

Prices, productivity, and agricultural ground rent: neither ‘deteriorated terms of trade’ nor ‘unequal exchange’

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Prices, productivity, and agricultural ground rent: neither ‘deteriorated terms of trade’ nor ‘unequal exchange’

Dependency and underdevelopment theories present the deterioration of the terms of trade as proof of their conceptions. They explicitly exclude a higher increase of labor productivity in the agricultural sector vis-à-vis the industrial one as a cause for this deterioration. The article measures this relative evolution for 1910-2009 based on the USA, which is the largest agricultural exporter and does not present specific obstacles to the development of agricultural labor productivity. A relative increase in the latter, which more than compensates for the decline in agricultural prices in the world market, is verified. The same absence of deterioration is confirmed by analyzing the evolution of labor productivity in the USA and Argentina for wheat, maize and soybeans. Nevertheless, obstacles to the intensive and extensive application of capital on land in Argentina become evident and turn acute when the analysis comprises the whole of the agricultural sector. The theory of unequal exchange cannot explain these obstacles given the significative presence of differential ground rent. In conclusion, as it invalidates said theories the article points towards the need to focus on the national specificity of the Argentine process of capital accumulation, which shares a common base with others prevalent in Latin America.

Keywords: terms of trade; unequal exchange; dependency theory; ground rent; capital accumulation; national forms; labor productivity

1. The conception of the ‘deterioration of the terms of trade’

The idea that the existence of a tendency to the ‘deterioration of the terms of trade’ is at the heart of the obstacles to the development of national capital accumulation processes characterized by their high degree of specialization in primary productions destined for export - a characterization historically typical of Latin American countries -, has been traditionally sustained by theoretical perspectives which present themselves as being very different.

Thus, the staunch defenders of international free trade - or more precisely, those who postulate freeing trade in industrial products while maintaining para-tariff barriers for agricultural products - recognize the effect of the evolution of the terms of trade on the conditions of

development of the countries involved, although this evolution is assigned an accidental character lacking any determined tendency:

Some trade is better than no trade, and an improvement in the terms of trade means an improvement in potential welfare if conditions in the country remain unchanged. (Krueger & Sonnenschein 1967, p. 127)

In contrast, for dependency theorists, the deterioration of the terms of trade against the countries that export primary products constitutes a structural feature that demonstrates the flow of social wealth from those countries to countries which are exporters of industrial products:

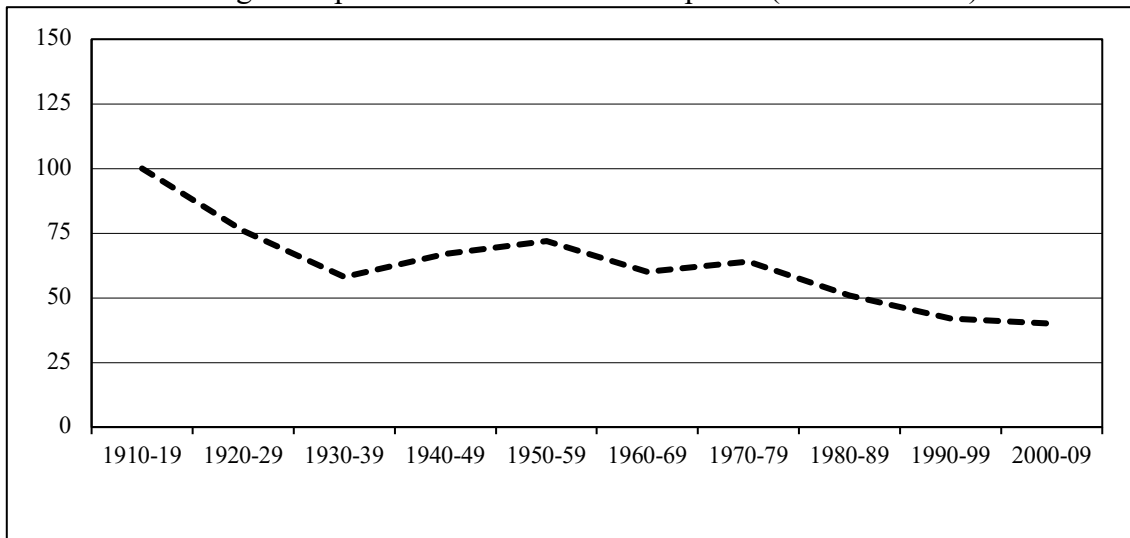
This is the well-known fact that the increase in the world supply of food and raw materials has been accompanied by the decline in prices of these products, relative to the price reached by manufactures. As the price of industrial products remains relatively stable, and in any case declines slowly, the deterioration of the terms of trade is in fact reflecting the depreciation of primary goods [...] Theoretically, the exchange of commodities expresses the change of equivalents, whose value is determined by the amount of socially necessary labor that the commodities embody. In practice, different mechanisms are observed that allow value transfers to be carried out, passing over the laws of exchange, and that are expressed in the way market prices and prices of production of commodities are fixed [...] In the second case - transactions between nations that exchange different kinds of commodities, such as manufactures and raw materials - the mere fact that some produce goods that the others do not produce, or cannot do so with the same ease, allows the former to avoid the law of value, that is, to sell their products at prices above their value, thus setting up an unequal exchange. This implies that disadvantaged nations must give up part of the value they produce free of charge. (Marini 1972, pp. 41-44)

At the same time, the process of 'reprimarization' of the production of the countries that export raw materials during the last decades has renewed the debate about the evolution of the terms of trade. (Cypher 2009).

The study of the question necessarily starts from analyzing this relative evolution of prices, upon which the term 'deterioration' already makes it seem to foreshadow an ominous determination for

the development of national processes of capital accumulation exporting raw materials, specially for those which export agricultural commodities, which concern the present article. Indeed, the relationship between agricultural and industrial prices shows a marked decline in the century that goes from the decade of 1910-19 to that of 2000-09, with the former falling back 60% in their relative purchasing power, as shown in Figure 1:

Figure 1. Evolution of agrarian prices relative to industrial prices (Terms of trade)



Source: Based on Appendix I.1 and Table 1

Note that not even the marked nominal rise in agricultural prices during the first decade of the present century manages to reverse the trend of the relative fall of these prices with respect to industrial prices in the world market.

2. The relative evolution of labor productivity according to the theories of structural underdevelopment and dependency

The evolution followed by the relative prices in Figure 1 immediately directs us toward the Prebisch-Singer theory, which treats it as a clear limitation to the development of the ‘peripheral countries.’ Prebisch synthesizes that theory as follows:

Simple reasoning on the phenomenon in question brings us to the following considerations:

First. Prices have not fallen concomitantly with technical progress, since, while on the one

hand, costs tended to decrease as a result of higher productivity, on the other, the income of entrepreneurs and productive factors increased. [...] *Second*. Had the rise in income, in the industrial centres and the periphery, been proportionate to the increase in their respective productivity, the price relation between primary and manufactured products would have been the same as if prices had fallen in strict proportion to productivity. Given the higher productivity of industry, the price relation would have moved in favour of the primary products. *Third*. Since, as we have seen, the ratio actually moved against primary products [...] it is evident that in the centre the income of entrepreneurs and of productive factors increased relatively more than productivity, whereas in the periphery the increase in income was less than that in productivity. In other words, while the centres kept the whole benefit of the technical development of their industries, the peripheral countries transferred to them a share of the fruits of their own technical progress. (Prebisch 1950, p. 10)

Prebisch completes the argument by attributing the different capacities of the ‘productive factors’ in the ‘center’ and in the ‘periphery’ to ‘institutional’ reasons:

The greater ability of the masses in the cyclical centres to obtain rises in wages during the upswing and to maintain the higher level during the downswing and the ability of these centres, by virtue of the role they play in production, to divert cyclical pressure to the periphery (causing a greater reduction of income of the latter than in that of the centres) explain why income at the centres persistently tends to rise more than in the countries of the periphery, as happened in the case of Latin America. That is the clue to the phenomenon whereby the great industrial centres not only keep for themselves the benefit of the use of new techniques in their own economy, but are in a favourable position to obtain a share of that deriving from the technical progress of the periphery. (Prebisch 1950, p. 14)

All that being said, this whole approach is predicated on the basis that labor productivity has been developed in a sustained manner to a greater extent in industrial production than in agricultural production, beyond the international division of labor between countries exporting industrial commodities and those exporting agricultural commodities. Presumably, then, in this foundational text of the theory of ‘structural underdevelopment’ due to the ‘deterioration of the terms of trade’, Prebisch ought to present unequivocal evidence about the relative growth of the productivity of industrial labor with respect to that of agricultural labor. But this is not the case. The only evidence

presented by Prebisch in this regard is a reference to Singer, co-founder of his same theory:

Speaking generally, technical progress seems to have been greater in industry than in the primary production of peripheral countries, as was pointed out in a recent study on price relations. (Prebisch 1950, p. 8)

This reference therefore leads us to the evidence presented in this regard by Singer:

Although statistical data on differential rates of increase in productivity of primary production in under-developed countries and production of manufactures articles in industrialized countries are almost entirely lacking [...] there is little doubt that productivity increased faster in the industrialized countries than in primary production in under-development countries. This is evidenced by the more rapid rise in standards of living in industrialized countries during the long period covered from 1870 to the present day. (Singer 1949, p. 126)

What is the concrete evidence that Prebisch and Singer present to substantiate their theory about the greater growth in labor productivity in the industrial sector with respect to agriculture? ‘Speaking generally ... seems,’ ‘although statistical data ... are almost entirely lacking,’ ‘there is little doubt,’ ‘this is evidenced by the more rapid rise in standards of living.’ Not a single statistical evidence. Only a presumption based on neoclassical economic theory, which denies the extraction of surplus value behind the argument that the workers are paid the full value that corresponds to the productivity of their labor, while profit and rent arise from the productivity of capital and land. Nevertheless, even a Marxist as Marini repeats the presumption in question without considering the need for statistical verification:

It is clear that such depreciation [of primary goods] cannot correspond to the real devaluation of those goods, due to a productivity increase in non-industrial countries, since it is precisely there where productivity rises more slowly. (Marini 1972, p. 42)

Almost three quarters of a century have gone since the deterioration of the terms of trade was postulated, and much has been written asserting its existence and its consequences on ‘underdevelopment’ or the ‘periphery’, based on the same absence of statistical verification

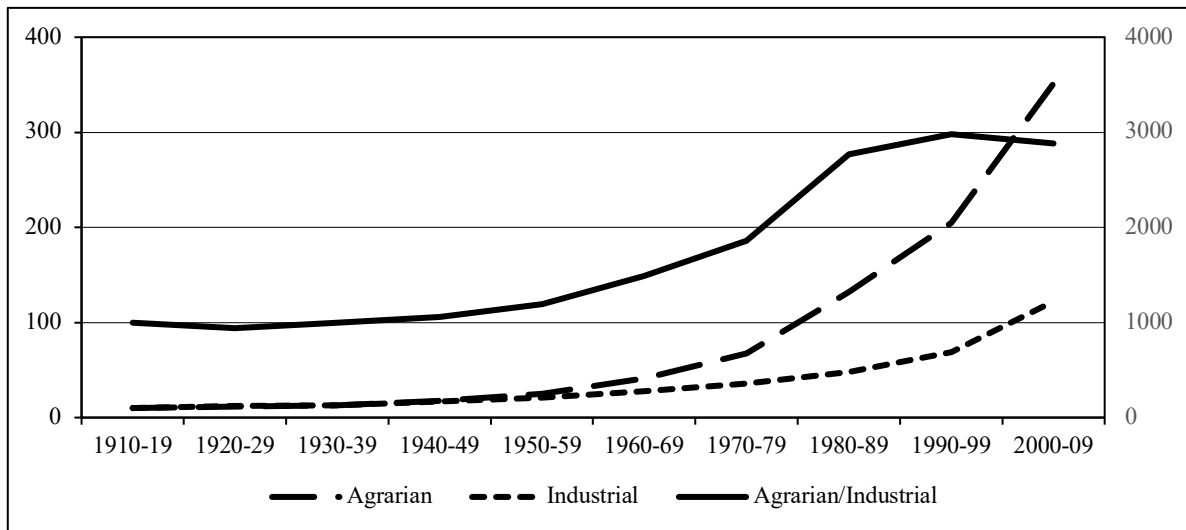
concerning labor productivity. Not even in the rare cases where the underlying supposed evolution of the productivity of agricultural and industrial labor becomes mentioned, and more rarely yet, a shadow of doubt falls on it, the need for its statistical verification has arisen:

As little long-term information is available on productivity and changes in product quality comparable to the price series examined above, it is difficult to include these variables in the statistical exercises. In any event, existing series for the OECD countries indicates that while manufacturing productivity rose faster than agricultural productivity up to around 1950, the opposite has been the case since then (Bairoch 1989; Maddison 1991). This structural break is not, however, reflected in the foregoing statistical results. (Ocampo & Parra-Lancourt 2010, pp. 34-35)

3. The calculation of the relative evolution of the productivity of agricultural and industrial labor

It is necessary to take the step that the theorists of the ‘deterioration of the terms of trade’ have not taken, that is, to compute the relative evolution of labor productivity in the agricultural sector and in the industrial sector. Given that the point is to analyze the alleged link between said evolution and the different specificities of each national process of accumulation, the calculation must start from considering that evolution in isolation from the effect that is attributed to it as the cause of the latter. The United States is the most expressive case in this regard, since it meets a double condition. First, that of being a general national expression of the course followed by the accumulation of capital where there are no particular barriers to the development of the productivity of agricultural labor due to the national specificity itself. Secondly, that of being, by far, the world's largest exporter of agricultural commodities. Figure 2 reflects the relative evolution of the productivities in question:

Figure 2. Evolution of agrarian labor productivity relative to industrial labor productivity. United States. Base 1910-1919 = 100



Source: Based on Appendix I.2 and Table 1

Contrary to the assumption on which the theories of ‘dependency’ and ‘structural underdevelopment’ linked to the ‘deterioration of the terms of trade’ are based, agricultural labor productivity in the United States grows steadily and sharply above the productivity of industrial labor. While the first one has multiplied by 35 between 1910-19 and 2000-09, the second only does it by 12.¹

This relative evolution is not surprising if one takes into account that while at the beginning of the 20th century mechanization in the industrial sector visibly contrasted with the presence of manual labor in agricultural production, for the 1950/59 decade capital in machinery per agricultural worker already equals 65% of the same relationship for the industrial sector. Moreover, this proportion rises to exceed that of the industrial sector, reaching a peak of 120% in the 1980-89 decade, although it later recedes to 84% for the 2000-09 decade (Based on Appendix I.3). As the figure shows, the relative acceleration and deceleration of the productivity of agricultural labor with

1. From 1910-19 to 1980-89, the productivity of labor in the US agricultural sector increased by 13.2 times according to my calculation, compared to 10.2 times estimated for ‘Occidental developed countries’ from 1910 to 1985 by Bairoch (based on Bairoch 1989, p. 327). In turn, from 1910-19 to 1990-99, the productivity of labor in the US industrial sector increased by 6.9 times according to my estimation, compared to 6.7 times for the total US economy from 1913 to 1998 computed by Maddison (based on Maddison 2006, p. 341).

respect to the industrial one keeps a notable correlation with equal sectoral movements in the proportion of capital in machinery per worker.

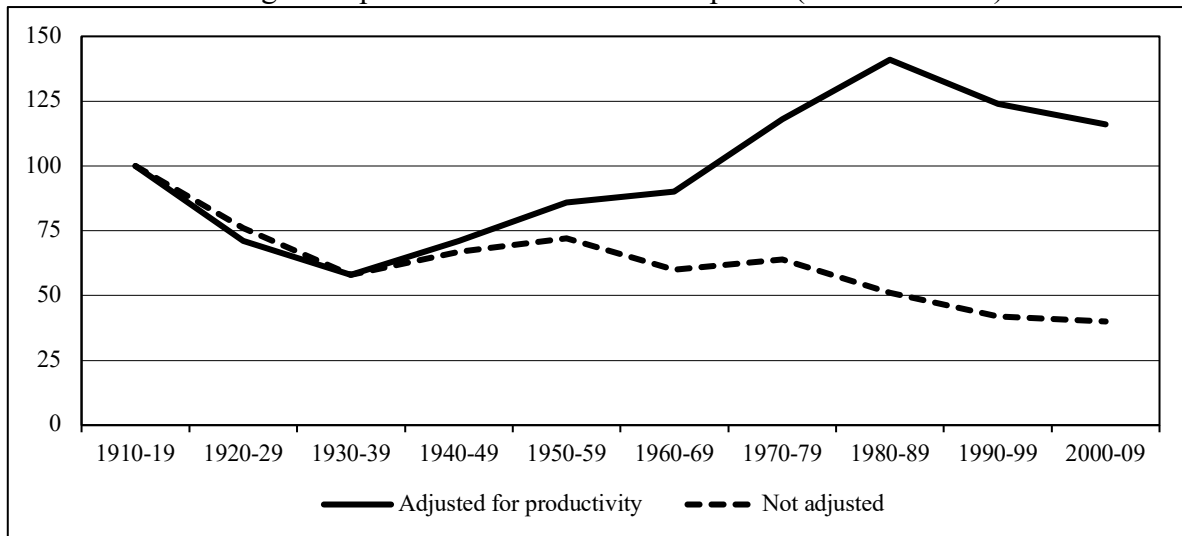
The strong centralization experienced by agricultural capitals in the United States constitutes a second determination that intervenes in the accelerated increase in the productivity of the labor they put into action. By 1914 the existence of 6.45 million farms with an average area of 57 hectares, with a work force of 2.1 persons per farm and 27.0 hectares worked per person. By 2002, the farms have been reduced to 2.14 million with 178 hectares of average area, which occupy 1.2 persons per establishment, that is, 147 hectares worked per person (Based on Appendix I.4).

That is to say, by means of the development of the technical composition and centralization of capital, not only is the productivity of agricultural labor multiplied in the aforementioned degree, but this multiplication is also manifested in more than the quintuplication of the land area worked by employed person.

4. The ‘deterioration’ of which terms of trade

Given the evolution of agricultural and industrial labor productivity within a national area of capital accumulation that does not appear to encompass specific limitations to the development of the former and that constitutes the largest supplier of agricultural commodities in the world market, the relative decrease in agricultural prices do not imply their abstract ‘deterioration’. The relevant concrete relationship is shown in Figure 3, which reflects the relationship adjusted for the differences in the growth of labor productivity.

Figure 3. Evolution of agrarian prices relative to industrial prices (Terms of trade)



Source: Based on Appendix I.1 and I.2, and Table 1

As of the 1930s, the net price relation adjusted by the movement of labor productivity becomes favorable to the agricultural sector. The continuous decline in the relative level of the nominal price is more than compensated by the proportionally greater growth of agricultural labor productivity compared to that of industrial labor. From the 1970s, agricultural prices adjusted by productivity exceeded the relative level that they had at the beginning of the period analyzed. From there they reach their peak in the 1980s, to then enter a phase of slight recoil which, in any case, leaves them with a net gain with respect to the initial level. Far from the supposed flow of social wealth from the countries that export agricultural commodities to the exporters of industrial commodities, the relative evolution of prices adjusted for the changes in labor productivity, manifests the possible existence of an inverse flow via their international trade. This result accentuates even more the need to find an answer in regard to the specificity of the national capital accumulation processes that, despite the possibility of nourishing themselves with this flow, present a course that contrasts negatively with the general development of the productive forces of society which is proper to the capitalist mode of production. Table 1 shows the values corresponding to the evolution analyzed.

Table 1. Agricultural/Industrial terms of trade and labor productivity. Base 1910-19=100

Years	Nominal terms of trade	Labor productivity in the USA			Adjusted terms of trade
		Agricultural	Industrial	Agricultural/ Industrial	
1910-19	100	100	100	100	100
1920-29	76	112	119	94	71
1930-39	58	131	131	100	58
1940-49	67	178	169	106	71
1950-59	72	249	209	119	86
1960-69	60	412	277	149	90
1970-79	64	671	361	186	118
1980-89	51	1319	477	277	141
1990-99	42	2051	687	298	124
2000-09	40	3513	1221	288	116

Source: Based on Appendix I.1 and I.2

5. Relative evolution of the average sale price and cost price per unit of agricultural product with the increase in the productivity of direct agricultural labor

The theory of the ‘deterioration of the terms of trade’ is unsustainable against the actual computation of the relative evolution of the productivity of directly applied labor - living labor - in the agricultural sector and in the industrial sector, where there are no specific national barriers to its general development. Nobody fails to see that the multiplication of the productivity of living labor is essentially based on the innovative incorporation of technically superior means of production (in particular machinery and other instruments, but also raw materials or auxiliary materials), that is, of products from previously performed labor, of dead labor. It is possible to ask, then, if the effect of the increase in the productivity of living labor on the sale price could have been offset by the increase in capital consumed in the means of production. However, against this condition, there rises a specifically capitalist limit to this innovative incorporation is raised: the dead labor that adds to the unit value of the product due to the additional consumption of means of production must be less than the paid living labor that is saved. (Marx 1965, pp. 392-393) In other words, the increase in the unit cost due to the amortization of machinery and the greater use of other means of production should be less than the decrease in the wage costs per unit produced. The lower the

weight of the wage costs in the structure of the capital consumed, or the higher the rate of surplus value, the lower the possible effect contrary to the decrease in the sale price due to the increase in the productivity of living labor, because of the increase of the cost price due to the incorporation of the means of production on which said higher productivity is sustained. Table 2 analyzes the relative movement in question for the whole agricultural production of the United States.

Table 2. Sale price and Cost price per average unit of agricultural product. Base: average agricultural unit price in US\$ based on CPI 1910-19=100

Years	Price Index		Agricultural sale prices and cost prices per average unit of product in constant purchasing power currency based on CPI				
	Consumer	Agricultural	Agricultural Price	Wage cost	Cost in means of production	Total Cost	% Cost/Sale
1910-19	100	100	100	48	37	86	85,6
1920-29	154	94	61	30	28	58	93,8
1930-39	124	53	43	21	22	43	100,5
1940-49	164	103	63	28	29	57	90,1
1950-59	236	143	60	21	36	57	94,5
1960-69	280	131	47	14	30	43	92,7
1970-79	458	261	57	12	37	49	86,6
1980-89	914	360	39	7	27	34	86,3
1990-99	1310	397	30	6	21	28	91,2
2000-09	1692	447	26	6	19	25	94,7

Source: Based on Appendix I.3

Clearly, the increase in the productive capacity of direct agricultural labor has been sustained on the incorporation of means of production. But the corresponding replacement of living labor for dead labor has far from counteracted the effect of this increase in the price of agricultural products. On the contrary, throughout the period considered and beyond the fluctuations that make the accumulation of capital have a necessarily cyclical character, such substitution has resulted in the proportional reduction of the unit cost price in a parallel course to that reflected in the unit sale price due to the growth of the immediate productivity of living labor. This evidence reaffirms the validity of the analysis based on directly considering this same growth.

6. The relative evolution of agricultural labor productivity in countries specialized in agricultural exports and in the United States: the case of Argentina

Up to this point, the relative evolution of the productivity of agricultural labor versus industrial labor has been considered for a country that, in addition to being the world's largest exporter of agricultural goods, does not present barriers to the development of said productivity due to its own national specificity. The question then arises as to whether the relative growth of agricultural labor productivity compared to the industrial one is a phenomenon exclusive to countries such as the United States. Consequently, it is now necessary to consider the issue through an analysis based on the comparative evolution of labor productivity that results from the application of techniques defined as being of normal use in this kind of country and in another which national specificity is characterized by its specialization in the exporting of agricultural products. Argentina is an expression of this second condition, focusing the analysis on the two crops that have historically had the greatest share in agricultural exports: wheat and maize. Any appearance that these are two singular cases with respect to the general movement disappears as soon as it is observed that the purchasing power of the respective unit prices at the point of production in the US has fallen for the 2000-09 decade to 23.3% and 25.5% of the level it had in 1900-09, compared to the evolution of the consumer price index (Based on Appendix I.5).

From 1980-89, the case of soy is added to the analysis of the relative evolution of labor productivity, as it is the most important agricultural commodity in current Argentine exports. Table 3 shows the evolution of the labor productivities under analysis.

Table 3. Evolution of labor productivity in wheat, maize and soy. Bases: 1910-19=100; 1980-89=100

Years	Wheat		Maize		Soy	
	Argentina	United States	Argentina	United States	Argentina	United States
1900-09	100	100	100	100		
1910-19	105	106	106	110		
1920-29	133	131	122	124		
1930-39	244	158	124	127		
1940-49	338	278	127	223		
1950-59	918	509	313	544		
1960-69	1658	964	1232	1633		
1970-79	2190	1179	1894	3267		
1980-89	3056	1513	2753	4900	100	100
1990-99	4382	1842	4657	4242	181	132
2000-09	5628	2354	10221	9291	395	314

Source: Based on Appendix I.6

From 1900-09 to 2000-09, the labor productivity in wheat production multiplied by 56 in Argentina (from 0.2 to 10.4 quintals per hour), while only by 24 in the United States for Hard Red Winter N° 2 variety equivalent to the Argentinian one (from 0, 2 to 5.4 q/h). On the other hand, the labor productivity in maize production multiplied by 102 in Argentina (from 0.3 to 27 q/h) and by 93 in the United States (from 0.2 to 16.1 q/h) (Based on Appendix I.6). If the period 1910-19 to 1980-89 is taken to standardize the starting point with the period in Figure 2, the labor productivity of wheat was multiplied by 22, and that of maize by 84, in the United States. In Argentina, the same increases were 54 and 96, respectively.² In turn, while the productivity of labor applied to soybean production in Argentina multiplied by 4 between 1980-89 and 2000-09 (from 4.8 to 19.0 q/h) in the United States, it did so by 3 (from 2.4 to 7.7 q/h).

2. The productivity of Argentine labor in maize production equals and exceeds that of its corresponding labor in North America, although it does so relatively late within the period considered. This delay has among its causes the historical predominance of dent maize in the United States, in contrast to that of hard (Flint) in Argentina, since it tends to be replaced by dent varieties from the 1980s. In this sense, the late incorporation of the hybrid varieties is involved, which barely accounted for 10% of the total in 1960, while in the United States they already represented the entire area planted (Rossi 2011). In turn, the mechanical harvest began to be widespread late in the 1950s (Frank 2017).

For the three crops, the evolution of labor productivity corresponding to the techniques defined as being of normal application in Argentina exceeds that of their registered equivalents for the United States. And it surpasses even more broadly the already favorable unit price-productivity of the whole set of world agricultural commodities as compared to the same unit of the whole set of industrial commodities. Incidentally, what seemed to be the collapse of the relative purchasing power of the unit prices of wheat and maize at the point of production in the case of the United States, actually corresponds to a multiplication of this power in the unit of price-productivity by 5.6 and 23.6 times, respectively.

It is worth adding here one further evidence regarding the relative evolution of agricultural labor productivity. In fact, the quantity produced per unit area is not an unequivocal indicator of the absolute level of said productivity, since it can correspond to very different intensities of application of capital, and consequently of labor, on land. However, the relative evolution of their levels over time can serve as an indirect indicator of the evolution of said productivity. Between 1961 and 2014, the so-called yield per unit of area applied to cereal production multiplied by 3.0 in the United States, but it did so by 3.4 in Argentina. If the comparison extends to the whole of the United States and Canada against that of the countries of Latin America and the Caribbean, the multipliers are 3.1 and 3.3 respectively (WB Indicators). Even on this indirect basis, it can be concluded that the growth of labor productivity applied to cereal production both in Argentina and in the whole of Latin America and the Caribbean has not deviated negatively from that applied to the same production in the United States.

Is there a deterioration of the 'terms of trade'? Quite the opposite. It was not in vain that the total ground rent of agricultural land in Argentina in terms of constant internal purchasing power multiplied by 4.2 times from 1900-09 to 2000-07 (Based on Iñigo Carrera 2008), and by 4.5 times to 2000-09 (Iñigo Carrera 2007). The impressionism based on the fantasies of neoclassical economics can only produce a knowledge that stops at appearances, namely ideology, even if it

wants to be coated with a critical spirit. The very possibility of facing the barriers to the development of the productive forces of social labor that is manifestly associated with the specific national form taken by the accumulation of capital in Argentina, as well as in the whole of Latin America and the Caribbean, must necessarily be grounded on objective knowledge. And this objective knowledge cannot avoid the effective computation of the variables that present themselves as those at stake.

7. Manifestations of the conditions that concern the relative development of agricultural labor productivity that result from the specific national form of capital accumulation: the case of Argentina

The analysis carried out so far does not make evident that the conditions under which the Argentine capital accumulation process takes place impose determinations that specifically limit the growth of agricultural labor productivity or, on that account, the application of agricultural capital on land.

The perspective changes radically when the same evolutions of labor productivity and production per unit area are set, not relating the values corresponding to each of the two countries to these countries themselves but comparing their absolute magnitudes between one and the other country.

Table 4 shows this comparison.

Table 4. Labor productivity per hectare in wheat, maize and soy. Base USA=100

Years	Argentina / USA % relation					
	Wheat		Maize		Soy	
	Product p/ hour	Product p/ hectare	Product p/ hour	Product p/ hectare	Product p/ hour	Product p/ hectare
1900-09	81	85	152	98		
1910-19	80	84	147	83		
1920-29	81	100	149	112		
1930-39	124	113	148	117		
1940-49	98	110	86	85		
1950-59	145	102	87	57		
1960-69	139	84	114	43		
1970-79	150	81	88	48		
1980-89	163	83	85	50	197	99
1990-99	192	105	166	58	271	87
2000-09	193	110	167	68	247	88

Source: Based on Appendix I.6

While, for all three crops, labor productivity is significantly higher in Argentina than in the United States, production per unit area in all cases keeps a no less significant inverse relationship.

The contrast between the two relations immediately refers the analysis to the question of the intensive application of agricultural capital on land. The greater production per unit area with lower average labor productivity implies that intensive portions of capital have been applied which show a decreasing labor productivity as a whole. Correspondingly, the greater productivity of labor that, however, yields a lower production per unit area implies the existence of a specific barrier to said intensive application with decreasing productivity. The question immediately arises: What specific determination of the Argentine national process of capital accumulation is manifested in this barrier?

The first general condition for there to be room for the intensive application of capital with decreasing labor productivity is that the commercial price at which the commodities in question circulate is above, and at the lower end at the same level of, the price of production resulting from said decreasing productivity. Argentine grains compete in the world market with those of the United States. Therefore, the question of why there is no intensive application of capital in Argentina

equivalent to that of the United States refers, above all, to the prevailing prices in said market. The comparison between the respective FOB prices shows an unfavorable difference for the Argentine prices: for wheat bread, in the average of 1980-2009, the Argentine ports FOB prices are equivalent to 96% of the Gulf of Mexico FOB; on the other hand, for soybeans in the average of 1980-2009, the former reach 97% of the latter. The main factor that explains these differences lies in the costs of shipping from both sources to the import markets. In the case of soy, the difference between these costs is equivalent to 2% of FOB prices, leaving only 1% of these prices as an unexplained difference (Based on Osenza & Pierri 2012, pp. 129-149). If the same cost difference is applied to wheat, the residual difference is 2 %.

The higher costs of international transport constitute, albeit to a limited extent, a restriction on the intensive application of agricultural capital for Argentina. It can be questioned whether these higher costs respond to a mere difference in relative location, or if they arise from conditions originated in the specificity of the Argentine capital accumulation process. But they are practically insignificant with respect to the intensity with which agricultural capital is applied in the face of another difference of substantially greater magnitude that falls on Argentine FOB prices and which, beyond doubt, emerges from that specificity.

At the base of the specificity of the national form that the global unity of capital accumulation takes in Argentina is the weight of agricultural ground rent within the mass of surplus value which is internally appropriated. In its process of primary appropriation, a significant part of said ground rent (63% on the average of 1900-2009, Iñigo Carrera 2008) escapes landowners and continues its course towards other appropriators of surplus value, in particular, the external creditors of the national state under leonine conditions and the foreign capitals of the industrial sector which operate in the country on a scale restricted to the size of the domestic market and, consequently, with the technology and equipment that they have ruled out as obsolete in places where they

produce to compete directly in the world market (Iñigo Carrera 1999; Iñigo Carrera 2007, pp. 41-85; Iñigo Carrera 2000, pp. 52-75; Iñigo Carrera 2004).

With regard to the intensive application of agricultural capital on land, this issue refers to the modalities through which the flow of ground rent to these other beneficiaries takes shape. Because the state does not operate on ground rent through a tax that falls directly on it once it has separated in circulation from the movement of agricultural capital that returns valorized but does so on the course of its primary appropriation when this separation has not yet occurred. This mode of operation has three main forms: taxes on exports, overvaluation of the national currency and direct regulation of domestic trade via price fixing, commercial monopoly and export restrictions (Iñigo Carrera 2007, pp. 110-117). The magnitude of the effect of these three modalities of operation on the internal expression of the FOB export price is reflected in the case of wheat in the first four columns of Table 5.

Table 5. Equivalent FOB price of wheat, rural salary and agricultural machinery price. Apparent productivity of Argentinian agricultural labor. Bases: FOB=100; USA=100; 1910-19=100

Years	Effect on the internal expression of FOB prices of wheat in %			Internal expression of FOB price of wheat in %	Argentina / USA % relation		Apparent productivity of agricultural labor in Argentina
	Exports taxes	Overvaluation	Direct price fixing		Rural salary	Agricultural machinery price	
1900-09	-	28,1	-	72	63	324	-
1910-19	0,6	35,8	-	64	56	359	100
1920-29	1,8	9,3	-	89	45	241	111
1930-39	0,1	-16,8	-	117	54	266	125
1940-49	-	19	25,6	55	31	359	149
1950-59	3,5	38,9	2,9	55	61	502	209
1960-69	9,2	2,6	3,8	84	23	315	286
1970-79	11,9	22,7	8,5	57	24	185	353
1980-89	11,4	3,7	2,2	83	19	142	437
1990-99	1,6	47,2	-	51	18	101	600
2000-09	16,8	7,8	6	69	10	133	868

Source: Based on Appendix I.7 to I.10

In the average of 1900-09 to 2000-09, the joint effect has been equivalent to a reduction in the internal expression of the FOB price of 28%. The national specificity of the accumulation of capital gives rise to a first highly significant barrier that slows down the intensive application of capital in contrast to the case of the United States, alien to that specificity. But this barrier also extends over the extensive application of agricultural capital on land, as the lower domestic price transforms into extramarginal a portion of lands that far from being such at the full FOB price, would result in the appropriation of differential ground rent at this price. In turn, this restriction to the application of capital on worse lands or in conditions of greater intensity with decreasing productivity is inversely reflected in the higher average productivity of agricultural labor in Argentina.

But the negative effect that the specific national form of the Argentine capital accumulation process has on the intensive and extensive application of agricultural capital and the development of labor productivity that this capital puts into action does not end here. The same specificity is manifested in a determination whose two extremes converge in a pincer movement that strangles the technical composition of agricultural capital with respect to that achieved in the absence of said specificity.

On one flank, the Argentine rural salary continually decreases with respect to its North American equivalent (see column 5 of Table 5). The gap opens in a significant and increasing way from the moment in which the accumulation of capital in Argentina begins to show its limits for the absorption of the relative surplus population that remains in a latent state in agriculture as active laboring population in the urban centers. A fact that occurs after two decades of accelerated transformation in this direction. On the other flank, the price of agricultural machinery has been substantially higher than that of similar machinery in the United States over the whole period (see column 6 of Table 5). This difference does not simply respond to a surcharge paid for imported machinery. On the contrary, the peaks of differences occur at times of import restrictions due to external circumstances such as world wars, but, above all, when importation is restricted in defense

of internal industrial production. This production is significantly centralized in the hands of foreign capitals that put into action a labor productivity that does not exceed 20% of that reached by the same sector in the United States (Iñigo Carrera 2007, p. 64). The higher domestic price constitutes a modality by which said capitals participate in the appropriation of ground rent. To do this, this modality operates directly on the turnover cycle of agricultural capital, making its machinery more expensive. It is notable that the relative cost of machinery has only been significantly attenuated in recent decades, when the opening of imports imposes itself displacing the internal production of agricultural machinery. The magnitude reached by the difference in productivity intervenes in this displacement, but so does the overvaluation of the national currency.

The increasing relative cheapness of agricultural labor power and the relative expensiveness of agricultural machinery in Argentina are mutually potentiating as barriers to the replacement of living labor by machinery and, consequently, to the increase in labor productivity, given the specifically capitalist limit already referred to for the incorporation of machinery. At the same time, the relative high prices of machinery undermine the intensive application of capital on land, especially when this intensity is associated with a decreasing productivity of labor.

In contrasting the substantial growth in labor productivity in the three crops analyzed with the specific barrier in question, it cannot be overlooked that such growth encompasses a factor that goes beyond the technical development considered in itself. Within the period considered from the 1960s onwards, annual rains in the Pampas region and in regions considered semi-arid, show a growing trend to the effect that, beyond circumstantial excesses, they have multiplied the natural fertility of the national territory suitable for such crops (Levín 2017).

The specific limitations considered so far become even more evident when one goes from considering the specific technical conditions of wheat, maize and soybean productions, to considering the indicators that the whole of the Argentine agricultural sector lay out.

As we saw earlier, throughout the second half of the twentieth century, the technical composition of agricultural capital in the United States is close to that of industrial capital in terms of the use of machinery. Argentine agricultural capital is far from reaching such equivalence in the degree of technical composition, not even in relation to the capital that operates in the local industrial sector: for the average of 1947-2009, the sum of agricultural capital in machinery and constructions (the data available for the industrial sector do not allow analyzing each item separately) per worker barely reaches 42% of that corresponding to the capital of the latter sector. It starts from being 54% for the 1950-59 decade and ends up being reduced to 22% for the 2000-09 decade (Based on Appendix I.9). The two factors mentioned above regarding the cost of machinery and the cheapening of labor power play a role here. Only that, when considering the sectorial comparison as a whole, it is worth pointing out two determinations specific to the national form that capital accumulation takes in Argentina, which sharpen the relatively low technical composition of agricultural capital. In the first place, given the steady collapse of rural wages, also put in relation to the weight that family work continues to have in agricultural employment (71% of the permanent workforce, INDEC 2002), it is reasonable to consider that the census record of the baseline of employment against which the technical composition is computed includes a significant proportion of latent surplus population (Marx 1965, p. 544). Secondly, the relative cost of machinery is compensated for the capitals of the industrial sector by their own sales prices in the domestic market. But this is not the case for the capitals of the agricultural sector, given that the effect of export taxes, the overvaluation of the national currency and the direct regulations governing its circulation fall again on its sales prices.

On the other hand, the process of centralization of agricultural capital in Argentina presents a markedly smaller advance than in the United States. In 1914, 307 thousand productive units are registered through census, with an average area of 531 hectares, with a labor force of 4.8 equivalent persons per unit and 112 hectares worked per person. For 2002, the total number of registered units

amounts to 334 thousand, of which 297 thousand have defined limits, with an average area of 588 hectares, a labor power of 2.5 persons per unit and 235 hectares worked per person Based on INDEC 1914, INDEC 2002 and Appendix I.10). Whatever the effect caused by the change in the definition of the census unit (from 'farm' to 'agricultural productive unit'), the 11% increase in the average area on which each agricultural capital is applied, is in contrast with 212% of the same type of growth in the United States. In turn, when this greater centralization of capital is added to the accelerated growth of the technical composition, there is an increase of 444% in the area worked per person in the United States, against 110% in Argentina.³

Due to the mediation of this sum of factors, the increase in the productivity of Argentine agricultural labor over that of North American agricultural labor in the production of wheat, maize and soybeans, its main export commodities, appears in an inverse relationship when the agricultural sector is considered as a whole. While in the United States the aggregate agricultural productivity is multiplied by 35 from 1910-09 to 2000-09, in Argentina it is only multiplied by 9 (see column 7 of table 5). Within the period there is a similar growth in both countries up to the decade of 1930-39, which begins to diverge slightly in the following two decades, opening the gap in a substantial and increasing way starting from the 1960-69 decade.

8. From the appearance of the 'deterioration of the terms of trade' to the appearance of 'unequal exchange'

Already from the founding text of Marini cited initially, dependency theory presents the appearance of the 'deterioration of the terms of trade' as an expression of the existence of an 'unequal exchange' to the detriment of the countries that export primary commodities. In turn, in general beyond Marini himself, the appeal to unequal exchange refers to Emmanuel's own conception in

3. The process of centralization of agricultural capital applied to the production of grains under the legal figures of sowing pools, trusts, etc. expanded strongly after 2002. The failure of the National Agricultural Census 2008 does not allow recording the general effect of this expansion.

this regard (Emmanuel 1972). Although the question cannot be fully deployed here, the link between the two conceptions makes it necessary to pause for a moment on the notion of ‘unequal exchange’, insofar as the discussion is pivoted around agricultural production for the world market (Iñigo Carrera 2017, pp. 229-245).

In the case of the United States, once the fixed capital in facilities and the circulating one in inventories are added to the capital in machinery, the composition of agricultural capital as a whole significantly exceeds that of industrial capital from 1925 to 2009, which is the end of the period under analysis (Based on Appendix I.3). The relatively low turnover speed of the circulating portion of agricultural capital, due to its subordination to the development of biological processes that cannot be controlled by capital, adds to this high relative composition. Inasmuch as this double condition applies to the agricultural capital applied on the worst land, the price of production which regulates the commercial price of agricultural commodities is higher than their value. Therefore, the ground rent demanded by the landowner of the worst land to allow it to be put into production has the character of a rent that arises from an actual monopoly price, that is, a simple monopoly rent. Thus, the commercial price with which US agricultural commodities as a whole circulate in the world market is above its regulatory price of production, which is per se already higher than its value. And even if a lower-than-average organic composition of agricultural capital is verified, not being compensated by the low turnover speed of its circulating portion, the difference in the price of production below the value will inevitably be compensated, and even canceled, by the absolute ground rent demanded by the landowner, and even reversed as soon as this ground rent transcends that of a simple monopoly (Iñigo Carrera 2017, pp. 79-80 and 124).

The agricultural capitals applied on better lands will also sell their product at the commercial price determined by the conditions prevailing for those applied on the worst land. Consequently, these capitals will not only appropriate the ground rent of simple monopoly and/or the absolute ground rent, but also a differential ground rent, regardless of their own organic composition and

turnover speed. In this way these capitals will appropriate a mass of surplus value greater than the one directly extracted from their own workers and, therefore, they will be selling their commodities at a price above the value materialized in them. And they will do so even if the eventual existence of absolute ground rent has not yet absorbed all the difference between the price of production and the value corresponding to the capital that operates on the worst land (Iñigo Carrera 2017, pp. 113-122).

This last determination extends to the agricultural capitals that put into action a productivity of labor superior to the one reached on the worst land in the United States, whatever the country in which they are applied, and sell in the world market at prices equivalent to those that American capitals do. Far from losing a portion of the value generated by their own workers, these capitals will receive an additional influx of value over it. This additional influx of value is independent of whether the capitals in question have a lower concrete organic composition than the Americans, or whether this lower composition has a different technical composition at its base or comes from the low relative value of the labor power they use, or whether the payment to this labor power lies below its value. In these two cases, if the relative cheapness of the labor power extends generally within the country, it will result in a higher rate of profit for the whole of the capitals operating in it; if, with the same intensity of labor, it reaches only the primary production of the national sphere, the surplus value extracted through its application will be added to that appropriated by the local landowners as ground rent (Iñigo Carrera 2017, pp. 63-65).

It has already been seen that the situation set forth is present, at least, in the case of the commodities which have the greatest weight in Argentine agricultural exports. When extending the analysis to the national agricultural capital as a whole, the same situation is manifested in the difference between the rate of profit that the latter yields before deducting ground rent and the one produced by the capital of the North American industrial sector. In the average of 1950-2009, the former reaches 41.4% (Based on Iñigo Carrera 2007, Table 6.2, and Iñigo Carrera 2008), while the

second is 12.9% (Based on Appendix I.12). At the same time, the profit rate of the Argentine industrial sector is 11.8% (Based on Iñigo Carrera 2007, Table 6.3). With this last rate as a reference for the general valorization of industrial capital, and therefore of agricultural capital, in Argentina, the rate of ground rent results in 29.6%. Of the resultant ground rent, 36% has been appropriated primarily by landowners, while 64% has been appropriated by other social subjects within the national sphere (Based on Iñigo Carrera 2007, Table 6.2, and Iñigo Carrera 2008).

This evidence thus exposes the invalidity of attributing the specific obstacles that the accumulation of capital manifests in Argentina to the supposed bleeding out of a part of the surplus value generated internally by the empire of an ‘unequal exchange’ in foreign trade.

9. Ground rent and the national specificity of capital accumulation in Argentina

The foregoing highlights the centrality of ground rent and the modalities of its primary appropriation with respect to the specificity of the national form that capital accumulation takes in Argentina. It is therefore appropriate to pause on it.

Differential ground rent is determined in the process of formation of the general rate of profit. And this process of formation occurs purely and exclusively in the sphere of circulation. In this same sphere, the determination of absolute ground rent and that of simple monopoly takes place. Consequently, ground rent cannot contain more surplus value than a portion of itself generated previously in production, with total independence of the circulation process and, therefore, with total independence with respect to the determination itself of said portion as ground rent.

Absolute ground rent is surplus value produced by the workers of the capital that operates on the worst land, whose possibility of existence depends on that of a price of production below the corresponding value and has the latter as its limit. Due to the monopoly exercised by the owners of said land, the surplus value in question remains retained in their power without flowing into the common well from which all the capitals appropriate pro rata the portion that corresponds to them

based on their amount and time of turnover as concrete organs of the total social capital. As soon as the amount of the absolute ground rent per unit area of the worst land is projected onto the best lands, and the relationship between prices of production and values corresponding to the latter coincides with that of the first, said amount is constituted by the surplus value produced by the workers who work on these better lands. Insofar as the projection of absolute ground rent over the best lands exceeds this amount due to the greater mass of product per unit area obtained on them, its source is the same as that of the ground rent of the simple monopoly type. This ground rent is surplus value that is appropriated above the value of the commodities that carry it, or above the price of production when the latter is in itself higher than the former. Consequently, its source is the surplus value taken from the productive workers of the industrial capitals as a whole, including the agricultural ones, which are deducted from the mass of total surplus value that is available to be appropriated on a pro rata basis by industrial and commercial capitals in the process of formation of the general rate of profit. In turn, differential ground rent results from selling the units produced with the highest labor productivity achieved on the best lands above their own price of production, given that the commercial price is governed by the price of production corresponding to the capital which operates on the worst land. Since this surplus value exceeds that which each of the capitals producing the commodity in question contributes to the common well, and withdraws from it as an aliquot part of the total social capital, differential ground rent is also constituted by surplus value taken from the productive workers of all the capitals of society, which escapes their appropriation and flows to the landowners in circulation.

As soon as differential ground rent and that of simple monopoly are realized in the world market through the export of the commodities that bear them, the surplus value that constitutes its content has been generated by the productive workers of the capitals that operate in the importing country. Consequently, it is a portion of surplus value generated in a national process of capital accumulation that escapes its own potentiation, to flow towards the national process of

accumulation which exports the commodities in question. Does this flow boost the latter national process of accumulation, transforming itself into an additional mass of industrial capital able to produce commodities in general with the labor productivity which is in turn required to compete with them in the world market? The full unfolding of the determinations in question does not fit the space of this article (See Iñigo Carrera 1999; Iñigo Carrera 2007; Iñigo Carrera 2000; Iñigo Carrera 2004). It is enough however to point out the courses that ground rent follows in its primary appropriation to show the core of the answer.

Undoubtedly, the influx of ground rent multiplies the consumption capacity of the national landowner class. But it was already seen that, in the Argentine case, this class is far from being the principal primary appropriator of agricultural ground rent. The bulk of it follows two central courses of primary appropriation. The first, flows to the payment of the public foreign debt systematically contracted under strongly onerous conditions for the national state and without effective application for productive purposes. The second course flows to industrial capitals that produce commodities in general on the restricted scale of the internal market, to which is added in large part the ground rent appropriated through the mediation of the sale of agricultural commodities for domestic consumption at prices lower than their world market equivalents. These capitals are characterized by putting into action a very low productivity of labor, and although they are presented as 'infants' in a process of industrial maturation, they are in fact the discarded remnants due to material agedness and technical obsolescence of those capitals which compete in the world market. Among them, also adding commercial capitals, those of foreign origin have a particular presence, which remit the ground rent appropriated internally to their countries of origin.

A substantial portion of agricultural ground rent thus flows abroad via both these courses, which is not limited to including that originally realized through exports. And, not coincidentally, the national processes of capital accumulation towards which this reflux is directed are the same from which part of it has originally escaped.

The possible strength signified for the Argentine capital accumulation process by the substantial masses of differential and simple monopoly ground rent which flow into it, is partially sterilized by the parasitic consumption made by the landowning class. And not only is it reversed with the outflow of said ground rent abroad, but the forms assumed by the course of this outflow raise specific barriers to the development of the productive forces of social labor by the national process of capital accumulation. Moreover, they determine this process as the very negation of said development.

10. The question of what is to be done

From all angles, the Argentine capital accumulation process presents obvious obstacles to the development of the productive forces of social labor. The brutal expression of these obstacles is the growing misery of the national working-class population that this process turns into surplus population for its own reproduction, which is based on the deterioration of the payment of labor power below its value. However, as demonstrated in this article, these obstacles are not linked to an alleged 'deterioration of the terms of trade', which is otherwise objectively non-existent, or to the conceptual emptiness regarding an 'unequal exchange'. On the contrary, they are linked to the influx into the country of a mass of social wealth in the form of differential ground rent and its appropriation process. What could generically enhance the Argentine capital accumulation process as a bearer of the development of the productive forces is reversed, determining this process as a specific national form in which the capitalist mode of production denies its own historical reason of existence.

Those who cultivate the theories of structural underdevelopment and dependency are unaware of this fact, and deny it even in cases where the existence of differential ground rent and its source is obvious (Prebisch 1950, p. 6; Laclau 1969, p. 294). They prefer to stop at the appearance of the relative evolution of prices abstracted from the relative evolution of labor productivity, covering up this evolution with the neoclassical impressionism of the determination of wages by

productivity and not by what it costs to reproduce labor power according to the productive attributes with which capital requires it. And, when they appeal to unequal exchange, they abstract from its own basis the existence of the obvious inequalities in the labor productivity of the primary sector due to its subjection to natural conditions that cannot be controlled by capital. However much they intend to differentiate between the two theories, these are two ideological representations based on the same abstractions. In essence, they differ because, the first, constitutes the ideological justification of the concrete historical process called 'import substitution industrialization' - particularly, of its heavy phase - as if it contained a genuine development of the productive forces emanating from the national sphere, when it in fact amounts to the negation of this development in the global unity of capital accumulation (Iñigo Carrera 1999, pp. 8-9 and 12-14). The second participates in the same ideological justification, but in the form of the criticism of the concrete course with which this process necessarily takes place, as if it could and should transcend the content manifested in that course (Bambirra 1974, p. 101). It is not in vain that it shares with the former the conception of the development of productive forces as if it were an abstractly national phenomenon and needs to stop at the same appearances.

The organization of the political action that aims to overcome the specific obstacles to the development of the productive forces is inert if it intends to be based on such apparent constructions. The real question for that organization starts from answering the concrete determinations of the national process as a specific organ of the global unity of capital accumulation. Only by recognizing the specificity of the national form that capital accumulation takes in Argentina it is possible to realize why, despite its significant weight in agricultural production for the world market based on its availability of natural conditions favorable to labor productivity, the reproduction of said specificity not only acts as a barrier to the general development of the productive forces, but also does it in a correspondingly specific way by limiting the development of agricultural labor productivity and the intensive and extensive application of

agricultural capital on land. But, again, and above all, the recognition in question constitutes the starting point of the organization of the political action capable of transforming this current specificity.

Needless to say, this national specificity as an organ of global unity is not limited to the Argentine process of capital accumulation. It is a condition that reaches the generality of countries of Latin America and the Caribbean. The task of producing such recognition is at the base of the organization of a political action that has to be exceedingly continental in scope (For progress in this direction, see Grinberg 2016; Dachevsky & Kornblihtt 2017; Rivas & Kornblihtt 2017; Oyhantçabal 2017).

Appendix I: Statistical Sources

General Note: All data and figures included in the text are of my elaboration, based on the sources and computational criteria indicated in each case. All the values taken from Iñigo Carrera 2007 and Iñigo Carrera 2008 were extended from 2005 to 2009 by resorting to criteria and sources similar to those published for 2004 in the former.

1. **Figure 1.** Evolution of agricultural prices compared to industrial prices. Source:

Pfaffenzeller, Newbold and Rayner 2007. The values were updated from 2003 using the price index series Agriculture and MUV (5 countries), from the World Bank. Criterion: The simple average of the indices of non-food and food agricultural products (GYCPINF and GYCPIF) divided by the Industrial Products Index (MUV).

2. **Figure 2.** Evolution of the productivity of agricultural labor compared to industrial labor in the USA. Criterion: the relationship between the sectoral indicators of physical production volume and the total number of jobs (wage earners and self-employed). Sources:

2.1. CB 1976.

- Production indices: 1910-29 agricultural series K 414; 1910-46 industrial series P 13 and P 15.

- Number of workers: 1910-70 agricultural wage earners, owners and family members series K 174-176; 1910-29 industrial wage earners and series owners P 3-5, (the years 1920/2/4/6/8, were obtained by interpolation; the value for the decade 1910-19 corresponds to the year 1914).

2.2. USDA, various years, quantity of workers, owners and relatives, 1971-2010 (since the USDA interrupted the publication of the group of owners and family members between 2002-2009, it was estimated by correlation - $r^2 = 0.986$ - with the series of self-employed workers of the source which is indicated next below; the labor of workers from 'agricultural services' is not included because the contribution of product imputed to them is not included in the volume indicator either.

2.3. NIPA.

- Production indices: 1929-2009 agricultural table 1.3.3; 1947-97 industrial GDPbyind_VA_NAICS; 1998-2009 industrial GDPbyInd_GO_NAICS.

- Number of salaried and self-employed workers in the industrial sector: 1929-2009 tables 6.4 and 6.7. (Note: the utilization of this same source to compute the evolution of employment in the agricultural sector would show an increase in labor productivity in said sector even higher than that presented in the article based on USDA data. The same would happen with respect to the technical composition of agricultural capital).

3. Sale price and cost per average unit of agricultural product in the US. Sources and criteria:

- BLS, Consumer price index, 1913-2009; CB 1976, series E 135, 1910-12.

- Source cited for Figure 1, agricultural price index.

- ERS Farm; the computation of the index of average physical unit of agricultural product is based on the relationship between the total annual income of the agricultural sector (farms)

and the agricultural price index of point 1; with the quantity of equivalent units estimated in this way, the total equivalent wage cost is divided by it (according to the computation of total agricultural employment indicated in point 1 and average agricultural wage resulting from NIPA, Tables 6.3 and 6.4, obtaining the average unit wage cost; the average unit cost of the means of production consumed (which includes those which are part of circulating capital applied directly to production and amortization of those that make up the fixed capital, excluding in both cases those applied to housing) is the result from taking the total cost of said elements divided by the number of equivalent units of product.

4. Relative composition of capital in machinery, facilities and inventories by worker in the USA. Sources and criteria: relation between the residual value of fixed capital and inventories at the end of each year at current prices, NEA Fixed Assets, Tables 3.1e and 3.1s and NIPA Table 5.8.5, 4th quarter, and the number of workers computed according to point 3. Note: the constructions item computed for the agricultural sector includes rural housing.
5. Centralization of agricultural capital in the USA and labor productivity. Sources and criteria: CB 1976, series K 4 and K 7, for 1914; USDA year 2005, Table 9-2, for 2002; employment, according to sources and criteria indicated for Figure 2.
6. Prices at the point of production for wheat and maize in the United States. Sources and criteria: nominal prices published in the same sources as indicated in the next point for labor productivity; consumer price index: Iñigo Carrera 2007, Table B.1.
7. Evolution of labor productivity in wheat, maize and soy for Argentina and the USA.
Sources and criteria:
 - 7.1. **Argentina:** Frank 2017.
 - 7.2. **United States:** 1900-1969: CB 1976, series K 445-454; 1970-79: CB 1982-83, series 1192; CB 1980-89; CB 1987, series 1136. From 1989 the publication of the series is suspended, so the values for 1985-89 were estimated on the basis of the hours corresponding

to the 1982-86 five-year period of CB 1988, series 1090 and production per acre was taken from the site of the NASS. 1990-2009: The working times applied to each crop were estimated from dividing the remunerations (those payed plus the imputed ones for family work), based on ERS Commodity, by estimated rural hourly wage based on NIPA, Tables 6.6 and 6.9. Before splicing the productivity series, the consistency of the criteria used for 1990-2009 was verified with respect to the data obtained directly for 1900-1989 on the basis of the estimated values for 1980-1989. The series corresponding to soybeans was computed wholly on the basis of the second criterion indicated.

8. Effect on the internal expression of the FOB price of wheat from taxes on export, overvaluation and direct regulation. Sources and criteria: Iñigo Carrera 2007, Tables B.17 and B.20.

9. Rural wages and price of agricultural machinery 1900-09 to 2000-09. Sources and criteria:

9.1. Wages: annual totals of rural workers, linked by the type of current exchange rate for agricultural exports,

- Argentina and exchange rate: Iñigo Carrera 2007, Tables B.6 and B.17.

- United States: 1900-1928, CB 1976, D 739 series; 1929-2009, NIPA, Table 6.6, Farms.

9.2. Prices of agricultural machinery (tractor base), linked by the current exchange rate for agricultural exports, Iñigo Carrera 2007, Table B.27.

10. Relative composition of capital in machinery and facilities per worker in Argentina.

Sources and criteria: Iñigo Carrera 2007, Tables B.8, B.10 and B.12. Note: the constructions item computed for the Argentine agricultural sector does not include housing.

11. Apparent aggregate productivity of agricultural work in Argentina. Sources and criterion: Iñigo Carrera 2007, Tables B.4 and B.8.

12. Rate of profit of industrial sector in United States: Sources and criteria: NIPA:

- Advanced and consumed capital: Fixed assets Tables 3.1 and 4.4 (equipment + structures); GDP & Personal Income Table 5.8.5 (Inventories).
- Gross value added, waged and self-employed labor cost: GDP & Personal Income Tables 6.1, 6.2, 6.4 and 6.7.

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