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Effects of Changes in Consumption and Trade Patterns on Agricultural Development in Latin America*

Adolfo Figueroa

One of the main features of economic development in Latin America is the continuous decline in agricultural output relative to total output. Table 1 shows that the share of agriculture in the gross domestic product (GDP) of the region has declined by almost a half in 35 years: from 25 percent in 1940 to 12 percent in 1975. Table 1 also shows that, in contrast, the share of manufacturing has increased over the period.

The decline of the share of agriculture in GNP is not an economic problem per se. Actually this change in the production structure has taken place also in the developed countries. However, what is specific to the present Latin-

Table 1

LATIN AMERICA: AGRICULTURE AND MANUFACTURE SHARES IN GROSS DOMESTIC PRODUCT 1940-75 (percentages)

Year	Agriculture	Manufacture
1940	25.0	16.4
1945	21.8	18.5
1950	20.1	19.2
1955	19.2	20.0
1960	17.3	21.6
1965	16.5	22.6
1970	13.8	24.3
1975	11.9	25.2

Source: UN, Cuadernos Estadisticos de la CEPAL, Series Históricas del Crecimiento de America Latina (Santiago, Chile: 1978), Tables 1, 7, and 9.

American historical stage is the fact that the relative decline in agriculture is associated with the prevalence of rural poverty. In Latin America poverty is basically concentrated in the rural areas.[1] Thus a change in the share of agriculture in national income has direct implications for income distribution and, even more important, for absolute poverty.

The usual explanation for the decline in the share of agriculture is that income elasticities for food consumption are very low. This is the well known Engel's law for food expenditure. In the case of Latin America, however, a rapid increase in population is taking place which must have a bearing on the demand for food. Given the same average income, expenditure for food must increase at the same rate as population growth. To this "population-effect," we should add the "income-effect" due to the increase in average income brought about by the economic development process. The Engel's law will apply to the second effect, whereas the "population-effect" will be shifting the Engel curve upward through time.

The figures we usually use for Latin America indicate a rate of growth of approximately 5 percent per year in food expenditure. This is a result of using 2.8 percent for population growth and 2.5 percent for per capita income as annual growth rates, and 0.7 as the income-elasticity.[2] However, the actual average growth rate of agriculture has been only 2–3 percent for the last three decades.

The other feature in the process of development in Latin America is the rapid urbanization process. Although the total demand for food may not be greatly affected by changes in the urban-rural distribution of population, these changes will increase the links between the city and the countryside stemming from food consumption. Moreover, with rapid urbanization, per capita income in the rural sector should increase rapidly as more people spend on food and relatively fewer people are producing it.

If we consider again the figure of 5 percent as agricultural output growth rate and use 1 percent as the growth rate in rural population, per capital income should be growing at a rate of 4 percent in rural areas. We know that this is not happening in Latin America, at least as a long-run trend.

The two characteristics of development in Latin America, population growth and urbanization, lead us to expect a much more dynamic agriculture than is suggested by the income elasticity explanation. Yet, we observe, as shown in Table 1, a rather slowly growing agriculture. This result must come from either a change in consumption patterns, that is, shifts in *aggregate* Engel curves for food expenditure; from a change in the production structure of the economy due to changes in the international division of labor, because in open economies agricultural output depends not only on domestic consumption patterns, but also on patterns of specialization in international trade; or from some combination of both effects.

This paper attempts to show the changes in consumption and international trade patterns that are taking place in Latin America and their effects on agricultural development. Two components of demand for food are considered as the most relevant: domestic demand coming from the cities and external demand. A simple model relating urban food expenditure to rural incomes is presented in the next section. In the following section, the model is applied to Peru, an economy with which I am more familiar. In the next sections, some hypotheses on the changes in patterns of domestic consumption and international trade are discussed.

A MODEL OF DERIVED DEMAND FOR RURAL FACTORS

Given the rapid increase in urban population and also in average urban income in Latin America, it is clear that the demand for food comes mainly from the cities. In this section, a simple model is constructed to determine the relationship between urban and rural incomes derived from urban consumption of food. The income generated in the rural sector from food expenditure in the cities will be called the "derived rural income."

The economy will be divided into three productive sectors: two food-producing sectors, agriculture and food-processing industry, and all remaining sectors which will be called "rest." There are three types of food: the two corresponding to the domestic sectors already mentioned and imported food. The productive sectors are interrelated, as shown in Table 2, an input-output table of the Leontief-type.

The total rural income (or value added) generated, directly and indirectly, by a unit of final demand in each sector will require taking into account all the

Table 2

INPUT-OUTPUT TABLE FOR FOOD PRODUCTION-CONSUMPTION ANALYSIS

	Agriculture	Food process	"Rest"	Final demand		Total
				Food consump.	Others	
Agriculture	X_{11}	X_{12}	X_{13}	C_1^*	D_1	X_1
Food processing	X_{21}	X_{22}	X_{23}	C_2^*	D_2	X_2
"Rest"	X_{31}	X_{32}	X_{33}	0	D_3	X_3
Imports: food	X_{m1}	X_{m2}	X_{m3}	C_m^*	0	X_m
Imports: others	X_{n1}	X_{n2}	X_{n3}	0	D_n	X_n
Value added	VA_1	VA_2	VA_3			
Total gross value	X_1	X_2	X_3			

interrelations of Table 2. Solving for all the "rounds" involved in the process of production,

$$(1) \qquad VA_1 = a_{01}[A_{11}(C_1^* + D_1) + A_{12}(C_2^* + D_2) + A_{13}D_3],$$

where a_{01} is the direct coefficient of value added per unit of gross sale in agriculture; the A_{1j} are the coefficients of direct and indirect requirements of Commodity 1 to produce one unit of final product of Sector j, which come from solving the Leontief system. From Equation (1) I derive total coefficients of value added as:

$$(2) \qquad VA_1 = B_{01}(C_1^* + D_1) + B_{02}(C_2^* + D_2) + B_{03}D_3,$$

where $B_{0j} \equiv a_{01}A_{1j}$. Thus, B_{01} measures the amount of increase in agricultural income due to an increase in one unit of food consumption of type 1, that is, agricultural food; B_{02} measures the same effect in processed food. Coefficient B_{03} does not concern us here because it is connected to nonfood consumption. I shall assume here that imports and exports are independent, so there will be no rural income generated from consumption of imported food (C_m^*).

Now consider the family expenditure side. The consumption expenditure for the three types of food can be written as follows:

$$(3) \qquad C_u = C_1 + C_2 + C_m,$$

where C_1 stands for the expenditure on agricultural food, C_2 for processed food, and C_m for imported food. Since this is the value of family expenditure in the city, not all this expenditure goes to the rural sector. In Table 2, values are at producers' prices (C_i^*) but in Equation (3) they are at consumers' prices (C_i). The difference between the price the producer gets and the price the consumer pays, usually called "trade margins," will be assumed to be a fixed amount for each type of food: t_1, t_2. Therefore, the amount of expenditure going to the rural sector would be:

$$(4) \qquad C^* = (1 - t_1)C_1 + (1 - t_2)C_2 = C_1^* + C_2^*,$$

where C_i^* corresponds to the consumption column of Table 2.

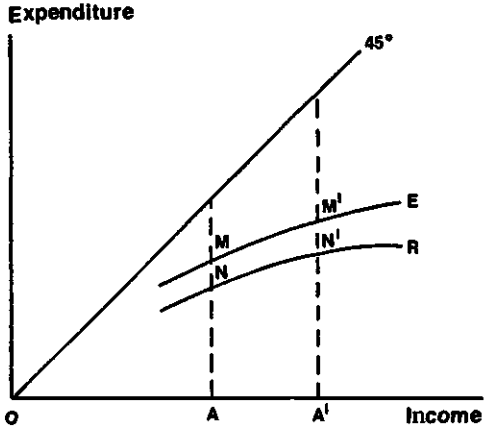
From Equation (2) we know that for each unit of sales of agricultural food rural income increases by B_{01}, and by B_{02} in the case of processed food. Then, *total* rural income (I_{ur}) derived from an urban family expenditure on food will be

$$(5) \qquad I_{ur} = B_{01}C_1^* + B_{02}C_2^* = B_{01}(1 - t_1)C_1 + B_{02}(1 - t_2)C_2.$$

If we represent Equation (5) as a ratio of the family's income (I_u), we will get the "derived rural income" ratio:

$$(6) \qquad \begin{aligned} I_{ur}/I_u &= B_{01}(1 - t_1)(C_1/I_u) + B_{02}(1 - t_2)(C_2/I_u) \\ &= (C_u/I_u)B_{01}(1 - t_1)(C_1/C_u) + B_{02}(1 - t_2) \\ &\quad (C_2/C_u). \end{aligned}$$

ENGEL'S CURVE AND DERIVED RURAL INCOME CURVE



This ratio is a measure of the income generated in the rural sector by the urban family's food expenditure. It is the rural income content of the urban family's expenditure. The higher the value of this ratio, the stronger the connection between urban-rural incomes.

The chart summarizes the relations established in the model. The vertical axis measures expenditures and the horizontal axis income. The Engel Curve for food expenditure is labeled E. From this curve I derive the proportion of the expenditure which becomes rural income. Curve R shows this "derived rural income," which also varies with the level of family income. The "derived rural income" ratio is just the proportion of income that is spent on rural factors of production, for example, AN/OA, when family income is OA, in the chart.

Let us call α' to the ratio of "derived rural income" with respect to average family income in the city (I_u'). Thus,

$$I_{ur} = \alpha' I_u'. \tag{7}$$

"Total derived rural income" represented by Y_{ur} as a proportion of total urban income (Y_u) will also be equal to α'. The other ratio of interest is the "total derived rural income" per head in the rural sector. Let N_u and N_r represent the populations of the urban and rural sectors, respectively. Then:

$$(Y_{ur}/N_r) = (I_{ur}N_u/N_r) = \alpha' I_u'(N_u/N_r). \tag{8}$$

Equation (8) shows that the per capita income generated in the rural sector by the urban expenditure in food depends on three factors: the "derived rural income ratio," the average urban income, and the ratio of urban population to rural population. These last two factors are increasing rapidly in Latin America and therefore rural per capita income should be increasing fast. However, α' reduces the effect of those factors because it decreases as average income goes

up. We need to know more on the determinants of α' and its tendencies in order to assess the combined effect of the three variables on the growth of rural incomes.

As shown by Equation (6), the "derived rural income" ratio depends on four sets of coefficients: the average propensity to spend on food, trade margins, production structure, and the mix of types of food consumed. In the next section, an estimate of these coefficients will be made for Peru. This will provide us with an application of the model as we estimate empirically curves E and R shown in the chart.

APPLICATION TO PERU

The availability of an input-output table for Peru and a family budget study for its largest city (Lima) for the same year, 1969, will enable an empirical estimate of Equation (6). The input-output table has been rearranged according to the sectors defined in the model. The relevant segment of the rearranged table is presented in Table 3. The direct coefficients computed from this table are $a_0 = 0.7170$; $a_{11} = 0.1896$; $a_{12} = 0.1626$; $a_{21} = 0.0522$; and $a_{22} = 0.1246$. The corresponding B_{0j} coefficients of Equation (2) are

$$VA_1 = 0.8940\, C_1^* + 0.1635\, C_2^*. \tag{9}$$

Thus, for each sol of sale of agricultural food, 0.89 becomes rural income; whereas for processed food, this becomes only 0.16.

The family budget data for Lima comes from a study carried out within the ECIEL program. The structure of family spending by income quartiles is presented in Table 4. Families in the lowest quartile spend 54 percent of their budget in food, whereas in the richest quartile this proportion declines to 31 percent. The average expenditure ratio in Lima is 43 percent.

In spite of the recurring discussion on the issue of trade margins, there are no systematic studies in Peru showing the magnitudes involved. Here we have

Table 3

PERU: PRODUCTION STRUCTURE FOR FOOD, 1969
(producer's price, billions of soles)

	Agriculture	Processing	Consumption
Agriculture	6.9	4.7	21.8
Food processing	1.9	3.5	19.2
Rest	1.0	5.6	0
Imported inputs	0.5	4.2	1.5
Value added	26.1	10.9	
Total gross value	36.4	28.9	

Source: Instituto Nacional de Planificacion, Relaciones Interindustriales de la Economía Peruana. Tabla de Insumo-Producto 1969. (Lima: 1973).

Table 4

LIMA: STRUCTURE OF FAMILY SPENDING, 1969
(porcentajes)

Item	Quartiles				Total
	I	II	III	IV	
Food	54	47	41	31	43
Housing	16	17	21	26	20
Durables	8	10	9	12	9
Clothing	7	7	9	8	8
Transportation	3	6	4	6	5
Others	12	13	16	17	15
Total	100	100	100	100	100
Average expenditure	49	61	100	191	100
Derived rural income ratio[a]	19	17	15	11	15

Source: Adolfo Figueroa, *Estructura del Consumo y Distribución de Ingresos en Lima Metropolitana 1968-1969* (Lima: Universidad Católica del Perú, 1974), Table 9.

[a]See text for the methodology used for these estimates.

made some gross estimates based on fragmentary information on particular goods and also on the data contained in the original input-output table for Peru. For agricultural food, the coefficient of trade margins has been estimated at 33 percent and for processed food at 20 percent.[3]

Regarding the mix in which the three types of food are consumed, I shall assume that all families consume them in the same proportion. There is no data available on these proportions. This assumption leads to an overestimation of processed food and imported food as a proportion of total food expenditure for low-income families, which should not be exaggerated, however. An important proportion of "popular food" in Peru is imported and/or processed, such as noodles, bread, oil and fats, milk, and sugar. The proportions to be used as estimates will accordingly be those appearing in the last column of Table 3: agricultural food 51 percent, processed food 45 percent, and imported food 4 percent.

To summarize, the estimates that have been made so far are $t_1 = 0.33$; $t_2 = 0.20$; $B_{01} = 0.89$; $B_{02} = 0.16$; $C_{1/C} = 0.51$; and $C_{2/C} = 0.45$. All these coefficients are independent of the income bracket of the family. Therefore the "derived rural income" for families in different quartiles will vary according to the average propensity to spend on food. Thus for the lowest quartile of Lima we have

$$I_r/I_u = 0.54(0.66 \times 0.89 \times 0.51 + 0.80 \times 0.16 \times 0.45) = 0.19.$$

Hence, the poorest quartile of Lima spends 19 percent of their family budget on rural factors of production. This proportion for each income quartile is shown at the bottom of Table 4. The average coefficient for Lima turns out to be 0.15, which means that only 15 percent of Lima's total income goes to the countryside as rural income as a consequence of food consumption. In sum, the first row of Table 4 shows the empirical Engel Curve and the last row the "derived rural income" ratio. These are the empirical counterparts of curves E and R in the chart in terms of ratios.

This empirical result shows, first, that the "derived rural income" ratio is relatively low. *The average proportion of family budget spent on food is 43 percent in Lima, yet only 15 percent becomes rural income.*[4] If OA were average income in the chart, NA would be one-third of MA in Lima. Second, the "derived rural income" ratio declines as family income rises. My estimation procedures have led to a constant vertical distance between the Engel Curve and the "derived rural income curve," which need not be the case if the consumption mix of different types of food varies with income.

Whether the results found for Peru are typical of the Latin-American situation remains to be seen. However, the gap between the Engel Curve and the "derived rural income curve" is so large in Peru that one would expect these differences to be very significant even if Peru is taken as an extreme case.

"DERIVED RURAL INCOME" TRENDS AND INCOME CONCENTRATION

The main purpose of this article is to present some hypotheses to explain the slow growth of rural income in Latin America. One coordinate in the analysis is the intensity in the derived demand for rural factors of production. In the case of domestic demand for food I have developed a simple model to relate urban incomes and expenditures to rural incomes (export-demand will be discussed in the next section). The model was summarized in Equation (8). From that equation, I can advance some hypotheses on the possible trends of the relevant variables involved so as to estimate changes on the "derived rural income."

It is clear from Equation (8) that, other things being equal, a process of urbanization increases the intensity of demand for rural factors. More people of equal average income in the cities will be generating a higher "derived rural income" which in per capita terms will increase even more because of the rural population's relative stagnation. If for each family in the countryside there is a family in the city, this family will be generating income in the amount of $\alpha' I_u'$ for his fellow *campesinos;* however, if in the process of urbanization for each family in the countryside there are two families in the city, income accruing to those rural families will double.

To this "urbanization effect" we must add the "pure income effect" due to the increase in the average income (I_u') in Latin-American cities, brought by

the economic growth process in the economy. That increase will augment income for the rural people but not proportionally, due to Engel's Law; that is, the α' ratio will decline. The question is, however, whether α' will decline due only to Engel's Law, or whether other variables affected by the particular process of economic growth could also change α'.

Let the curves E and R in the chart represent the aggregation of all individual curves, so that the axes now measure average income and expenditures. For the E-curve to represent a given pattern of consumption income distribution must be held constant along the curve, only in this case the elasticity of the aggregate Engel Curve will have the same value of the individual Engel Curve. The "pure" Engel's Law will then apply to a given pattern of consumption, that is to an E-curve where income distribution is held constant. Therefore, changes in income distribution will cause a shift in the aggregate Engel Curve (curve E in the chart).

The economic growth process in Latin America has, almost invariably, been accompanied by a higher concentration of income. This is another feature of of economic development in this region, as several studies have shown [10]. The effect of the more unequal income distribution is a downward shift in the E-curve, which in turn will shift downwards the R-curve. This result comes from differences in average and marginal propensities to spend on food of different income groups.

The other effect of higher-income concentration upon the "derived rural income" comes from differences in the mix of types of food between income groups. It is expected that marginal propensities to spend for imported food is higher for the rich. The same can be said about processed food.[5] Given the lower content of rural factors in these latter types of food, as illustrated in the Peruvian case, the effect is to shift the R-curve downward. *One implication of the higher concentration of income in Latin America is, therefore, a further decrease in the "derived rural income," a shift downwards in the R-curve.*

CHANGES IN PATTERNS OF TRADE

In Latin America, as in open economies, agricultural output depends not only on domestic consumption patterns but also on patterns of specialization in international trade. Therefore, if domestic patterns of food consumption have not created enough stimulus for higher rural incomes, the alternative exists that foreign demand might have. The international division of labor has usually been presented as that of developed countries producing manufactures and less developed countries producing agricultural products. The fact is, however, that foreign demand for agricultural commodities produced in Latin America has not been dynamic. The share of food in total exports from Latin America has declined from 43 percent to 35 percent between 1961–76, as shown in Table 5.

Table 5

LATIN AMERICA: COMPOSITION OF TRADE, 1961-76
(percentages)

SITC		Imports		Exports	
		1961-66	1971-76	1961-66	1971-76
(0+1)	Foods	11.6	10.0	43.5	35.5
(2+4)	Raw materials	6.6	4.4	19.8	13.8
(3)	Fuels	6.9	19.2	26.5	31.8
(5)	Chemical products	10.9	10.5	1.2	3.0
(6+8)	Misc. manufactures	24.3	20.2	8.3	12.0
(7)	Machine and transportation equipment	37.8	33.8	0.5	3.4
(9)	Others	1.9	1.9	0.2	0.5
(0-9)	Total	100.0	100.0	100.0	100.0
(5-8)	Manufactures	73.0	64.5	10.0	18.4

Source: Inter-American Development Bank, *Economic Report 1978*, Table 11-5

On the imports side, Table 5 shows that the share of food in total imports in Latin America declined from 11.6 percent to 10 percent. However, if one excludes the effect of oil imports on the structure of imports, which seems to be a more appropriate procedure in comparing long-run trends in the structure of imports caused by the oil crisis of recent years, that share remains constant, around 12.5 percent. On the other hand, since total imports grow at almost the same rate as GDP in Latin America, which in turns grows at a higher rate than agriculture, it follows that food imports grow at a higher rate than agriculture output. Hence, there is an increase in the proportion of imported food to agriculture output in Latin America over time.

A direct measure for the case of Peru of the ratio of food imports to total production clearly supports that view. Table 6 shows an increase in that ratio for the basic foods imported in Peru for the last 30 years.

The present structure of exports and imports in Latin America is certainly a reflection of changes that have been taking place in the international division of labor, particularly after World War II. First, in this period, world exports have grown faster than GDP both in developed and underdeveloped countries, which means that the world as a whole has increased its degree of integration. However, export growth is faster for developed countries.[6] Second, in terms of exports of agricultural commodities, the developed countries' share has increased from 49 percent in 1955 to 61 percent in 1975, whereas the share of the developing countries has decreased from 40 percent to 26 percent. Currently, the US supplies 60 percent of grains sold in the international market. The less developed countries, as Juergen Donges points out, "have lost ground in fields where their resource endowments should have given them a comparative advantage: in food products, agricultural raw materials..." [1, p. 11]. Third, exports of manufactures from the underdeveloped countries are increasing their

Table 6

PERU: IMPORTS/DOMESTIC OUTPUT RATIOS FOR BASIC IMPORTED FOOD (percentages)

	1943	1960	1965	1970	1975
Wheat	49	70	76	84	86
Corn	n.a.	n.a.	0	1	52
Milk	3	22	22	35	41
Beef	2	4	12	28	11
Rice	10	10	32	0	12
Barley	2	6	10	10	32

Source: Manuel Lajo, "Industria Agroalimentaria y Transnacionales: El Caso Peruano," Departamento de Economía, Universidad Católica, December 1979.

Table 7

CHANGES IN WORLD EXPORT STRUCTURE (percent)

	SITC	Developed countries			Developing countries[a]					
					Total			Excluding OPEC		
		1955	1970	1975	1955	1970	1975	1955	1970	1975
Food and related products	0+1+22+4	48.7	59.0	63.3	42.6	31.8	28.7	41.0	29.3	27.5
Agricultural raw materials	2 less 22,27,28	49.4	58.4	61.3	40.4	30.3	26.2	38.5	25.6	24.3
Crude fertilizers and minerals	27 + 28	52.6	58.0	54.3	33.0	31.4	32.8	31.5	28.0	29.7
Mineral fuels	3	31.7	26.5	17.4	57.5	63.1	73.9	9.0	10.1	11.0
Chemical products	5	88.1	88.9	87.3	5.1	3.9	5.4	5.0	3.7	4.6
Machinery and transport equipment	7	86.6	87.6	87.1	0.7	1.6	2.8	0.6	1.5	2.7
Iron and steel	67	86.6	82.5	86.5	0.9	3.3	2.7	0.9	3.1	2.5
Nonferrous metals and products	68	59.2	63.6	67.9	33.9	29.0	22.0	33.5	28.6	21.2
Other manufactures	6+8 less 67,68	82.6	79.9	78.1	8.8	11.2	13.4	8.7	10.9	13.0
Total export	0 - 9	64.7	71.9	66.2	25.4	17.6	24.1	22.5	11.8	11.4

Source: UNCTAD, *Handbook of International Trade and Development Statistics*, 1976 and UN, *Monthly Bulletin of Statistics*, May 1977. Taken from [1, p. 12].

[a]Excluding centrally planned economies.

share in world trade. These changes in patterns of trade can be seen in Table 7.

An explanation for the change in the comparative advantage in agricultural products lies in the tremendous increase in productivity in agriculture in developed countries. Agricultural economists have argued that this increased productivity is caused by a change from resource-based agriculture to science-based agriculture. Yujiro Hayami and Vernon Ruttan, for instance, have reported for several products that agricultural productivity differences between the developed and less developed countries have widened. They conclude: "The basis for comparative advantage shifted from natural resource endowments to the endowments of scientific and industrial capacity. The shift in comparative advantage in agricultural production from the less developed to the developed

countries was accelerated after World War II" [4, p. 242]. As a result of this technological change, land has increased in terms of efficiency-units in developed countries and they have become relatively land-abundant countries.

In addition to this shift in natural comparative advantage, economic policies have pushed relative prices in the same direction: developed countries protect agriculture whereas less developed countries protect manufacturing. Supporting agricultural prices, tariffs and quotas on imports are clear cases for the former. In less developed countries policies for import substitution industrialization have led to a decrease in agricultural relative prices.

All these shifts in comparative advantage (natural and made up through economic policies) have resulted in a change in the international trade patterns. In Latin America, the change in export structure follows the pattern already mentioned for underdeveloped countries. As Table 5 shows, there has been a relative decrease in the export of agricultural products and an increase in manufactures. The level of exports in manufactures is by now even higher than the value of traditional exports of raw materials. The significant decline in the share of agriculture in total exports in Latin America, together with the fact that the share of imported food has not been reduced with respect to total imports and has increased with respect to agricultural output, indicate that Latin America has, in fact, lost comparative advantage in agriculture. Mostly, the agriculture in Latin America is still based on natural resource endowments.

Two consequences of this shift in the international trade pattern for agricultural development in Latin America can be seen. First, the production structure of the national economy shifts away from agriculture. The *level* of agricultural output decreases relatively. This is the result of the slow growth in exports and, on the domestic demand side, it is caused by the increase in the ratio of imports to total production. An increase in this ratio shifts the R-curve further down because a shift in this curve also comes from a process of saving rural factors of production, that is by reducing the B_{0j} coefficients of Equation (6). This is precisely what happens as the ratio of imports to total output in agriculture increases in Latin America. It is an import substitution process on reverse.

The second consequence is the restructuring within the agricultural sector. There is a shift in the *structure* of the agricultural production away from the production of food for the domestic market. Food can be imported at lower prices. Given the heterogeneity in the units of production in Latin-American agriculture where large and modern farms produce for the external markets and traditional medium and small (peasant families) units produce the food, the change in structure of production means that the traditional agriculture plays a less important role as supplier of food for domestic consumption.

CONCLUSIONS

This paper has attempted to identify some variables that work against a more dynamic rural sector in Latin America. The rapid increase in population, the rapid process of urbanization are dynamic forces that more than offset Engel's Law for food expenditure and, therefore, should generate an increasing demand for food and rural income. On the other hand, Latin America produces a a variety of agricultural commodities for the international markets, which should also be inducing a dynamic rural sector in view of the growth in international demand. However, the reality shows a slowly growing agricultural sector.

The statistical evidence and the arguments presented here suggest that, in addition to Engel's Law, there have been changes in consumption and international trade patterns that have contributed to the modest growth in agriculture. An important statistical finding, based on Peru, is that the "derived rural income," derived from the urban family expenditure on food, is a very small fraction of the family's income. In this sense, urban-rural economic links are very weak. Moreover, the "derived rural income" curve, as a function of average urban income, shifts downward over time.

The fact that income distribution becomes more unequal in the process of growth in Latin America should lead to a change in consumption patterns. In particular, aggregate Engel Curves for food consumption must be shifting downward over time, which in turn also shifts downward the "derived rural income" curve.

The main change in the international division of labor seems to be the increasing share of developed countries in agricultural exports and the increasing share of less developed countries in the world exports of manufactures. This implies that underdeveloped countries have lost ground in food production where their resource endowment should have given them a comparative advantage. Latin America is, in fact, subject to these changes. The exports of agricultural products are becoming less important compared with total exports. Moreover, imported food maintains its share within total imports and is growing faster than total domestic agricultural output. The first result indicates that, as a whole, there is a very weak stimulus for agriculture coming from external markets; the second result contributes to a further decline in the value of the "derived rural income," as imports substitute for domestic agricultural production.

In sum, the slow growth in rural income is not due to Engel's Law only. Shifts in consumption patterns, associated to a higher concentration in income distribution; substitution of rural factors of production with imported goods and the slow increase in agricultural exports, both associated to changes in trade patterns, are some of the factors that work against a more dynamic rural economy in Latin America.

The agricultural sector seems, as a consequence, to be changing its role in the process of economic development in Latin America. It has been said that the role of agriculture is to provide both foreign exchange and cheap food. The new trends would indicate a move toward foreign exchange earnings. So, in addition to a change in the *level* of agricultural output, there is a tendency to change its *structure* toward more production for the external market and less for the domestic market. Since most of the food for the domestic market is produced in the traditional subsector, this restructuring implies a decrease in the importance of traditional agriculture as food supplier in the national economy.

What is then the new role of traditional agriculture? At least for the peasant families, it seems to be the supply of the only remaining commodity that peasants can offer in a market economy: the labor force. In fact, part of the labor in the cities comes from this rural sector through outmigration; also part of the labor supply (permanent and temporal) for rural labor markets comes from that sector. Traditional agriculture, therefore, serves as the present historical form of the "reserve army." It is not the function of traditional agriculture to produce cheap food to have cheap labor for industrialization, as that food and other wage goods are obtained through international trade; rather it is to produce cheap labor directly. For the first role, Professor Schultz's advocacy of "transforming traditional agriculture" was necessary; for the new role it is not.

This process explains, in my view, the common rural neglect in economic policies. It is expected that peasants should adjust to the new production structure. However, Latin-American economies show a limited capacity to accommodate displaced rural people. In addition, we seem to forget that a move from one point to another on the production frontier curve is always accompanied by costs of reallocation, which in this case are burdened on the rural poor.

NOTES

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1. For an empirical support of this statement see [10].

2. Estimates of income elasticities for food and other consumer goods for 10 Latin American cities can be seen in [7].

3. Given the tremendous dispersion of producing units and the significant real costs involved in moving commodities caused by poor conditions in the transport system, and also given imperfect market structures, these coefficients are underestimates of true values. However, this will give a bias in favor of a smaller difference between curves R and E in the chart, which I am trying to challenge.

4. An implication of this result is that the city-countryside conflict is not as acute as is usually stated. One could double the prices for the food rural people sell and double their income, yet urban real income would decline by only 15 percent. There

is much room for income redistribution through price policies for food. A further development of these issues can be found in [3].

5. The substitution of agricultural food by processed food seems also related to another much deeper trend in the Latin-American economies: the *irrevocable* expansion of the market system. This expansion requires an increasing amount of processed goods. A more recent, and related, phenomenon is the presence of multinational corporations in the food-processing industry.

6. For evidence on this point see [1].

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