepared in sections 1 and 2. The analytical starting point is given with the structural axiom set which represents the pure consumption economy inclusive of a central bank. In sections 3 to 5 the profit for the business sector as a whole is determined and the relations with distributed and retained profit are made explicit. The correct differentiation between profit and distributed profit on the one hand and saving and retained profit on the other is crucial for the understanding of the functioning of the money economy and resolves the cognitive dissonance between the micro- and the macro-perspective. After the apposition of the definition of saving and four structural key ratios in sections 6 to 9 the determinants of the market clearing price are established. Finally, in section 10, the mechanism of redistribution and the interaction of nominal and real variables is analyzed in detail in order to determine the real shares of the recipients of wage income and distributed profits. Section 10 concludes.

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<sup>1</sup> 'The introduction of mathematical techniques, therefore, is a mixed blessing. Without that magic ability called scientific intuition, there is no way to tread a careful route between the Scylla of mathematical complication and the Charybdis of fruitless oversimplification.' (Bellman, quoted in Schmiechen, 2009, p. 349)

## 1 Axioms

The first three structural axioms relate to income, production, and expenditures in a period of arbitrary length. For the remainder of this inquiry the period length is conveniently assumed to be the calendar year. Simplicity demands that we have for the time being one world economy, one firm, and one product.

Total income of the household sector  $Y$  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  $N$ .

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

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

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

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

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

It is far off the mark to accept as well as to reject axioms as ‘universal truths’ (e.g. Davidson, 1998, p. 67). They are nothing of the sort. Axiomatization is a modus operandi that starts with the question: ‘What are the propositions which may reasonably be received without proof? (Mill, 2006, p. 746) and proceeds as follows:

The attempt is made to collect all the assumptions, which are needed, but no more, to form the apex of the system. ... The axioms are chosen in such a way that all the other statements belonging to the theoretical system can be derived from the axioms by purely logical or mathematical transformations. (Popper, 1980, p. 71)

The rationale of the axiomatic method is not the least weakened because it has been misunderstood or mishandled by economists:

To Plato’s question, “Granted that there are means of reasoning from premises to conclusions, who has the privilege of choosing the premises?” the correct answer, I presume, is that anyone has this privilege who wishes to exercise it, but that everyone else has the privilege of deciding for himself what significance to attach to the conclusions, and that somewhere there lies the responsibility, through the choice of the appropriate premises, to see to it that judgment, information, and perhaps even faith, hope and charity, wield their due influence on the nature of economic thought. (Viner, 1963, p. 12)

## 2 Money

Since buying $\equiv$ selling is the basic *economic* fact (barter and economizing are interesting pre- or extra-economic *social* phenomena that take an entirely new form within the buying $\equiv$ selling framework) the first task in a structural setting is to show how money consistently follows 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:

$$\Delta M_H \equiv Y - C \quad |t \quad (4)$$

The stock of money at the end of an arbitrary number of periods is defined as the numerical integral of the previous changes of the stock plus the initial endowment:

$$M_H \equiv \sum_{t=1}^t \Delta M_{Ht} + M_{H0} \quad (5)$$

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

$$\Delta M_B \equiv C - Y \quad |t \quad (6)$$

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

$$M_B \equiv \sum_{t=1}^t \Delta M_{Bt} + M_{B0} \quad (7)$$

To simplify matters here 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 eq. (5) the current overdrafts of the business sector are of equal amount according to eq. (7) and vice versa. Money and credit are symmetrical. From the central bank's perspective the quantity of money at the end of an arbitrary number of periods is given by the absolute value either from (5) or (7):

$$M_t \equiv \left| \sum_{t=1}^t \Delta M_t \right| \quad \text{if } M_0 = 0 \quad (8)$$

The quantity of money thus follows directly from the axioms and this implies for the time being that the central bank plays an accommodative role and simply supports the autonomous market transactions between the household and the business sector.

The quantity of money is different from the average stock of transaction money which follows also from the axiom set (Kakarot-Handtke, 2011, pp. 12-13) but is not needed in the following.

### 3 Profit

The business sector's financial profit  $\Delta Q_{fi}$  in period  $t$  is defined with (9) as the difference between the sales revenues – for the economy as a whole identical with consumption expenditures  $C$  – and costs – here identical with wage income  $Y_W$ :

$$\Delta Q_{fi} \equiv C - Y_W \equiv PX - WL \quad \text{with} \quad Y_W \equiv WL \quad |t \quad (9)$$

For the business sector as a whole to make a profit consumption expenditures  $C$  have in the simplest case to be greater than wage income  $Y_W$ . So that profit comes into existence in the *pure consumption economy* the *household* sector must run a deficit at least in one period. This in turn makes the inclusion of the financial sector mandatory. An economic theory that does not include at least one bank that supports the concomitant credit expansion, which is covered by (5), cannot capture the essential features of the market economy. Money is not a veil to be treated in an afterthought, it has to be present from the very beginning. As Minsky put it: ‘... the axiom of reals must be abandoned’ (1984, p. 454).

### 4 Beyond Parochial Realism

From (9) and (1) follows for the relation of profit and distributed profit:

$$\Delta Q_{fi} \equiv C - Y + Y_D \quad \text{with} \quad Y_D \equiv DN \quad |t \quad (10)$$

The determinants of profit look essentially different depending on the perspective. For the firm price, quantity, wage rate, and employment in (9) are all important; under the circuit perspective (10) these variables play no role at all. Distributed profit  $Y_D$  is a flow of income from the business to the household sector analogous to wage income. By contrast, profit  $\Delta Q_{fi}$  is the difference of flows within the business sector. Since (9) and (10) are formally equivalent both perspectives are valid.

Profit is not connected to a factor input. So far, we have labor input as the sole factor of production and wage income as the corresponding factor remuneration. Since the factor capital is nonexistent in the pure consumption economy, profit cannot be assigned to it in functional terms. And since profit cannot be counted as factor income there is no place for it in the theory of income distribution. The income definition: total income = wage income + profit, e.g. (Kaldor, 1956, p. 95) or (Keynes, 1973, p. 23), is commonsensical, but theoretically erroneous and therefore inapplicable in the real world.

The individual firm is blind to the structural relationship given by (10). 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. There is a lot of empirical plausibility in this subjective interpretations (which, incidentally, is the defining characteristic of commonplace economics, see

Niehans, 1994, p. 14). Seen under the broader circuit perspective, though, business does not ‘make’ profit, it redistributes profit. 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 the consumption expenditures  $C$  are equal to income  $Y$  and distributed profit  $Y_D$  is zero in (10), profit will invariably be zero. The existence and magnitude of total profit is not explicable by the subjectivist marginal principle and is beyond common sense as well. *Ab origo* total profit is a factor-independent residual.

Under the condition  $C=Y$  profit  $\Delta Q_{fi}$  must, as a corollary of (10), be equal to distributed profit  $Y_D$ . The fundamental difference between the two variables is not an issue in this *limiting* case. The equality of profit and distributed profit is an implicit feature of equilibrium models. These have no counterpart in reality. Neither is the neoclassical equilibrium condition, profit rate = marginal productivity of capital, applicable in the pure consumption economy because we have profit but no capital. The question of whether in equilibrium profit is zero or not – Walras’s ‘ni bénéfice ni perte’ – is of no concern within the structural axiomatic framework because the notion of simultaneous equilibrium is no constituent part of it.

## 5 Retained Profit

Profits can either be distributed or retained. If nothing is distributed, then profit adds entirely to the financial wealth of the firm. Retained profit  $\Delta Q_{re}$  is defined, for the business sector as a whole, as the difference between profit and distributed profit in period  $t$ :

$$\Delta Q_{re} \equiv \Delta Q_{fi} - Y_D \quad |t \quad (11)$$

From (10) and (6) follows:

$$\Delta Q_{re} \equiv_a C - Y \equiv_b \Delta M_B \quad |t \quad (12)$$

Retained profit  $\Delta Q_{re}$  is the residual  $C-Y$  as it appears at the firm; the same residual appears at the central bank as a change of the business sector’s stock of money  $\Delta M_B$ . The *two aspects* are kept apart by the notation  $\equiv_a$  and  $\equiv_b$  respectively. It follows immediately that the development of the business sector’s stock of money, which may carry a positive or negative sign, is given by (7).

## 6 Saving

Financial saving is given by (13) as the difference of income and consumption expenditures. In combination with (4) this yields the straightforward relation:

$$\Delta S_{fi} \equiv Y - C \quad \Rightarrow \quad \Delta S_{fi} \equiv_a Y - C \equiv_b \Delta M_H \quad (13)$$

Saving and the change of the household sector's stock of money are *two aspects* of the same flow residual that are kept apart by the notation  $\equiv_a$  and  $\equiv_b$  respectively. It follows immediately that the development of the household sector's stock of money, which may carry a positive or negative sign, is given by (5).

Financial saving (13) and retained profit (22) always move in opposite directions, i.e.  $\Delta Q_{re} \equiv -\Delta S_{ji}$ . Let us call this the complementarity corollary because it follows directly from the definitions themselves. The corollary asserts that the complementary notion to saving is *not investment* but negative retained profit. Positive retained profit is the complementary of dissaving. Since there is no investment in the pure consumption economy the IS-equality-identity-equilibrium cannot hold. It does not hold in the investment economy either (Kakarot-Handtke, 2011, pp. 18-23).

## 7 The Economy In a Nutshell

Definitions are supplemented by connecting variables on the right-hand side of the identity sign that have already been introduced by the axioms (Boylan and O'Gorman, 2007, p. 431). To the already introduced definitions four structural ratios are added now. With (14) the expenditure ratio  $\rho_E$ , the sales ratio  $\rho_X$ , the distributed profit ratio  $\rho_D$ , and the factor cost ratio  $\rho_F$  is defined:

$$\rho_E \equiv \frac{C}{Y} \quad \rho_X \equiv \frac{O}{X} \quad \rho_D \equiv \frac{Y_D}{Y_W} \quad \rho_F \equiv \frac{W}{PR} \quad |t \quad (14)$$

The axioms and definitions are consolidated to one single equation:

$$\frac{\rho_F \rho_E (1 + \rho_D)}{\rho_X} = 1 \quad |t \quad (15)$$

The period core (15) as the *absolute* formal minimum determines the interdependencies of the measurable *structural* key ratios for each period. The period core is free of any behavioral assumptions, unit-free because all real and nominal dimensions cancel out, and contingent. Contingency means that it is open until explicitly stated which of the variables are independent and which is dependent. The form of (15) precludes any notion of causality. The period core represents the pure consumption economy, that is: no investment expenditures, no foreign trade, and no taxes or any other state activity.

## 8 The Market Clearing Price

From the period core (15) we derive first the structural price equation:

$$P = \frac{\rho_E}{\rho_X} \left( \frac{W}{R} + \frac{Y_D}{RL} \right) = \frac{\rho_E}{\rho_X} (1 + \rho_D) \frac{W}{R} \quad |t \quad (16)$$



As a purely formal relationship the period core must hold in each period. Its new form now implies the *additional* assumption that the price is determined by the rest of the system. This is an assumption about the direction of dependency in a system with complex and mutual interrelations and this *add-on* assumption is not implied in the axiom set which is clearly open to various dependency interpretations. Dependency is conceptually different from causality.

The price equation asserts that the price as dependent variable is determined by the expenditure ratio, the sales ratio, the distributed profit ratio, and unit wage costs.

Under the double condition of market clearing , i.e.  $\rho_X = 1$ , and budget balancing, i.e.  $\rho_E = 1$ , the market clearing price follows as:

$$P^* = (1 + \rho_D) \frac{W}{R} \quad \text{if} \quad \rho_X = 1; \rho_E = 1 \quad |t \quad (17)$$

The market clearing price is determined by the distributed profit ratio and unit wage costs. It deserves mention that the quantity of money is *not* among the determinants.

Price theory is, of course, concerned with the interrelations of more than one market and more than one product price. This presupposes the differentiation of the axiom set (see Kakarot-Handtke, 2011a). For our present purposes this differentiation is not required.

## 9 Distribution

We have wage income, distributed profit, and profit on one side and period output on the other. This raises the question how the interaction of nominal and real variables determines the real shares of the receivers of wage income and distributed profits respectively. The second question, how profits are distributed among firms is left open here (see Kakarot-Handtke, 2011b, pp. 10-14).

### 9.1 The Way Distribution Works

As starting point we take again the period core (15) . For the initial period three conditions are applied: the quantity bought is equal to output, consumption expenditures are equal to income, and distributed profits are zero:

$$\rho_{X0} = 1 \quad \rho_{E0} = 1 \quad \rho_{D0} = 0 \quad (18)$$

This reduces the period core for the initial period to:

$$\rho_{F0} = \frac{W_0}{P_0 R_0} = 1 \quad (19)$$

A factor cost ratio  $\rho_F$  of unity means that the real wage is equal to productivity which in turn means that profit per unit and total profit (10) is zero. The initial

conditions are simple and clear: the households buy with their wage income the whole output. Profit as well as distributed profit is absent.

**Period<sub>1</sub>** In the next period the expenditure ratio  $\rho_E$  is greater than unity. Consumption expenditures rise while income remains unchanged. A subset of households increases consumption expenditures by drawing on overdrafts that are provided by the central bank. The period core changes to:

$$\frac{W_0}{P_1 R_0} \rho_{E1} = 1 \quad (20)$$

When the expenditure ratio changes a second variable must change in order to satisfy the period core. It is assumed that the price rises and that the other variables remain unchanged. For the households that spend only their unaltered wage income this means that they can buy less than in the initial period. Their share of output diminishes. The complementary group of credit-spenders that has an unchanged wage income plus overdrafts at their disposal has also to pay the higher price, but since the increase of spending power is greater than the price increase their share of output increases. Thus a redistribution of the unvaried output takes place *within* the household sector. This redistribution is effected indirectly through the price increase. The price mechanism clears the market, signals an increased demand, and acts at the same time as anonymous redistribution mechanism.

Output does not change and is fully absorbed by the household sector as in the initial period. The real wage in (20) is now lower than productivity as a result of the altered spending behavior. The real wage is *not* determined in the labor market.

According to (9) profit is now greater than zero. But no share of output corresponds to profit which as a matter of fact increases the stock of money of the business sector. Hence in terms of real quantities nothing changes between the household and the business sector. The rise of the expenditure ratio affects the price and the quantity of money. This effect cannot possibly occur in real exchange models. And this is the very reason why they can be, at best, a marginal subject of economics.

The redistribution mechanism works both ways. If the expenditure ratio is below unity the market clearing price falls with reduced consumption expenditures. This makes it possible for the non-savers to absorb the whole output with unchanged consumption expenditures. The output share of the savers is simply taken over by the non-savers. The business sector incurs a loss and the household sector's stock of money rises.

**Period<sub>2</sub>** For period<sub>2</sub> it is now assumed that consumption expenditures stay exactly at the higher level of period<sub>1</sub>. But now income increases through profit distribution. Hence the expenditure ratio returns to unity. The distributed profit ratio is now greater than zero. The period core changes to:

$$\frac{W_0}{P_1 R_0} (1 + \rho_{D2}) = 1 \quad (21)$$

In order that everything else remains unchanged, particularly the price, it must hold that:

$$1 + \rho_{D2} = \rho_{E1} \quad (22)$$

This follows from (21) and (20). Accordingly the profit from the previous period is fully distributed in period<sub>2</sub> and profits are equal in both periods. In contrast to period<sub>1</sub> the quantity of money does not change.

The part of consumptions expenditures that was equal to the overdraft credit in period<sub>1</sub> is now equal to the spending of the receivers of distributed profit. In contrast to period<sub>1</sub> total income is increased by distributed profits in period<sub>2</sub>. The price in (21) and (20) is the same.

At this price wage income can buy only a part of the output. The rest goes to the households that spend their distributed profit income completely. The mechanism of redistribution is exactly the same as in period<sub>1</sub>. Only the personnel has changed. In the product market the credit-spenders have been replaced as buyers by the receivers of distributed profit. The situation in period 1 and 2 is indeed fundamentally different with regard to income and both sectors' stocks of money. In period<sub>2</sub> the nominal and real flows are symmetric. In period<sub>1</sub> the expenditure ratio is greater than unity. Profit has still no real counterpart but since it is equal to distributed profit this is not as obvious as in period<sub>1</sub>.

## 9.2 Real Shares

The share of the total quantity bought that wage earners absorb with a given expenditure ratio at a given price is defined as:

$$\delta_W \equiv \frac{\rho_E \frac{Y_W}{P}}{X} \equiv \frac{1}{1 + \rho_D} \quad \text{with} \quad \rho_X = 1 \quad (23)$$

Since the quantity bought  $X$ , which by assumption  $\rho_X = 1$  is equal to output  $O$ , the share  $\delta_W$  is identical with the share of output. This share depends solely on the distributed profit ratio.

Analogously, the real share of the receivers of distributed profit is given by:

$$\delta_D \equiv \frac{\rho_E \frac{Y_D}{P}}{X} \equiv \frac{\rho_D}{1 + \rho_D} \quad (24)$$

Both shares add up to unity:

$$\delta_W + \delta_D = 1 \quad (25)$$

The division of output between the two categories of income depends solely on the distributed profit ratio  $\rho_D$ . Profits do not have any impact. An increase in profits without a simultaneous increase in distributed profits therefore has no effect on the

real situation of the wage earners taken as a whole. If profits are always retained in full, i.e.  $\rho_D=0$ , then total output goes to the wage income recipients.

When distributed profits stay the same and the wage rate or employment increases then the distributed profit ratio  $\rho_D$  falls and the distribution of the output changes in favor of the wage earners. The real shares of output correspond exactly to the distribution given by the ratio  $\rho_D$  for nominal incomes if the expenditure ratio  $\rho_E$  for both income categories is identical. This, however, is normally not the case.

### 9.3 Effects of Spending Behavior

In general the expenditure ratio is not identical for spending out of wage income and spending out of distributed profits. When the recipients of wage income and distributed profits belong to two separate groups with different spending behavior the general definition of the expenditure ratio is given as the weighted average of the groups' individual expenditure ratios:

$$\rho_E \equiv \rho_E^W \frac{Y_W}{Y} + \rho_E^D \frac{Y_D}{Y} \quad (26)$$

The definition of the real share of the wage income recipients changes accordingly when in (23) the average expenditure ratio  $\rho_E$  is replaced by the group-specific expenditure ratio:

$$\delta_W \equiv \frac{\rho_E^W \frac{Y_D}{P}}{X} \equiv \frac{\rho_E^W}{\rho_E^W + \rho_E^D \rho_D} \quad (27)$$

Analogously, the real share of the receivers of distributed profit is then given by:

$$\delta_D \equiv \frac{\rho_E^D \rho_D}{\rho_E^W + \rho_E^D \rho_D} \quad (28)$$

Both shares add up to unity:

$$\delta_W + \delta_D = 1 \quad (29)$$

Hence in general the real shares are determined by the distributed profit ratio  $\rho_D$  and the spending pattern of both income groups. With a higher distributed profit ratio and more spending out of distributed profits the real share of the wage earners shrinks. And vice versa: a higher ratio of retained profit and more saving out of distributed profit increases the real share of wage earners. If the spending out of distributed profit is zero the wage earners absorb the whole output. Therefore the income distribution alone cannot tell much about the real distribution. The real distribution is as a rule better – from the perspective of the wage income recipients – than the nominal appearances. This means that discussions about distribution that do not go beyond parochial realism easily miss the point.

When it is assumed as a theoretical *limiting* case that the wage earners always spend more than their income in each period and the receivers of fully distributed

profits always save their income and consistently invest all their savings in the shares and bonds of the business sector then wages earners get the whole output and the receivers of distributed profits own the whole business sector.

Profit, therefore, is *not* the economic antagonist of the workers real income share as in Ricardo's distribution theory (1981, pp. 110-127) and this real income in no way depends, as history testifies, on some society specific subsistence level, but on productivity, on profit distribution and on that part of distributed profit that goes to consumption. Profit is mainly relevant for the distribution of ownership of the business sector. This distribution is an entirely different issue.

Standard distribution theory derives the real shares from the profit maximizing hypothesis and a well-behaved production function. In the axiomatic context no such questionable device is necessary. Since the formal properties of the production function can be left open the structural axiomatic approach is reconcilable with any real world production function (including increasing returns) and is therefore intrinsically general. Within the structural axiomatic framework the real shares of output are determined in the spheres of income and expenditures and not, as they have since the classics, in the sphere of production. Accordingly the real wage follows from (16) as:

$$\frac{W}{P} = \frac{R}{\rho_E (1 + \rho_D)} \quad \text{if } \rho_X = 1 \quad |t \quad (30)$$

The real wage rises with productivity and falls with an increase of the expenditure ratio and/or the distributed profit ratio. Since there is no capital the real wage cannot have anything to do with the marginal productivity of capital. It has nothing to do with the marginal productivity of labor either. The real wage is a *structural* fact. Distribution is neither dependent on an imaginary production function with convenient properties nor on the behavioral hypothesis of profit maximization.

For labor to get the whole product, a claim as old as political economy, it must then hold:

$$\frac{W}{P} = R \quad \Rightarrow \quad \rho_E = \frac{1}{1 + \rho_D} \quad \text{if } \rho_X = 1 \quad |t \quad (31)$$

If distributed profits are greater than zero the expenditure ratio  $\rho_E$  must be less than unity, i.e. the household sector as a whole must save. In this case profit in (10) is zero and retained profit in (11) is negative. This is obviously not a feasible scenario for the longer run. A sustainable scenario demands that profits and distributed profits are positive with the structural minimum profit as lower limit (Kakarot-Handtke, 2011b, pp. 10-12; 2011d, pp. 14-15). Hence it is structurally impossible that the real wage is equal to productivity. The condition for workers to get the whole product is therefore to become the receivers of distributed profits and to spend them fully.

It is quite remarkable for a distribution theory that, first, neither the wage rate, nor profit, nor monopoly power or class struggle turn up in this condition, and, second, that all this follows in a quite natural way directly from three structural axioms.

## 10 Conclusions

The analytical priority claim of the structural axiomatic approach rests on the simple fact that, since the structure that is given by the axiom set does not adapt to behavior, behavior has to adapt to structure. When behavioral and structural logic are at odds, behavioral logic is conducive to frustrated plans and expectations. That is the normal state of economic affairs.

The main results of the structural axiomatic inquiry are:

- From the three structural axioms follow the determinants of profit as circuit residual, of the quantity of money, of the market clearing price, and of the output distribution for the pure consumption economy.
- Profit is determined by the expenditure ratio and the distributed profit ratio.
- The development of the quantity of money is determined by the expenditure ratio.
- The market clearing and budget balancing price is determined by the distributed profit ratio and unit wage costs. The quantity of money is no determinant.
- The complementary notion to saving is not investment but negative retained profit.
- The output share of wage income receivers is determined by the distributed profit ratio and the spending behavior of the receivers of wage income and distributed profits, that is, by their specific expenditure ratios.
- The real wage and the distribution of output are determined in the income and consumption sphere and not in the production sphere.
- Models that are based on the collapsed definition  $\text{total income} \equiv \text{wages} + \text{profits}$  are theoretically erroneous, because profit and distributed profit is not the same thing, and therefore inapplicable in the real world.
- The existence and magnitude of profit and the distribution of the real product is not explicable by the marginal principle.

The three structural axioms provide the common formal core of circuit-, money-, price-, and distribution theory.

## References

- Boylan, T. A., and O’Gorman, P. F. (2007). Axiomatization and Formalism in Economics. *Journal of Economic Surveys*, 21(2): 426–446.
- Davidson, P. (1998). Reviving Keynes’s Revolution. In D. L. Prychitko (Ed.), *Why Economists Disagree*, pages 68–82. Albany, NY: State University of New York Press.
- Davidson, P. (2002). *Financial Markets, Money and the Real World*. Cheltenham, Northampton, MA: Edward Elgar.
- Debreu, G. (1959). *Theory of Value*. New Haven, London: Yale University Press.
- Kakarot-Handtke, E. (2011). Keynes’s Missing Axioms. *SSRN Working Paper Series*, pages 1–29. URL <http://ssrn.com/abstract=1841408>.
- Kakarot-Handtke, E. (2011a). The Pure Logic of Value, Profit, Interest. *SSRN Working Paper Series*, pages 1–21. URL <http://ssrn.com/abstract=1838203>.
- Kakarot-Handtke, E. (2011b). Schumpeter and the Essence of Profit. *SSRN Working Paper Series*, pages 1–25. URL <http://ssrn.com/abstract=1845771>.
- Kakarot-Handtke, E. (2011d). Beginning, Crises, and End of the Money Economy in Three Consistent Steps. *SSRN Working Paper Series*, pages 1–29. URL <http://ssrn.com/abstract=1855578>.
- Kaldor, N. (1956). Alternative Theories of Distribution. *Review of Economic Studies*, 23(2): 83–100. URL <http://www.jstor.org/stable/2296292>.
- Keynes, J. M. (1973). *The General Theory of Employment Interest and Money*. The Collected Writings of John Maynard Keynes Vol. VII. London, Basingstoke: Macmillan. (1936).
- Mill, J. S. (2006). *A System of Logic Ratiocinative and Inductive. Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation*, volume 8 of *Collected Works of John Stuart Mill*. Indianapolis, IN: Liberty Fund. (1843).
- Minsky, H. P. (1984). Frank Hahn’s "Money and Inflation": A Review Article. *Journal of Post Keynesian Economics*, 6(3): 449–457. URL <http://www.jstor.org/stable/4537831>.
- Niehans, J. (1994). *A History of Economic Theory*. Baltimore, MD, London: Johns Hopkins University Press.
- Popper, K. R. (1980). *The Logic of Scientific Discovery*. London, Melbourne, Sydney: Hutchison, 10th edition.

- Ricardo, D. (1981). *On the Principles of Political Economy and Taxation*. The Works and Correspondence of David Ricardo. Cambridge, New York, NY, etc.: Cambridge University Press. (1821).
- Rosenberg, A. (1994). What is the Cognitive Status of Economic Theory? In R. E. Backhouse (Ed.), *New Directions in Economic Methodology*, pages 216–235. London: Routledge.
- Schmiechen, M. (2009). *Newton's Principia and Related 'Principles' Revisited*, volume 1. Norderstedt: Books on Demand, 2nd edition.
- Stigum, B. P. (1991). *Toward a Formal Science of Economics: The Axiomatic Method in Economics and Econometrics*. Cambridge, MA: MIT Press.
- Viner, J. (1963). The Economist in History. *American Economic Review*, 53(2): pp. 1–22. ISSN 00028282. URL <http://www.jstor.org/stable/1823845>.

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