The Profit Theory is False Since Adam Smith. What About the True Distribution Theory?

Kakarot-Handtke, Egmont

University of Stuttgart, Institute of Economics and Law

21 October 2014

The Profit Theory is False Since Adam Smith.
What About the True Distribution Theory?

Egmont Kakarot-Handtke*

Abstract

All popular schools lack a consistent profit theory. Economists have no true conception of the most important phenomenon in their universe. This methodological defect persists since Adam Smith. Therefore, the theories of income and wealth distribution are wrong by logical implication. If the conclusions of a theory do not find any counterpart in reality the fault lies in the premises. In order to rectify distribution theory it is necessary to substitute the conventional subjective-behavioral axioms by objective-structural axioms. A major result of the present paper is that distribution is not governed by marginal productivity but by the distributed profit ratio.

*Affiliation: University of Stuttgart, Institute of Economics and Law, Keplerstrasse 17, 70174 Stuttgart, Germany. Correspondence address: AXEC Project, Egmont Kakarot-Handtke, Hohenzollernstraße 11, 80801 München, Germany, e-mail: handtke@axec.de. Research reported in this paper is not the result of a for-pay consulting relationship; there is no conflict of interest of any sort.

1 Distribution theories are hanging in the air

A remarkable discussion has been lately going on in the blogs and journals concerning the distribution of income and wealth, touching even the question whether the market system undermines itself through increasing inequality. Attention was drawn to the matter by Thomas Piketty's *Capital in the XXI Century*. The book has been praised for its richness of facts and criticized for its poverty of theory. The discussion brought again the known fact into focus that conventional distribution theory is wanting.

Critical economists never bought into marginalism as a theory of income distribution (Syll, 2014, p. 40). It is clear by now that the orthodox approach is a failure. Quite naturally, Heterodoxy is drawn to Marx. Unfortunately, Marx too got it wrong (2014c). Thus all popular economic schools lack a consistent profit theory (Desai, 2008, p. 10). Economists have no true conception of the most important phenomenon in their universe. What is immediately obvious is that the theories of income and wealth distribution are wrong by logical implication.

If the conclusions of a theory do not find any counterpart in reality the fault lies invariably in the premises.

> Besides, nothing can be derived from an analytical model that is not logically contained in its axiomatic basis. (Georgescu-Roegen, 1979, p. 321)

An axiomatic foundation is indispensable and the selection of the minimum set of foundational propositions is crucial. Standard economics rests on behavioral axioms (Debreu, 1959; Arrow and Hahn, 1991; McKenzie, 2008). The gross methodological mistake is that behavior does not yield to axiomatization (for details see 2014b). The conceptual consequence of the present paper is to discard conventional subjective-behavioral axioms and to take objective-structural axioms as the logically indispensable steppingstone.

In the following, Section 2 first provides the new formal foundations with the set of three structural axioms. In Section 3 the elementary Profit Law is derived first. Clearly, profit is the key to distribution theory. In Section 4 the market clearing price and the real wage are jointly determined. The latter is a crucial determinant of the living standard and it is *not* determined in the labor market. In Section 5 the differentiation of wage income is consistently integrated into the structural axiomatic framework. Section 6 shows how profit distribution and spending behavior determine the distribution of the real product. In Section 7 it is shown that the distributed profit ratio is the key variable for the distribution of property rights which define the ownership of the capital stock. The analysis covers the major distributional phenomena. There is, though, plenty of room for further expansion and refinement. Section 8 concludes.

2 Axioms define the paradigm

> The basic concepts and laws which are not logically further reducible constitute the indispensable and not rationally deducible part of the theory. (Einstein, 1934, p. 165)

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.

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.

$$Y = WL + DN \tag{1}$$

This holds for each period t from 0, the initial period, to ∞.

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

$$O = RL \tag{2}$$

The productivity R depends on the underlying production process. The 2nd axiom should therefore not be misinterpreted as a linear production function. Geometrically the 2nd axiom is a ray from the coordinate origin that tracks underlying discontinuous non-linearities; it does not contain any implicit assumption about increasing or decreasing returns.

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

$$C = PX \tag{3}$$

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 acceptance of axioms is always tentative. All depends on whether the deductions find their exact counterpart in the real world. The selection of axioms determines analytical success of failure.

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:

$$Y_W \equiv WL \qquad Y_D \equiv DN. \tag{4}$$

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:

$$\rho_X \equiv \frac{X}{O}. \tag{5}$$

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:

$$\rho_E \equiv \frac{C}{Y}. \tag{6}$$

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:

$$\rho_F \equiv \frac{W}{PR}. \tag{7}$$

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:

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

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

3 Rethinking profit

> Profit theory has been largely concerned with specifying and isolating the "function" for which profit is the "reward." This is scientifically irrelevant. The pertinent questions are: What are the sources of profit or the conditions under which profit arises? (Murad, 1953, p. 13)

Total profit consists of monetary and nonmonetary profit. Here we are at first concerned with monetary profit. Nonmonetary profit is treated 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:

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

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

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

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

3.1 The Profit Law

From (9) and (1) follows:

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

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

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

The four equations (9) to (12) are formally equivalent and show profit under different perspectives. The Profit Law (12) states 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 $\rho_E \neq 1$ 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.

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.

3.2 Monetary saving

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

$$S_m \equiv Y - C. \tag{13}$$

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

$$Q_m \equiv Y_D - S_m. \tag{14}$$

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):

$$Q_m \doteq -S_m$$
$$\text{if} \quad Y_D = 0. \tag{15}$$

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 pure consumption economy. The precondition of profit in the business sector is either dissaving of the household sector or profit distribution.

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.

3.3 Zero profit

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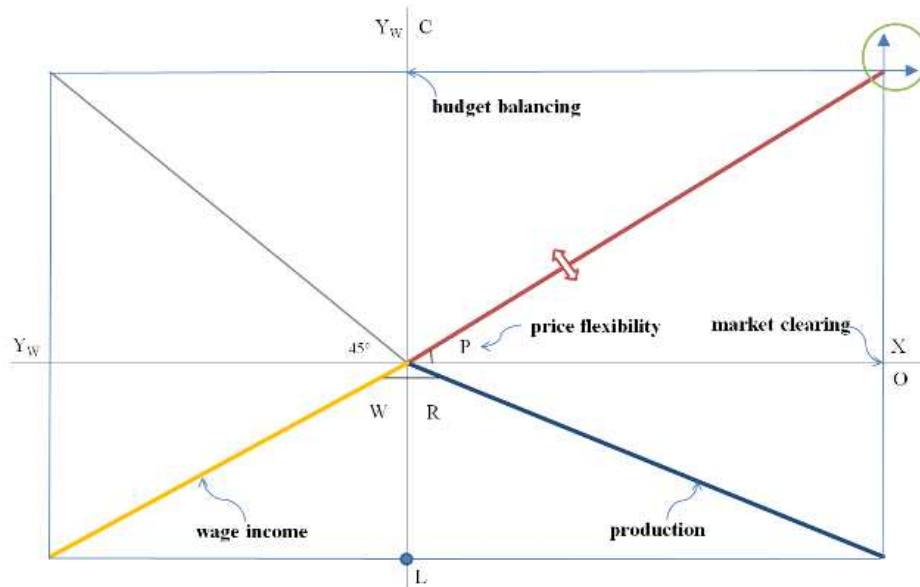

Figure 1: The price in the pure consumption economy is objectively determined by the conditions of market clearing and budget balancing and varies with 'supply and demand'. Legend: P price, L employment, W wage rate, Y_W wage income, C consumption expenditure, R productivity, O output, X quantity bought/sold.

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.

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 profit is zero, or in Walras's terms, there is 'ni bénéfice ni perte.'

3.4 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.
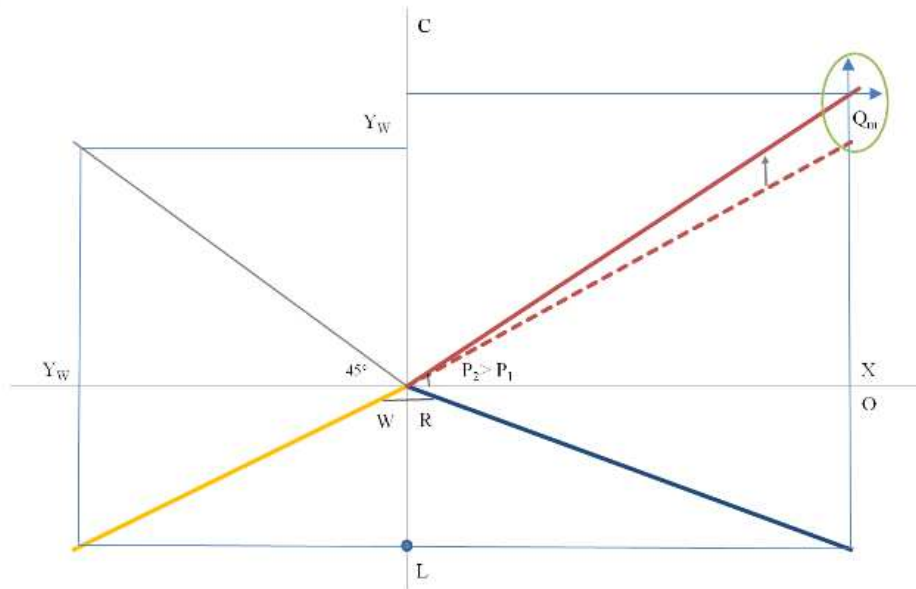

Figure 2: Monetary profit in the pure consumption economy is objectively determined by the difference between consumption expenditure and wage income under the condition of market clearing

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 2013, 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.

There is no relation between productivity and profit for the economy as a whole. Profit is not an indicator of how efficient an economy is.

In the case of Figure 2 monetary profit is given as $Q_m \equiv C - Y_W$ 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.

3.5 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 or expect. Hence there is no need to speculate about it. Profit for the business sector as a whole is a systemic property. Psychologism explains nothing. Second-guessing the agents is futile.

3.6 Structural facts

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 relation of consumption expenditures to wage income.

- The value of output is, in the general case, different from the sum of factor incomes. This is the defining property of the monetary economy.

The fundamental mistake 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. It is not, it never was, it never will be. And because reality is what it is there is no other way than to abandon erroneous premises.

4 Market clearing price and real wage

From (3) and the other axioms and the definitions follows the price as dependent variable:

$$P = \frac{\rho_E}{\rho_X} \frac{W}{R} \left(1 + \frac{DN}{WL} \right) . \tag{16}$$

This is the general structural axiomatic Law of Supply and Demand for the pure consumption economy with one firm (for the generalization see 2014a). In brief, the price equation states that the price is equal to the product of the expenditure ratio ρ_E, the inverse of the sales ratio ρ_X, unit wage costs $\frac{W}{R}$, and the distributional factor $1 + \rho_D$. The structural axiomatic price formula is testable in principle and fully replaces supply-function–demand-function–equilibrium.

Under the condition of market clearing we get:

$$P = \rho_E \frac{W}{R} \left(1 + \frac{DN}{WL} \right) \tag{17}$$

$$\text{if} \quad \rho_X = 1.$$

Conditional price flexibility is, clearly, an algebraic concept. Nothing is said about the behavior of the firm except that it sets exactly the market clearing price. For our present purposes there is no need to discuss price setting behavior of the firm (for details see 2013, Sec. 11)

If, in addition, the household sector's budget is balanced then we have:

$$P = \frac{W}{R} \left(1 + \frac{DN}{WL} \right) \tag{18}$$

$$\text{if} \quad \rho_E = 1, \rho_X = 1.$$

In the standard case with budget balancing and market clearing the price is equal to the product of unit wage costs and the distributional factor. Changes of the wage rate, the productivity, distributed profit, and employment all act upon the market clearing price. Budget balancing, too, is algebraic and not behavioral.

If, again in addition, distributed profit is set to zero then:

$$P = \frac{W}{R} \quad \rightarrow \quad \frac{W}{P} = R \tag{19}$$

$$\text{if} \quad \rho_D = 0, \rho_E = 1, \rho_X = 1.$$

The market clearing price is equal to unit wage costs or, what amounts to the same, the real wage is equal to the productivity. The first point to notice is that the real wage is not determined by supply-demand-equilibrium in the labor market. The wage rate W may go up or down by an arbitrary percentage rate, this has, due to conditional price flexibility, no effect on the real wage.

The real wage is determined by the systemic and the production conditions. What is not determined at the moment is the labor input L. Therefore, it may well be the case that the actual labor input is below the full employment level. Because employment is not the issue here (see 2014d) it is assumed that full employment obtains.

From (17) follows the general formula for the real wage:

$$\frac{W}{P} = \frac{R}{\rho_E \left(1 + \dfrac{DN}{WL}\right)}$$ (20)

$$\text{if} \quad \rho_X = 1.$$

If the expenditure ratio is unity and the distributed profit ratio is zero, i.e. $\rho_E = 1$, $\rho_D = 0$ which is the zero profit condition in (12), then the real wage is equal to the productivity R. In distributional terms: in this case the employees get exactly the hourly product. If $\rho_E > 1$, $\rho_D > 0$ then the real wage is below the productivity. Ultimately, it is the real wage that determines the living standard; and the basic determinant of the real wage is productivity. Note that profit Q_m is not a determinant of the real wage but distributed profit DN is. However, if the denominator is exactly unity, i.e. $\rho_E < 1$, $\rho_D > 0$, the effect of profit distribution is neutralized. The real wage is in this case again equal to the productivity.

Eq. (20) determines the real distribution of the hourly product. Note that marginal productivity of labor or capital does not play any role whatsoever. These are entirely redundant subjective concepts with no counterpart in reality. Here we are alone concerned with *objective* relationships.

5 Wage rate differentiation

Hitherto the wage rate has been undifferentiated. To take the same wage rate for each hour of labor input is, clearly, a convenient simplification. The workforce is a highly differentiated entity. The umbrella term worker or employee embraces the whole hierarchy. Correspondingly is wage rate to be taken as an umbrella term for all kinds of remuneration. These details can be left out when we look at the elementary interactions. They become interesting, of course, when we look closer at the income distribution.

To focus entirely on wage income distributed profit is set to zero and the expenditure ratio is fixed at unity. Hence total profit is zero according to (12).

We have different types of 'workers' (CEO, management, specialists, workers in the colloquial sense, etc.). Each category may have different working hours per period, and to each category may apply a different hourly wage rate. Other pay schemes, e.g. monthly salary, can be mapped onto this basic scheme. A category may consist of one individual only. By including all these details the southwestern quadrant of Figure 2 morphs now into Figure 3.
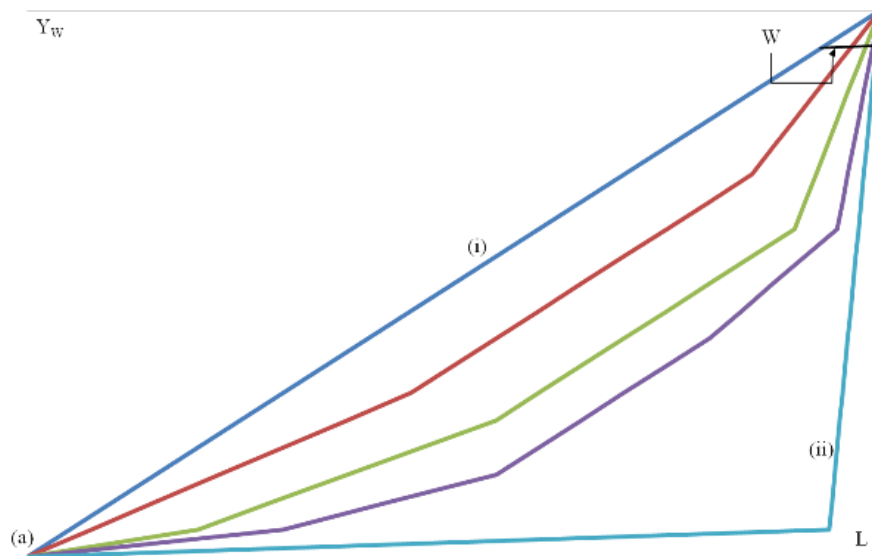

Figure 3: Payroll curves with alternative differentiation of the wage rate W and a given distribution of labor input L (augments the southwestern quadrant of Figure 2)

Curve (i), let us call it the payroll curve, represents the case to start with: the wage rate is equal for all categories of labor input. The payroll curve (ii) is the other extreme: the wage rate for one individual is high; for all others it is lower and equal. The curves in between exemplify distributions with increasing inequality. From Figure 3 it is easy to get to a Gini curve and to obtain the Gini index, i.e. the widely used measure for inequality.

At the present state of the analysis nothing can be said about whether the measured inequality is in some sense justified or not. The inequality may, for example, correspond to education, human capital, performance, scarcity, seniority, gender/age/race, etc. Nor is there any good sense in philosophizing about whether inequality is good or bad for motivation and performance in an organization and whether there is an optimal inequality. We strictly refrain from psychologism and leave this ineffective mode of economic explanation to the so-called social sciences.

Total labor time and total wage income is equal for all possible distributions of Figure 3. In the case of wage rate differentiation the angle of curve (i) represents the average wage rate W. Any distribution that is found in the real world can be mapped as a payroll curve and then transformed into a Gini curve. Thus wage rate distribution is an implicit feature of the structural axiom set which is summarily expressed by the average wage rate.

At the moment we do not know how the concrete differentiation of labor time and wage rate comes to pass. But we can determine how it fits into the structural axiomatic framework. Figure 3, which is descriptive and not explicative, tells us that any of the shown distributions is feasible without affecting the market clearing price. In the depicted zero profit case wage rate differentiation neither alters the average nominal wage rate nor the average real wage according to (19). The individual real wage is, with a given market clearing price P, proportional to the nominal wage rate. The average splits any population logically into two subgroups: the above and below averagers. The obvious next question is how the subgroups develop over time and whether this has behavioral consequences.

When we start with a perfectly equal distribution as given by curve (i) and demand that total income at (a) should remain unchanged then a redistribution among different categories requires that the wage rate for one category must fall if it rises for another category. Let us call this overt redistribution.

The second route to change the income distribution is to increase the wage rate for one category and to let the rest unchanged. In this case total income increases – point (a) moves to the left – and with it the market clearing price under the condition of budget balancing, i.e. $C = Y_W$. This lowers the real wage for all other categories while keeping the nominal wage rates unchanged. The redistribution takes an indirect route via the market clearing price. The average real wage remains unaffected according to (19). Let us call this covert redistribution.

Any possible redistribution as shown in Figure 3 takes place among the 'workers' or employees. Profit is zero in all cases. The 'workers' or employees get the whole period output. Whatever the distribution is, the rest of the economy is not affected as long as point (a) is fixed and all individuals have an expenditure ratio of unity. We know at the moment of no factors or any law that determines the distribution. Since total profit is zero any distribution is as good as any other for the business sector as a whole.

It is important to repeat that nothing can be said at the moment about whether any distribution is in some sense just or better than any other. Figure 3 shows only what the actual empirical distribution looks like and how it fits consistently into the overall structural axiomatic framework.

6 Redistributing real shares

Profit and distributed profit have hitherto been zero. We now generalize and have wage income, distributed profit, and profit on one side and period output on the other. This raises the question of how the interaction of nominal and real variables determines the real shares of the receivers of wage income and distributed profit income, respectively.

Initial period As formal starting point we take (16). For the initial period three conditions are applied: market clearing, budget balancing, and zero distributed profit:

$$\rho_{X0} = 1 \quad \rho_{E0} = 1 \quad \rho_{D0} = 0. \tag{21}$$

This reduces (16) for the initial period to:

$$\frac{W_0}{P_0 R_0} = 1 \quad \text{or} \quad \rho_{F0} = 1. \tag{22}$$

The real wage $\frac{W}{P}$ is equal to productivity R which in turn means that profit per unit, and by consequence total profit (12), 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 at first absent.

Period 1 In the next period the expenditure ratio ρ_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 banking industry. Eq. (12) changes to:

$$\frac{W_0}{P_1 R_0} \rho_{E1} = 1. \tag{23}$$

When the expenditure ratio changes a second variable must change in order to satisfy (16). 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 the invisible redistributor who translates nominal shares into real shares.

Output does not change and is fully absorbed by the household sector just as in the initial period. The real wage $\frac{W}{P}$ in (23) is now lower than productivity as a result of

the altered spending behavior. Note again that the real wage is not determined by supply-demand-equilibrium in the labor market.

According to (12) 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 (for details see 2011a, Sec. 7-12). Hence in terms of real quantities nothing changes between the household and the business sector taken as a whole.

Period 2 For the next period it is now assumed that consumption expenditures stay exactly at the higher level of period 1. But now total income increases through profit distribution. Hence the expenditure ratio returns to unity. The distributed profit ratio ρ_D is now greater than zero. Eq. (36) changes to:

$$\frac{W_0}{P_1 R_0} (1 + \rho_{D2}) = 1. \tag{24}$$

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

$$1 + \rho_{D2} = \rho_{E1}. \tag{25}$$

This follows from (24) and (23). Accordingly, the profit from the previous period is fully distributed in period 2 and profits are equal in both periods. While in period 1 we had $Q_{m1} > 0$, $Y_{D1} = 0$, in period 2 we have $Q_{m2} > 0$, $Y_{D2} > 0$ and it holds $Q_{m1} = Q_{m2} = Y_{D2}$.

The part of consumptions expenditures that was equal to the deficit-spending in period 1 is now equal to the spending of the receivers of distributed profit. In contrast to period 1 total income is increased by distributed profits in period 2. The price in (24) and (23) 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 1. Only the personnel has changed.

In the product market the credit-spenders have been replaced as buyers by the receivers of distributed profit. Profit has again no real counterpart. In period 2 profit has no effect on the business sector's stock of money because of profit distribution. Both, the stock of deposits of the business sector and the stock of overdrafts of the household sector remain unaltered.

In sum: If there is profit distribution then the output is redistributed between the receivers of wage income and the receivers of distributed profits under the condition of budget balancing. The real share of the wage income receivers is reduced through the increase of the market clearing price. The two income groups may overlap. If they are identical then total real income remains unaltered for everybody. In this case the fall of the real wage is compensated by an increase of the real dividend.

6.1 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:

$$\delta_W \equiv \frac{\rho_E \dfrac{Y_W}{P}}{X} \equiv \frac{1}{1+\rho_D} \quad \text{with} \quad \rho_X = 1. \tag{26}$$

Since the quantity bought X, which by assumption $\rho_X = 1$ is equal to output O, the share δ_W is identical with the share of output. This share depends solely on the distributed profit ratio ρ_D. The higher the distributed profit ratio the lower the real share of the wage income receivers.

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

$$\delta_D \equiv \frac{\rho_E \dfrac{Y_D}{P}}{X} \equiv \frac{\rho_D}{1+\rho_D}. \tag{27}$$

Both shares add up to unity:

$$\delta_W + \delta_D = 1. \tag{28}$$

The division of output between the two income categories depends solely on the distributed profit ratio ρ_D. Profits do not have any impact. An increase of 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. The fact that profit is greater than zero because of $\rho_E > 1$ in (12) has no effect on the real share of wage earners *as a whole*. It does have an effect on the distribution of output *among* the wage earners.

The distributed profit ratio has already been defined with (8) as:

$$\rho_D \equiv \frac{DN}{WL} \equiv \frac{Y_D}{WL} \equiv \frac{Y_D}{Y_W} \tag{29}$$

If distributed profits Y_D stay the same and the wage rate or employment increases then the distributed profit ratio falls and the distribution of the output changes according to (26) in favor of the wage earners. The real shares of output correspond to the relation of the nominal magnitudes distributed profit income Y_D and wage income Y_W that is expressed by the ratio ρ_D if the expenditure ratio ρ_E for both income categories is identical. This, however, is normally not the case.

Wage rate and employment variations have no effect on the real shares if the dividend moves in lockstep with the wage rate and if the number of shares moves in lockstep with employment. In this case ρ_D remains constant throughout and by consequence the real shares remain constant.

6.2 Effects of spending behavior

In general, the expenditure ratio is not identical for spending out of wage income and spending out of distributed profit income. 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:

$$\rho_E \equiv \rho_E^W \frac{Y_W}{Y} + \rho_E^D \frac{Y_D}{Y}. \tag{30}$$

The definition of the real share of the wage income recipients changes accordingly when in (26) the average expenditure ratio ρ_E is replaced by the group-specific expenditure ratio:

$$\delta_W \equiv \frac{\rho_E^W \frac{Y_D}{P}}{X} \equiv \frac{\rho_E^W}{\rho_E^W + \rho_E^D \rho_D}. \tag{31}$$

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

$$\delta_D \equiv \frac{\rho_E^D \rho_D}{\rho_E^W + \rho_E^D \rho_D}. \tag{32}$$

Both shares add up to unity:

$$\delta_W + \delta_D = 1. \tag{33}$$

Hence in general the real shares are determined by the distributed profit ratio ρ_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 independently of what the distribution of nominal incomes looks like. 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 because it is the received wisdom that saving out of distributed profit income is relatively higher than saving out of wage income.

Let us assume, in analogy to Kalecki's famous prototype, that wage income is fully spent and distributed profit is fully saved. Then (30) turns to:

$$\rho_E = \frac{Y_W}{Y} \quad \rightarrow \quad \rho_E < 1. \tag{34}$$

According to (12) this means that total profit is exactly zero. However, this in turn means that there is distributed profit but no profit. This is possible for some periods but not for a longer time span. From (30) follows the condition:

$$\rho_E = \rho_E^W \frac{Y_W}{Y} = 1$$

$$\text{if} \quad \rho_E^D = 0. \tag{35}$$

and this means that $\rho_E^W > 1$, that is, the dissaving of the wage income receivers must compensate the saving of the distributed profit receivers, such that profit and distributed profit is equal. This, too, is a configuration that cannot last for long because it implies that the wage income receivers continually increase their overdrafts while the distributed profit receivers continually increase their deposits. In the pure consumption economy, the only long term stable configuration is an expenditure ratio of unity for both income categories.

It cannot be said *a priori* how long the Kalecki configuration could last. However, as long as it lasts it changes the distribution of wealth. The savers accumulate deposits, which may eventually take the form of bonds, share or other financial assets, and the dissavers accumulate overdrafts or other forms of debt. This in turn makes it necessary to take interest on financial assets and liabilities into the picture.

Since we cannot follow this path any farther here it is assumed that in the pure consumption economy the respective expenditure ratios are unity. This reduces the question for the moment to the distribution of nominal income and to the distribution of the period output. In this simplified case eqs. (26) and (27) apply, that is, the distribution of the real product is solely governed by the distributed profit ratio ρ_D.

7 Distribution in 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 the first stage of the process. The productivity effect of investment, and depreciation as an element of costs are not of immediate 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:

$$Q_{mC} \equiv C - Y_{WC}$$
$$Q_{mI} \equiv I - Y_{WI}.$$

(36)

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:

$$Q_m \equiv C + I - (Y - Y_D)$$
$$\text{with} \quad Y_W \equiv Y_{WC} + Y_{WI}.$$

(37)

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

$$Q_m \equiv Y_D + I - S_m. \tag{38}$$

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. (38) 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.

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.

If it happens that saving is equal to distributed profit, then profit is equal to investment expenditures. This case corresponds to Kalecki's configuration. The wage income receivers spend their income fully and absorb the whole consumption good output. The receivers of distributed profits spend nothing on consumption but accumulate deposits.

The Kalecki configuration implies that the business sector as a whole has in each period a financing deficit vis-à-vis the household sector of the amount Y_D. On the other hand the real assets of the business sector increase by I and decrease through depreciation. As long as investment expenditures are greater than depreciation the

value of the real assets increases. The business sector's stock of capital grows in real and nominal terms (for the details see 2011c).

Now it is assumed that the receivers of distributed profits buy in each period newly emitted shares from the business sector, such that the financing requirements of the business sector are exactly met. There is no credit financing. That is, the receivers of distributed profit own the total number of shares N and thus indirectly own the business sector. We then have on the one hand a growing capital stock and on the other a growing number of shares.

Eqs. (31) and (32) tell us that the share of output of the wage income receivers is $\delta_W = 1$ and correspondingly $\delta_D = 0$ for the receivers of distributed profit under the conditions $\rho_E^W = 1$ and $\rho_E^D = 0$. That is, wage income receivers absorb the whole consumption good output. As the productivity increases they are on the average better off. Whether the individual employee is better off depends in addition on where he finds himself on the payroll curve, which may become steeper or flatter in the process. Note that we have made the simplifying assumption that the expenditure ratio for *all* employees is unity. If the high income brackets save, then things get again a bit more complex. When we ignore the distribution among employees we arrive at the simplistic resume: labor gets the whole product.

The investment good output remains in the business sector and over time the real and the valued stock of capital K as the numerical integral of investment expenditures grows. From (38) follows:

$$Q_m = I \quad \rightarrow \quad \frac{Q_m}{K} = \frac{I}{K} \quad \rightarrow \quad q = g$$

$$\text{if} \quad Y_D = S_m.$$

(39)

The profit rate q is equal to the growth rate of the nominal capital stock g under the Kalecki condition. The real capital stock helps to increase productivity R and therefore the real wage according to (20).

The capital stock is indirectly owned by the receivers of distributed profits who invest the full amount in each period in shares emitted by the business sector. Of course, the total number of shares N is not equally distributed, therefore distributed profit is not evenly distributed either. The graphical representation looks like the distribution of wage income in Figure 3 and can easily be added. When we ignore the distribution among share owners we arrive at the simplistic resume: the share owners own the whole capital stock. Let us equate the capital stock for the moment with wealth then we can say that the distribution of wealth corresponds to the distribution of shares. This distribution in turn comes about in a historical process that defies generalization. However, logically there are two possibilities: there are positive or negative feedback mechanisms in the system. In the first case inequality increases in the second it decreases. Growing empirical evidence, made popular recently by Piketty, points to an increasing inequality (Wade, 2014).

One of the major positive feedback loops is given with the Profit Law (12) which produces more profit with more profit distribution if the expenditure ratio is ≥ 1. This could explain the increase of the relation of profit Q_m to wage income Y_W (which is different from ρ_D) in recent times.

The number of shares N and its distribution is explicable in principle by historical circumstances which, however, are at the moment unknown. We have said nothing about who owns the shares. What is commonly known is that dividend receiving share owners and wage income receivers are different groups. However, there is no compelling economic reason why both groups could not overlap. They could even be identical. From the analytical standpoint it makes much sense to start with a situation where all employees get the same wage rate and own an equal number of shares and then to observe which factors change the initial distribution.

What has been left out so far are the distributive effects of foreign trade and government activity. The results which have been derived from the structural axiom set apply, strictly speaking, to the world economy as a whole. What also has been left out is the distribution of the stock of produced but not yet consumed consumption goods like cars or houses or other durables in the possession of households (for details see 2011b) and finally the distribution of initial endowments like land or natural resources. There is ample room for consistent analytical expansion.

What we have done is to put the basic aspects of distribution consistently together. It turned out that the distributed profit ratio is the key variable for the distribution of the period output as well as for the distribution of property rights which define the ownership of the capital stock. The basic results refer to real income and real wealth and are beyond the reach of marginalism. The results follow in direct lineage from the objective structural axiom set. Distribution is not governed by marginal productivity but by the distributed profit ratio. To begin with, marginalism does not get the distinction between income and profit right. This is fatal for the whole theoretical superstructure. Within a few years nobody will understand how anybody could ever have taken the marginal productivity theory of distribution seriously. Keynesians, too, got it wrong. Heterodoxy is groping in the dark. There is no alternative to the structural axiomatic distribution theory.

8 Conclusion

Conventional approaches are based on indefensible subjective-behavioral axioms which are in the present paper replaced by objective-structural axioms. New axioms define a new paradigm. In this paper they are applied to the question of income and wealth distribution.

The main results of the structural axiomatic analysis are:

- the fundamental theorem of income distribution states: profit is not a factor income,

- profit is, in the simplest case, determined by the increase and decrease of household sector's debt,

- there is no relation between productivity and profit for the economy as a whole,

- there is no such thing as "a share of profit in income" but there is "a share of distributed profit in income",

- in the pure consumption economy, real shares of output are determined by the distributed profit ratio and the spending behavior of the receivers of wage income and distributed profit,

- in the investment economy the receivers of wage income get – under the Kalecki condition – the whole consumption good output, and the receivers of distributed profit own the whole stock of capital.

Lacking correct axioms, the conventional approaches cannot explain how the actual economy works and how the period output of consumption and investment goods is distributed. The structural axiomatic paradigm can.

References

Arrow, K. J., and Hahn, F. H. (1991). *General Competitive Analysis*. Amsterdam, New York, NY, etc.: North-Holland.

Debreu, G. (1959). *Theory of Value. An Axiomatic Analysis of Economic Equilibrium*. New Haven, London: Yale University Press.

Desai, M. (2008). Profit and Profit Theory. In S. N. Durlauf, and L. E. Blume (Eds.), *The New Palgrave Dictionary of Economics Online*, pages 1–11. Palgrave Macmillan, 2nd edition. URL http://www.dictionaryofeconomics.com/article?id=pde2008_P000213.

Einstein, A. (1934). On the Method of Theoretical Physics. *Philosophy of Science*, 1(2): 163–169. URL http://www.jstor.org/stable/184387.

Georgescu-Roegen, N. (1979). Methods in Economic Science. *Journal of Economic Issues*, 13(2): 317–328. URL http://www.jstor.org/stable/4224809.

Kakarot-Handtke, E. (2011a). Keynes's Missing Axioms. *SSRN Working Paper Series*, 1841408: 1–33. URL http://ssrn.com/abstract=1841408.

Kakarot-Handtke, E. (2011b). Primary and Secondary Markets. *SSRN Working Paper Series*, 1917012: 1–26. URL http://ssrn.com/abstract=1917012.

Kakarot-Handtke, E. (2011c). Squaring the Investment Cycle. *SSRN Working Paper Series*, 1911796: 1–25. URL http://ssrn.com/abstract=1911796.

Kakarot-Handtke, E. (2012). Primary and Secondary Markets. *Levy Economics Institute Working Papers*, 741: 1–27. URL http://www.levyinstitute.org/publications/?docid=1654.

Kakarot-Handtke, E. (2013). Understanding Profit and the Markets: The Canonical Model. *SSRN Working Paper Series*, 2298974: 1–55. URL http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2298974.

Kakarot-Handtke, E. (2014a). The Law of Supply and Demand: Here it is Finally. *SSRN Working Paper Series*, 2481840: 1–17. URL http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2481840.

Kakarot-Handtke, E. (2014b). Objective Principles of Economics. *SSRN Working Paper Series*, 2418851: 1–19. URL http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2418851.

Kakarot-Handtke, E. (2014c). Profit for Marxists. *SSRN Working Paper Series*, 2414301: 1–25. URL http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2414301.

Kakarot-Handtke, E. (2014d). The Three Fatal Mistakes of Yesterday Economics: Profit, I=S, Employment. *SSRN Working Paper Series*, 2489792: 1–13. URL http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2489792.

McKenzie, L. W. (2008). General Equilibrium. In S. N. Durlauf, and L. E. Blume (Eds.), *The New Palgrave Dictionary of Economics Online*, pages 1–18. Palgrave Macmillan, 2nd edition. URL http://www.dictionaryofeconomics.com/article?id=pde2008_G000023.

Murad, A. (1953). Questions for Profit Theory. *American Journal of Economics and Sociology*, 13(1): 1–14. URL http://www.jstor.org/stable/3484955.

Syll, L. P. (2014). Piketty and the Limits of Marginal Productivity Theory. *real-world economics review*, (69): 36–43. URL http://www.paecon.net/PAEReview/issue69/Syll69.pdf.

Wade, R. H. (2014). The Piketty Phenomenon and the Future of Inequality. *real-world economics review*, (69): 2–17. URL http://www.paecon.net/PAEReview/issue69/Wade69.pdf.