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Productivity: agriculture compared with the economy at large

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This paper posits the need for a study in greater depth to identify the special features of the structural heterogeneity of the Latin American economies. Such a study is needed regardless of whether this phenomena is defined ultimately as the presence of marked inequalities in the productivity of labour between different sectors of the economy or whether the heterogeneity of the economies of Latin America is understood fundamentally as a significant relative lag of agriculture compared with other sectors of the economy. It is demonstrated in this article that on the one hand, in many currently developed economies there is even now a significant gulf between the productivity of labour in agriculture and productivity levels in the economy at large, while in two countries of late industrialization studied here (Italy and Japan) it is observed that until a few years ago the productivity differential had continued to grow to the point that, in the case of Japan, it reached levels similar to those of some Latin American economies of a medium level of development. Finally, the background information presented suggests that there is a more or less well defined uniform relation between productivity in agriculture and in the rest of the economy: at the beginning of the industrial development process, both indicators register very similar levels, but as industrial growth speeds up, agriculture begins to fall behind in terms of productivity. Subsequently, however, this leads to a phase in which agricultural productivity grows faster than the average levels, thus leading to a narrowing of the gap between this sector and the rest of the economy.

The methods used to arrive at these conclusions include both cross-sectional studies and studies of the long-term behaviour of the ratio of agricultural productivity to economy-wide levels.

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Introduction

One of the most outstanding features of the Latin American economy is its internal heterogeneity. This is expressed in the existence side by side of capitalist and pre-capitalist sectors, which is reflected in enormous intersectoral differences in productivity. With regard to the latter aspect, Aníbal Pinto held that in the light of the changes brought about by industrialization, the structure of production of Latin America can be broken down into three main strata. On the one hand, there is the so-called "primitive" stratum, whose levels of per capita productivity and income are probably similar (or even sometimes inferior) to those prevailing in the colonial economy and even, in some cases, the pre-Columbian economy. At the other extreme there is a "modern" pole made up of export, industrial and service activities operating at levels of productivity similar to the *average* levels of the developed economies, while between the two there is the "intermediate" stratum which in some respects corresponds more closely to the average productivity of national systems (Pinto, 1973, pp. 105-106).

For the vast majority of the Latin American countries, the most typical representative of the "primitive" sector of the economy is agriculture, with its low relative level of productivity. This assertion should not be allowed to conceal two facts, however: firstly, that Latin American agriculture likewise displays internal heterogeneity and contains a modern sector which must be distinguished from the traditional sector, while secondly, two countries of the region (Argentina and Uruguay) do not display the profound imbalances between labour productivity in agriculture and that in the rest of the economy which are characteristic of the other countries of Latin America.

The foregoing general assertion is illustrated by the figures of table 1, which shows the arithmetic means of the shares of agriculture in employment and added value for a set of six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico and Peru), as well as the ratio of labour productivity in agriculture to average productivity in the economy at large.

Table 1

LATIN AMERICA: SHARE OF AGRICULTURE IN EMPLOYMENT AND ADDED VALUE AND RATIO OF AGRICULTURAL TO GENERAL PRODUCTIVITY

	Share of agriculture[a] in:		
	Employment	Added value	Agricultural/ general productivity[b]
1950	50	23	0.46
1980	29	12	0.41
1986	24[c]	11	0.46

Source: Maddison, 1989, p. 20 and calculations by the author on the basis of World Bank (1985).
[a] Arithmetic mean for Argentina, Brazil, Chile, Colombia, Mexico and Peru.
[b] The productivity ratio was calculated according to the methodology set forth in the annex of this study.
[c] Data for 1985, excluding Peru.

The table shows that on the one hand, the agricultural sector's share in employment is more than double its share in the product, which is due to the fact that the productivity of labour in agriculture is less than half that of the average productivity of the economy. On the other hand, although the share of agriculture in employment has displayed a rapid decline between 1950 and 1986, the same trend has been observed with regard to the percentage of the total added value in the economy generated in this sector, so that between 1950 and 1986 there was no improvement in the negative productivity differential of agriculture. Ultimately, however, these data could be an indication that the economies of Latin America have now passed through the phase in which the productivity gap was moving against agriculture and that this has subsequently given way to a stage in which agricultural productivity is growing more rapidly than the average.

The aim of this study is to determine, through empirical data, whether the relation between agricultural productivity and the average productivity of the economy has shown any definite trend, in the course of the economic growth process, which could make it possible to determine whether the situation of heterogeneity displayed by Latin America in this field is in keeping with the regular patterns of behaviour of the development process and the trends which may be expected in the future in this respect. The behaviour of this relation was determined through a cross-sectional study and a study of the long-term trends of this relation in the development process of some selected countries.

I

Cross-sectional study

Table 2 shows the ratio of the productivity of labour in agriculture to the average productivity of the economy towards the end of the 1950s for groups of countries ordered in rising levels of per capita gross domestic product.

Table 3 gives three estimates of the same ratio, obtained by grouping together the countries in table 2 in five strata by per capita product levels and calculating the weight of agriculture in the

product and in employment by extrapolation (see Kuznets (1972), p. 110).

Table 4 shows the same ratio at the beginning of the 1980s for 113 countries grouped in three major categories by per capita income levels.

Table 2

WORLD (SELECTED COUNTRIES): RATIO OF AGRICULTURAL TO GENERAL PRODUCTIVITY AT THE END OF THE 1950s[a]

Per capita GDP strata	Ratio of agricultural to general productivity
I	0.67
II	0.70
III	0.57
IV	0.54
V	0.60
VI	0.80
VII	0.62
VIII	0.79

Source: Calculations by the author on the basis of Kuznets, 1972, pp. 104 and 200.

[a] Notes on the original data on the share of agriculture in the product and employment which served as the basis for the calculations:

- Share of agriculture in GDP: based on data for 57 countries.
- Share of agriculture in employment: based on data for 59 countries.
- The data on the share of agriculture in GDP and employment were based on the above numbers of countries in the case of strata II, III and V-VIII. In the case of stratum I, the share of this sector in the product and employment was based on data for 6 and 5 countries, respectively, while in the case of stratum IV it corresponded to 15 and 18 countries, respectively.
- The strata were defined on the basis of the per capita GDP in US dollars in 1958.
- The share of agriculture in employment corresponds to the period around 1960.
- The levels of per capita GDP corresponding to strata I-VIII for the share of agriculture in GDP were: 51.8; 82.6; 138; 221; 360; 540; 864 and 1382 US dollars
- The levels of per capita GDP corresponding to strata I-VIII for the share of agriculture in employment were: 72.3; 107; 147; 218; 382; 588; 999 and 1501 US dollars.
- Agricultural GDP corresponds to crop-farming, stock-raising, forestry, hunting and fishing.
- GDP was taken at factor cost.

Table 3

WORLD: RATIO OF AGRICULTURAL TO GENERAL PRODUCTIVITY AT THE END OF THE 1950s

Per capita GDP [a]	A [b]	B [c]	C [d]
70	0.60	0.60	0.63
150	0.58	0.58	0.63
300	0.57	0.57	0.63
500	0.60	0.60	0.65
1 000	0.66	0.69	0.75

Source: Calculated by the author on the basis of Kuznets, 1972, pp. 111 and 203 (columns A and B) and p. 209.

[a] Per capita GDP in 1958.

[b] Ratio in 1958.

[c] Calculated according to the share of agriculture in the product (1958) and in employment (1960).

[d] The total GDP used as a basis for the calculations does not include income in respect of banks, insurance companies, real estate, or ownership of property.

Table 4

WORLD: RATIO OF AGRICULTURAL TO GENERAL PRODUCTIVITY AT THE BEGINNING OF THE 1980s

	Per capita GNP (in current 1983 dollars)[a]	Ratio of agricultural to general productivity[ab]
I. Low-income countries (35 countries with a per capita GNP under US$400)	250	0.50
II. Middle-income countries (59 countries with a per capita GNP between US$400 and US$7000)	1 310	0.34
– Lower middle income (37 countries with per capita GNP between US$400 and US$1500)	750	0.41
– Upper middle income (22 countries with per capita GNP between US$1500 and US$7000)	2 050	0.37
III. Industrialized market economy countries (19 countries): USA, Canada, Australia, New Zealand, Japan and European market economy countries)	11 060	0.50

Source: Calculations by the author on the basis of World Bank, 1985, pp. 198, 199, 202, 203, 238 and 239.

[a] Both the per capita GNP data by strata and the figures for the share of agriculture in the product and in employment used to calculate the productivity ratios for each stratum are weighted averages.

[b] The data on the share of the agricultural labour force in the total correspond to 1981.

Two main conclusions may be drawn from the above information. The first one is that whatever the per capita product stratum, there is a significant gulf in labour productivity against agriculture. According to the data in table 4, even in the industrialized capitalist countries, which are those that have the most homogeneous economies, the productivity of agricultural labour is only half the average: that is to say, the same ratio as in the least developed countries. Tables 2 and 3 show that at high levels of per capita income there are smaller differences in productivity against agriculture, but these are still substantial. There are exceptions to this rule however. At the beginning of the 1980s, in the group of industrialized countries, the United States and the United Kingdom registered levels of productivity in agriculture equal to the average level for the economy, while at the other extreme there was Japan, where the ratio between the two indicators was only 0.33. The ratio in Europe was closer to the average for the whole group (Federal Republic of Germany and France: 0.50; Italy: 0.55; Sweden and Norway: 0.60; and Netherlands: 0.67).[1]

The group of upper middle income countries, which includes the five relatively most developed Latin American economies (Argentina, Brazil, Chile, Mexico and Uruguay), also includes three cases which considerably exceed the average ratio of productivity of the group. These are Argentina (0.92), Uruguay (1.1) and Israel (0.86). In contrast, among those which show the biggest productivity differential against agriculture are Mexico (0.22), South Africa (0.20) and Portugal (0.29).

The set of countries making up the stratum of lower middle income countries generally display a smaller dispersion of the ratio of agricultural to general productivity around the average (0.34). Among the countries in this group with relatively high agricultural productivity are Colombia (0.77) and Costa Rica (0.79), whereas the ratio is extremely low in Peru (0.20), Ecuador (0.27) and some African countries, notably the Congo and Zimbabwe.

Finally, among the low-income countries there is likewise greater concentration around the average for the group.

The second conclusion deriving from the foregoing data is that as one progresses from countries of low per capita product to those with a higher level of product, the productivity ratio tends initially to deteriorate to the detriment of agriculture as one passes from the group of poor countries to the middle-income nations, but as one continues towards the group of developed countries a second phase in which the productivity gap tends to narrow is observable. Thus, among the extremely poor countries (with a per capita GNP of less than US$250 in 1983) the ratio is generally over 0.60 (it is lower in only four of the 13 countries), while in the 67 countries which have a per capita product of between US$260 and US$7 000 it is only higher in seven of them, yet in the 19 countries making up the group of developed capitalist nations, nine of them register a higher ratio.

II

Long-term trends

The foregoing data suggest the existence of a regular pattern in the ratio of agricultural to general productivity in line with the levels of development of the countries. In this section, the search for this pattern will be further pursued through the study of the behaviour of this ratio over time in the long-term development process of some advanced countries.

Table 5 shows the trend in the ratio in question in six currently developed countries from periods near the beginning of their processes of modern economic growth up to the 1950s and 1960s.[2] Tables 6 and 7, for their part, show the annual

[1]These calculations, together with the others in this section, were made by the author on the basis of World Bank, 1985.

[2]According to S. Kuznets, the initial years of modern economic growth were 1765-1785 in the United Kingdom; 1831-1840 in France; 1834-1843 in the United States; 1850-1859 in Germany; 1861-1869 or 1895-1899 in Italy, and 1874-1879 in Japan (see S. Kuznets, *op. cit.*, p. 24).

Table 5

SELECTED DEVELOPED COUNTRIES: LONG-TERM TRENDS IN RATIO OF AGRICULTURAL TO GENERAL PRODUCTIVITY, 1801-1967

	United Kingdom	France	United States	Germany	Italy	Japan
1801	0.91[a]					
1801-1811	0.99[b]					
1839			0.67[c]			
1839/1840		0.67[c]				
1841	0.96[a]					
1850-1959/1952-1858				0.76[d]		
1851-1861	0.93[b]					
1860-1869/1852-1858				0.59[d]		
1861-1865/1861-1871					0.96[c]	
1861-1870/1861-1871					0.94[e]	
1869-1879			0.40[f]			
1869-1879/1870			0.39[f]			
1872-1982/1886		0.98[c]				
1876-1880/1871					1.08[g]	
1878-1882/1872						0.74[h]
1878-1882-1877						0.76[h]
1879-1883/1882						0.75[h]
1891-1900/1881-1901					0.83[e]	
1901	0.67[a]					
1905-1914-1907				0.49[c]		
1904-1913/1920						0.75[h]
1907-1911	0.53[b]					
1908-1910/1911		0.17[c]				
1919-1928/1929			0.58[f]			
1919-1929/1929			0.55[f]			
1923-1927/1920						0.48[h]
1924/1921	0.52[b]					
1924-1933/1925						0.43[h]
1929			0.44[i]			
1935-1938/1933				0.47[d]		
1936/1939				0.52[j]		
1939-1948/1950			0.75[i]			
1947-1954/1950			0.58[g]			
1949/1950		0.70[g]				0.50[h]
1950						0.54[h]
1950-1952/1951					0.74[e]	
1951-1952/1951					0.65[e]	
1948-1954/1951	1.20[k]					
1950/1946				0.36[l]		
1950-1954/1951					0.74[g]	
1950-1954/1954					0.63[g]	
1953/1950			0.46[e]			
1954/1951		0.60[e]				
1951-1955/1954					0.61[e]	
1952-1953/1950						0.47[h]
1955/1951	0.94[m]					
1955/1961	1.27[m]					
1959-1961/1960						0.41[h]
1959-1964				0.66[n]		
1960-1964				0.53[n]		
1962		0.45[e]				
1963/1962		0.42[o]				
1962/1964						0.50[h]
1961-1963/1965			0.70[i]			
1963-1967/1961	0.92[m]					
1963-1967/1964				0.40[n]	0.52[e]	0.43[h]
1963-1967/1965			0.58[e]			

Source: Calculations by the author on the basis of Kuznets, 1972, pp. 144-147 and 250-252; Kuznets, 1973, pp. 88-91 and 106-107; and Kuznets, 1964, pp. 51-53.

[a] Great Britain, national income. [b] Great Britain, net domestic product. [c] National income. [d] With pre-World War II frontiers; gross domestic product. [e] GDP. [f] GDP at 1929 prices. [g] National product. [h] Net domestic product. [i] National income. [j] With frontiers of the Federal Republic of Germany, excluding the Saare and West Berlin; net domestic product. [k] Great Britain, national product. [l] Federal Republic of Germany, excluding the Saare and West Berlin; gross domestic product. [m] United Kingdom, gross domestic product. [n] Federal Republic of Germany, including the Saare and West Berlin; gross domestic product. [o] GDP at 1954 prices.

Methodological Notes: 1) Calculated on the basis of data on the share of agriculture in the product and employment. 2) When the data in question were not all available for the same year but for years close to each other, the productivity ratio was calculated on the basis of the share of agriculture in the product in the years indicated to the left of the slash and its share in employment in the years shown to the right of the latter. 3) When the source used gave two different figures for the same year, the arithmetic mean was taken. 4) Except where otherwise indicated, the data on the share in the product were based on series at current prices. 5) Where different sources gave two figures for the same period, the most recently published data were used.

average rates of change in the productivity of labour for the agricultural, industrial and services sectors in the period 1913-1984 and the ratio of agricultural to general productivity in 1950 and 1978 for five of the six countries examined in table 5 (excluding Italy).

Table 6

SELECTED DEVELOPED COUNTRIES: GROWTH IN LABOUR PRODUCTIVITY (ADDED VALUE PER PERSON EMPLOYED), BY SECTORS, 1913-1984

(Average annual growth rates)

	Agriculture			Industry [a]			Services		
	1913-1950	1950-1973	1973-1984	1913-1950	1950-1973	1973-1984	1913-1950	1950-1973	1973-1984
United Kingdom	2.5	4.6	4.2	1.4	2.9	2.9	0.7	2.0	0.6
France	1.8	5.9	4.8	1.4	5.2	3.1	0.4	3.0	1.1
United States	1.6[b]	5.4	2.5	1.5[b]	2.2	0.8	1.0[b]	1.4	0.4
Germany (Fed. Rep.)	-0.4	6.3	4.5	1.3	5.6	2.7	-0.2	2.8	1.7
Japan	0.5	7.3	2.1	0.7	9.5	3.7	0.9	4.0	1.9

Source: Maddison, 1988, p. 45.
[a] Including construction.
[b] 1909-1948.

1. *Behaviour of the ratio in question in each country studied*

a) *United Kingdom.* At the beginning of the nineteenth century, when England was initiating its modern industrialization process, the level of productivity in agriculture was almost equal to the general level, but as the weight of the industrial sector in the economy increased there was a growing lag in agricultural productivity, so that at the beginning of the present century it was only half that of general productivity. Subsequently, it was observed that the economy tended to become increasingly homogeneous, since agriculture has tended to come closer to the average level of productivity of the economy. This trend towards the narrowing of the productivity gap is the result of the faster growth of productivity in agriculture than in the other sectors of the economy between 1913 and 1984. It may be seen from table 6 that between 1913 and 1950 the productivity of agricultural labour in the United Kingdom grew at a significantly higher average annual rate than that of industry and services (2.5% versus 1.4% and 0.7%, respectively), and this growth differential in favour of agriculture was maintained between 1950 and 1984, so that according to A. Maddison the ratio of agricultural to general productivity rose from 0.47 in 1950 to 0.88 in 1978 (see table 7).

Table 7

SELECTED DEVELOPED COUNTRIES: RATIO OF AGRICULTURAL TO GENERAL PRODUCTIVITY

	1950	1978
United Kingdom	0.47	0.88
France	0.41	0.58
United States	0.31	0.63
Germany (Fed. Rep.)	0.34	0.51
Japan	0.40	0.37

Source: Maddison, 1986, p. 151.

b) *France.* Chronologically, this was the second country to develop industry. In the initial phases of this process, it displayed the same situation observed in the case of the United Kingdom, that is to say, levels of agricultural productivity almost equal to the general level. According to table 5, up to the 1960s the trend in productivity ratios continued to deteriorate to the detriment of agriculture, which at the beginning of that decade had a level of productivity only a little over 40% of that of the economy as a whole, although the data in table 6 indicate that France too has embarked upon the trend towards the equalizing of intersectoral productivity levels. Indeed, even in the period 1913-1950 agricultural productivity grew at an annual rate slightly higher than that of industry (1.8% versus 1.4%), and this situation was maintained between 1950 and 1973 and accentuated between the latter year and 1984, over which period the growth rate of agricultural productivity was 55% higher than that of industry. This caused the ratio of agricultural to general productivity to increase from 0.41 in 1950 to 0.58 in 1978 (see table 7). In contrast with the United Kingdom economy, however, French agriculture still registers a level of productivity which is significantly below the average.

c) *United States.* The available data give grounds for asserting that the trend in this ratio has been rather similar to that observed in the United Kingdom: agricultural productivity was relatively high in comparison to the general level in the first third of the nineteenth century, subsequently dropped to a lower level, but has more recently tended to rise again, this being particularly marked as from 1973, so that the ratio of agricultural to general productivity rose from 0.31 in 1950 to 0.63 in 1978 (table 7). There is an important difference between the two cases, however: in the United States, agricultural productivity has persistently been substantially lower than the general level. Whereas in the United Kingdom this only occurred in the middle chronological phase of the industrialization process, in the United States this phenomenon has always been present throughout the period under review.

There are also clear similarities and differences between the United States and France in this respect: on the one hand, both countries displayed a high degree of internal heterogeneity to the disadvantage of agriculture up to the 1970s, while on the other hand, in the initial phases of the French industrialization process the difference in productivity levels was very small, but according to the available data this was not so in the case of the economic development of the United States.

d) *Germany.* In this country, which is one of the cases of relatively late industrial development, the behaviour of the ratio under examination tends to fit in with the identified pattern, i.e., after a long phase in which the productivity ratio was against agriculture this gave way to a phase in which agricultural productivity began to grow more rapidly than that of the rest of the economy, the transition in this respect being observed in Germany in the 1950s and becoming more marked from 1973 onwards.

Even in recent years, however, German agriculture displayed a considerable relative lag (in 1978, the productivity of this sector was only 51% of the general level): a feature it shares with France and the United States. A further characteristic shared by the German and United States economies is the fact that even in the initial phases of the industrialization process there was a significant productivity gap against agriculture.

e) *Italy and Japan.* These two cases of late industrial development share the feature that even up to relatively recent times the ratio of agricultural to general productivity has continued to deteriorate. In Italy agricultural productivity was only half that of the national average in the 1960s, while in 1987 Japan was the country which displayed the severest imbalance in these ratios of all the countries reviewed: in 1950 the ratio of agricultural to general productivity was 0.4, while in 1978 it was only 0.37 (even though labour productivity in agriculture grew at an extremely high rate between those years), and it continued to decline up to 1984. Whereas in Italy agricultural productivity was almost equal to the average level at the beginning of that country's industrialization process, in Japan (as in the United States) agricultural productivity was substantially below the general level at the beginning of the process.

The above historical background information gives grounds for reasserting one of the conclusions suggested by the cross-sectional study: that the ratio of agricultural to general productivity follows a fairly regular pattern over the course of the long-term economic development process. It can clearly be seen that at the beginning of the industrial growth process agricultural productivity was

quite close to the average level, but subsequently it fell behind, later progressing, however, to a phase in which the productivity gap tends to narrow. This full cycle has been observed in the economies of the United Kingdom, United States, France and Germany. The extent to which these economies have completed this cycle is not the same in all cases, however: whereas in the first two countries the productivity differential against agriculture is relatively slight[3], in France and Germany there is still a significant productivity gap against agriculture. The two cases of late industrial development examined (Italy and Japan) show that up to recent years these economies were still in the first phase of the productivity cycle: i.e., the phase in which agricultural productivity grows less than general productivity, thereby explaining the increase in the differential between the two indicators.

III

Conclusions, and some fresh questions

The foregoing details point to the need for a study in greater depth in order to identify more precisely the nature of the structural heterogeneity of the Latin American economies. Clearly, reducing the essence of this characteristic exclusively to the existence of significant international productivity gaps is not enough, since this feature is also present in highly developed economies.

The view has recently been expressed in the economic literature that one of the determining causes of the loss of dynamism of the Latin American economies is the emphasis placed on industrial growth to the detriment of agriculture. In particular, it has been stressed that one of the factors which explains the economic dynamism of Japan and the newly industrialized countries of Asia is that they have followed a development pattern which maintains a relative balance between industry and agriculture (Fajnzylber, 1990, pp. 56-58). However, the information on the Japanese economy gives grounds for asserting that the productivity gap between agriculture and the rest of the economy is currently as big as or even bigger than that existing in many Latin American economies, yet this has been no obstacle to the dynamic growth of the economy. This raises the question of reformulating the whole issue of the role of agriculture in the economic development process, the internal features of that sector which determine whether or not it is an element that promotes development, and the type of relations between agriculture and industry that are characteristic of a dynamic economy.

Since the foregoing data indicate that in a certain phase of industrial growth it is normal that there should be profound imbalances in levels of productivity to the detriment of agriculture, then if balanced development merely means the absence of significant differences in this relationship, it would appear that the normal state of affairs in economic growth is *unbalanced* development: the significant progress of industrial productivity compared with average productivity. This is why there is a need to study the nature of the imbalances and balances which are created in the process of economic development and the ways in which these are overcome.

Finally, it is necessary to study in greater depth the elements which cause a graph showing the relation between agricultural productivity and general productivity to have the form of a letter U. Explaining why this coefficient is at a high level in the first phases of industrial development is not difficult. Since in this stage the fundamental sector of the economy is agriculture, the average productivity of the economy as a whole will obviously be decisively influenced by the level of productivity in that sector. The problems come later: How is it that agriculture can lag behind without this being an insoluble obstacle to growth? How is it that in a later stage agriculture can become the most dynamic sector of the economy in terms of productivity?

[3]This situation is borne out by *all* the data on the United Kingdom economy, whereas in the case of the United States there are appreciable disparities between different sources with regard to the relative level of agricultural productivity.

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Annex

Methodology

Since labour productivity links the output obtained with the amount of labour used in its production, it can be expressed as follows:

$$\pi = \frac{P}{L}$$, where: π : productivity of labour
P : product
L : amount of labour.

In this study, we are interested in the behaviour of the ratio of agricultural productivity to average productivity, that is to say, the following coefficient:

$$\frac{\pi_a}{\pi_m} = \frac{\frac{P_a}{L_a}}{\frac{P_t}{L_t}}$$

where π_a : productivity of labour in agriculture
π_m : average productivity of labour in the economy as a whole
P_a and P_t : agricultural product and total product, respectively.
L_a and L_t : agricultural labour and total labour, respectively.

From the foregoing expression we obtain the following:

$$\frac{\pi_a}{\pi_m} = \frac{\frac{P_a}{P_t}}{\frac{L_a}{L_t}}$$

That is to say, the ratio of the productivity of labour in agriculture to the average productivity of labour equals the coefficient of the shares of agriculture in the total product and in total employment.

The behaviour of the ratio of the productivity of labour in agriculture to the average productivity of the economy was established through the following methods:

i) A cross-sectional study, that is to say, a study at a given point in time to detect the size of this ratio at different levels of per capita product, and ii) A study of the trend displayed over time by this same coefficient in the long-term economic development process of some selected countries.