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Kakarot-Handtke, Egmont

University of Stuttgart, Institute of Economics and Law

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Essentials of Constructive Heterodoxy: Institutions

Egmont Kakarot-Handtke*

Abstract

What do economists understand about the economy if they do not understand the profit phenomenon? Next to nothing. Therefore, the very first task in theoretical economics is to clarify the difference between profit and wage income and their respective determinants. It was Ricardo who tackled the problem first, but neither Orthodoxy nor Heterodoxy solved it until this day. The need for a paradigm shift is indisputable. The new structural axiomatic approach is more comprehensive as it embraces the consistent interaction of real and nominal variables of the monetary economy and the economic consequences of alternative variants of institutions.

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Keywords new framework of concepts; structure-centric; axiom set; real analysis; nominal analysis; profit; distributed profit; ownership

*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 The true paradigmatic revolution

It is a fact that orthodox economics is a failed approach. Traditional Heterodoxy, on the other hand, has spent all its energies on debunking and pleading for pluralism. As a result, it has not been possible to replace the obsolete standard paradigm. Because of this complementary methodological unfitness, economics is still at the proto-scientific level. From this follows for the new Constructive Heterodoxy.

We should also like to underline Debreu's effective reference to Bacon when he says that "citius emergit veritas ex errore quam ex confusione." It would be a mistake to lower the level of analysis and clarification. The only way possible is a *thorough* reexamination of the theory's basic hypotheses, i.e., a true paradigmatic revolution. (Ingrao and Israel, 1990, p. 362) original emphasis

Each theory starts from a small set of foundational 'hypotheses or axioms or postulates or assumptions or even principles' (Schumpeter, 1994, p. 15). Standard economics rests on a set of *behavioral* axioms (McKenzie, 2008). This is the formal consequence of a self-imposed methodological imperative.

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

The crucial point is that human behavior does not yield to the axiomatic method, yet the axiomatization of the monetary economy's fundamental structure is feasible. The point at issue is not axiomatization *per se* but the real world content of axioms. The paradigm shift consists in the replacement of behavioral axioms by structural axioms which then effects the transformation of the entire theoretical superstructure.

By choosing objective structural relationships as axioms behavioral hypotheses are not ruled out. The structural axiom set is open to *any* behavioral assumption and not restricted to the standard optimization calculus. In addition, by abandoning methodological individualism it becomes possible to include economic and social institutions into the analysis. The structural axiomatic approach is more comprehensive than the standard approach as it embraces the consistent interaction of real and nominal variables and the economic consequences of alternative variants of institutions.

We proceed as follows. The formal frame that constitutes the pure consumption economy is set up in Sections 2 to 4. In Section 5 is shown how the institutions of firm and land ownership affect the distribution of profits among the firms that constitute the business sector. The determinants of the price of land services are established in Section 6. In Section 7 transaction money is introduced. To complete the picture, in Section 8 the economic subsystem is integrated into the overarching social system and alternative distributions of private or public dividends are discussed. Section 9 concludes.

2 Objective axioms define the paradigm

Then, as now, economists seemed to feel that the glaring lack of consensus on fundamental principles compromised the scientific status of their discipline, and there were strong professional and public pressures to establish a new orthodoxy which could speak authoritatively on economic matters. (Deane, 1983, p. 1)

So, let us establish the new orthodoxy. 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 at first one world economy, one firm, and one product. By starting with one firm micro- and macroeconomics fall into one. The irreducible formal core is consistently differentiated in the sequel.

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 .

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

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

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

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

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

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

The axioms represent the pure consumption economy, that is, no investment expenditures, no foreign trade, and no taxes or any other government activity.

Some definitions are now supplemented by connecting variables on the right-hand side of the identity sign \equiv that have already been introduced by the axioms. Hence, they add no new content to the set of axioms but determine the logical context of concepts.

The business sector's monetary profit in period t is defined with (4) 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 WL :

$$Q_m \equiv C - WL \equiv PX - WL. \quad (4)$$

Using the first axiom (2) one gets from (4) monetary profit in a slightly different form:

$$Q_m \equiv (C - Y) + DN. \quad (5)$$

In the pure consumption economy monetary profit is greater than zero if consumption expenditures are greater than total income or if distributed profits are greater than zero, or both.

The formal differentiation of the axioms requires additional definitions of a rather simple kind. The total employment of three firms is for instance given by:

$$L \equiv L_1 + L_2 + L_3 \quad (6)$$

3 From the real to the nominal consumption economy

The term "real" is used, as usual in economic discussions, to refer to physical quantities as opposed to values denoted in money terms, which are referred as "nominal" magnitudes. (Arrow, 1980, p. 146)

We first go back to the real economy as the elementary and most transparent point of departure. Real means formally that there are no nominal variables.¹

We follow here Ricardo's classical practice and use a numerical example that, of course, is just a concretization of the structural axiom set. The starting point is given with Table 1a.

$P = 1$	L	R	O	W	WL	C	L	R	O	W	WL	C	Q_m/DN
1	10	3	30	3	30	30	10	3	30	2	20	30	10
2	10	2	20	2	20	20	10	2	20	2	20	20	0
3	10	1	10	1	10	10	10	1	10	2	20	10	-10
Σ			60		60	60			60		60	60	0

(a) Real and nominal sphere of the initial economy

(b) Applying a uniform wage rate

Table 1: The emergence of profit and loss

¹ "... rational individuals are interested in the commodities they can exchange and produce. Their motives are measured in "real" terms (in terms of goods), not in "nominal" terms (values expressed in money)" (Arrow, 1980, p. 139). Note that, up to now, we have strictly avoided to speculate about the agents' motives.

We have three agents, the farmers 1, 2, 3 who cultivate three parcels of land of perfectly equal size but with different productivities R and correspondingly with different outputs O per period t , given an equal labor input L of 10 units. The left part of Table 1a shows the real sphere. Since each agent consumes his own output real consumption differs markedly. ‘The produce of the earth’ (Ricardo) is unequally divided among three autarkic farmers. Workers, capitalists and landlords are absent.

The unequal real distribution of output is due to the given productivity differentials, i.e., to Nature and the random assignment of parcels to agents. There is no relationship between individual labor input, which is assumed to be perfectly equal in all cases, and the higher or lower output. The possibility that the three farmers throw together their parcels, apply the same amount of labor input and share the total output equally is not considered in the following.

Next, without any real change, the self-sufficient farmers become economically literate, that is to say, they start to calculate in nominal terms as shown in the right part of Table 1a. At first, the wage rates W are set in exact proportion to productivities R . From this follows the distribution of wage incomes WL . The individual consumption expenditures are equal to the individual wage incomes. These consumption expenditures ‘buy’ the respective outputs at the price $P = 1$. There are no market transactions and there is no money in the initial economy. Money is only present as a unit of account.

By comparing their calculations the farmers realize that they arrive at an equal price for their qualitatively identical outputs but that their wage rates are different. Since their labor input is qualitatively identical, different wage rates are clearly unjustified, and they decide to impute the same wage rate $W = 2$ to their calculations. The result is shown in the right part of Table 1b.

Farmer 1 realizes that his wage income falls from 30 to 20 units when he regards himself as a household. Yet when he regards himself as a firm he now makes a profit of 10 units. Taking both components together, his situation is unchanged in nominal as well as in real terms. The same is true for farmer 3 who now gets a higher wage income but makes a loss when he regards himself as a firm. After equalizing the wage rates the different productivities reappear as the nominal magnitudes profit and loss. These new phenomena are a consequence of the application of the so-called law of one price and of the fact that wage incomes and consumption expenditures are no longer equal for each farmer. In their capacity as households farmer 1 dissaves and farmer 3 saves.

Total monetary saving is defined as:

$$S_m \equiv Y - C \quad \text{here} \quad S_m \equiv WL - C \quad \text{because } DN = 0. \quad (7)$$

From the symmetric dissaving and saving of the individual farmers follows that total saving is zero. Likewise, the profit and loss of the firms sums up to zero.

It deserves mention that all these new phenomena emerge *uno actu* and have no counterpart whatsoever in the real part of the economy. From this follows that it cannot be taken for granted that the concepts of profit or saving are actually applicable to the real part of the economy. In fact, as Knight already recognized (1935, p. 7), this back projection is methodologically inadmissible. Using the terms profit or saving in a real model is a blatant category mistake.

Up to this point profit and loss exist only in the minds of the calculating agents. Their real situation is the same as in the initial state. To make profit and loss real we have to split the initial economy into the household and the business sector. In very general terms that is to say we define institutions and specify their roles. Institutions are an add-on that is not automatically given with the structural axiom set.

The households receive income and either spend it in full or save/dissave. They do nothing else. All economic activities take place in the business sector. As with Walras ‘The economic system is made up of households and firms.’ (Arrow and Hahn, 1991, p. 3). Analytical clarity demands that the multiple roles of the autarkic farmers are differentiated. Accordingly, the farmers become at first owners of their firms and hire themselves as workers. In this role they receive wage income. The profit accrues to the firm (Ellerman, 1986). The owner of the firm in the last instance decides whether profit goes in the form of distributed profit to the household sector or else remains as retained profit in the business sector.

Retained profit for the business sector as a whole is defined as difference between monetary profit and distributed profit in period t :

$$Q_{re} \equiv Q_m - DN. \quad (8)$$

In Table 1b firm 1 distributes $D_1N_1 = 10$ units to the household sector. Distributed profit is then equal to profit. This is obviously a limiting case. In the real world profit and distributed profit are never equal. A loss first hits the firm, but in the last instance the owner has to balance it (with details depending on the legal definition of ownership). This is the case of firm 3. Profit and loss sum up to zero for the business sector as a whole. Dissaving and saving sum up to zero for the household sector as a whole.

Full differentiation requires that the firm hires the workers. *Uno actu* with the analytical splitting of the economy into the household and the business sector both the labor and the product market come into being and this entails money as a transaction medium. It is assumed that transaction money is provided by the central bank (for details see Section 7 and 2011).

Since firm 3 makes a loss the situation is not stable in the longer run. To establish structural stability it is necessary that the profit is at least zero in the marginal firm. This can be achieved by raising the price from $P = 1$ to $P = 2$ as shown in Table 2.

To buy the unchanged quantities each agent now has to double consumption expenditures as shown in the C -column. The result is that firms 1 and 2 make a monetary

$P = 2$	L	R	O	W	WL	C	Q_m	DN	Y
1	10	3	30	2	20	60	40	40	60
2	10	2	20	2	20	40	20	20	40
3	10	1	10	2	20	20	0	0	20
Σ			60		60	120	60	60	120

Table 2: Real and nominal spheres of the structural axiomatic economy

profit Q_m while the marginal firm breaks even. These profits are fully distributed. The household sector's income Y consists of wage income WL and distributed profit income DN according to the 1st axiom (1). Total income is equal to total consumption expenditures. Profit is equal to distributed profit. The real part of the economy has not changed an iota. We have formally transformed the initial state into a stable monetary economy without any change in labor input, productivity, and real consumption. In both the product and the labor market the law of one price holds.

The move from the real to the monetary economy creates entirely new phenomena and enables an institutional differentiation. In this sense, money is not neutral at all.

Securing the existence of the marginal firm at zero profit entails a change of the distribution of output. Wage earners absorb at the new price 30 units, the other 30 units go to the receivers of distributed profits under the condition that both groups spend their whole income. Making, for the sake of argument, a back projection from our new vantage point we see that the erstwhile autarkic farmers' real income was not 'really' 30, 20, 10 but consisted of the real wage incomes 10, 10, 10 and the real distributed profits 20, 10, 0. The nominal and real distributed profits are the mirror images of the productivity differentials. This becomes perfectly clear when we change the initial conditions and assume that the productivities are equal on all parcels of land. The result is shown in Table 3.

$P = 1$	L	R	O	W	WL	C	Q_m	DN	Y
1	10	2	20	2	20	20	0	0	20
2	10	2	20	2	20	20	0	0	20
3	10	2	20	2	20	20	0	0	20
Σ			60		60	60	0	0	60

Table 3: Real and nominal spheres with equal productivities

In the new structure the price is $P = 1$ and all profits and distributed profits vanish. The real wage incomes are now 20, 20, 20, that is, they double in comparison to Table 2. The real wage does not depend alone on the effort of the workers, which is the same in all cases, but also on the productivity differentials *between* firms, that is on natural factors. The same is true for the nominal magnitudes profit and distributed profit. Their 'cause' is in natural givens and their *raison d'être* is in

the last instance to keep the marginal firm in the market and to maintain the given structure of the business sector.

It is obvious that, in order to secure a zero profit for the marginal firm, it is necessary to realize a special configuration of profits and distributed profits that depends on the productivity differentials. To recall, the autarkic farmers' real income was 30, 20, 10 without any differentiation. In the nominal economy the real income consists of the real wage incomes 10, 10, 10 and the real distributed profits 20, 10, 0. If the farmers are workers and firm owners in one person their total real income is the same.

Let us add another differentiation and call the real wage income of the marginal firm (= 10 units of output) the basic real income. In the example of Table 2 all households realize the basic real income. It is assumed that there is an infinite supply of parcels with a productivity of $R = 1$ so there is no scarcity and the economy can expand with every new farmer realizing the basic real income.

Due to the productivity differentials the intramarginal households realize also what may be called a real surplus income. In the nominal economy the realization takes the form of profit=distributed profit=consumption expenditures. In the strict sense this surplus income cannot be attributed to work effort, it is, so to speak, an extra gift of Nature which can take the form, as we shall see later, of a private or public real dividend.

Any relation between profit and capital is absent because there is no capital in the pure consumption economy to begin with.

In total we have the following objective conditions in place: market clearing, budget balancing, law of one price, zero profit in the marginal firm, and full employment. This pure hand-in-the-mouth consumption economy is reproducible for an indefinite time. No claim is made that the economy is spontaneously drawn or driven into this state. The notion of equilibrium is inapplicable in economics and this means that *all* equilibrium models are methodologically unacceptable.

4 The Law of Supply and Demand

The expenditure ratio ρ_E , the sales ratio ρ_X , and the distributed profit ratio ρ_D is defined as:

$$\rho_E \equiv \frac{C}{Y} \quad \rho_X \equiv \frac{X}{O} \quad \rho_D \equiv \frac{DN}{WL}. \quad (9)$$

An expenditure ratio $\rho_E = 1$ indicates that consumption expenditures are equal to income, or, in other words, that the household sector's budget is balanced. A value of $\rho_X = 1$ of the sales ratio means that the quantities produced and sold are equal in period t or, in other words, that the product market is cleared.

From the axioms (1) to (3) and definitions (9) follows the price as dependent variable:

$$P = \frac{\rho_E}{\rho_X} \frac{W}{R} (1 + \rho_D). \quad (10)$$

Under the condition of market clearing $\rho_X = 1$ and budget balancing $\rho_E = 1$ the price is determined by the distributed profit ratio and unit wage costs:

$$P^* = \frac{W}{R} (1 + \rho_D) \quad (11)$$

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

For a wage rate $W = 2$, an average productivity $R = 2$, and a distributed profit ratio $\rho_D = 1$ the market clearing price is $P^* = 2$ as in Table (2).

From (11) follows the real wage:

$$\frac{W}{P^*} = \frac{R}{1 + \rho_D} \quad (12)$$

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

The real wage is $\frac{W}{P^*} = 1$ if the distributed profit ratio is unity as in Table 2. Since the labor input is 10 units the wage income recipients absorb in total 3x10 units of output. The other half is absorbed by the recipients of distributed profit income. The real wage is $\frac{W}{P^*} = 2$ if the the distributed profit ratio is zero as in Table 3. The wage income recipients absorb the whole output. In the last instance, the real wage depends on the productivity differentials among firms and the law of one price in the labor market. The real wage is *not* determined in the labor market or in the sphere of production but by the structural interaction of real and nominal variables under the conditions of market clearing and budget balancing.

5 The redistribution of profit within the business sector

For the initial economy we have left open the question of whether the farmers own their land parcels or not. We now have to carry the analytical differentiation one step further and to discriminate between the ownership of the firm and the ownership of land. Therefore, an additional firm is introduced that owns the land. This is an institutional assumption.

A private person that offers land for commercial use is no longer a private person but a firm. The economically relevant activity takes place in a separate firm and

all firms together form the business sector. This analytical separation is essential. It makes it possible to abstract from historical peculiarities and to treat agrarian and industrial production alike. The household sector provides the labor input and absorbs the final output. As shareholders the households receive in addition to wage income the distributed profit income.

To begin with, it is assumed that all available land is owned by firm 4. There is no scarcity of land, only productivity differentials. The output of firm 4 consists of land services that are bought by firms 1, 2, 3. Being not storable, there can be no difference between services produced O and services bought X , hence $O_4 = X_4$. Firm 4 sells a quantity X of land services at a leasing price P to each firm. The profit of the land owning firm follows from in analogy to (4) as:

$$Q_{m4} \equiv P_{41} X_{41} + P_{42} X_{42} + P_{43} X_{43} - W_4 L_4 \quad |t. \quad (13)$$

Firm 1 pays for the land services, therefore its profit equation changes from (4) to:

$$Q_{m1} = P_1 X_1 - P_{41} X_{41} - W_1 L_1 \quad |t. \quad (14)$$

Likewise for the other firms. It is assumed now at first that firm 4 as land owner fixes a lease price for each firm such that the profits of firms 1 and 2 vanish and are completely transferred to firm 4. This does not alter the profit of the business sector as a whole. When (13) and (14) are summed up the lease payments $P_{41} X_{41}$ always cancel out. Profit and full profit distribution now reappear in firm 4 as shown in Table 4. To forestall second round effects the wage costs of firm 4, i.e., Y_{W4} , have been here set to zero. Hence total income Y and consumption expenditures C do not change compared to Table 2. The owners of firm 1 and 2 'lose' but the owners of firm 4 'gain' but total profits remain unchanged and the wage income recipients are not affected.

$P = 2$	L	R	O	W	Y_W	$P_4 X_4$	C	Q_m	$P_4 X_4$	Y_{W4}	Q_{m4}	Y_{D4}	Y
1	10	3	30	2	20	40	60	0	40	0	40	40	60
2	10	2	20	2	20	20	40	0	20	0	20	20	40
3	10	1	10	2	20	0	20	0	0	0	0	0	20
Σ			60		60	60	120	0	60		60	60	120

Table 4: Redistribution of profits between the consumption good producing firms and the land owning firm

Based on the ownership of land firm 4 governs via the lease price to some extent the distribution of profits within the business sector. The crucial factor for the distribution of output is productivity differentials in combination with the law of one price, which, of course, is not a law in the physical sense.

There is no need to invent a new income category and to call the distributed profits of firm 4 rent, as Ricardo did. The two categories wage income and distributed

profit suffice. By ignoring the monetary side of the economy Ricardo could not see that what appears as a factor remuneration is actually profit redistribution. On the theoretical level rent is not a separate income category but just another manifestation of distributed profit. By analytically separating the production of land services from the personal ownership of land the former landlord now becomes the owner of firm 4 and receives distributed profits as income.

6 The pricing of land services

From (13) and (14) follows that the distribution of profits between firms 1 and 4 depends on the lease price P_4 if all input quantities and the wage rates are given for the period under consideration.

Firm 1 faces the following situation. The productivity R_1 of the parcel of land which it has leased from firm 4 is given and known as a rough average. All other available sites have a lower productivity – again on the average. The productivity differential is expressed by a productivity factor $\tau < 1$. Therefore, if firm 1 moves to another site its profit will be lower. Equation (4) changes to:

$$Q_{m1} \equiv P_1 \tau R_1 L_1 - W_1 L_1 \quad (15)$$

$$\text{if } \rho_{X1} = 1, \quad \text{with } \tau < 1.$$

On the other hand, firm 1 has current leasing costs per period of $P_4 X_4$ which lower its profit:

$$Q_{m1} \equiv P_1 R_1 L_1 - P_4 X_4 - W_1 L_1 \quad (16)$$

$$\text{if } \rho_{X1} = 1.$$

The lease price P_4 can be rewritten as the product of the lease price factor ψ and the minimum lease price P_{40} . At this price firm 4's profit is zero when firm 2 and 3 are taken out of the picture for simplicity.

$$Q_{m1} \equiv P_1 R_1 L_1 - \psi P_{40} X_4 - W_1 L_1 \quad (17)$$

$$\text{with } P_{40} = \frac{W_4}{R_4}.$$

The diverse qualities of land open the possibility to raise the minimum lease price P_{40} , or to drive it higher in the process of competition, by a factor ψ for the site currently used by firm 1. The relation between the productivity factor τ and the maximum lease price factor ψ can be derived from (15)=(17) and is given by:

$$\psi^{max} \equiv (1 - \tau) P_1^* \underbrace{\frac{1}{P_{40}} \frac{R_1}{R_4} \frac{L_1}{L_4}}_{\text{Structural ratios}}. \quad (18)$$

The maximum lease price factor depends on the productivity differential to the next best parcel and the market clearing price of the consumption good and an array of structural ratios. At the maximum lease price the profit of the consumption good producing firm is zero.

The margin for bargaining is then given by P_{40} as lower bound and $\psi^{max} P_{40}$ as upper bound. At a higher lease price it is advantageous for firm 1 to move to another site. Within these objectively given bounds firm 4 is in the position to influence the distribution of profits. It is improbable, though, that firm 4 knows the varying ratios of (18) exactly. Moreover, their further development over the relevant time span is in any case guesswork. The exact margin for bargaining is therefore shrouded in mist and no behavioral theory is capable of predicting the final outcome.

This said, it is for the sake of argument assumed that firm 4 sets the price as a limiting case such that the profit of the consumption good producing firms becomes exactly zero. This, again, is a reproducible configuration; all firms cover at least their costs.

7 Transaction money

In order to reduce the monetary phenomena to the essentials it is supposed that all financial transactions are carried out by the central bank (for details see 2015). 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 then the current overdrafts of the business sector are of equal amount and vice versa. Each sector's *stock* of money is either positive or negative. Money and credit are at first symmetrical. From the central bank's perspective the quantity of money at the end of an arbitrary number of periods is then given by the absolute value either from deposits or overdrafts. The quantity of money is always ≥ 0 . 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.

To make matters simple for the beginning the central bank provides the transaction money cost-free.

By sequencing the initially given period length of one year into months the idealized transaction pattern that is displayed in Figure 1a results.

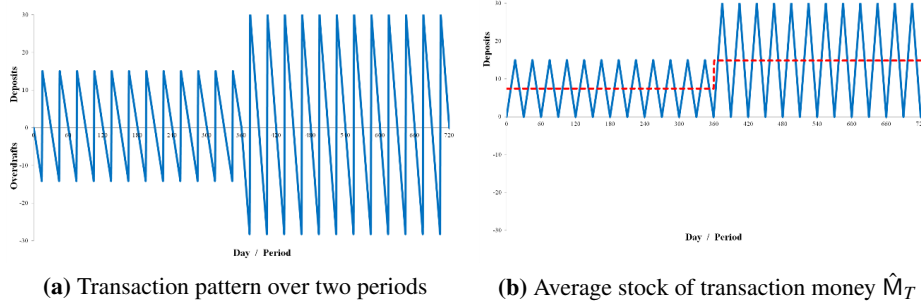


Figure 1: Household sector's transaction pattern for different nominal incomes in two periods

It is assumed that the monthly income $\frac{Y}{12}$ is paid out at mid-month. In the first half of the month the daily spending of $\frac{Y}{360}$ increases the current overdrafts of the households. At mid-month the households change to the positive side and have current deposits of $\frac{Y}{24}$ at their disposal. This amount reduces continuously towards the end of the month. This pattern is exactly repeated over the rest of the year. At the end of each subperiod, and therefore also at the end of the year, both the stock of money and the quantity of money is zero. Money is present and absent depending on the time frame of observation.

In period 2 the wage rate, the dividend and the price is doubled. Since no cash balances are carried forward from one period to the next, there results *no* real balance effect provided the doubling takes place exactly at the beginning of period 2.

From the perspective of the central bank it is a matter of indifference whether the household or the business sector owns current deposits. Therefore, the pattern of Figure 1a translates into the average amount of current deposits in Figure 1b. This average stock of transaction money depends on income according to the transaction equation

$$\hat{M}_T \equiv \kappa Y. \quad (19)$$

For the regular transaction pattern that is here assumed as a idealization the index is $\frac{1}{48}$. Different transaction patterns are characterized by different numerical values of the transaction pattern index.

Taking (19) and definitions (9) together one gets the explicit transaction equation for the limiting case of market clearing *and* budget balancing:

$$(i) \hat{M}_T \equiv \kappa \frac{\rho_X}{\rho_E} RLP^* \quad (ii) \frac{\hat{M}_T}{P^*} = \kappa O \quad (20)$$

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

We are now in the position to substantiate the notion of accommodation as a money-growth formula. According to (i) the central bank enables the average stock of transaction money to expand or contract with the development of productivity, employment, and market clearing price. In other words, the real average stock of transaction money, which is a statistical artifact and no physical stock, is proportional to output (ii) if the transaction index is given and if the ratios ρ_E and ρ_X are unity. Under these *initial* conditions money is endogenous and neutral in the structural axiomatic context. Money emerges from *autonomous* market transactions and has three aspects: stock of money, quantity of money (here $\bar{M} = 0$ at period start and end because of $\rho_E = 1$) and average stock of transaction money ($\hat{M}_T > 0$).

8 From economic function to institution

The economy is integral part of society. For a comprehensive picture it has to be shown how the monetary economy as formally defined by the structural axioms set interacts with the institutions of society.

In the pure consumption economy with productivity differentials between firms profit and profit distribution have the function to guarantee that the economy can reproduce itself under the conditions of market clearing, budget balancing, law of one price, and zero profit for the marginal firm. These are objective factors, entirely independent of what the individual agent thinks about profit. For the individual agent the systemic necessity and in particular the bidirectional causality between profit and distributed profit is invisible and therefore plays no role at all for his economic behavior. What is visible is the concrete organization of land ownership and the firm's individual profit.

Land ownership is an institution and institutions are man made. Institution building is, in the strict sense, not a subject matter of theoretical economics. To actually implement a viable Politeia is the task of a legitimate social entity. At a concrete moment in time this LSE, which is another institution, is historically given. What economics can contribute is to analyze the economic consequences of various possible institutional variants.

On the analytical way from the real consumption economy to the monetary economy we have introduced the following institutions and assigned them specific roles: business sector, household sector, firms, households, markets, ownership, money and the central bank. Institutions do not fall out of the blue sky but are organized by the legitimate social entity. How the LSE comes into existence and how it works in detail and how it should work is beyond theoretical economics. This is the subject matter of political science, sociology, philosophy, history, etcetera.

Generally speaking, the economy is a subsystem of the social system (Luhmann, 1995). The total population can therefore be divided into Business-Sector-employable and BS-nonemployed. BS-employable in turn splits into the two sub-

categories currently employed/unemployed. The actually employed receive a wage income. To start with, the real income is equal and determined by the productivity of the marginal firm as exemplified in Table 4. All currently employed agents secure their livelihood. The basic real income in the marginal firm is above the so-called existence minimum. There remain two groups which do not secure their livelihood through participation in current production: the currently unemployed and the BS-nonemployed.

It is assumed that both groups cannot be reduced to zero and that it falls ultimately to the LSE to secure their livelihood in one institutional form or another.

Let us consider the four possibilities as summed up in Table 5. Firm 4, the land owning firm, may be privately or publicly owed and there may be one single owner or a multitude of owners.

Ownership	Centralized	Decentralized
Private	#1	#2
Public	#3	#4

Table 5: Variants of land ownership

Let us take case #3 first. Firm 4 is publicly owned and the LSE decides directly how to distribute the firm's total profit Q_{m4} , i.e., it determines $D_0N_0, D_1N_1, D_2N_2, \dots, D_nN_n$. At the beginning of any given period the number of recipients N_0, N_1, N_n is historically given. The budget for the BS-unemployed and the BS-nonemployed comprises in more detail the following heterogeneous composition of possible recipients:

- Y_{D0} unemployed
- Y_{D1} physically/mentally disabled (too old, too young, sick, etc.)
- Y_{D2} ideologists/social healers (e.g. philosophers, priests, gurus, propagandists, etc.)
- Y_{D3} guardians (e.g. standing army, police, agencies, etc.)
- Y_{D4} out-of-BS producers (e.g. support of researchers, scientists, experts, teachers, artists, etc.)
- Y_{D5} gratuities (due to merit, honor, popularity, favoritism, coercion, extortion, subterfuge, etc.)
- Y_{D6} for self-consumption, legitimate
- Y_{D7} for self-consumption, illegitimate
- Y_{D8} other payments.

In the case of public ownership the amount Y_{D6} should be small or zero and precautionary measures have to be implemented such that Y_{D7} is zero.

All recipients spend the dividend fully in the period under consideration. There is neither saving nor dissaving. Total consumption expenditures C are always equal to total income $Y = Y_W + Y_D$.

In case #1 the single private owner of firm 4 has in principle the same options as a public owner except Y_{D7} because any amount of self-consumption Y_{D6} is always legitimate for the private owner. This defines the institution of private ownership. If the amount Y_{D6} is zero then the whole amount of profit is distributed as public dividend. On the other hand, if $Y_{D6} = Q_{m4}$ the public dividend is zero.

It is, of course, possible that the private owner distributes Q_{m4} exactly in the same manner as the public owner would have done. In this limiting case the ownership of land is of no consequence.

It should be noted in passing that in the special case of the pure consumption economy the amount for self-consumption Y_{D6} of the single private owner tends to be relatively small. Discussing the problem of feudal luxury consumption, Adam Smith remarked:

The desire of man is limited in every man by the narrow capacity of the human stomach; ... (2008, p. 152)

In case #2, that is, decentralized private land ownership, the individual share of total profit Q_{m4} is relatively small and it is very probable that the n -th land owner distributes all his individual profit on self-consumption, i.e., $Q_{m4}/n = Y_{D6n}$. In this limiting case, the public dividend for the BS-unemployed and the BS-nonemployed is zero. The LSE has to resort to taxation. Case #2 is by and large realized in all market economies.

It is clear from the discussion of alternatives that the actual amount of distributed profit $Y_D = Q_{m4}$ may or may not be equal to the required amount of what we have called public dividend Y_D^θ ; whereby it can be left open how the required amount is determined.

The point to notice is that the systemic equality $Y_D = Q_{m4}$ does not tell anything about causality. One tends to think that there must be first profit before it can be distributed. This is true in the case of the individual firm. However, in the monetary circuit the opposite causality also applies, that is, profit distribution creates profit. An autonomous increase of Y_D takes its way over the price mechanism and reappears under the condition of budget balancing and market clearing as Q_{m4} . The increase of the market clearing price reduces the basic real income in the business sector. Hence, in our pure consumption economy the institution of land ownership in collaboration with the market price mechanism can in principle take over the role of the institution of taxation. Indeed, it is the most natural form of interaction of the monetary economy with society at large because it uses only the well established and accepted mechanisms for the socially determined distribution of period output.

9 Conclusion

In standard economics real analysis is *de rigueur*. This is the main reason why Orthodoxy does not come to grips with the actual monetary economy and in particular with the phenomenon of profit. The fixation on real variables and the ignorance of nominal variables is an inexcusable methodological blunder. In contradistinction, the structural axiomatic approach enables a consistent real and nominal analysis. The second severe methodological blunder is the fixation on methodological individualism which holds institutions out of the picture or reconstructs them as representative individuals.

Structural axiomatization overcomes all those analytical drawbacks. The main results of the theoretical reconstruction of the monetary economy as a subsystem of society are:

- Profit is not a factor income. The distinction between distributed profit as income and profit as factor independent residual is fundamental. Most economic approaches fail already at this first analytical step.
- In a real economy there is neither profit nor saving. Using these terms in real models is a blatant category mistake. Most economists do not realize this.
- Profit for the business sector as a whole is ultimately determined by the expenditure ratio and the distributed profit ratio. In the limiting case of budget balancing profit and distributed profit are equal. This is the simplest case of a reproducible consumption economy.
- Ricardian rent is in fact not a separate income category but just another manifestation of distributed profit. The Ricardian real model is methodologically unacceptable.
- Models that are based on the collapsed definition $\text{income} \equiv \text{wages} + \text{profits}$ are *a priori* false because profit and distributed profit is not the same thing. Most economists do not realize this.
- The objective factors that determine the amount of profit and distributed profit are entirely independent of what the individual agent thinks about profit.
- The causality between profit and distributed profit is bidirectional.
- The institution of land ownership is a determinant of profit distribution among the firms that constitute the business sector.
- Depending on private/public and centralized/decentralized ownership of land the amount of the public dividend lies between zero at minimum and the total monetary profit per period at maximum.

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