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University of Patras

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George Economakis

*Department of Business Administration, University of Patras, University Campus,
26504 Rio, Achaia, Greece. Tel. +30 2610 969833. Email: economak@upatras.gr*

George Economakis is Professor of Political Economy in the Department of Business Administration at the University of Patras. He has published in many academic journals (among them are the Review of Radical Political Economics, Rethinking Marxism, Science and Society, History of Economic Ideas, History of Economics Review, Capitalism Nature Socialism and Critique) and collective volumes. He has numerous contributions to international conferences and has co-authored several books. His research interests include: Theory of Modes of Production and Social Classes; Labor Theory of Value; Theories of Economic Crises and Imperialism; Economic Development; International Competitiveness.

Abstract

In this paper are examined some aspects of the economic relations between agriculture and industry, under capitalism, which derive from Marx’s labour theory of value. The focal points of this rereading are the theory of differential rent, the theory of formation of market values in agriculture and industry and the Marxian reproduction schemes. This analysis rather justifies Ricardo’s theoretical view regarding the fact that the spontaneous laws of capitalist economy lead to an extraction of an extra value from the industrial sector in favour of the agricultural sector. This is a relation of unequal exchange between the industrial and the agricultural sector which consists of what Marx has called ‘false social value’.

Keywords: Labour Theory of Value; Differential Rent; Market Values; Marxian Reproduction Schemes; Industrial and Agricultural Sector; Conditions of Unimpeded Simple and Enlarged Reproduction; ‘False Social Value’

JEL classification: B12, B14, B24, O13, O14

1. Introduction

A first version of this paper has been published under the title ‘Differential Rent, Market Values and “False” Social Value: Some implications’, in *Critique*, Vol. 38, Num. 2, May 2010, pp. 253-266 (see Economakis 2010). Re-studying my paper, I realized that a misinterpretation of a relation and obscure points confuse the analysis. In this version of the paper I intend to correct and clarify some points of the former analysis, while I will omit some secondary points.

The aim of this paper is to demonstrate some *theoretical implications* concerning the economic-exchange relations between agriculture and industry (or generally non-agricultural sectors), *which originate from the Marxian theory of differential rent and market value* – in the light of Marxian reproduction schemes. The central point of these theoretical implications concerns the unequal exchange between agriculture and industry in favour of the former, which is depicted by the Marxian notion of ‘false social value’, that is, according to Marx, a value originating from the particular law of market value to which agricultural products are subjected. For this purpose, an abstract model of a closed economy is formed, based on Marxian (and elements of the Ricardian) labour theory of value. This model (and its various versions) is exposed in the assumptions posed during the analysis and is expounded through simple arithmetical examples.

The paper is structured as follows: In section 2 the basic assumptions of this study are posed and the main arguments that concern the unequal exchange between the agricultural and the industrial sector in favour of the former are exposed. In this section, the relationship between agriculture and industry and the condition for unimpeded reproduction of the economic system is examined under the presupposition that both the agricultural and the industrial sector are capitalist and follow a model of simple reproduction. In section 3 the relationship between agriculture and industry is examined under the presupposition that the class structure of agricultural sector is dominated by simple commodity production while the industrial sector is a capitalist sector. Two versions for the unimpeded reproduction of this economic system are examined, in this section: a version that assumes the simple reproduction of both sectors and a version that assumes the simple reproduction of the agricultural sector and the enlarged reproduction of the industrial sector. In section 4 the condition for unimpeded reproduction of the economic system is extracted under the assumption that both sectors are capitalist and follow a model of enlarged reproduction. Finally, in section 5 the main conclusions of the study are codified. The conclusions drawn from the assumptions accommodated to the purpose of this study do not claim a general theoretical validity. They aim to demonstrate some potential trends in the relations between agriculture and industry under capitalism, as they derive from aspects of Marxian analysis, namely the *Marxian theory of differential rent and market value*.

2. Simple Reproduction of a Two Capitalist Sectors Closed Economic System

2.1. Introductory Assumptions

The following two theoretical assumptions are posed, both of which are related to the question of the determination of exchange values.

- The commodities are sold at their labour values – as they are determined by the Marxian ‘law of market value’ (see below).

- The (exchange) value of a commodity, ‘is determined not by the necessary labour-time that it itself contains, but by the *socially* necessary labour-time required for its reproduction’ (Marx 1991: 238) in a way that: (a) the worst agricultural soil determines the market value of the agricultural product (MV.II), because of the ‘imperfection’ of the land ‘compared with the natural agents by which manufacturers are assisted’: that is, the limitation of available adaptable soil for cultivation (Ricardo 1984: 39, 33 ff.). According to Marx, this produces ‘a false social value’, that is a value which ‘results from the law of market value to which agricultural products are subjected’ (Marx 1991: 799, 788 ff.). (b) The market value of the industrial product (MV.I) is equal to the ‘average value’ of all commodities produced in the sector, and/or MVI is equal to the individual value of the commodities which are ‘produced under the average conditions’ of the sector (Marx 1991: 279); where, ‘market value... forms... the centre around which market prices fluctuate – these being the same for all commodities of the same species. [...] Thus if supply and demand regulate market price... the market value in turn regulates the relationship between demand and supply, or the centre around which fluctuations of demand and supply make the market price oscillate’ (Marx 1991: 279, 282). When the forces of demand and supply are mutually ‘cancelled’ ‘market prices... become market values’ (Marx 1991: 291-292). These market prices are the prices in which commodities are sold in value terms; in the following analysis it is assumed that market value equals market price.

It is also assumed that:

- There is a closed economy (or economic system) that consists of two sectors, the industrial (I) and the agricultural (II), interwoven in the frame of simple reproduction. In this system the ‘role’ of ‘Department I’ (*‘means of production’*) and the ‘role’ of ‘Department II’ (*‘means of consumption’*) (Marx 1992: 471 ff.) of Marxian reproduction schemes is assigned correspondingly to industry and agriculture.¹
- Both sectors are capitalist sectors – that is, sectors that are organized under the capitalist mode of production.
- In the agricultural sector, the legal ownership of land is separated² from the real ownership of the means of production. For simplicity, in the industrial sector the real ownership of the means of production coincides with the legal ownership of the land, or there is a rent-free-land for industrial investment. Thus, there are three classes in this economy: the class of landowners (legal ownership of agricultural land), the capitalist class (real ownership of the means of production), which is divided into two sections, the agricultural capitalist class and the industrial capitalist class, and finally the working class in both sectors.
- To facilitate arithmetical calculations, the market value of a unit of the annual agricultural product (as it is determined by the worst agricultural soil) is equal to the market value of a unit of the annual industrial product (as it is determined by average conditions).

¹ The assumption that industry is identified with the production of the means of production and agriculture with the production of the means of consumption provides the link for the involvement of the ‘pure’ agricultural sector to the reproduction schemes (see below).

² According to Marx, ‘the capitalist cultivation of the land assumes a separation between functioning capital and landed property... the separation between capital and land, tenant farmer and landowner corresponds to the capitalist mode of production’ (Marx 1991: 885).

2.2. Agricultural and Industrial Sector: The Unequal Exchange

It is additionally assumed that:

- There is a single agricultural sector (producing a similar product) in this economy, which consists of only five lots ($i = 1 \dots 5$) of different quality and thus of different labour productivity (where, 1 is the worst soil and 5 is the best), each one producing a unit of the agricultural product (AP) per time unit.

The economic function of the agricultural sector of the economy is characterized by (or based on) the following theoretical assumptions:

- Provided that the worst agricultural soil pays no rent, the only rent is the (agricultural) differential (ground) rent (R), according to Ricardo (1984: 33 ff.), of the first form, according to Marx's analysis (Marx 1991: 788 ff.), and more specifically (for the sake of simplicity), it is assumed that it is a rent depending on the 'fertility' of the different lots of cultivated land (Marx 1991: 789); where, $R_i = MV.II$ of a unit of AP minus the individual value of a unit of AP in better land i ($= 2 \dots 5$). That is, the differential rent is the outcome of two conditions: (a) difference in quality of the agricultural soil and (b) determination of the market value of the agricultural products by the worst agricultural soil.
- Following Marx's 'theoretical simplification' of a uniform rate of surplus value (Marx 1991: 275) in conditions of different compositions of capital, the rate of surplus value (s/v) is equal for all capitals of sector II ($= 100\%$), and the amount of labour needed for the production of a unit of the AP is equal for all cultivations, so that the increase of labour productivity in more fertile lands is expressed only through the decrease of the necessary constant capital for the production of a unit of the AP.³ It is assumed, for simplicity, that the longevity of constant capital is one period of production.

Table 1 illustrates a simple arithmetical example based on the above assumptions.

Table 1: Agricultural sector II – capitalist mode of production: AP in values		
i	Values	Rent
1	$80c + 20v + 20s = 120$	$R = 0$ worst soil / market value (= market price)
2	$70c + 20v + 20s = 110$	$R = 10$
3	$60c + 20v + 20s = 100$	$R = 20$
4	$50c + 20v + 20s = 90$	$R = 30$
5	$40c + 20v + 20s = 80$	$R = 40$

Where, c = the constant capital, v = the variable capital, s = the surplus value.

The total product value of sector II = $120+110+100+90+80 = 500$.

$MV.II = 120$, that is the individual value of the product of the worst soil, that gives no rent.

³ The net value is equal for all capitals invested in sector II, while the capitals invested in agricultural land have different (organic-value) compositions. According to the posed assumptions, the increasing productivity of land is represented by successive decreases in the composition of constant capital. This is the effect of increasing land fertility-productivity: diminution of needed capital per labour unit; this diminution is a central point of the Ricardian and Marxian notion of differential (ground) rent.

When the AP is sold (exchanged with the industrial product) the total value received by the agricultural sector is equal to:

$$120 * 5 = 600.$$

This is an *excess or extra value* of:

$$600 \text{ (received value)} - 500 \text{ (actually produced value)} = 100 = R (= 10+20+30+40).$$

It could be additionally assumed that:

- Within this closed economy there are only five industrial capitals ($i = 1 \dots 5$), which constitute a single industrial sector (producing a similar product), of different labour productivity (where, 1 is the capital of the lowest productivity and 5 is the most productive capital), each one producing a unit of the industrial product (IP) per time unit.
- The rate of surplus value is equal for all capitals of sector I (= 100%), and the amount of labour needed for the production of a unit of the IP is equal for all production processes, so that the increase of labour productivity in the industrial sphere is expressed only through the decrease of the necessary constant capital for the production of a unit of the IP.⁴ It is also assumed, for simplicity, that the longevity of constant capital is one period of production.

Table 2 illustrates a simple arithmetical example based on the above assumptions.

Table 2: Industrial sector I – capitalist mode of production: IP in values		
i	Value	Excess value
1	$120c + 20v + 20s = 160$	-40
2	$100c + 20v + 20s = 140$	-20
3	$80c + 20v + 20s = 120$	average composition of capital / market value (= market price)
4	$60c + 20v + 20s = 100$	20
5	$40c + 20v + 20s = 80$	40

The total product value of sector I = $160+140+120+100+80 = 600$.

$MV.I = (160+140+120+100+80)/5 = 600/5 = 120$, that is the average value of commodities produced in the sector, and/or the individual value of the commodity which is produced under the average conditions of the sector.

⁴ The net value is equal for all capitals invested in sector I, while the capitals invested in the industrial sector have different (organic-value) compositions. It is assumed that the increasing technical composition of capital is overcompensated by the increase in labor productivity, so that the organic-value composition of capital falls – despite the rising technical composition. Therefore, cost-reducing technological innovations are assumed. As a result, the decreasing organic composition of capital goes hand in hand with increasing labour productivity. Moreover, the average composition of capital (c/v) in agriculture equals to 3 and in industry to 4. Thus, the Marxian condition (see Marx 1991: 892 ff.) that the average (value) composition of capital is higher in industry than in agriculture is also fulfilled.

When the IP is sold (exchanged with the agricultural product) the total value which sector I could receive is equal to:

$$120*5 = 600 = (160+140+120+100+80),$$

while, the total excess value of sector I equals zero:

$$(-40-20+0+20+40) = 0.$$

This means that the actually produced value equals the received value.

But:

Total product in values of sector I = 600 = actually produced value of sector II (= 500) + R in values (= 100, paid to sector II by sector I).

Therefore, an extra value of 100 (= R) is transferred from sector I to sector II.

Consequently, between sectors I and II there is a relation of *unequal exchange* in favour of sector II:

500 (actually produced value of sector II) \Leftrightarrow 600 (total product in values of sector I).

This unequal exchange hides behind a *specious exchange of equivalents*:

500 (actually produced value of sector II) + 100 (R in values) = 600 \Leftrightarrow 600 (total product in values of sector I).

At the basis of this specious exchange of equivalents is 'a false social value' of 100R. This 'false social value' displays a real value of 1,100 (= 500 + 600) as a value of 1,200 (600 + 600). Nonetheless, through this 'false social value' the agricultural sector II extracts a value equal to 100 from the industrial sector I.

If a legal monopoly of landownership exists in distinction to the capitalist real ownership of the means of agricultural production (landowners as a separate social class from capitalists), this excess or extra value (= R = 100), is appropriated by the landowners, otherwise it is appropriated by the investor-farmer (capitalist) (see Marx 1991: 889, 940).

Assuming that the AP is sold at its market value, if a legal monopoly of landownership exists, the appropriation of R by landowners leaves the total of the surplus value of the agricultural sector ($20*5 = 100$) untouched.

2.3. The Condition for Unimpeded Simple Reproduction of the Economic System

The condition for unimpeded simple reproduction of Marxian reproduction schemes is:

$$I_{lc} = I(v+s) \text{ or } II_{lc} = I(v+k) \text{ (1a) (Marx 1992: 474 ff.),}$$

where, I_k or II_k = the personal consumption of capitalists of Department I or II, that is the part of surplus value that is spent for personal, non-productive consumption, which in the case of simple reproduction equals surplus value.

Relation (1a) means that for the unimpeded simple reproduction of a two departments' economy (Department I, means of production, and II, means of consumption) the demand of Department II for means of production must be equal to the demand of Department I for means of consumption.

I_{Ic} = the net supply of Department II in means of consumption, which is the value of the means of consumption that Department II offers after subtracting from its total production the means of consumption it needs, since:

$$I_{Ic} + II_v + II_s = I_{Ic} + II_v + II_k \Rightarrow I_{Ic} + II_v + II_k - II_v - II_k = I_{Ic}.$$

Therefore, relation (1a) also means that for the unimpeded simple reproduction of a two departments' economy, the net supply of Department II in means of consumption must be equal to the demand of Department I for means of consumption (see Stamatis 1997: 91 ff.).

Assuming that the 'role' of 'Department I' is assigned to industry and the 'role' of 'Department II' to agriculture, the condition for unimpeded simple reproduction of Marxian reproduction schemes is modified as follows:

$$I_{Ic} = I(v+s) + R \quad (1).$$

That is: For the unimpeded simple reproduction of the economic system of two sectors the demand of sector II for means of production must be equal to the demand of sector I for means of consumption *plus rent*:

$$\begin{aligned} \text{Demand of sector II for means of production (} I_{Ic} \text{)} &= \\ (80+70+60+50+40)I_{Ic} &= 300. \end{aligned}$$

$$\begin{aligned} \text{Demand of sector I for means of consumption (} I_v \text{) plus surplus value of sector I (} I_s \text{) plus rent} \\ \text{(} R \text{)} &= \\ 100I_v + 100I_s (+ 100R) &= 200 + (100) = 300. \end{aligned}$$

Or, for the unimpeded simple reproduction of the economic system of two sectors the net supply of sector II in means of consumption must be equal to the demand of sector I for means of consumption *plus rent* (i.e. increased by the value of rent):

$$\begin{aligned} \text{Net (actual)}^5 \text{ supply of sector II in means of consumption} &= 500 - 200(II_v+II_s) = 300 \\ \text{Demand of sector I for means of consumption plus rent (} R \text{)} &= 200(I_v+I_s) + 100(R) = 300. \end{aligned}$$

Thus – in the frame of this modified *static model* of simple reproduction –, through an amount of 100R an amount of 100 of value of the product (actual supply) of sector II (100 = 500 - 400), is realized by sector I, since:

$$\begin{aligned} \text{Actual supply of sector II (= actually produced value)} &= 500 = \text{Demand for the product} \\ \text{of sector II + Rent} &= (100II_v + 100II_s + 100I_v + 100I_s) + 100R = 400 + 100 = 500. \end{aligned}$$

⁵ Actual in the sense that rent is not taken into account.

This means that the value of the demand for the product of sector II is overvalued by 100.

Correspondingly, the value of the demand for the product of sector I is undervalued by 100:

$$\text{Supply of sector I} = 600 = \text{Demand for the product of sector I} - \text{Rent} = (300I_{IIc} + 400I_{Ic}) - 100R = 700 - 100 = 600.^6$$

Thus we have:

$$\text{Actual supply of sector II} + \text{Supply of sector I} = 500 + 600 = 1,100.$$

$$\begin{aligned} \text{Demand for the product of sector II} + \text{Rent} + \text{Demand for the product of sector I} - \\ \text{Rent} = \text{Demand for the product of sector II} + \text{Demand for the product of sector I} = 400 + 700 \\ = 1,100. \end{aligned}$$

The total of supply equals the total of demand as well as the actually produced value in the economic system = 1,100.

Thus, in the frame of the unequal exchange between agricultural sector II and industrial sector I, the condition of unimpeded simple reproduction of the economic system is fulfilled.

2.4. Ricardo Was Essentially Right

Consequently, the above conclusions rather justify Ricardo's theory of capitalist development (Ricardo 1984: 33 ff., 52 ff., 64 ff.), regarding the fact that the spontaneous laws of a capitalist economy lead to an extraction of an extra value from the industrial sector in favour of the agricultural sector, that is what Marx has called 'false social value'. This extraction is based on the 'imperfection', according to Ricardo, of land as a productive agent (which leads to the determination of the market value of the agricultural products by the worst agricultural soil) while its extent is dependent only on the differences in the fertility-productivity of the lots of cultivated land; besides the 'only precondition' of differential rent of the first form 'is the inequality of types of soil' (Marx 1991: 798). Moreover, 'the total rental grows with the expansion of cultivation, as long as this does not take place exclusively on the worst lands, which pay no rent' (Marx 1991: 802).

If we assume that a class of landowners exists and that the worst agricultural soil pays rent, that is, if we discard the assumption that the only (agricultural) rent is the differential rent, the entire amount of R received by landowners augments. This is the case of the existence of an (agricultural) 'absolute ground-rent', according to Marx's analysis (Marx 1991: 882 ff.).

⁶ The argument developed here is not negated if we assume that all industrial capitals ($i = 1 \dots 5$) are of identical size and composition, $80c + 20v + 20s = 120$.

3. Simple Commodity Agricultural Production and Capitalist Industrial Production

3.1. Simple Reproduction of Both Sectors and the Condition for Unimpeded Reproduction of the Economic System

In order to eliminate the extraction of an extra value in favour of the landowners and/or the capitalist class of the agricultural sector, the state (expressing the interest of the industrial capitalist class, or those of the so-called traditional petty bourgeoisie of agriculture, and under a proper correlation of class forces in the historical field of a capitalist social formation) could discard big land properties and capitalist enterprises from the agricultural sphere, through institutional-legal policy measures (redistribution of land) imposition of a maximum in agricultural prices and imports of agricultural goods (transformation of terms of trade between agriculture and industry against the former), tax-policy, credit-policy, etc.; and indeed historically, in some cases, state policy has discarded both big land properties and capitalist mode of production from agriculture (see Vergopoulos and Amin 1975; Vergopoulos 1975). Under these political-class conditions, simple commodity production emerges in agriculture.

Simple commodity production is the mode of production where,

‘[t]he independent peasant or handicraftsman is cut up into two persons. As owner of the means of production he is capitalist; as labourer he is own wage-labourer. As capitalist he therefore pays himself his wages and draws his profit on his capital; that is to say, he exploits himself as wage-labourer’ (Marx 1975: 408).

In simple commodity agriculture, a part of surplus product (possibly produced by agricultural non-capitalists or simple commodity producers), ‘is taken away from them in the form of taxes, etc.’ (Marx 1975: 407), since these producers produce contenting themselves (even) to the equivalent of a wage of labour.

According to Marx (1991: 941-942),

‘[t]he only absolute barrier he [a small-scale peasant owner] faces... is the wage that he pays himself, after deducting his actual expenses. He cultivates his land as long as the price of the product is sufficient to him to cover this wage; and he often does so to a physical minimum’.

Expressing the conditions of simple commodity production in sector II, it is assumed that:

- The market value of the agricultural product must, at least, be equal to its production costs on the worst soil ($= 80c+20v$), assuming that these producers produce contenting themselves to the equivalent of a wage of labour.

Under the class conditions of simple commodity production in sector II, table 1 must be transformed. Table 3 depicts the new assumptions.

Table 3: Agricultural sector II – simple commodity production: AP in values		
i	Values	Surplus product and rent received by producers
1	$80c + 20v + 20sp = 120 \rightarrow 100$	$R = 0, sp = 0$ worst soil / market value (= market price)
2	$70c + 20v + 20sp = 110$	$10sp$
3	$60c + 20v + 20sp = 100$	$20sp$
4	$50c + 20v + 20sp = 90$	$30 = 20sp + 10R$
5	$40c + 20v + 20sp = 80$	$40 = 20sp + 20R$

Where, c = the depreciation of the means of production (in this case also, for simplicity, it is assumed that c is depreciated in one period of production), sp = the surplus product and v = the equivalent of a wage of labour which the simple commodity producer pays him/herself, while the rate of ‘self-exploitation’ $sp/v = 100\%$.

Again, the total product value of sector II = $120+110+100+90+80 = 500$.

But now $MV.II = 100$, that is the individual value of the product of the worst soil minus the surplus product.

When then the AP is sold the total value received by the agricultural sector is equal to:

$$100*5 = 500.$$

Now there is no excess of value, since:

$$500 \text{ (received value)} - 500 \text{ (actually produced value)} = 0.$$

It is assumed that sector I is a capitalist sector, and thus there are again three classes in this economy, however, the class structure is transformed as follows: traditional petty bourgeoisie in agriculture, industrial capitalist class and the working class in the industrial sector.

Assuming that sector I is a capitalist sector (table 2 remains as it is), the above means that there no longer exists a relation of unequal exchange between sector I and II, in favour of II.

In this way, through the emergence of non-capitalist or simple commodity production as the prevalent form of production in sector II, the specific ‘imperfection’ of agricultural land as an agent of production is addressed in favour of industrial capital.

However, even in this case, inasmuch as the worst soil determines the market value, the state or the (industrial, credit etc.) capital could not extract the total of produced surplus product or the total of differential rent from these simple commodity producers:

$$10+20+30+40 = 100.$$

From this untouched amount of value an amount of 70 is surplus product produced by simple commodity producers (given to themselves as profit on their capital) while an amount of 30 is self-appropriated differential rent (see table 3).

As Marx (1991: 941) poses it,

‘there must evidently be a differential rent, an excess portion of commodity price, for the better... lands, just as there is in the capitalist mode of production. It is simply that the peasant whose labour is realised under more favourable natural conditions pockets this himself’.

If this reasoning is correct it follows that a process of class differentiation among simple commodity producers is active even under these conditions of extrusion of capitalism out of the agricultural sphere.

But now another problem emerges. An amount of value 100, that is, the excess or extra value that was absorbed from industry by agriculture in conditions of capitalist agriculture (= $600 - 500 = R$), cannot be realized within the closed economic system of simple reproduction.

The condition of unimpeded simple reproduction of the economic system is infringed:

$$I_{IIc} > I(v+s) \text{ (1b),}$$

since,

$$\begin{aligned} \text{Demand of sector II for means of production (IIc)} &= \\ (80+70+60+50+40)I_{IIc} &= 300 \end{aligned}$$

$$\begin{aligned} \text{Demand of sector I for means of consumption (Iv) plus surplus value of sector I (Is)} &= \\ 100I_{Iv} + 100I_{Is} &= 200. \end{aligned}$$

Or:

$$\begin{aligned} \text{Net supply of sector II in means of consumption} &= 500 - 200(I_{Iv}+I_{Is}) = 300 \\ \text{Demand of sector I for means of consumption} &= 200(I_{Iv}+I_{Is}). \end{aligned}$$

Inasmuch as the industrial sector I does not pay an excess or extra value = 100 to the agricultural sector II, an amount of value 100 of the production of sector II cannot be realized. The net supply of sector II exceeds the demand of sector I for its product, as well as, the total value produced by sector II exceeds its demanded value:

$$\begin{aligned} \text{Supply of sector II} = 500 &> \text{Demand for the product of sector II} = 100I_{IIv} + 100I_{IIs} + 100I_{Iv} + \\ &100I_{Is} = 400. \end{aligned}$$

Consequently, Malthus (1836: 398 ff.) seems to be justified, inasmuch as high agricultural prices and consequently high rents (and, according to his reasoning, landowners) are raised as factors of unimpeded reproduction of the economic system.⁷

Malthus was criticized for ignoring enlarged capitalist reproduction (see Rubin 1989: 299). In the following analysis this case is examined.

3.2. Simple Reproduction of the Agricultural Sector, Enlarged Reproduction of the Industrial Sector and the Condition for Unimpeded Reproduction of the Economic System

⁷ At the same time, Malthus (1836: 404-405) rejected any thought of increasing the consuming power of workers, as this would have a negative effect on the profits of agricultural and industrial capital.

Given the above posed assumption about the class structure of sector II, this sector of simple commodity production follows a model of simple reproduction. The capitalist sector I, however, follows a model of enlarged reproduction (see Milios and Economakis 2011).

Thus we have:

Sector II: $IIc + IIv \rightarrow$ simple reproduction with extraction of surplus product ($IIv = IIk$)
Sector I: $Ic + Iv + Is \rightarrow$ enlarged reproduction.

We now have to extrapolate a condition of reproduction of this particular hypothetical economic system.

For unimpeded reproduction of the system, it must be:

$$\text{Supply} = \text{Demand.}$$

Supply of means of consumption = Demand of means of consumption:

$$IIc + IIv = Iv + IIv(=IIk) + Ik + \Delta Iv \quad (3).$$

Supply of means of production = Demand of means of production:

$$Ic + Iv + Is = Ic + \Delta Ic + IIc \quad (4).$$

Where, ΔIc = the variation of constant capital of sector I and ΔIv = the variation of variable capital of sector I.

Posing the assumption that the overall demand in every sector for means of production and consumption is equal to the value of the gross product of that sector, we have:

$$IIc + IIv = IIc + IIv \quad (5)$$

$$Ic + \Delta Ic + Iv + \Delta Iv + Ik = Ic + Iv + Is \quad (6).$$

From relation (6) it follows:

$$Is = Ik + \Delta Iv + \Delta Ic \quad (7),$$

which means that the surplus value of sector I is spent for personal consumption of the capitalists of the sector and for the enlargement of constant and variable capital of the sector. This relation also implies that the capitalists of sector I do not spend for their consumption (Ik) and for the accumulation of capital ($\Delta Iv + \Delta Ic$), neither more nor less than the surplus value produced in the sector (Is); therefore, it is assumed that a credit system is absent.

From relation (7) it follows:

$$Ik + \Delta Iv = Is - \Delta Ic \quad (8).$$

From relation (4) through relation (7) it follows:

$$IIc = Iv + Ik + \Delta Iv \quad (9).$$

Relation (9) is the new (modified) condition of unimpeded reproduction of the system, and means that the demand of sector II for means of production is equal to the demand of sector I for means of consumption.

It also means that the net supply of sector II in means of consumption

$$IIc + IIv - IIv = IIc,$$

is equal to the demand of sector I for means of consumption.

From relation (9) through relation (8) it follows:

$$IIc = Iv + Is - \Delta Ic \text{ (10).}$$

Relation (10) is another version of the new (modified) condition of unimpeded reproduction of the system.

Given the data of tables 2 and 3, from relation (10) it follows:

$$300 [IIc] = 100 [Iv] + 100 [Is] - \Delta Ic \Rightarrow \\ \Delta Ic = -(-100).$$

Consequently

$$300 [IIc] = 100 [Iv] + 100 [Is] - (-100) [\Delta Ic],$$

that is,

$$300IIc = 100Iv + 100Is + 100\Delta Ic.$$

Therefore, the system would satisfy the condition of unimpeded reproduction if $\Delta Ic = 100$, that is, if the constant capital of sector I augments at 100 (in the next period of production).

3.3. Rent and Reproduction of the Economic System in Conditions of Simple Reproduction of the Agricultural Sector

From the above it could be inferred that:

If

$$IIc = I(v+s) + R \text{ (1)}$$

[simple reproduction of the economic system in conditions of legal landownership / rent and capitalist production in both sectors],

while,

$$IIc = I(v + s) - \Delta Ic \text{ (10)}$$

[simple reproduction of sector II and enlarged reproduction of sector I in conditions of simple commodity production in sector II and capitalist production in sector I],

then, from relations (1) and (10), it follows:

$$R = -\Delta Ic \text{ or } \Delta Ic = -R \text{ (11).}$$

Relation (11) means that if a rent existed it would absorb the accumulation of constant capital,⁸ that is, it would tie down (sector I, and thus) the whole system to simple reproduction. However, in this case, the condition of unimpeded simple reproduction of the economic system would still be fulfilled – at least in the frame of the *static model* of reproduction⁹ developed in this study.

The same applies if we consider that both sectors are capitalist sectors, and that the economic system as a whole (that is both sectors) follows a model of enlarged reproduction. In the following analysis this case is examined.

4. Enlarged Reproduction of a Two-Sector Closed Economic System and Rent as an ‘Absorber’ of Capital Accumulation

It is assumed again that there is no state intervention against big land properties and capitalist enterprises in agriculture.

The condition for unimpeded enlarged reproduction of the economic system (see Marx 1992: 565 ff.; Stamatis 1997: 96 ff.; Milios and Economakis 2004) is:

$$IIc + \Delta IIc = Iv + Ik + \Delta Iv \quad (12a),$$

which means that the demand of sector II for means of production is equal to the demand of sector I for means of consumption.

On the basis of the assumption that the overall demand in every sector, and thus of sector II, for means of production and consumption is equal to the value of the gross product of that sector (see also above) it follows that:

$$IIc + \Delta IIc + IIv + \Delta IIv + IIk = IIc + IIv + IIs \Rightarrow IIs = IIk + \Delta IIv + \Delta IIc \quad (7a),$$

which means that the surplus value of sector II is spent for personal consumption of the capitalists of the sector and for the enlargement of constant and variable capital of the sector.

The net supply of sector II in means of consumption, is the value of the means of consumption that sector II offers after subtracting from its total production the means of consumption it needs:

$$IIc + IIv + IIs - IIv - \Delta IIv - IIk.$$

Given relation (7a), it follows that,

$$IIc + IIv + IIs - IIv - \Delta IIv - IIk = IIc + IIv + IIk + \Delta IIv + \Delta IIc - IIv - \Delta IIv - IIk = IIc + \Delta IIc.$$

⁸ On the frame of the posed assumptions of the study (and of the arithmetical data of the example), inasmuch as the augmentation of constant capital in sector I ($\Delta Ic = 100$) results from the unpaid rent ($R = 100$) by sector I to sector II, the surplus-value of sector I ($I_s = 100$) could be spent either for the consumption of capitalists or for the accumulation of variable capital. This ‘remaining’ and ‘intact’ surplus-value in sector I was forgotten in Economakis 2010, thus leading to a misinterpretation of relation $300IIc = 100Iv + 100I_s + 100\Delta Ic$.

⁹ The condition of unimpeded reproduction of this system is fulfilled only statically, i.e. in the first round of reproduction – and not in a dynamic process of capitalist expansion (see also Economakis and Milios 2004). Given that sector I follows a model of expanded reproduction in conditions of simple reproduction of sector II a shortage of means of consumption for its reproduction would be generated. Imports of agricultural products will be needed for the unimpeded reproduction of the system. And this was in essence Ricardo’s theoretical strategy. Correspondingly, this was in essence what Malthus fought to be avoided (see Rubin 1989).

Therefore, relation (12a) also means that, for the unimpeded enlarged reproduction of a two departments' economy, the net supply of sector II in means of consumption must be equal to the demand of sector I for means of consumption

Assuming the existence of a rent that overvalues the value of the demand for the products of sector II, in accordance with relation (1), relation (12a) is modified as follows:

$$I_{IIc} + \Delta I_{IIc} = I_v + I_k + \Delta I_v + R \quad (12).$$

That is: For the unimpeded enlarged reproduction of the economic system of two sectors, the demand of sector II for means of production must be equal to the demand of sector I for means of consumption *plus rent*. Or, for the unimpeded enlarged reproduction of the economic system of two sectors the net supply of sector II in means of consumption must be equal to the demand of sector I for means of consumption *plus rent* (i.e. increased by the value of rent).

Relation (7) holds as it is. From relation (7) it follows:

$$I_k = I_s - \Delta I_v - \Delta I_c \quad (13).$$

From relation (12) through relation (13) it follows:

$$I_{IIc} + \Delta I_{IIc} = I_v + I_s - \Delta I_c + R \quad (14).$$

Given the data of tables 1 and 2, from relation (14) it follows:

$$\begin{aligned} 300 [I_{IIc}] + \Delta I_{IIc} &= 100 [I_v] + 100 [I_s] - \Delta I_c + R \Rightarrow \\ 100 &= -(\Delta I_c + \Delta I_{IIc}) + R. \end{aligned}$$

If $R = 100$, it follows:

$$100 = -(\Delta I_c + \Delta I_{IIc}) + 100[R] \Rightarrow \Delta I_c + \Delta I_{IIc} = 0 \quad (15).$$

Relation (15) of the *static model* of enlarged reproduction means that if a rent exists it will absorb the accumulation of constant capital, and, as a consequence, it will tie down both sectors and the entire economic system to simple reproduction, as relation (1) indicates. Nevertheless, even in this case, the condition of unimpeded simple reproduction of the economic system is fulfilled – given the assumptions and the arithmetical data of this study.

5. Conclusions

The aim of this paper is to demonstrate some *theoretical implications* concerning the economic-exchange relations between agriculture and industry (or generally non-agricultural sectors), *which originate from the Marxian theory of differential rent and market value* – in the light of Marxian reproduction schemes. The posed assumptions (and the arithmetical data) are

accommodated to this purpose. The conclusions of this study do not pretend a general theoretical validity but they must be seen within the limits of the posed framework. These conclusions are the following:

1. In conditions of capitalist agriculture, if a legal monopoly of landownership exists in distinction to the capitalist real ownership of the means of agricultural production (landowners as a separate social class from capitalists), then an excess value in the form of rent is appropriated by the landowners, otherwise it is appropriated by the investor-farmer (capitalist). This is a process of unequal exchange between agriculture and industry (or non-agricultural sectors in general). This unequal exchange between agriculture and industry in favour of the former consists of what Marx has called ‘false social value’.
2. This excess value is extracted from industrial (non-agricultural) sectors because of the ‘differential’ way in the formation of the market price in the agricultural vis-à-vis the industrial sector; market value on the basis of worst conditions (agriculture – creation of differential rent) vis-à-vis market value on the basis of average conditions (industrial or generally non-agricultural sectors – zero excess value).
3. Rent would absorb the total or at least a part of the accumulation of capital, and thus would suspend enlarged capitalist reproduction. Given this absorption, that is, the extraction of an extra value from the landowners and/or the capitalist class of the agricultural sector, against the industrial sector, the state policy, on occasions, has favoured (in the historical field of capitalist social formations) the embedding of simple commodity production in agriculture, that is, the abolition of big land properties and agricultural capitalist mode of production. This is a political-class correction of ‘false social value’. Inasmuch as simple commodity producers could produce without any profit or rent, being sufficient even with an equivalent of a labour wage, the revenue outcome of the specific ‘imperfection’ of agricultural soil as a productive agent is addressed. However, even under these class conditions a process of class differentiation is active among simple commodity producers in agriculture, since the worst soil continues to determine the market value of agricultural products.

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