Understanding Smith's theory of distribution: the determination of land rent as a residual magnitude

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ABSTRACT

The objective of this paper is to deepen the understanding of Adam Smith's theory of distribution and by doing so to unveil his adherence to the hypothesis of a given social product and technique in use determined by labor productivity and past accumulation of capital when determining short term fluctuations of the distributive shares and when discussing taxation. The paper can be directly linked to Sraffa's 1951 and 1960 proposition of the existence of a classical approach to value and distribution fundamentally different from posterior marginalist analysis. In the paper I refute the existence in "An Inquiry into the Nature and Causes of the Wealth of Nations" (henceforth "WN") of an "additive theory of value", a proposition clearly advanced by Marx and shared by many economists, including Sraffa. According to this interpretation, Smith neglected the implications of a given social product and technique in use as a binding constraint to the distributive shares when determining the natural prices of commodities. Starting in the nineties, some of Sraffa's followers began to question the "adding up" interpretation by identifying a theory of distribution compatible with the hypothesis of a given social product in Smith's narrative. This paper is part of this ongoing effort and it shows that the key to understand Smith's theory of distribution lies in the correct identification of the rent of land as a residually determined distributive share and of real wages determined exclusively in terms of the most common agricultural produce of the country. As a consequence, the rent of land is determined independently of relative prices while wages and profits are allowed a degree of liberty in their relative movements, the acknowledgment of which dissolves the perceived incompatibility of various passages of "WN" – specially the ones concerning the competition of capitals – with the hypothesis of a given social product and technique in use biding distribution, while completely denying the independent determination of the distributive shares. It is also shown that the residual determination of land rent demands the exogenous determination of profits to reach a definite solution as to how profits and land rents share the surplus. Smith's "competition of capitals" cannot be interpreted then as a failure to see the biding constraint of distribution, nor it can be used as an evidence of the "additive theory of value" interpretation. Therefore, once the residual land rent and the "agricultural" real wage are identified, Smith can be unambiguously included as belonging to the surplus approach to value and distribution. This paper contains eight sections: 1) Introduction; 2) Smith's theory of distribution and value; 3) Wages; 4)Profits; 5) Rent of Land; 6) Distribution and relative prices; 7) Manifestations of Smith theory of distribution and value: bounties and taxes; and 8) Conclusion.

Understanding Smith's theory of distribution: the determination of land rent as a residual magnitude[§]

Alexandre Laino Freitas[¥]

1. Introduction

The main purpose of this paper is to emphasize the important role played by the residual determination of the rent of land in Smith's theory of distribution and value logical structure. It denies the common interpretation that Smith determined the distributive shares independently of each other and thereby ignored the binding constraint imposed by the techniques in use to the distributive shares.

The idea of independence in the determination of the distributive shares in Smith's work can be easily found in Marx's “Theories of Surplus Value” (Marx 1862-1863, p. 264, 492, 549, 552, 559, 622). His reproach is focused in the independence of the natural price – the compounded sum of wages, profits and rents payed in the various stages of production – in relation to the labor time spent in the production of the commodity. In Marx's interpretation, Smith goes from correctly *resolving* the natural price into wages, profits and rents to the direct opposite of *determining* the natural price by adding up wages, profits and rents.

> “Adam Smith, as we saw above, first correctly interprets value and the relation existing between profit, wages, etc. as component parts of this value, and then he proceeds the other way round, regards the prices of wages, profit and rent as antecedent factors and seeks to determine them independently, in order then to compose the price of the commodity out of them” (Marx 1862-1863, p. 492).

Therefore, Smith allowed a “vulgar” conception to “creep” onto his writing[1]: that value arises not only from labor, but also from capital and land (Marx 1862-1863, p.622). This would have *led* Smith to determine the distributive shares independently of each other, losing awareness of the fact that only labor could add exchange value to the commodities.

Sraffa (1951), in his *Introduction* to The Works and Correspondence of David Ricardo, argues that Ricardo's reproach of Smith's theory of value was akin to Marx's by affirming that Smith determined wages, profits and rents independently[2]. This “adding-up interpretation” of Smith's

§ I wish to thank Prof. Franklin Serrano for the supervision on my P.h.D thesis entitled “Adam Smith and the classical surplus approach: a contribution to the sraffian interpretation” from which this article is directly derived. The usual disclaimers apply.

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1 K. Marx made a well known distinction among the esoteric and the exoteric character of Smiths writing. The esoteric part would only describe the economy as it appears in the surface and the exoteric would explain its inner connections, and more importantly the labor theory of value.

2 O'Donnell (1990, p.121-122) advances that Ricardo's disagreements with Smith might have been

theory of value and distribution, now based on Ricardo, Marx and Sraffa was then reaffirmed by Dobb (1973, 1975) and used by him to support another proposition: that Smith possessed a "adding-up-cum-supply-and-demand" theory of value, which characterized him as a precursor to the latter marginalist (general equilibrium) theorists. It will not be our direct purpose here to discuss Dobb's allegations. Our focus is on the original proposition of independently determined distributive shares.

It is worth mentioning, however, that the "supply and demand" element of Smith theory needs to be interpreted very cautiously. Garegnani (1983) has advanced already that the supply and demand elements in Smith theories shows little resemblance to modern neoclassical theory logical structure, since there are no schedules of supply and demand, ultimately because substitution, being in consumption or in production, does not play any role in the determination of natural (equilibrium) prices. And also in a single market, classical economists are not building schedules of supply and demand but are talking about single quantities, proportions.

Back to the main subject – Smith's theory of distribution – there have been welcome novelties in the sraffian literature starting in the nineties with O'Donnell (1990), followed by Dome (1998), Aspromorgous (2009) and Sinha (2010). They have all in common the identification of rent of land as a residually determined distributive share showing that in fact there was a biding constraint in Smith's theory of distribution. The difference among then (and myself) is how this finding is incorporated into the interpretation, or more precisely, the classification of Smith's theory of distribution and value. I will come back to these authors in the end of the paper. Garegnani (2007, p. 200-201) in a footnote, condenses what I aim to confirm in the following sections:

> "Of course Smith had the difficulty of the rent of land as a second element in the surplus — an element of which Ricardo could get rid of by means of Malthus's theory of rent. Indeed, some elements make it appear that Smith's notion of a rate of profits varying independently of wages might be reconstructed not so much as the result of an adding up price theory but, rather, as an erroneous quasi Physiocratic scheme, where the rent of land constitutes the ultimate surplus. As, unlike in Quesnay, profits on capital also entered the surplus, Smith seems to have treated them as independently variable within the limits of the aggregate surplus according to a rate determined by whatever Smith may have meant by 'competition of capitals'". (Garegnani, 2007, p.200-201)[italics added]

2 - Smith's theory of distribution and value

Smith's theory of distribution is key to understand his theory of (exchange) value. Even though Smith explains the "natural prices" and "real prices" before detailing how the "natural rates" of wages, profits and rent of land are determined, I believe that for a clear

overestimated. While any definite conclusion on the question if Ricardo really advanced an "adding up" hypotheses or not demands a throughout revision of Ricardo's lengthy published works, it seems that when commenting on Smith's treatment of taxes Ricardo was fully aware of the residual determination of the rent of land. That is why I was not able, at the present stage of my knowledge, to attribute the primacy of the "adding up" hypotheses to Ricardo or Marx. Anyhow, it is the main purpose of this paper to discuss Smith writing and not Ricardo's interpretation of Smith.

understanding of Smith's theory of the determination of exchange value one better fully understand how he determined the distributive shares before a full judgment of the theory on the determination of relative prices.

The “natural price” of any commodity – formed by the sum of the natural rates of profit, wages and land rent, by “adding then up” – is a consequence of distribution. This is important because the “adding up” interpretation implies that *because* Smith added up the distributive shares to reach value he was *led* to determining them separately and independently.

But I believe the opposite is true: the “adding up” theory of value was a manifestation of a broader attempt to “root” exchange value in the production of a material commodities. If a revenue is generated in the production process of a commodity, it had as a *counterpart* this material commodity whose exchange value exactly mirrors the value of the sum of all revenues payed in the production process. Therefore, the sum of money payed as original revenue is leveraged by a real wealth, being therefore an original source of value. All other revenues, although allowing its receivers to consume commodities – and thereby to destroy a stock of past produced commodities – does not have as a counterpart the creation of a new commodity, and must therefore oblige a redistribution of the existent commodities, of the existent original sum of exchange values. As a consequence, all taxes are derived from the original sources of values:

> “All taxes, and all the revenue which is founded upon them, all salaries, pensions, and annuities of every kind, are ultimately derived from some one or other of those three original sources of revenue, and are paid either immediately or mediately from the wages of labour, the profits of stock, or the rent of land” (WN, I.vi.18)[*].

Smith achieved this correspondence of original revenue and newly produced commodities by reducing all costs to revenue. The algorithm through which costs are all reduced to wages, profits and rents is to simply consider the “fourth part” – ie. the circulating capital and the depreciation of fixed capital – and understand that they production process also involved the payment of wages, profits, rents and another “fourth part”. Smith's well known example is that of the need to replace “the stock of the farmer” and to compensate the “wear and tear of his laboring cattle and other instruments of husbandry” (WN, I.vi.11).

Setting aside the problems that Smith had when dealing with fixed capital and intermediate goods[3], it is remarkable that the “adding up theory of value” allowed Smith “root” the “original” revenue into newly produced commodities, into new wealth, real wealth. The adding up theory of value was the way to introduce the biding constraint given by the techniques of production in use in a world were costs seemed to depend on other costs and any revenue could be identified with the creation of social wealth. As we will see in the next

* All references to Smith's WN follow a (WN, BOOK.chapter.section.paragraph) scheme. The book number is referred to in capital roman letters, chapter number in small roman letters, sections (when it applies) are identified with small Latin alphabet and paragraph number in Arabic numbers. The quotation above was taken from Book One, Chapter VI, paragraph 18. The references are kept in their original form, presenting some more archaic words.

3 When describing the production process in Chapter VI (WN, I.vi.12) Smith does not mention the fixed and circulating capitals anymore and develops his narrative as if capital was only composed of wages. This omission arises not from Smith “forgetting” that production uses fixed and circulating capital composed by all sorts of inputs and not only wages, but from difficulties of incorporating fixed and circulating capital in the initial stage of development of his theory.

sections the rent of land was seen by Smith as endogenously determined by the system, not independent neither in relation to profits nor wages[4]. In the following sections I describe how Smith determined each of the three distributive shares.

3 - Wages

In Smith's WN the wage rates are determined by institutional elements in the labor market, mainly the higher bargaining power of the masters in relation to the workers, that forces the wages to a minimum subsistence level. This minimum allows for the reproduction of the working class and includes not only physiological necessities (like food and shelter), but also some socially determined necessities (for example a linen shirt and leather shoes in the case of the English working class).

This subsistence wage rate will be different from actual market wage rate if the country experiences either a rapid capital accumulation or a declension of its stock. If the rate of accumulation is high, a temporary shortage of workers would follow which in turn would trigger a dispute among masters to hire the available workers, breaking their tacit arrangement to never raise wages. If, otherwise, the country was consuming its capital stock, there would be ever fewer job than workers, and the workers would not be able to receive even the minimum subsistence wage, being therefore left to a miserable condition.

The labor market adjustment mechanism is based on population growth, the quantity supplied of workers adapting to the quantity demanded. The transmission channel is the infant mortality rate, and the argument, straightforward: the better the workers are fed and lodged, the higher the proportion of the surviving offspring, and being the birth rates somewhat constant, the faster the population growth[5].

The key aspect in the adjustment mechanism is demographic growth determined by the actual, concrete conditions of living of the laboring class (I.xiii.15). Therefore, the labor market sets the *real wage rate*, the amount of commodities on which labor class will survive upon. This conclusion is explicit in Smith's text:

> The money price of labour is necessarily regulated by two circumstances; the demand for labour, and the price of the necessaries and conveniencies of life. The demand for labour, according as it happens to be increasing, stationary, or declining, or to require an increasing, stationary, or declining population, determines the quantity of the necessaries and conveniencies of life which must be given to the labourer; and the money price of labour is determined by what is requisite for purchasing this quantity. (WN, I.xiii.52)

Smith coherently treats the monetary wage rate as being determined by the real wage rate

4 Marx himself notices the "inconsistency" of rent first entering as a component part of the natural price and latter entering as a result of the difference in the payment of profits plus wages and the price payed. But it was this treatment of rent that provided a closure to Smiths theory of exchange value and distribution, a theory that was, as far as its logical structure is built, sound and not tautological.

5 For a far more throughout description of Smith's (and other classical authors) theory of determination of the wage rate see STIRATI (1994).

along with the monetary prices of the wage basket.

Considering Smiths theory of distribution internal logic, the real wage rate is determined by the growth path of the capital accumulation that determines the demand for labor in t_0 , while the quantity supplied of labor was determined by capital accumulation in $t_{(0-n)}$. The real wage rate is not directly influenced by the profit rate or by the rent of land rate.

4 - Profits

Smith believes that the rate of profit is determined by the expansion or contraction of the amount of capital in a society. The “increasing or declining state of wealth of the society” affects profit in the opposite direction that it affects wages. “The increase of stock, which raises wages, tends to lower profit” (WN, I.ix.2). It is the *increase* of capital that affects the profit rate (and also the wage rate as seen above) and not the absolute amount of capital[6]. Smith is clearly thinking in a dynamic context. It is as if the expansion of capital accumulation would be always temporarily constrained:

> As the capital of a private man, though acquired by a particular trade, may increase beyond what he can employ in it, *and yet that trade continue to increase too*; so may likewise the capital of a great nation. (Wn, I.ix.10)[italics added]

It appears that Smith's theory of profit is more a historically inducted theory then a logically deducted one. On chapter IX, “Of the Profits of Stock” there are several historical examples in which the stock of capital has been augmented and the interest rates have accordingly fallen (and real wages have gone up): the author mentions England (paragraph 6), Scotland (paragraph 8), France (paragraph 9) and Holland (paragraph 10)[7]. When there is a declension of capital, the symmetrically opposite occurs: too much capital in relation to the “business it has to transact” entails higher profit rates. Bengal and the Roman republic before it fell are cited as historical examples (paragraphs 13 and 21).

The American colonies and the West Indian colonies (paragraph 11) represent a problem since they stand as a historical counter-proof: the profits are high despite the rapid increase in the stock of capital. It therefore needs a particular and specific explanation as to why it falls out of the general rule and do not invalidate it. Smith advances that the initial higher productivity in agriculture and the low payment of rents explains why the profit rate does not fall in the initial stages of the colonies exploration, only to return later to the same historical induction: “As riches, improvement, and population have increased, interest has declined” (WN, I.ix.11). The superior technology in the initial stages of agricultural production modifies the conditions of production in a way that even though the increase of capital still determines the profit rate, its effects only become apparent in a latter stage of capital accumulation.

6 Although this affirmative seems *in*compatible with Smith's own proposition that all the revenue received will be readily spent.
7 In the case of Holland (paragraph 10) the rationale is the same, but the evidence is inverted: the low interest and high wages are used as proof of the state of increasing stock of that country.

What is then the mechanism of transmission from the rate of accumulation to the rate of profits? Smith's explanation boils down to *increased competition* in all branches of trade, lowering prices and/or augmenting wages. As explained above, this is done in a dynamic contest of expanding (or declining) stock of wealth, population and markets. So the competition is increased in the context of an increasing market. Smith's illustrations are specially deceitful because they make unclear that the market is expanding meanwhile, and this might expalin why the author never uses the terms “demand” and “quantity taken to market” of capital, as they were given magnitudes.

> “When the stocks of many rich merchants are turned into the same trade, their mutual competition naturally tends to lower its profit; and when there is a like increase of stock in all the different trades carried on in the same society, the same competition must produce the same effect in them all*”* (WN, I.ix.2).

A surplus approach economist is very tempted to identify, at least in some passages of Chapter IX on profits, a clear wage-profit inverse relationship in Smith's narrative. But I now believe that much importance should not be given to the description of the effect of this increased competition on the theoretical relation among profits and wages. Profits, it must have been clear to Smith and also to any capitalist, even if unintelligent and ill-informed, depends on the difference of prices and costs, being wages the most relevant of costs in Smith's time. It is not a surprise then that when trying to explain the historical fall of profits, Smith referred both to an augmentation of wages and to a fall of prices. The rise in wages accompanied with the fall in profits is a historical relationship associated with the same cause, capital accumulation, but they are not theoretically linked in the way that Ricardo did latter, specifically because of the residual nature of the determination of land rent.

Smith also believes that there is a maximum amount of capital that a country could theoretically absorb, the “complement of riches” in relation to “the nature of its (the country) soil and climate, and its situation with respect to other countries”. The productivity in husbandry determines, once the total agricultural land of the country is used, a maximum population that the country can sustain. This gives a maximum number of surplus workers that can be set to productive or unproductive roles. Being the capital-labor relation in each branch of trade given by technology, the composition of demand will determine the maximum amount of capital that the country is able to withhold, its “full complement of riches”[8]. Since this maximum implies in the impossibility of a further accumulation of capital once it is reached, the profits of capital must fall to a very low level.

> “In a country fully stocked in proportion to all the business it had to transact, as great a quantity of stock would be employed in every particular branch as the nature and extent of the trade would admit. The competition, therefore, would everywhere be as great, and consequently the ordinary profit as low as possible” (WN, I.ix.14).

It is important to stress that there is no proposition of a systematic decrease in the labor productivity in food production. Both in manufacture and in agriculture and the production of

8 The composition of demand is important since Smith acknowledges the different capital-labor ratios according to what is being produced: “the quantity of labour, which equal capitals are capable of putting into motion, varies extremely according to the diversity of their employment” WN (II.v.1).

raw produce, the hypotheses of a increasing productivity with the increase in capital stock holds[9]. It is increased competition, and the diminished monopoly power over the command of capital that makes profits sink to a very low level[10]. As productivity is very high on these circumstances, Smith argues that "...perhaps no country has ever yet arrived at this degree of *opulence*" (WN, I.ix.15).

A greater competition then is the transmission mechanism Smith seems to think suffices in explaining the relation among the capital accumulation rate and the profit rate. The determination of the average rate of profits is clearly the less developed part of Smiths theory of distribution. But, this very simple treatment of the determination of the rate of profit[11] allowed Smith to explain the historical evidence of his time, while at the same time offered a very simple rule of thumb when dealing with wage changes: if the pace of capital accumulation was not changed very much the capital earner could pass on the increase in cost. This "rule of thumb" is applied in the theory of taxation.

5. The determination of the rent of land

To determine the rent of land in Smith theory one has to seek the determination of the rent of land in the production of corn since it's the "corn rent" that determines the level of rent that all other products that can be produced in the "most common lands" – be it food or not – have to pay in order to be produced. It sets the "cost of use" of the most common land:

> "It is in this manner that the rent of the cultivated land, of which the produce is human food, regulates the rent of the greater part of other cultivated land. No particular produce can long afford less; because the land would immediately be turned to another use: And if any particular produce commonly affords more, it is because the quantity of land which can be fitted for it is too small to supply the effectual demand. In Europe corn is the principal produce of land which serves immediately for human food. Except in particular situations, therefore, the rent of corn land regulates in Europe that of all other cultivated land...." (WN, I.xi.b.34-35).

9 Any proposition on marginalist lines to explain the fall of the rate of interest is so detached from textual evidence that its more a matter of psychoanalysis than of economics. There are increasing returns in manufacture, constant and/or increasing returns on food production and the techniques in use are not directly affected by distribution.

10 That is one of the reasons why I disagree with Sinha's argument that clear profit was not surplus, since he interprets the "subsistence" of the capital owner in the same sense as the subsistence of the laborer. He forgets though, as Smith points out, that the capital owner still has its own labor to offer in the market in order to earn his subsistence. "In a country which had acquired its full complement of riches, where in every particular branch of business there was the greatest quantity of stock that could be employed in it, as the ordinary rate of clear profit would be very small, so that usual market rate of interest which could be afforded out of it, would be so low as to render it impossible for any but the very wealthiest people to live upon the interest of their money. *All people of small or middling fortunes would be obliged to superintend themselves the employment of their own stocks*" (WN, I.ix.20) [italics added]. It might be thought also that one could infer at least a supply schedule for capital, but the passage just cited disregards that. A positive rate of clear profit, as low as it might be, would be sufficient to keep the stock of wealth in the form of capital.

11 What is otherwise highly complex and full of layers is the attempt made by interpreter to fit Smith's theory of the average rate of profit as a coherent application of any modern counterpart: be it surplus or marginal approach.

Then, to ascertain how the rent of land is determined in Smiths theory of distribution, one has to identify its explanation for the determination of rent in corn production. But Chapter XI on the rent of land is a long chapter that deals with a variety of subjects. For example, most of the discussion on the determination of rent deals with the explanation of how other agricultural produce converge or not to the rent of corn production, about how the silver value of commodities have varied and how relative prices of different types of agricultural produce can be used as a capital accumulation index. Therefore, singling out the corn determination requires attention.

Nonetheless, it is possible to clearly identify three "parameters" determining the level of rent in corn production: technology – the physical inputs as well as the labor inputs of production –, the real wage rate and the profit rate. The real wage rate is determined in the labor market and the profit rate depends on the increase of capital stock, both outside the realm of corn production. It is then productivity, the physical inputs, that are mainly discussed on the chapter on rent. Relative prices plays no active role in the determination of the land of rent payed in corn production since the relative price of corn – compared to labor or to any other commodity – is not altered as a consequence of a change in the productivity of corn.

Consider almost any other commodity other than corn in Smith's book and an increase in productivity, reducing directly or indirectly the labor inputs, will decrease its price compared to all other commodities. In fact, one of Smith's most underlined conceptions throughout WN is that the only way to augment wealth for all, to make all prices go down in relation to income, was to augment the productivity of labor (see for example the Introduction and Plan of Work). It was otherwise in the case of corn, since the better productivity would bring the augmentation of rent of land instead of a fall in its price. This difference was not due to any metaphysical property of corn compared to other commodities, but to the simple fact that it fed the workers:

> "If in any country the common and favorite vegetable food of the people should be drawn from a plant of which the most common land, with the same or nearly the same culture, produced a much greater quantity than the most fertile does of corn, the rent of the landlord, or the surplus quantity of food which would remain to him, after paying the labor and replacing the stock of the farmer together with its ordinary profits, would necessarily be much greater" (WN, I.xi.b.36).

It is clear then that Smith is thinking in terms of a physical reduction to corn: if both the produce and the costs are made of the same product, one can calculate the surplus physically and independently of other relative prices. And because the measure of "real" value was the amount of work time that the commodity could be exchanged with, the reduction to corn meant also the possibility of determining its "real value" without recourse to relative prices when wages are "paid in corn". In all examples of possible substitutes to corn as common food of the people, the author insists in making clear that the validity of his rationale depends on the product feeding the workers.

> "In those rice countries, therefore, where rice is the common and favourite vegetable food of the people, *and where the cultivators are chiefly maintained with it*, a greater share of this greater surplus should belong to the landlord than in corn countries" (WN,

I.xi.b.37) [italics added].

> "Should this root [potatoes] ever become in any part of Europe, like rice in some rice countries, the common and favourite vegetable food of the people, so as to occupy the same proportion of the lands in tillage which wheat and other sorts of grain for human food do at present, the same quantity of cultivated land would maintain a much greater number of people, *and the labourers being generally fed with potatoes*, a greater surplus would remain after replacing all the stock and maintaining all the labour employed in cultivation" (WN, I.xi.b.39) [italics and brackets added].

When the determining the land of rent in corn production there is a reduction of all inputs and output to corn that, alongside with Smith's "real measure of value", would determine the "real value" of the rent payed in the production of corn once productivity, real wages and profit rates are known.

This reduction process can be objected on the grounds that corn is not the only input of agricultural production, since "the stock of the farmer" to be replaced "together with its ordinary profits" and also the workers wages are composed of a diverse number of commodities. Then, a reduction to corn would not be possible unless all relative prices were known. Smith was well aware of these two characteristics of the economy and nowhere conceived the reduction process as an ontological description of corn production. He thought though that it was a good enough approximation, a theoretical approximation, to think the determination of land rent in the production of corn. He sometimes then identifies the capital applied in agriculture with seeds only:

> "A corn field of moderate fertility produces a much greater quantity of food for man, than the best pasture of equal extent. Though its cultivation requires much more labour, yet the surplus which remains after *replacing the seed and maintaining all that labour*, is likewise much greater" (WN, I.xi.b.6)[italics added].

"Seeds and labor" are considered here as the only inputs in food production. It is a theoretical approximation because when Smith describes the agricultural production process in several parts of WN (see for example I.xi.l for cattle) there are many inputs, not only seeds. For example, in the beginning of the chapter on rent Smith writes that the farmer "furnishes the seed, pays the labour" and alongside with it also "purchases and maintains the cattle and other instruments of husbandry" (WN, I.xi.a.1). If we divide the inputs of husbandry into two groups defined as "stock" and "labor", the stock will be made of seeds, cattle and other instruments of husbandry. Alongside with seeds, "cattle" stands as "the principal instruments of agriculture" (WN, I.xi.e.28). The other purchased instruments of husbandry represented thus only a reduced part of the whole instruments of husbandry. Being cattle produced in agriculture, some lands have not to be planted with corn or to be planted with some other product to feed the cattle (I.xi.l.1-3). Therefore "cattle" can be though as being made up of labor and seeds that were not produced because of the alternate use of land. Besides these physical inputs, labor was a major component in agricultural production, and Smith wrote that "the capital employed in agriculture..., ...puts into motion a greater quantity of productive labour than any equal capital employed in manufactures..." (WN, II.v.12). Seeds and labor then appears as a good enough approximation.

The second step in the "reduction to corn approximation" involves the transformation of labor into seeds. By recollecting numerous passages throughout WN it is possible to build a very diversified English worker´s consumption basket: beer, tobacco, sugar, tea, coats and shirts of cotton and linen, leather shoes, coal, wood furniture, plates, glass windows, soap, salt candles, simple houses, all types of food, etc. Nonetheless the weight of food as a percentage of total income is very high:

> When food is provided, it is easy to find the necessary cloathing and lodging. But though these are at hand, it may often be difficult to find food. In some parts even of the British dominions what is called A House, may be built by one day's labour of one man. The simplest species of cloathing, the skins of animals, requires somewhat more labour to dress and prepare them for use. They do not, however, require a great deal. (WN, I.xi.c.6)
>
> The necessaries of life occasion the great expence of the poor. They find it difficult to get food, and the greater part of their little revenue is spent in getting it. (WN, V.ii.e.6)

The bulk of the expenditures are in food, and among foodstuffs, corn represents the greater expense. Not only that but since the rent of land payed in corn production regulates the rent of land payed in all other agricultural production, the relative prices inside agriculture are more stable than the relative prices among agriculture and manufacture (as I will show in detail below). Therefore, all food, by the equivalence of the land rent payed, would be connected to corn price, and therefore could be identified with it as an approximation. As food makes part of the majority of the expenses of the “working poor”, the reduction of wages to seeds seemed again as a good enough approximation.

In the end, seeds, labor, cattle and other instruments of husbandry could be considered as seeds, inputs and outputs homogeneous. These theoretical approximations accomplish to make the determination of the rent of land very simple in physical and “real” terms. As seen earlier, the rates of wages and profits alongside with technology determines the residue. A variation in any of these “parameters” (taken as a datum as far as the determination of land rent is concerned) will alter the rent of land. For expository purposes only, we can represent these theoretical relations in terms of mathematical equations.

Considering a fully vertically integrated agricultural sector where the only input was corn (A_{11}), and also that the workers would receive a given amount of corn as the wage (B_c). Let Q_c be an amount of produced corn, P_c the price of corn, L_c the amount of labor needed in the production of Q_c units of corn, r the natural rate of profit, R_c the rent of land payed in the production of Q_c units of corn.

$$Q_c.P_c=(A_{11}.P_c+L_c.B_c.P_c).(1+r)+R_c.P_c \qquad (1)$$

$$W=BcPc \qquad (2)$$

And dividing both sides by $Q_c.P_c$, and defining $a_{11}=A_{11}/Q_c$, $l_c=L_c/Q_c$, $r_c=R_c/Q_c$:

$$r_c=1-[a_{11}+l_c.b_c].(1+r) \qquad (1.1)$$

Equation 1* is at the same time the theory of determination of land rent and the closing of Smith's theory of distribution. It is this basic relation that Smith has in mind when discussing the bounty on corn and the different types of taxation. From it we can see clearly the technological constraint biding the distributive shares, and the consequent determination of rent of land as a residue when wages and profits are given. Note that the real wage (b_c) and the profit rate (r) can vary independently as long as they do not fal out of the limits of the aggregate surplus $(r_c \geq 0)$.

Real wage rate is taken as a datum from the labor market, and the profit rate a given magnitude determined by rate of capital accumulation. That is why when considering the substitution of corn by a more productive crop, Smith speaks of an augmentation of rent along with productivity "whatever was the rate at which labor was commonly maintained in that country", ie., given the real wage, were it high, moderate or low. The rent of land in corn production is thus determined residually.

Since the rent determined on corn production sets the opportunity cost to the alternate uses of land, Smith referred to the determination of rent in "states above ground" *as being proportionate to* the "absolute fertility[12]" whereas in the production of mines, rent was payed in proportion to the "relative fertility" of the mine in comparison to others of the same product (WN, I.xi.c.33-35).

Because of the specificity of corn in feeding the workers, Smith thought that the physical surplus in the production of corn – or any other favorite vegetable food of the people – would be determined independently of relative prices. And competition would ensure that the rent of land in all "states above ground" was also determined residually. For example, when exemplifying countries with high profit rates, the residual determination of rent is clearly outlined: "The highest ordinary rate of profit may be such as, in the price of the greater part of commodities, eats up the whole of what should go to the rent of the land" (WN, I.ix.21).

Another passage that can be read as violating the technological biding constraint on distribution if the residual determination of rent is not accounted for is when Smith discusses the event that a country (theoretically) reaches its maximum wealth, its "full complement of riches":

> "In a country which had acquired that full complement of riches which the nature of its soil and climate, and its situation with respect to other countries allowed it to acquire; which could, therefore, advance no further, and which was not going backwards, both the wages of labour and the profits of stock would probably be very low.... But perhaps no country has ever yet arrived at this degree of opulence" (I.ix.14-15).

When the residual determination of rent of land is accounted for, it becomes clear how it is possible to profits and wages to go down amidst *opulence*. Recalling that there is no progressive decrease in productivity, the contrary being true, productivity is augmented with the stock of capital, the wealth of the nation would be great, and profits and rents being low, most of the opulence would be appropriated by the landlords.

Despite of the peculiar nature of the determination of the price of corn (and the relative price to almost every other sort of goods), corn was still a good that was sold in the market, having therefore

12 The idea of an "absolute rent" is quite deceitful since it gives an impression of the rent of land as a given magnitude determined exclusively by productivity, when in fact rent was determined by productivity alongside with the real wage and the natural rate of profit. It is determined by the other distributive shares and the productivity, and therefore proportionate to its fertility only once the other distributive shares are given.

a market and a natural price. Like all other goods, it's market price would fluctuate around an average value. But the demand of corn would not interfere with the quantity produced. Rent of land payed in corn production depends on productivity in corn production and of the level of the other distributive shares. If demand could not influence the quantity produced and taken to market through the price mechanism explained by Smith in Chapter VII of Book One, what impeded a progressive under-supply or over-supply of corn? The answer is that, in the case of corn, demand adjusts to the quantity taken to market:

> "As men, like all other animals, naturally multiply in proportion to the means of their subsistence, food is always, more or less, in demand. It can always purchase or command a greater or smaller quantity of labour, and somebody can always be found who is willing to do something, in order to obtain it" (WN, I.xi.b.1).

This hypotheses logically closes Smiths theory of rent of land and of distribution, by giving stability to the market price of corn and letting it "free" to be determined by all other commodities[13], as it will be discussed in the next section.

6 - Distribution and relative prices

The reduction to seeds is not only important to the determination of the "real" rent of land, but also plays an important role in the determination of relative prices movements created by changes in the distributive shares. If we recall that the "corn rent" sets the level of rent for almost all other agricultural production, we can affirm that a variation in wages or profits will cause a contrary variation in the rate of land rent payed in all other agricultural production. This explains why Smith considered a good approximation to treat the "states above ground", the raw produce, as being affected differently from the manufacture when the natural rates of profits or wages changed.

For the sake of simplicity, we can construct a simple two good system by adding one manufactured good to our corn equation. The correct understanding of the objective of this set of equations and its limits in what is proposed to accomplish demands the acknowledgment that in Smith there are very rich description of the economic reproduction alongside with a theory of distribution that was built on simplifying assumptions[14].

$$P_m = P_c.(a_{12} + l_m.b_c).(1+r) \qquad (3)$$

$$r_c = 1 - [a_{11} + l_c.b_c].(1+r) \qquad (1.1)$$

13 This solution by Smith throws the over-determination out of the price of corn to the growth of population. Population growth rate was previously determined by the real wage, but now it is also determined by the pace of expansion of food production. It could be argued that there is not an over determination, since both real wages and the expansion of cultivation depends on capital accumulation but this specific question in never touched upon.

14 Putting it bluntly: Smith did not neglect in WN that agricultural production needed some manufactured inputs that came from the cities, or that the workers lived on a multi-good basket, or that production used produced goods as inputs and not only corn and labor. Here, it is necessary to differentiate the description of the economy contained in Smith's narrative and the limits of his underlying theoretical model.

To find the influence of changes in the distributive shares in the relative prices of manufacture and agriculture, we will calculate P_m / P_c :

$$P_m / P_c = (a_{12} + l_m . b_c) . (1 + r) \qquad (4)$$

Although very simple, I believe this equation correctly represents Smiths reasoning when dealing with relative prices and changes in distribution in WN. One can see that the manufacture relative to corn price is directly proportional to the amount of agricultural inputs and of hours of labor in its production, to the real wage and to the rate of profit. This very simple example condenses Smith's theory about relative price changes in the face of changes in distribution induced or not by taxation. Of course he considers more complex examples (see the example of bounties below), but Smith builds first his more synthetic theory and then introduces the complexities while maintaining the original conclusions.

Other manufactures can be added without changing the basic logic as long as corn remains isolated from the system. Corn becomes the ultimate building block, and is produced by means of itself. Then, by feeding the workers and influencing the price of almost all produce of nature, is also considered as a building block of all manufacture. This clear identification of relative price dynamics in Smiths theory of distribution and value is useful in reinterpreting some passages of WN. For example in Chapter Eight, on wages, Smith discusses the rising real wages caused by rapid capital accumulation and its effects on prices:

> "The increase in the wages of labour necessarily increases *the price of many commodities*, by increasing that part of it which resolves itself into wages, and so far tends to diminish their consumption both at home and abroad" (WN, I.viii.57).

This passage can be read as violating the biding technological constraint on distribution. If prices rise in the face of wages, the real wages will go down. But Smith speaks of *many* commodities, and not all commodities. By equation 1* we know that the rent of land is inversely proportional to the real wage and that the price of corn would not be altered because rent would go down. Since wages are composed mostly of agricultural products, the real wages would not be affected. Manufactures, on the other hand, would have its relative price augmented in relation to agricultural produce. In the passage above Smith was discussing the problems of exporting more expensive products due to greater salaries, and although he does not specify which type of commodities he is referring too, it is known that England was mainly a manufacture exporter at the time. The above passage, therefore, does not violate the technical biding constraint on distribution.

7. Manifestations of Smith theory of distribution and value: corn bounty and taxes

Since the residual determination of the rent of land was for a long time obscured, it is worthwhile to revisit a few passages of WN in the light of the interpretation on the determination of the distributive shares here advanced. Of special interest are the discussion of the corn bounty and of taxes.

The corn Bounty

So far in the above equations the corn price is not defined by neither the distributive shares, nor by the productivity of labor in the production of corn, as a consequence of the residual determination of rent. On the other hand, manufactures prices in relation to corn are determined by these exact parameters: the technique of production in each manufacture and the distributive shares. Smith comments about this difference when discussing the bounty on corn (see also WN, IV.v.a.10 e IV.v.b.41):

> "Our country gentlemen..., ...when they established the bounty, seem to have imitated the conduct of our manufacturers. ...[T]hey endeavoured to raise its real value, in the same manner as our manufacturers had, by the like institutions, raised the real value of many different sorts of manufactured goods. They did not perhaps attend to the great and essential difference which nature has established between corn and almost every other sort of goods. ..., ...The nature of things has stamped upon corn a real value which cannot be altered by merely altering its money price" (WN, IV.v.a.23).

Two characteristics of corn has "stamped in it" a real value which cannot be changed: i) real wages determined mostly by a corn basket and; ii) corn as the ultimate "building block" of production, as it is produced by means of itself. Therefore, all other commodities can be reduced to corn once the distributive shares and technology are taken into account. All other commodities can be though as representing a determined quantity of corn, the relative quantities being determined by technology and distribution. That is the intuition from which Smith's invariance of the corn price is built upon. A specific commodity can have its corn equivalence altered by a bounty or a tax, and thus its relative price, but corn, the ultimate building block of all commodities, will alter all other prices. In the end, the relative value of corn to all other commodity will not have changed:

> "The real effect of the bounty is not so much to raise the real value of corn, as to degrade the real value of silver; or to make an equal quantity of it exchange for a smaller quantity, not only of corn, but of all other homemade commodities: for the money price of corn regulates that of all other home-made commodities.
>
> It regulates the money price of labour, *which must always be such as to* enable the labourer to purchase a quantity of corn sufficient to maintain *him and his family* either in the liberal, moderate, or scanty manner in which the advancing, stationary or declining circumstances of the society oblige his employers to maintain him.
>
> It regulates the money price of all the other parts of the rude produce of *land*, which, in every period of improvement, *must bear a certain proportion to that of corn*, though this proportion is different in different periods. It regulates, for example, the money price of grass and hay, of butcher's meat, of horses, and the maintenance of horses, of land carriage consequently, or of the greater part of the inland commerce of the country.
>
> By regulating the money price of all the other parts of the rude produce of land, it regulates that of the materials of all manufactures. By regulating the money price of labour, it regulates that of manufacturing art and industry. *And by regulating both, it regulates that of the compleat manufacture*. The money price of labour, and of every

thing that is the produce either of land or labour, must necessarily either rise or fall in proportion to the money price of corn" (WN, IV.v.a.11-14).

It is important that the above passage be linked to the corn reduction process, otherwise, it might appear as a metaphysical belief that the corn value did not change.

What we find is once only corn determines the real wage and agriculture is considered an integrated sector in which the main costs are seeds, the mathematical calculations are very simple and straightforward. Agricultural products other than corn and manufactures can have their relative prices determined in relation to corn by technology (physical inputs to production) and distributive shares without any recourse to solving a system of simultaneous equations.

As Smith has written, corn has "a real value which cannot be altered by merely altering its money price". Although Smith defines "real value" as the amount of labor a determined quantity of corn can buy, when discussing the corn bounty he considers also the real value as the amount of other goods that corn can buy, represented in our model by (P_c/P_m) . Corn is identified with the only "basic" good of the economy, to use an sraffian terminology, and this basic is not influenced by any other price, then all other relative prices can be determined in terms of technical and distributive conditions in relation to the price of corn[15]. That is why the price of corn, unlike all others, could not be altered.

The Taxes

The chapter on taxes confirms all evidences found in the theoretical chapters: Smith reaffirms that the intensity of capital accumulation is the main determinant of both profits (WN, V.ii.f.3) and wages (WN, V.ii.i.1) and the rent of land continues to be determined residually (WN, V.ii.d.1).

The agriculture-manufacture relative price movements also remain the same. Any tax associated with the agricultural sector, for example a tax on land rent, will fall upon the rent of land and will not alter the relative prices.

> "Taxes upon the produce of land are in reality taxes upon the rent; and though they may be originally advanced by the farmer, are finally paid by the landlord. When a certain portion of the produce is to be paid away for a tax, the farmer computes, as well as he can, what the value of this portion is, one year with another, likely to amount to, and he makes a proportionable abatement in the rent which he agrees to pay to the landlord" (WN, V.ii.d.1)"

Taxes on wages, profits, and on necessaries (workers wage basket components) will increase manufacturing prices in comparison to agriculture because while the capitalist-manufacturer would shift the burden of the tax to the consumers, the capitalist-farmer would shift it to the landlords.

> "If he [the capitalist] employed it as a farming stock in the cultivation of land, he could raise the rate of his profit only by remaining a greater portion, or, what comes to the same thing, the price of a greater portion of the produce of the land; and as this could be

15 The price of corn is therefore a natural *numeraire*, since it does not change when the technology of production or the real wage changes. All the relative prices change in relation to the price of corn are due to changes in the production process of other goods and of changes in the distributive shares. So, the choice of corn as the *numeraire* was not accidental.

> done only by a reduction of rent, the final payment of the tax would fall upon the landlord. If he employed it as a mercantile or manufacturing stock, he could raise the rate of his profit only by raising the price of his goods; in which case the final payment of the tax would fall altogether upon the consumers of those goods" (WN, V.ii.f.2) [brackets added].

Smith considered that if a tax would not alter the intensity of capital accumulation, both wage earners and capitalists would be capable of avoiding the taxes by maintaining the average levels of real wages and profit rates prior to the tax.

Specific considerations were made in explaining how the capitalist avoids the tax, because Smith distinguishes two parts in the determination of profits: the part of profits that are reserved to cover the "risk and trouble" of its application and a second part which he calls clear profit. It is from the clear profit that the interest on money, if the capital was borrowed, is subtracted from. In relation to the interest of money Smith argues that:

> "The interest of money seems at first sight a subject equally capable of being taxed directly as the rent of land. Like the rent of land, it is a neat produce which remains after compleatly compensating the whole risk and trouble of employing the stock" (WN, V.ii.f.3).

But Smith adds latter that if it was taxed, the capital would flee from the country. It is supposed then that the money holders are able to avoid the tax by expatriating capital, thereby affirming that the capitalist avoids the tax by either encroaching upon rent or by augmenting prices, as described above.

For the objective of this paper it suffices to say that the treatment of taxes is completely coherent with the residual determination of rent and the price dynamics entailed by it[16]. It is clear that Smith consistently applies his theory of rent of land as an ultimate residue and is fully aware of the implications of his theory of distribution on relative prices of two broad groups, agricultural or manufactured commodities.

8. Conclusion

By acknowledging the residual determination of land rent one can find in Smith a logically coherent theory of distribution and value. It is possible to find solid textual evidence that rent of land was residually determined based on the "corn reduction" procedure. Smith's argument is developed in Book One and consistently and coherently applied in Book Five in the discussion of Bounties and Taxes.

As Dome (1998, p.80) clearly pointed out, "Smith's system of price determination contains rent as an endogenous variable, giving the rate of profits and the wage basket exogenously". Indeed, the detailed analysis of Smith's theory of distribution shows that O'Donnell (1990, p.121) was precisely right when he affirmed that "the differences between the conclusions reached by Smith and Ricardo on the relation of wages, taxes and bounties to prices and distribution were a result of this new theory of profits *in combination with* a new set of assumptions adopted by Ricardo" (italics in the

16 Dome (2004) makes a coherent and detailed analysis of the treatment of taxes in Smith.

original). The most important assumptions were the residual rent and the agricultural wage simplifications when building the theoretical model.

Dome (1998) affirms that "Smith theory of tax incidence is consistent as long as his presumptions concerning price determination are accepted". This paper is highly complementary to Dome's in the sense that it shares the same conclusions although reached through different paths. While Dome (1998, 2004) identifies Smith's coherence in the book on taxes and then logically reconstructs a model of Smiths theory of value and distribution, I search for textual evidence in Book One that deals distribution and value and then use the book on taxes as proof of coherence.

Sinha (2010a, b) advances the exact same conclusion on Smith's coherence concerning the residual determination of the rent of land. Apart from interpretative differences elsewhere, the biggest being Sinha's claim that profit was not a part of the surplus in Smith's theory, in relation to the residual determination of rent and its coherent application when dealing with taxes we fully agree.

What these authors and I have in common is the intention to stress Smith's presumptions concerning distribution and value and analyze its logical coherence. I believe the search for a surplus theory of the rate of profit in Smith in a proximate manner to Ricardo and Marx has the consequence of blurring the continuance of the theoretical developments of Smith in the surplus approach. For example, O'Donnell (1990) and Aspromorgous (2009) have very detailed readings of Smith, both acknowledging the residual determination of the rent of land and defining Smith as "surplus approach" theorist while denying that he was a precursor to marginalism. Yet, both stress the nonexistence of a surplus theory of profit as something quite surprising.

O'Donnell speaks of a "dichotomy" in Smith's theory of value: a surplus theorist when writing on accumulation but not when writing on value and distribution. But a rate of profit *determined* by the aggregate profits and aggregate supply of capital advanced makes no sense in Smith's world, exactly because of his different set of assumptions concerning the residual determination of rent. The total surplus is determined by the technique in use along with the wage rate, and this is why O'Donnell finds a "surplus theory" in the discussion of accumulation. But this surplus will be divided among profit and rent earners and this division will be determined by the rate of profit (exogenously determined by "competition of capitals") which in turn will determine the rate of aggregate profits in relation to the aggregate capital advanced. There is no dichotomy, precisely because of the way Smith determines the rent of land.

Aspromorgous (2000) also acknowledges rent of land as determined residually. "To be sure, Smith has some notion of a binding constraint on distribution" (Aspromourgos, 2009, p.262). But I believe one could conclude that Smith had more than some notion of a binding constraint on distribution: he had a logically coherent theory of distribution and value as long as his theory of residual rent and determination of profit by competition was accepted. Aspromorgous (2009, p.262) though prefers to emphasize the absence of the surplus theory of profit: "But the technological constraint binding together real wage and profit rates is not perceived by him, partly because of the vexed Smithian treatment of rents".

I believe that the difference in my interpretation, that of Dome (1998, 2004) (and is some respects of Sinha 2010a,b) with the one advanced by Aspromorgous and O'Donnell's is not fundamental. Although there are differences in the readings themselves, I believe the biggest difference is on what one is *not* trying to find: the surplus theory of profit rates.

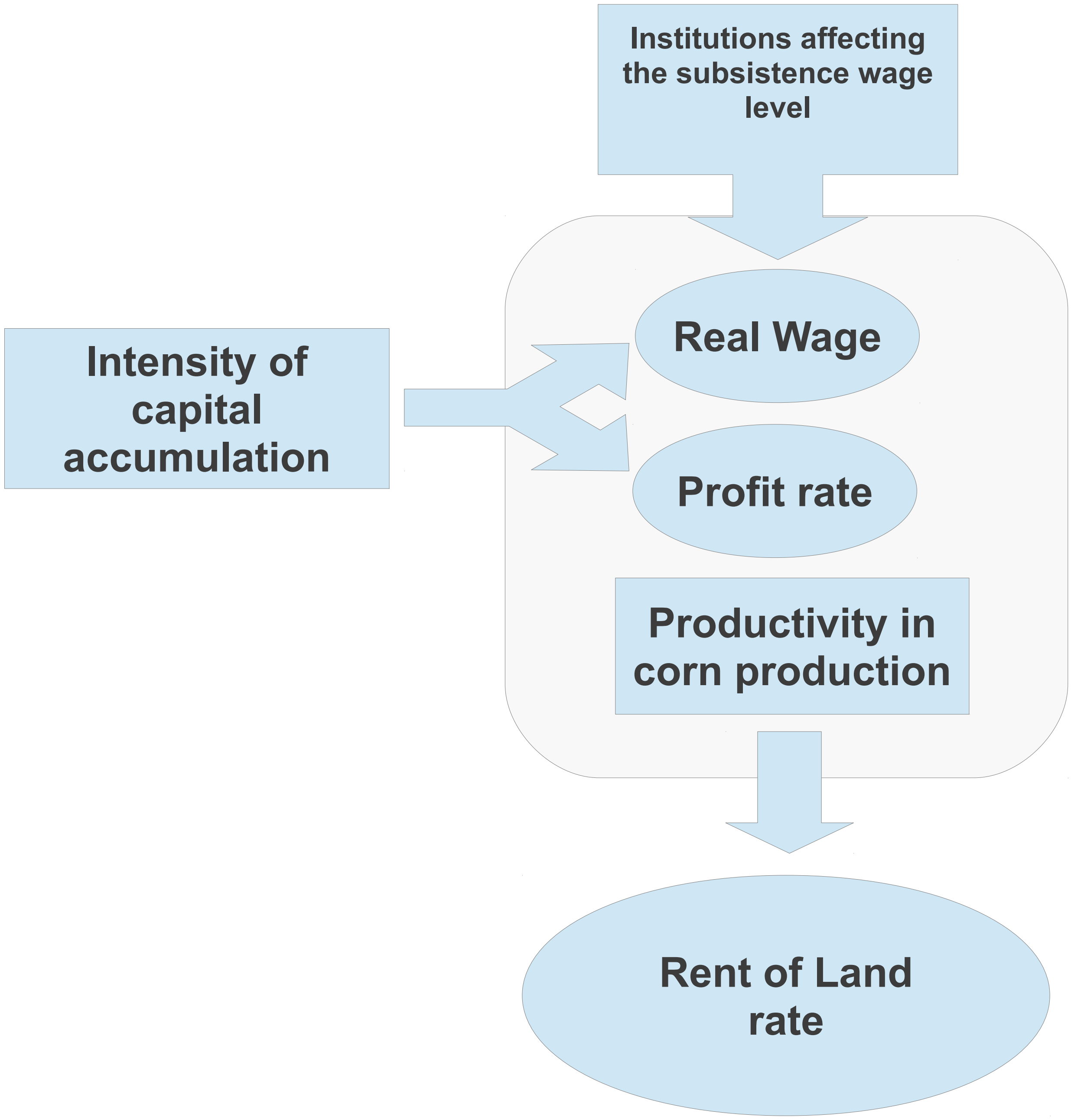
The acknowledgment of Smith's coherence in trying to deal with distribution and value can diminish the doubts about his adherence to the surplus approach. The competition of capitals, considering his hypotheses, does not deny Smith as a surplus theorist (see Figure 1 in the

Appendix). The most important surplus characteristics lies not in the theory of profit, but in the biding constraint on total surplus given by the technique in use that surfaces in his differentiation of original and derivative revenues, in the identity established among “the revenue of the great body of the people” and “the annual produce of the land and labour of the country” (V.ii.k.25), and in the analysis on accumulation, among other passages.

Smith's theory of distribution has thus been deeply misinterpreted historically. Not only Smith possessed a logically coherent theory of distribution, but he applied it recurrently and correctly throughout his book. To assert this is by no mean to underweight Smiths flaws in his assumptions when dealing with a rent of land determined physically, with profits depending on “competition of capitals”, and other theoretical problems. But when one separates the theory's logical structure and the particular set of assumptions adopted by the author, it makes clearer the elements of continuance and of divergence among the surplus approach authors when dealing with distribution and value.

APPENDIX

Figure 1 - Graphical representation of Smith's theory of distribution logical structure



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