Some Questions on the Rates of Profit and Rents

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Foreword

We deal with three subjects, namely, the presence of more than one rate of profit in an economy due to the existence of rents (absolute and monopoly rents); the subordination of the prices and the rate of profit (in price terms) to the real profit or net product, measured in value terms; and the impact of leveraging on the rate of profit and on a simple calculation of the sum of credit (money) generated in an economy over a given period of time.

1.- Existence and implications of different rates of profit in an economy

It is an assumption in classical political economy that there is only one rate of profit in the industries of an economy, or, at least, a tendency to the equalization of different rates is recognized.

This equalization, according to Marxians, is the result of competition among capitalists. Empirical studies however, do not support the assumption of only one rate of profit (see Fröhlich).

1.1 From a system with a unique rate of profit to a system with industries' own rates of profit

The price system used in this paper follows a Sraffian simple production model without joint production, where the wage is set as a basket of commodities, paid in advance.

This price system is expressed as follows:

$$P' = (1 + r).P'.A \qquad (1)$$

P is a column vector of production prices, A is the Leontief matrix plus the matrix of the basket of commodities that form the wage employed in the production of one unit of product – and which corresponds to the product of the column vector of wage commodities: B, and row vector of labour employed in each industry: L'-; r is the rate of profit.

Prices can be expressed also as a function of the current labour employed plus the labour employed (embodied) in different previous periods, following the Sraffian dated labour formula:

$$P'_{i,w} = l_i.(1+r) + L'.A.A_{i.}(1+r)^2 + L'.A^2.A_{i.}(1+r)^3 + \ldots \qquad (2)$$

This second expression corresponds to a specific commodity price, measured in wage units. L' is a row vector of the live labour $L = l_1, l_2, \ldots l_i \ldots l_n$ that is used in each industry; A_i is the column vector of inputs of industry: i.

The unknowns are the prices of products and the rate of profit.

If we, now, consider that equalization of the rate of profit does not operate, we will have the following system:

$$P' = P.\begin{bmatrix} a_{11}.(1+r_1) & a_{12}.(1+r_2) \ldots a_{1n}.(1+r_n) \\ a_{21}.(1+r_1) & a_{22}.(1+r_2) \ldots a_{2n}.(1+r_n) \\ \ldots & \ldots \quad \ldots \\ a_{n1}.(1+r_1) & a_{n2}.(1+r_2) \ldots a_{nn}.(1+r_n) \end{bmatrix} + \; w.L'.\overline{(1+r)}$$

$\overline{(1+r)}$ is a diagonal matrix, the components of which are the rates of profit of the different industries and the row vector L is multiplied by the scalar wage, w[1].

The price of good 1 expressed, in terms of wage units, will be:

$$P_{1,w} = l_1.(1+r_1) + \left[\sum_{i=1}^{n} l_i \,.\, a_{i1}\right](1+r_i).(1+r_1) + \left[\sum_{i=1}^{n}\sum_{j=1}^{n} l_i \,.\, a_{ij}.a_{j1}\right].(1+r_j).(1+r_i).(1+r_1) + \cdots \qquad (3)$$

In (3), each of the products of the rates of profit could be replaced by an average rate. Moreover, a general average rate could be found that equates price $P_{1,w}$ with the amounts of dated and live labour. Thus, even if we do not assume an equalized rate of profit, we can calculate a central or average rate, obtaining a solution from the polynomial expression above (as we can see in Example 5 below, where a quartic polynomial is calculated, given the industries' rates of profit, in addition to the Leontief matrix and labour). The system will behave as if it has a common rate of profit. Such a rate is not calculated independently of the quantities produced (in Example 5 below, the rate obtained corresponds to a situation where only one unit of each product is being produced).

The value system we will use in conjunction with the price system is the standard Marxian system.

[1] The wage is a scalar obtained by the product of a row vector of prices P' and the column vector B of the basket of commodities that form the wage per unit of labour.

$$\Lambda' = L'.(I - A)^{-1} = \Lambda'.A + L' \qquad (4)$$

where Λ is a column vector of labour values and I a diagonal matrix with components equal to 1.

1.2 Reasons for the existence of different rates for different industries

Marx's study of the existence of an absolute rent that modifies prices, and the reference he makes to monopoly rent (see reference to Marx's Capital's in Bibliography), are the starting point for our modification of the initial assumption of only one rate of profit. Absolute rent could be represented by an industry generating a greater rate of profit in terms of values expressing its lower organic composition of capital, and that is not equalized because of barriers to the competition. This rent is due to the existence of a ground property right.

The difference between absolute and monopoly rent lies in the existence of a created value counterpart in the case of the absolute rent whereas the monopoly rent does not require that a created value be retained; it implies only a redistribution of the surplus value already created elsewhere.

Rents are an even more important issue today, since many economic actors (the banking and financial industry in general, together with large utilities companies and those companies related to the land use and urban planning) strive to make their source of rent untouchable. Additionally, political economy in important parts of the world, such as the euro area tends to favour rent holders by focusing on maintaining the value of the euro and, in this way, the value of rents and loans, instead of profit and wage earners.

1.2.1 Example to represent absolute rent

Data of a three industry economy can be found in Table 1, where values and different rates of profit in value terms are obtained according to the different organic composition of capital and which will serve to produce some examples.

As far as absolute rent is concerned (see Example 1), it would be represented by the higher than the average rate of profit in terms of value due to barriers to competence (a rate of 0.0559 in Table 1). We observe that using the same industry rates of profit found in the value system (Table 1), we are able to calculate the corresponding prices of production of such a system, which maintain the same rates, and, therefore, the case of absolute rent.[2] The

[2] It can be seen in Table 1 and Example 1 that values and production prices differ, which is not a surprise taking into account the calculation formulae (1) and (4); nevertheless it is curious that besides common I/O matrix and labour force, they share in this case the same rates of profit. This is due to the different way profit increases: in a value system only live labour can produce new surplus value, whereas, in terms of prices, the rate of profit includes also the constant capital. Logically the calculation of the rates of profit can also be applied to the value system ex post.

In the Sraffian system, the production prices are calculated simultaneously with the rate of profit in order to make the existence of the rate possible. Although the role and existence of prices of production are mainly related to the calculation of this unique

average rate for the remaining industries could be represented by the weighted rate of profit in value terms (Marxian rate) or by the rate corresponding to the eigenvalue (in price terms). In any of two cases, the selected absolute rate would be higher than the average.

Table 1

Initial data			
Leontief I/O matrix			
	0.30	0.20	0.20
	0.10	0.10	0.00
	0.10	0.20	0.05
L Labour employed in each industry (*per unit of product)*	1.00	0.10	2.00
B Wage goods *per unit of labour*	0.10	0.10	0.25
Sum of inputs in value			5.3561
Sum of outputs in value			5.5624
Individual values Λ			
Λ_1			1.9452
Λ_2			1.1023
Λ_3			2.5149
Rate of profit in value (Marxian)			0.0385
Wage *(in value, per unit of labour)* $\Lambda'.B$			0.9335
Rate of plus value *(per unit of labour)* $(1-\Lambda'.B)$			(0.0665=1-0.9335)
Individual rates of profit in value			
r_1			0.0354
r_2			0.0061
r_3			0.0559

Example 1.- Case of absolute rent	
Sum of Individual production prices ΣP_w	5.9589
Individual production prices *- in wage units*	
$P_{1,w}$	2.0839
$P_{2,w}$	1.1809
$P_{3,w}$	2.6941
Calculations *Individual industry rates of profit in value (equal to rates of profit in prices by construction) are used in calculations. Prices of production in unit wages are calculated given the I/O matrix, the quantity of work employed and the rates of profit.*	

1.2.2 Example to represent the monopoly rent

As far as monopoly rent (Example 2) is concerned, if we increase, for instance, the lowest rate of profits (see Table 1 for rates) by multiplying it by 10, an increase in prices – in wage units – is produced, smaller than this rate's increase, which affects every industry of the

rate of profit of the system, they can be obtained, as well - as we can see in Example 1 - when different rates of profit are considered. As the rates of profit enter in action to calculate the production prices, the initial undifferentiated product price based on labour (the unique "price" of labour), becomes differentiated as production prices of the commodities. (The non-equalized initial Marxian value system could, thus, be interpreted as an example of different rates of profit and only one "price" for every industry product unit, which is valued at only one labour-based price independently of what that product is.)

system, not only to the industry to which the rate's increase had been initially applied. The system's weighted rate of profit in prices is also increased. The net product expressed, for instance, by surplus value, does not change.

Example 2.- Case of monopoly rent	
Sum of Individual production prices ΣP_w	6.0488
Individual production prices *- in wage units*	
$P_{1,w}$	2.0956
$P_{2,w}$	1.2565
$P_{3,w}$	2.6967
Calculations *Individual industry rates of profit are used in calculations. Rates are in value;* r_2 *(*10): 0.06112. Prices of production in unit wages are calculated given the I/O matrix, the quantity of work employed and the rates of profit. It can be seen that the higher the global rate of profit, the higher the sum of prices.*	

Thus, let it be a non-equalized system; when an increase of a monopoly rate of profit occurs, there is an increase of the weighted global rate of profit and a rise in the prices of all industries, as can be deduced from Equation(3) above. The real product and Marxian rate of profit as expressed by labour magnitudes remain equal. In the case of agriculture, or when more than one production method coexists (see Annex 1), the increase in the global rate of profit modifies the differential rents in an industry with more than one production method.

1.2.3 Examples with significant calculations of production prices in terms of wages, using a single rate of profit

We select three significant calculations of production prices in terms of wage, using three different rates of profit: one corresponding to the eigenvalue, another corresponding to the rate that equates total profits and total surplus value in our system (see next section) and, finally, one obtained from the solution of a quartic polynomial of dated labour (Equation (2)).

Example 3.- Rate of profit corresponding to the Eigenvalue of the I/O matrix *(r=0.043)*	
Sum of Individual production prices ΣP_w	6.002
Individual production prices *- in wage units*	
$P_{1,w}$	2.1089
$P_{2,w}$	1.2282
$P_{3,w}$	2.6649
Calculations *A single general rate of profit is used in calculations. Prices of production in unit wages are calculated given the I/O matrix, the quantity of work employed and the rate of profit. It can be seen that the higher the global rate of profits, the higher the sum of prices.*	

Example 4.- Rate of profit that equates total surplus value and total profits *(r =0.036)*	
Sum of production prices ΣP_w	5.9284
Individual production prices *- in wage units*	
$P_{1,w}$	2.0815
$P_{2,w}$	1.2069
$P_{3,w}$	2.64
Calculations *A single general rate of profit is used in calculations. Prices of production in unit wages are calculated given the I/O matrix, the quantity of work employed and the rate of profit. It can be seen that the higher the global rate of profits, the higher the sum of prices.*	

Example 4, shows the prices associated with the "r", obtained in labour terms, which defines the sustainability of the sraffian system (see next section for the analysis of the sraffian system in terms of labour time and value).

Example 5.- Rate of profit r=0.0393 *(r approximated solving a quartic polynomial)*	
Sum of Individual production prices ΣP_w	5,9327
Individual production prices *- in wage units*	
$P_{1,w}$	2,0742
$P_{2,w}$	1,2112
$P_{3,w}$	2,6473
Calculations *Using the industries' rates of profit (Table 1) in Equation (3), an approximate sum of production prices is obtained and from this data (together with the remaining data: I/O matrix and the quantity of work employed) a single general rate of profit is calculated which is a quartic polynomial root of the equation formed. Afterwards the prices of production, in unit wages, associated to this rate, are calculated.*	

2.- The rate of surplus value per unit of labour & the rate of profit and its associated production prices: a limitation of the sraffian system

As has been shown in equations (2) and (3) above, according to Sraffa the relation between prices of production (measured in wage units) and value (or labour forming part of value) is expressed by live and dated or embodied labour time in successive production periods – multiplied by successive powers of r. The use of the wage as the unit for prices eliminates this distribution variable from the equations.

It is also known that these production prices, obtained in this way, are higher than values, and that when r is zero, prices and values are the same.

Therefore, it can be said that the sum of production prices and the sum of values differ in the amount of total profits cumulated in the system (not only the profits obtained in the current period.

In Meléndez-Plumed (2009), it is shown that an "r" in value terms can be calculated that equals total profits and total surplus value, and that this "r" corresponds to the following, Marxian, formula for the rate of profit- in value terms:

$$(\Sigma\Lambda - \Sigma CC - \frac{Tv}{1+(1-w)})/((\Sigma CC + \frac{Tv}{1+(1-w)}) \qquad (5)$$

Where, $\Sigma\Lambda$ is the sum of the labour values, $\Sigma CC = \Lambda'.\mathrm{A}$, is the sum of constant capital in terms of value, Tv is the system's all live labour (Σ(V+Pl) in Marxian terminology), and w is the wage per unit of labour (If B is the wage commodities basket per unit of labour, then, the product of vectors of labour values and commodities basket: $\Lambda'.B = w$, is a scalar that expresses wage in terms of value). $(1-w)$ is, then, the surplus value rate per unit of labour.

It can be observed in Equation (5) that the numerator expresses the net value produced, and the denominator, the resources employed, both in terms of labour value. The live labour is divided by "1" plus the rate of surplus value, so as to obtain the variable capital employed.

In this specific case, the difference between the sum of prices and the sum of values would be the <u>total</u> surplus value (not only the current period surplus value) as well as total profit.

It can be said that:

$$Tv + Pl = Tv + Tv * (1-w)$$

Since

$$Tv.(1-w) = Pl$$

As value is the sum of all the live labour incorporated in any period:

$$\Sigma\Lambda = \Sigma Tv$$

Then

$$\Sigma\Lambda.(1-w) = \Sigma Pl$$

Provided that the prices calculated at the "r" rate, which equals total surplus value and total profits, are equal to the value plus the total surplus value, we can express them as follows:

$$\Sigma P_w = \Sigma\Lambda + \Sigma Pl = \Sigma\Lambda.(1+(1-w))$$

In our Example 4:

$\Sigma P_w = 5{,}92 = \Sigma\Lambda + \Sigma PL = 5{,}56 + 0{,}37 = 5{,}92$ (See Example, part 4, above)

And

$\Sigma\Lambda.(1+(1-w)) = 5{,}56.(1+(1\text{-}0{,}9335)) = 5{,}92$

Thus, prices (and rates of profit) must conform to the evolution of the surplus value. The sustainability of the Sraffian prices and the corresponding rate of profits, depend on the rate of surplus value, since:

$$\Sigma P_w = \Sigma\Lambda.(1+(1-w) = (1+r).L.(I-(1+r)A)^{-1}.I_{vector}$$

where $I \ \ and \ I_{vector}$ are respectively, a diagonal matrix with components equal to 1 and a column vector with components equal to 1.

Moreover, if the Sraffian reduction of prices to dated labour (Equation (2)) is to be sustainable, it must incorporate the rate of profit in labour terms that equals total surplus value and total profits.

3.- Credit and the rate of profit, credit and money, credit as a rent

Credit is needed to mobilize human and material preexisting resources to be acquired outside the industry, because its own resources - new ones or previously existing ones - can be mobilized directly. The existing money in the system is derived (generally speaking) from credit and corresponds to the leveraged part of the production. For this reason – industry's own resources are not mobilized by money – already existing money does not correspond to the sum of the existing assets whatever they be. Provided that the workforce has to be paid with a wage to be converted to a basket of goods, these goods have to pre-exist in order for the production process to begin.

Since wages can be considered as advanced, credit – the form of financing wages as well as circulating constant capital - can be considered as an advancement in future production. Credit borrowed must have collateral assets.

Credit requires banking that earns a (net) interest rate on the credits given. This constitutes an extra cost of inputs and reduces the global rate of profit and increases the commodity's price.

Interests of credits have a similar expression as differential rents. In both cases there is a depression of the rate of profit and the capitalists that do not need to borrow money have a "differential rent". The banking role: mobilizing resources, is not essential and, furthermore, might well be achieved by other means.

The equations of the system are, in this case, as follows:

$$\left(a_{11}+a_{21}.(1+i).\frac{P_2}{P_1}\right).(1+r)=1$$

$$\left(a_{12}.(1+i).\frac{P_1}{P_2}+a_{22}\right).(1+r)=1$$

The inputs used are the total production of the previous period, according to the following equations:

$$\left(a_{11}.(a_{11}+a_{12})+a_{21}.(a_{11}+a_{12}).(1+i).\frac{P_2}{P_1}\right).(1+r)=(a_{11}+a_{12})$$

$$\left(a_{12}.(a_{21}+a_{22}).(1+i).\frac{P_1}{P_2}+a_{22}.(a_{21}+a_{22})\right).(1+r)=(a_{21}+a_{22})$$

The new total credit in the present system producing one unit in both products is represented by the quantity:

$$\frac{P_1}{P_2}.a_{12}+\frac{P_2}{P_1}.a_{21}$$

The interests obtained by banks are:

$$\frac{P_1}{P_2}.a_{12}.(i)+\frac{P_2}{P_1}.a_{21}.(i)$$

The credit that has been paid off is as follows:

$$\frac{P_1}{P_2}.a_{12}.(a_{21}+a_{22})+\frac{P_2}{P_1}.a_{21}.(a_{11}+a_{12})$$

The credit increase is the difference between the two quantities above:

$$\frac{P_1}{P_2}.a_{12}.\left(1-(a_{21}+a_{22})\right)+\frac{P_2}{P_1}.a_{21}.(1-(a_{11}+a_{12}))$$

This positive difference of credit amounts is what allows the resources needed to continue the production to be mobilized in the same way as before and has no counterpart in existing money corresponding to the previously created surplus value. [3]

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[3] According to Steve Keen (2), citing Schumpeter in 1934

> *"Even though the conventional answer to our question is not obviously absurd, yet there is another method of obtaining money for this purpose, which … does not presuppose the existence of accumulated results of previous development, and hence may be considered as the only one which is available in strict logic. This method of obtaining money is the creation of purchasing power by banks… It is always a question, not of transforming purchasing power which already exists in someone's possession, but of the creation of new purchasing power out of nothing. (Schumpeter 1934, p. 73)"*

And also from Keen, available in his ppt files:

> *"It follows that over a period during which economic growth takes place, at least some sectors finance a part of their spending by emitting debt or selling assets." (Minsky 1982, p. 6)"*

> *"Schumpeter on same issue: growing debt adds demand beyond that generated by sales of goods & services*

The increase in the quantity of credit is a natural consequence of economic growth. The rate of growth of the quantity of credit corresponds to the proportion between the effective use and the production of commodities.

A price increase produced by a speculative process –sustained demand of dwellings, for instance - can produce an continuous rise in the specific industry rate of profit and of the general average rate of profit; therefore due to this increase in the price of the commodity subject to speculation, along with other prices there is continuous growth of the total credit generated. This may involve a bias in the real product being produced, however it is expressed.

4.- Conclusions

- A model with different industries' rates of profit is possible and compatible with a resultant single rate.
- The rise of an industry rate of profit increases the global rate, the system prices and modifies the differential rents in any industry with more than one production method. The real product expressed in values is not altered.
- Labour magnitudes determine the sustainable price system because the rate of profit and prices must conform to the surplus value produced. Specifically, the rate of surplus value per unit of labour sets the rate of profit in terms of prices. The reduction of prices to dated labour must employ the rate of profit in labour terms that equals the total surplus value and total profits.
- A procedure to introduce the concept of credit (and money) in the Sraffian schemes is envisaged where an increase in the quantity of credit is a natural consequence of the economic growth and the rate depends on the proportions of the effective use and the production of commodities.

-Debt essential for entrepreneurial function

–Entrepreneur often has idea but no money

–Needs purchasing power before has goods to sell

–Gets purchasing power via loan from bank

–Entrepreneurial demand thus not financed by "circular flow of commodities" but by new bank credit"

According to the analysis of the work of Karl Marx regarding money, by Dallemagne, p. 140:

The problem that arises is how to buy a value: c + v + pl as goods with a value c+v in the form of money.

But this also implies that the accumulated surplus value that appears on the market in the form of goods has no equivalent in money.

p. 72: *The creation of this money is made ex nihilo. (all quotations from Dallemagne translated from Spanish)*

- A continuous price increase produced by a speculative process may generate a continuous rise of all the prices of the system and a subsequent continuous growth of the total credit generated.
- Interests of credits have similarities with differential rent, provided that the production costs increase depressing the rate of profit and generating a “rent” to capitalists who do not need to borrow money.

Annex 1.- Remarks on rents

- We use a simple Sraffian production system in which one industry produces only one product, although (subject to a precondition of an increase in demand) there may be different production methods. As far as these are concerned, we accept the restrictions established by Sraffa: first, the new method which is beginning to be used due to the existing demand, needs to be more productive and at the same time more expensive, and, thus, in this case of basic system change, it is always expected that changes in the production costs of the (originally, agricultural) commodities may increase and not decrease. Otherwise this method would substitute the previously existing less productive one (because it would also be less expensive). A second precondition is that there are no negative rents. Then, if a change in the order of profitability takes place due, for instance, to a change in the distribution variables, and the once less productive but more profitable method becomes less profitable, it will not continue to be used. The basic system in this case, remains the same. This does not imply that the price of a product subject to demand pressures might not, nevertheless, decrease in some cases, for instance, following changes in the distribution variables.

- Absolute and monopoly rents are calculated at the same time as the rate of profit and prices. In fact, rents are considered as added to the price. It is not our intention to obtain the differential rents since they do not affect the common rate of profit (once the less cheap method has been introduced). Differential rent is paid to the owner of the land, compensating the gain based by the use of a cheaper method of production. This is a hidden profit in terms of the price system, and thus, the rate of profit would be higher in the case the rent (the property of the land) did not exist, due to a reduction in the production costs.[4]

[4] The theoretical debates on rent go back to the analyses on the ground rent in Adam Smith (AS), David Ricardo (DR), Karl Marx (KM) and (more recently) Piero Sraffa (PS), with the aim of calculating the specific rents that are created, the way they are created and the repercussions they have. Harvey (Harvey, David. **The Limits to Capital**.Verso: London, 2006, http://libcom.org/files/The%20Limits%20to%20Capital.pdf) emphasizes the importance of real estate rents. Bidard (1) (Bidard, Christian. **Getting Rid of rent?** March 2013, http://www.centrosraffa.org/public/19e84341-f3ab-48eb-bc32-58f15b1f85f8.pdf), makes an analogy on the treatment of ground rents and those coming from the oil industry. Barceló (Barceló, Alfons. **Modelització econòmica a partir de dades històriques**. Recerques: Història, economia i cultura, ISSN 0210-380X, Nº 19, 1987 , vol. I , págs. 9-16. http://www.raco.cat/index.php/Recerques/article/viewFile/137639/241450) shows how the analysis of rents may have a direct use in the explanation of historical facts relating to agricultural trade. Bidard, criticizes the Sraffian and Ricardian theoretical stance on the basis that more than one production methods for the same basic commodity makes both the compatibility with a single-product system (p. 9) and the trade-off between profits and wages (p. 7) impossible. He also criticizes the Sraffian restriction regarding new agricultural methods, which must be both more productive and more expensive than before (p. 6) (a restriction that allows the continuation of the analogy of the extensive rents to intensive rents: the production increases at a higher unit cost of production) Similar positions are defended in Bidard (2) (Bidard, Christian. **Intensive Rent and Value in Ricardo**. 21 March 2013, http://www.centrosraffa.org/public/0120d71b-5467-4aba-8650-54ce5e18a78f.pdf)
We consider with Fratini (p- 6) (Fratini, Saverio. **A remark on intensive differential rent and the labour theory of value in Ricardo.** June 2010, http://mpra.ub.uni-muenchen.de/30144/. MPRA Paper No. 30144, posted 9. April 2011) and even Schefold, - p. 252 – (Schefold, Bertram. **Mr Sraffa on Joint Production and Other Essays**. 1989, http://digamo.free.fr/schefold.pdf) and in agreement with AS and KM, that there is no land use without rent payment, in opposition to DR who considers that less productive land pays no rent. The part of land where agricultural commodity production has the higher unit price - and is the cause of rent generation from other, more profitable lands, enter, in our opinion, in the calculation of the present single rate of profit of the system and its industry forms the basic system.
However, we, disagree with Fratini (p. 13) that the specific differential rent has to be counted in the calculation of the general rate of profit. His argument in favour of this, only demonstrates that the degree of productivity of land may move the rate of profit of a given economic system up or down but the differential rent itself does not influence the rate of profit. In our view, Bidard (1 and 2) would not be relevant creating a new case of rent (external rent), since it would not be based directly on a property right. It is really a general case, not directly related even to monopoly. It would be derived from the increase of a (monopoly) basic industry price that would make it feasible for a second technology to be introduced in another basic industry.

- We, therefore, do not calculate the rate of profit and prices first so as to obtain the differential rents in a second step[5] because it is not our intention to calculate them.

Annex 2

Remarks on prices as different from gravitational centres and on the uniformity of the rate of profit

According to Sinha&Dupertuis[6], the prices that allow the existence of a single rate of profit in an economy are not obtained following the gravitational centres theory involving supply and demand curves, but, instead, from the interrelation of the prices according to Sraffian basic products:

> *"This finding shows that uniformity of the rate of profits in the system has nothing to do with the equalization of the supplies with their effectual demands. As a matter of fact, relative prices cannot go anywhere they feel like—they are completely constrained by the system of production and the condition of its reproduction. In some sense Sraffa's result points to a similar break in economics as the break from classical mechanics to quantum mechanics. The classical and neoclassical economics treat individual industries as independent entities, which through their interaction generate centres of gravitation that bring a system into being. Sraffa's result show that the system is not made up of independent industries but must be treated as a whole unit and the properties of the whole determine the properties of its parts."*

The existence of one rate, common to all industries, implies that this rate corresponds to the standard commodity rate:

> "*Thus the necessary condition for equality of the local rates of profits is that the global rate of profit of the system must be equal to the Standard rate*."

A rate that is independent of "rescaling", according to the terminology of Sinha, indicates that it does not depend on the quantities produced or the weights of the different branches.

Sinha, however, sees having one rate and several industry rates as being compatible:

> *"Let us make it clear what the above proposition is not saying. It is not saying that unequal rates of profits in different sectors cannot exist. One can always find a vector of all positive prices, if imposed on the given system of production would generate all positive but differing rates of profits."*

We consider, thus, that in some cases there may be no equalization of rates of profit due to the presence of absolute rents or of monopoly rents.

This second technology which would be more expensive but would save inputs of the basic commodity subject to monopoly, would coexist with the previous one.

[5] Klimovsky, Edith. Modelos de reproducción en desequilibrio: Nuevos desarrollos. **Revista Ecos de Economía**, Vol. 14, núm. 30 (2010). http://publicaciones.eafit.edu.co/index.php/ecos-economia/article/view/179/0

[6] Sinha, Ajit. **Sraffa and the Question of Equilibrium.** Society of Heterodox Economists, Working Paper 2007-06 http://wwwdocs.fce.unsw.edu.au/economics/Research/Heterodox/WorkingPapers/2007-06.pdf

The existence of different rates of profit does not imply that there is not, in practice, a single rate of profit, resulting from the interrelation of the different industries, which can be calculated from the polynomial expression of the Sraffian dated labour (Equation(2)) See Example 5.

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