

The Economic Cycle in Latin American Agricultural Export Economies (1880- 1930): A Hypothesis for Investigation

Author(s): Hector Perez Brignoli

Source: *Latin American Research Review*, Vol. 15, No. 2 (1980), pp. 3-33

Published by: The Latin American Studies Association

Stable URL: <https://www.jstor.org/stable/2503042>

Accessed: 27-08-2019 17:39 UTC

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



The Latin American Studies Association is collaborating with JSTOR to digitize, preserve and extend access to *Latin American Research Review*

THE ECONOMIC CYCLE IN
LATIN AMERICAN AGRICULTURAL
EXPORT ECONOMIES (1880–1930):
A Hypothesis for Investigation*

Héctor Pérez Brignoli
University of Costa Rica

AGRARIAN CRISES AND EXPORT ECONOMIES

Most economic historians are probably familiar with Ernest Labrousse's model of the "Crisis of the Old Regime,"¹ although it remains largely unknown to economists, sociologists, and other specialists in the social sciences. Yet Pierre Vilar² feels that it is one of Labrousse's most important contributions to the "development of a science of history," and considers that as an "instrument of analysis," it can shed light not only on the "old style" crises of Western Europe but also on many essential aspects of the agrarian history of "underdeveloped" countries. We do not mean that contemporary "underdevelopment" and the "economy of the old regime" are one and the same. Rather, our intent is only to emphasize with Vilar that the "historical roles played in most of the world by meteorological abnormalities and *agricultural cycles in the recent past* have not been subjected to sufficiently methodological and reasoned study."

Our aim is to demonstrate the usefulness of Vilar's propositions for the study of nineteenth- and twentieth-century Latin American export agriculture. Four criteria for building a typology of agricultural export economies will be given, certain basic characteristics of long-term trends and short-run cycles in the external sector will be defined, and the requirements that must be met by any theoretical model of cycles in this type of economy will be specified. Using two case studies—Argentine grain exports during the period from 1880 to 1930, and the coffee-based economy of Costa Rica during the same period—a number of conclusions will be drawn: some are methodological, in the sense that

*Translated by John Gitlitz

they suggest a future strategy for investigation and verification; others are substantive.

A few brief comments on the currently predominant mode of economic analysis, associated with ECLA, are needed here. The external conjuncture has received far too much attention, both theoretical and empirical, in ECLA-inspired writings.³ Our argument is not that external factors are unimportant, but only that, in the ECLA analysis, the internal context has been “reduced” to only part of the external.⁴ There have been two principal consequences: the ECLA approach has been notoriously blind to the basic behavioral characteristics of agricultural producers;⁵ and, despite great attention to verifying statistically the long-run evolution of the terms of trade necessary to the ECLA argument, the results have been inconclusive.⁶ The first follows from the fact that the ECLA analyses have been based on overly simple models of export economies; these, derived from development theory, have lacked sufficient understanding of the economic history of the societies under examination. The second consequence derives from the “reductionism” noted above. To this ECLA students have added questionable use of the comparative method and a naive attitude that accepts statistical data that are both unreliable and of little significance.

Although more critical schools of thought began to appear after 1965, these, too, have offered little significant analysis in this area. Their decisive contribution has been to change fundamentally some aspects of ECLA’s theory and methodology. Thus, Cardoso and Faletto⁷—by far the most serious—are basically preoccupied with examining social forces in the development process. They accept the economic structure as given, and in all essential points their vision of the economic context coincides with that of Celso Furtado. Theotonio dos Santos, who explicitly notes the need for a theory of economic crises in underdeveloped countries,⁸ is the only author who recognizes the unique importance of the problem that concerns us here. Yet his substantive contribution, too, is inconclusive. He limits himself to analyzing, from a perspective similar to that employed by the ECLA school, the consequences of a drop in the value of exports and the stimulus this provides for industrialization.⁹ In this essay we will try to demonstrate the usefulness of a systematic study of agrarian crises and the relevance these have to understanding adequately the dynamics of export economies. We do not deny that external demand and the world conjuncture are important, but we do seek to avoid the reductionism of explaining the internal situation merely as a reflection of the external.

CRITERIA FOR A TYPOLOGY OF AGRICULTURAL EXPORT ECONOMIES

Any effort at comparative analysis requires a typology capable of imposing order upon a wide variety of observable phenomena. Here we focus specifically on Latin American agricultural export economies from 1880 to 1930, though it is entirely possible that our criteria could be applied across a wider time span. We suggest that a typology be built upon four criteria:

1. *The kind of product exported*—annual crops in temperate zones and the tropics, perennial tropical crops, cattle, etc. These distinctions are important because they take into consideration the time needed for production, which in any given ecological context in turn determines whether crops can be varied from year to year, and the elasticity of internal demand for the particular crop.

2. *The technology used in the export sector*—is it labor saving or does it conserve the natural resource base, principally land.¹⁰ Given the nature of the product, the ecological conditions, and the existing level of knowledge, entrepreneurs will make their decisions along a transformation curve defined by the labor supply, the rate of return on the product in question, and the availability of land.

3. *Varieties of linkages*—here we are interested in the impact of the export sector on the rest of the economy. In a recent article, Albert Hirschman has suggested a method for conceptualizing this problem.¹¹ In it he distinguishes among production linkages, consumer linkages, and fiscal linkages. This approach permits us to analyze all possibilities, from those of economies evolving toward greater variety in production to those extreme cases where a single crop and enclaves continue to predominate.

4. *Characteristics of the market for the exported staple*—a number of aspects interest us here. (a) How durable is the product? Whether a crop is perishable or can be stored will affect the complexity of the technology required and the capital necessary in marketing. (b) Where and how widely is the product produced? Is production geographically concentrated? (c) How elastic is demand in the consuming market and how available are substitutes? (d) What commercial policies are adopted by the consuming countries—quotas, tariffs, etc.? Although such market characteristics have received little attention, they are of great importance. It is common knowledge that underdeveloped countries control neither maritime transport nor market networks, and to ignore market structures, while assuming they are fully competitive, is unrealistic.

Criteria (2) and (3) could be elaborated more precisely through the application of input-output models; all four are limited, however, in

that they only *describe* an export economy's evolution over time; they cannot *explain* it. To do that we would have to explain the form of capital accumulation predominating in each individual case. As Joan Robinson has written: "To build up a causal model, we must start not from equilibrium relations but from the rules and motives governing human behavior."¹² In turn, a process of accumulation can best be explained by the social relations of property involving the factors of production; in other words, how the available economic surplus is appropriated and utilized.

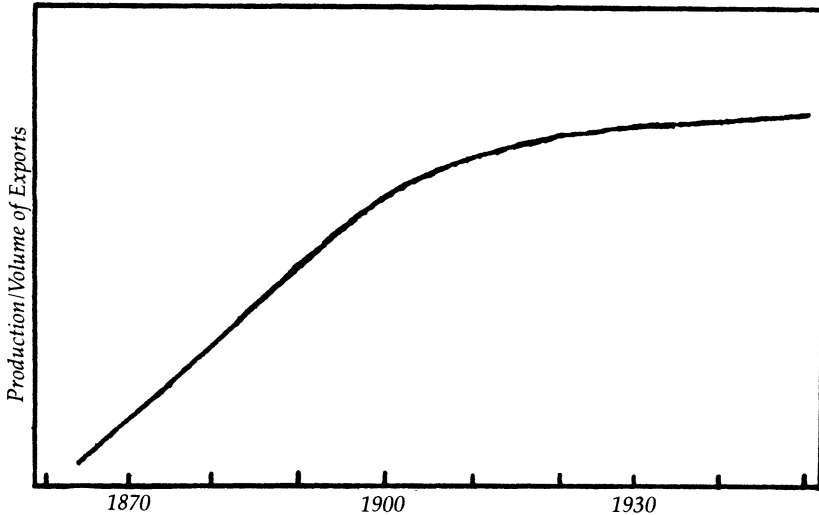
ECONOMIC TRENDS AND CYCLES

Studies of export economies have been preoccupied primarily with analyzing secular trends in the volume and value of exports. Comparative study of the statistics that are available¹³ shows that these trends almost always take the form of a logistic function or Gompertz curve.¹⁴

Three general periods can be distinguished in the long-term evolution of exports: during the first, in most cases extending from the mid-nineteenth century through the 1880s, production and exports expanded slowly; in the second, generally from about 1880 to 1914, the growth rate increased rapidly; during the third, which began definitively with the 1929 crisis, production and the volume of exports essentially stagnated, i.e., the growth rate was near zero. To some extent we can explain this pattern by noting the behavior of consumer markets and the employment of the factors of production and of capital in the producing countries. But such an explanation, in and of itself, is insufficient. We need a model that can explain simultaneously both secular trends and short-run cycles. Indeed, economists who have given serious thought to the subject of export economy dynamics have perceived this need. Yet even the most interesting studies, such as Celso Furtado's, have sought explanations generally by considering internal factors merely as reflections of the external conjuncture.

Models of the economic cycle based on the experience of developed capitalist economies have been more successful. Schumpeter's monumental opus¹⁵ established with mathematical rigor the relationship among three fundamental economic movements: the Kondratieff, Juglar and Kitchin cycles. His explanation for the historical phases of capitalism was based upon copious statistical data, and at the same time he developed a complete theory of the process of economic change. Michael Kalecki's model, first advanced in 1935 and later reformulated a number of times,¹⁶ showed similar methodological preoccupations. We could name any number of others: Hicks, Frisch, Goodwin, etc. How-

FIGURE 1



ever, with the exception of Schumpeter, all have shown practically no preoccupation with historical verification. In a sense their models are "parables" of economic theory.¹⁷

Before leaving this point, we must make note of the important work of Oscar Lange.¹⁸ Lange, who based his analysis on the experience of the centrally planned economies, used a dynamic input-output analysis to build a multisector model explaining not only reproduction and accumulation mechanisms but also long-term economic trends and cycles. Although his model is highly abstract, the fact that it is formulated in input-output terms opens numerous possibilities for its practical use; these ought to be explored.

REQUIREMENTS FOR A MODEL OF ECONOMIC CYCLES IN EXPORT ECONOMIES

To be useful, a model of export economy cycles in Latin America must not only be logically coherent, it must also have explanatory reach and, more generally, historical significance. The first requirement is that at least *some* of the model's assumptions and results ought to be empirically verifiable.¹⁹ Second, the model must be linked explicitly to a more inclusive export economy model;²⁰ in other words, it cannot simply describe the behavior of economic variables, it must also consider basic

institutional aspects. Third, it must be able to explain simultaneously both trends and cycles. A fourth requirement is that it must identify the frequency and breadth of movements, the economic variables affected by these movements, the “shocks” or “impulses” that—it is assumed—give rise to them, and, finally, the mechanisms by which such “shocks” are spread.²¹

A fifth and final requirement concerns the use of the comparative method and historical verification, and reflects our vigorous reaction against the dependency school’s misuse of the “historical-structural” method. In many cases, dependency writers have presented us with little more than a “collage.”²² Invariably there appear certain citations from Marx and Lenin, followed by simplistic summaries of a few historical and economic works. Such methodology not only reveals olympian disdain for historical analysis, but also leads to vacuous formalism, different in expression but similar in effect to those very interpretations that the dependency school originally criticized.²³

A FIRST EXAMPLE: ARGENTINE GRAIN EXPORTS (1880–1930)

Elements of the Model

The basic elements of our model are derived from the historical experience of the period from 1880 to 1914;²⁴ however, three prior conditions were indispensable for it to function: there had to be an expanding agricultural frontier with ample virgin land suitable for ranching and temperate-zone agriculture; there had to be expanding external markets for the products of temperate-zone agriculture; and, finally, adequate maritime transport had to be available to connect producers with consumers—in other words, declining shipping charges²⁵ and adequate shipping capacity. More precisely, these were variables external to the model that had to remain constant for it to function. We have deliberately excluded political and institutional factors because our goal is to identify the essential variables of the economic structure.

In order to describe the model’s basic elements, we will try to identify the characteristics of the export economy of Argentina from 1880 to 1914 and, by extension, until the 1929 crisis. This outline is only a first attempt, and the list below is not necessarily in descending order of importance:

1. export agriculture was the predominant economic activity;
2. productive forces were distributed in two basic activities—cereals and flax, and cattle ranching;

3. cultivatable land was appropriated by an oligarchy that derived its power from owning large properties;
4. an immigrant labor force from Europe could enter freely and without restrictions;
5. farming developed subordinate to cattle ranching—this occurred through the diffusion of agricultural tenancy (which was made possible by number 3, above);
6. labor productivity was high, but that of land was low (obviously yields were much greater in agricultural enterprises than in ranching);
7. foreign investments could enter freely and located primarily in transport, banking and finance, commerce, and infrastructure;
8. urban development was rapid, based on expansion in services and manufacturing—an expansion that responded to the growing needs of the agricultural export sector;
9. the internal demand for manufactured goods was met with imports as well as the products of domestic industry;²⁶
10. the landowning oligarchy invested its economic surplus in improving cattle raising (both the quality of stock and installations), industrial activities using as inputs the products of export agriculture (slaughter houses, flour mills, tanneries, etc.), luxury goods (reflecting cultural patterns adopted from Western Europe), and construction, both public and private;
11. the state followed laissez-faire economic policies.

The Reproduction and Accumulation of Rent and Capital

The landowning oligarchy, which engaged primarily in stock raising, relied upon tenancy to earn rent;²⁷ we are using the term “rent” in its proper sense, that is, as fees paid for the use of the land (whether in money or in kind). Tenancy provided other income as well, what we might call rent from “capitalization”;²⁸ by this we mean the “indirect” benefits of tenancy, which played an essential role in ranching. First, tenancy provided fields of alfalfa for the landlords, who for their part had to contribute only the seed; in this way, the landed elite obtained sufficient cattle fodder at minimal cost. Second, the owners benefitted from whatever improvements tenants made in the land. The railroad also had a favorable impact on land values; in fact, landowners were able to appropriate to themselves a large portion of the economic benefits generated in the society by the building of the railroads.

What were the necessary preconditions for the creation of this

mechanism for accumulating rent? First, both owners and tenants had to enjoy complete legal freedom to sign contracts, with no prior external conditions affecting rates or the duration of contracts. Second, the productive units had to be large and the exploitation of the land had to be extensive rather than intensive; this meant that a large portion of the total area was left in natural pastures. Last, external demand, both for agricultural products and for cattle, had to be expanding. Changes in these three conditions, which in fact did occur, particularly after 1930, affected profit levels and eventually made the perpetuation of these social relations more difficult.²⁹

Both farming and ranching enterprises sought to maximize their profits. In ranching, profits essentially depended on the difference between production costs and the prices paid by the slaughter houses. Given the land tenure pattern and the nature of improvements in livestock, capital reproduction and accumulation was possible for the ranchers with minimum investments. Obtaining the land and refining cattle stocks involved an initial expense but required little subsequent investment; thus, once the initial capital had been amortized, ranchers could amass high profits.³⁰

In farming enterprises, profits depended on the difference between production costs and the prices paid by middlemen. The farmer's dependent position should be emphasized here: he depended on the landlord for land, middlemen for credit, and the climate for yields. Consequently profit margins for small farmers were really narrow, barely sufficient for them to recoup their initial investments. For farmers to have been economically independent would have required significant investment inputs (land, installations, grain storage facilities) as well as an infrastructure that simply did not exist (an extensive network of grain elevators, access to credit, etc.). Obviously, to the extent that the oligarchy's ability to accumulate rent depended on the continued presence of tenants, the small farmer's independence and any increase in his ability to accumulate capital would have conflicted with the interests of the landowners.

The benefits small farmers received from the Argentine banking system were limited. The Banco de la Nación Argentina, the principal government agent, distributed loans primarily to the ranching and commercial interests.³¹ Before 1933 the only measure intended principally to aid small farmers was the Agrarian Loan Law (No. 9644) of 1914, which sought to counter the effects of that year's severe agricultural crisis. It provided for short-term loans (180 days, extendable to 540) which were to be guaranteed by harvests, cattle, and tools; obviously, these were merely palliative.³² The banking system served commercial

interests above all; farmers who needed financing had to find it, in turn, through middlemen.³³

Monetary management was more subtle. Between 1881 and 1935, money was based on the gold standard, with periods of convertibility (1881–85, 1891–1914, and 1927–39) and inconvertibility. Gold never circulated internally; during periods of convertibility, the *Caja de Conversión* paid for paper money in gold, at a fixed rate, and emissions of paper money were automatically regulated by the amount of metal in existence. As John Williams has demonstrated,³⁴ the system depended closely on the balance of payments. Inconvertibility, by depreciating paper money, favored exporters and, in particular, landowners.³⁵ This was because it cheapened production costs in terms of gold. Nevertheless, Lucio Geller³⁶ has recently shown that this analysis may be too simplistic. The return to convertibility in 1899 benefitted both cattlemen and farmers because the latter happened to be in a favorable cost position following upon several years of mediocre harvests. At this peculiar conjuncture, inconvertibility played a vital role in the tremendous expansion in cereals and flax that took place between 1899 and 1914, an expansion that occurred primarily through the mechanism of tenancy.³⁷

Using the criteria for constructing a typology presented above, the characteristics of export agriculture in the Argentine pampas can be summarized as follows: (1) export products were temperate annual crops that could easily be shifted from one year to the next, and there was an internal market for them that could increase at a rate greater than population growth; (2) technical change was concentrated primarily on labor-saving possibilities; (3) both backward and forward linkages were significant in production, and the same was true of consumer linkages—fiscal linkages, in contrast, were less important; and (4) the pampas were of great importance in the world cereal and flax markets, and this importance expanded up to the crisis of 1929.

The Behavior of Agricultural Producers

Farmers, who grew a combination of three basic crops—wheat, corn and flax—followed a variety of rotation patterns, the goal of which was, after four or five years, to leave the fields in pastures (principally alfalfa) that the landowner would then use for cattle. For the farmer these three crops formed *complementary*³⁸ and not competitive options. This was so for a number of reasons: (a) crop rotation was necessary to insure greater yields; (b) combining the three served to cushion the unfavorable impact of drops in the price of any single one; (c) combining them also permitted more rational use of family labor throughout the year, since

planting and harvesting periods did not coincide; and (d) since requirements for seasonal labor differed for each of the crops, and because labor inputs were among the most expensive, combining them enabled the farmer to limit his costs.

A farmer's production decisions are illustrated schematically in figure 2 (note that we are considering only one crop). The area that was sown in any one year, t , depended on the resources available to the farmer from the previous year $t - 1$. In turn, the gross income from year t was a function of the area sown, A_t ; of the prices he received for his produce in the fields or at the train station (which depended on international prices); and of his yields per hectare (which depended on climate, assuming that farming and harvesting technology did not vary during the period considered). The resources available to the farmer for the following year, $t + 1$, depended on his net income (his gross income minus inputs and rent) and on the balance between his consumption and savings. The proportion he devoted to consumption, in turn, most likely depended on the size of his family and the living standards to which they were accustomed. These relationships can be represented formally:

$$A_t = f(I_{t-1}) + a_i \quad (1)$$

$$I_{t-1} = g(Y_{t-1}) - c_{t-1} + Cr_{t-1} \quad (2)$$

$$Y_{t-1} = A_{t-1}Re_{t-1}(P_{t-1}\alpha_{t-1}) - R_{t-1} - i_{t-1} \quad (3)$$

$$Cr_{t-1} = Cr_{t-2}(1 + \Theta) + \delta(A_{t-2} - A_{t-3}) \quad (4)$$

Replacing in (2) and in (1):

$$I_{t-1} = g(Y_{t-1}) - c_{t-1} + [Cr_{t-2}(1 + \Theta) + \delta(A_{t-2} - A_{t-3})] \quad (5)$$

$$A_t = f\{g[A_{t-1}Re_{t-1}(P_{t-1}\alpha_{t-1}) - R_{t-1} - i_{t-1}] \cdot \cdot \cdot - c_{t-1} + [Cr_{t-2}(1 + \Theta) + \delta(A_{t-1} - A_{t-2})]\} + a_i \quad (6)$$

A_t = area sown in year t

I_{t-1} = investments available to the farmer in the previous year, $t - 1$

Y_{t-1} = gross income of the farmer in $t - 1$

c_{t-1} = consumption by the farmer and his family in $t - 1$

R_{t-1} = rent paid annually by the farmer to the landlord in $t - 1$

i_{t-1} = the farmer's inputs in $t - 1$

P_{t-1} = cereal prices in $t - 1$

Re_{t-1} = average yields per hectare in $t - 1$

Cr_{t-1} = credit received from middlemen or buyers in $t - 1$

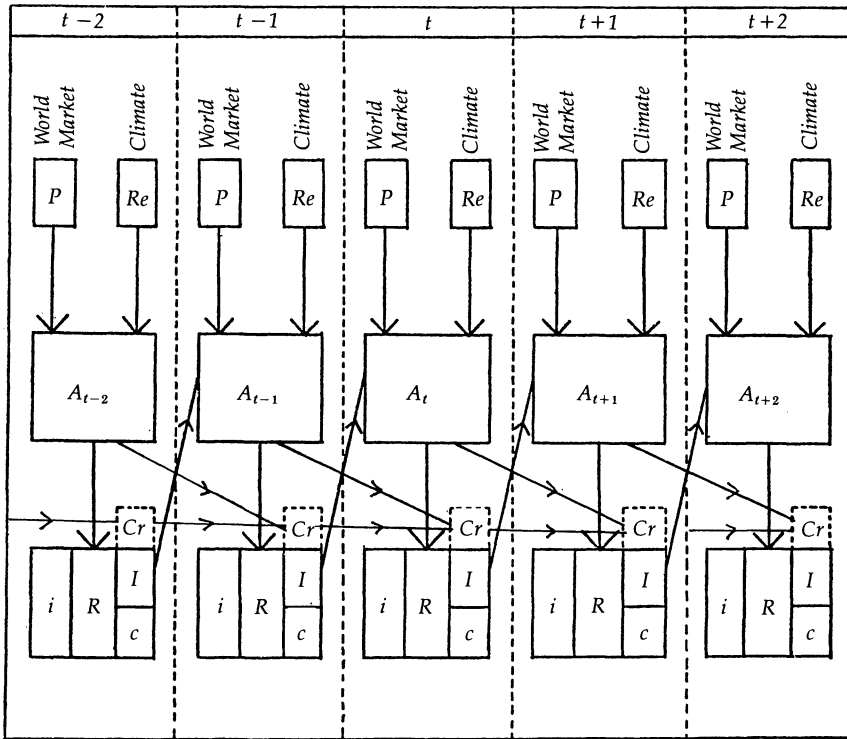
a_i = a random factor

α_{t-1} = exchange rate in $t - 1$

Θ = rate of growth in exports

δ = a constant, if A_{t-1} is less than A_{t-2} , then δ is less than 0.

FIGURE 2



In the short run, R_{t-1} , i_{t-1} , and c_{t-1} can be considered to have been constants; as a result, A_t was determined by $t-1$, P_{t-1} , Re_{t-1} , and Cr_{t-1} . Since we know that, in the final analysis, P_{t-1} depended on the international market, in our model P_{t-1} was an exogenous variable. Hence, the three indogenous variables that explained A_t were A_{t-1} , Re_{t-1} , and Cr_{t-1} .

Variations in the area sown (eliminating any consideration of long-term trends) followed, after a lapse of one year, fluctuations in the value of the harvest. Thus, A_t depended in part on the value of the harvest in $t-1$. However, the effect of the latter was often softened by credit from middlemen, Cr . In other words, mediocre results in agricultural year $t-1$ may not necessarily have led to an equivalent contraction in the area sown. Middlemen (who, in turn, received aid from banks and export houses) would provide credit or delay debt repayments in order to prevent the farmers' bankruptcy, because this would have

meant their own bankruptcy as well. It was this that provided the flexibility the system needed to function, for without it, massive bankruptcies among tenants would have affected both middlemen and landlords.

In the long run, however, neither R_{t-1} nor c_{t-1} nor i_{t-1} can be considered to have been constants; hence we must examine the farm enterprise's cost function.³⁹ The farm's expenses over the course of the production period included rent (or, for the owner, interest on the value of land), amortization on equipment and installations, cultivation costs (sowing, preparing the land and other care), harvest costs (reaping, heaping, threshing, sacks for wheat, etc.), transport to the railroad station, railroad shipping fees and storage (if the farmer could not sell directly to the nearest buyer), losses involved in storage, insurance and taxes, and interest payments on credit from middlemen.

What share did each of these account for in the total production costs? For the case of wheat, the costs of preparing the fields and sowing, along with those of threshing, absorbed the largest proportion. In Buenos Aires province, between 1894 and 1898, sowing costs accounted for 34 percent of the total, threshing for 32 percent, and reaping 26 percent.⁴⁰ In the province of Santa Fe, during the period from 1899 to 1904, a small owner who obtained yields of seven *quintales* (hundred-weight; measurement of weight, equal to 100 kilos or 217 pounds, used in Argentina) per hectare found that sowing absorbed 16 percent, reaping 7 percent, and threshing 25 percent of his total costs.⁴¹ In the case of corn, the harvest costs were proportionately greater since mechanization was less. In Buenos Aires, between 1894 and 1906, these absorbed 83 percent of the total cost of production;⁴² in Santa Fe, from 1899 to 1904, harvest costs represented 52 percent.⁴³

Although the cost of land and tenancy varied considerably, depending above all on the land's location and quality, some illustrative data are available. In Buenos Aires province, from 1894 to 1896, rents for wheat represented approximately 15 percent of total production costs; for corn the figure was 13 percent.⁴⁴ In 1902, Huergo calculated that in the northern region of the same province, an average tenant, who paid rent in money, paid 15.5 pesos (paper money) per hectare; if he paid rent in kind, his rent amounted to somewhere between 12 and 20 percent of the harvest. A farmer with 100 hectares in corn, paying rent in money, found that his rent amounted to 21 percent of his total costs; for wheat, a similar proportion was found.⁴⁵ In Santa Fe, between 1899 and 1904, rents in kind varied between 15 and 20 percent of the harvest; those in money represented up to 29 percent of total costs.⁴⁶

Another important factor was transport, which included both railroad fees and the costs of moving produce from the fields to the

station. Unfortunately, precise quantitative calculations are difficult. Rates were fixed between stations but were not directly proportionate to distance. Hence, to assess accurately the weight of transport costs, a careful study of local traffic as well as the charges on different lines would be necessary; as yet, no one has done this.⁴⁷ However, the portion of total costs that railroad fees represented gives an incomplete notion of their relative importance. The farmer, who had no way to store his crops, needed to transport his harvest as quickly as possible (at their best, storage installations at the railroad stations were inadequate); thus, the scarcity of railroad cars in many cases became a serious problem. Concerning transport to the station we know even less—it was done by carts over dirt roads that were usually very bad. Almost all observers agree that if the distance from the station was greater than twenty kilometers, costs became prohibitive.

We cannot be precise about the interest paid to middlemen either. Obviously the interest rates charged by banks do not reflect those the farmers themselves had to pay. Still, we should note that farmers were not subject to the kind of usurious credit that is typical of precapitalist agriculture. To some extent the middleman's profit paralleled the farmer's. A good harvest meant punctual payments and probably increased consumption; the opposite occurred when the weather was bad.⁴⁸

Although we lack information on production costs for the period 1914–30, it is unlikely that the above proportions would have varied by much. The 1937 census⁴⁹ indicated the following average proportions for the pampas region as a whole, by quintal produced (see fig. 3).

How had costs changed between 1900 and 1930? Since there are no studies of "parity prices," we must make do with some broad indicative data. It seems that the increase in land rents, which paralleled a similar increase in the price of land, was widespread.⁵⁰ Rents reached

FIGURE 3

	<i>Wheat</i>	<i>Corn</i>	<i>Flax</i>
Rent	22.7%	27.0%	24.9%
Interest	8.6	4.6	7.6
Amortization	11.0	7.6	9.7
Production Costs	47.2	45.8	49.8
Transport	10.4	15.0	8.0
Total	100.0	100.0	100.0
Average Yields (quintales/hectare)	9.17	20.67	7.15

the point that some observers actually became alarmed; Miatello, for example, predicted potentially catastrophic results in case of bad harvests.⁵¹ That this was true for the farmer became clear in 1911 when the corn harvest was lost and social protest erupted in the "*grito de Alcorta*." Juan Alvarez observed at that time that because of increasing corn prices, rents had been climbing since 1898. Following the abrupt collapse in 1911–12, farmers, who faced ruin, initiated an agrarian strike.⁵² According to Lázaro Nemirovsky,⁵³ railroad fees for shipping wheat, corn, or flax over 200 kms increased on the average 62 percent between 1913 and 1930; the cost of commonly used agricultural machinery increased by about 103 percent during the same period; and the cost of clothing and feeding an "average large family" with 200 hectares of land increased by 100 percent.⁵⁴ These data suggest that costs had, indeed, increased, above all between 1914 and 1930. However, at present we cannot be any more precise.

Next we must examine the ratio of costs to benefits for farming enterprises. Using the detailed agricultural surveys that were carried out in Santa Fe and northern Buenos Aires provinces at the beginning of the century, we have constructed tables 1 and 2. These show that a farmer's earnings depended on a delicate equilibrium in which good harvests were linked with favorable international prices. Note that farms raising cereals only produced profits if the salaries that should correspond to the farmer and his family are not computed. When calculations are based on costs that include salaries for all labor employed (column "salaried workers only," table 2), we find that farms were profitable only when yields were very high, and that this occurred only in a few exceptional cases. Thus Miatello observed in the conclusion to his report on agriculture in Santa Fe:

Given that average yields in the province during the last ten years were less than seven quintales per hectare, it is clear that wheat farming brings no profit whatsoever. We reach this conclusion by strict compliance with the rules of applied rural economics. However, except for the latifundistas who rent out their land, landowners in the province cultivate their farms personally. As a result, the column labeled "owners" actually shows profits when yields are above a minimum of five quintales per hectare. This profit, however, does not take into account interest on capital, amortization, or the salaries that ought to be calculated for the tenant's labor and that of his family. In other words, when all is said and done there are a few pesos per hectare, but these do not compensate for the farmer's labor.⁵⁵

To summarize: between 1880 and 1930 the typical Argentine grain farmer, who rented or owned around one hundred hectares, occupied a relatively unique economic position. In some ways he was a capitalist producer: he owned his own tools, machinery, farm animals, and some

TABLE 1 *Cost/Benefit in Wheat, Corn and Flax Production, in Northern Buenos Aires Province, in 1902 (in pesos m/n)*

	<i>Tenant Paying in Kind</i>	<i>Tenant Paying in Money</i>	<i>Owner</i>
<i>Wheat (yields, 15 qt/ha)</i>			
Total Production*	7256	7256	7256
Total Costs	4563	4593	4089
Liquid Benefit	2693	2563	3167
Cost per Quintal	3.13	3.22	2.81
<i>Corn (yields, 25 qt/ha)</i>			
Total Production*	6768	6768	6768
Total Costs	3832	4832	4222
Liquid Benefit	2123	1935	2545
Cost per Quintal	1.63	2.06	1.80
<i>Flax (yields, 9 qt/ha)</i>			
Total Production*	7259	7259	7259
Total Costs	4242	4371	3761
Liquid Benefit	3017	2888	3498
Cost per Quintal	5.01	5.17	4.44

Source: Ricardo Huergo, *Investigación agrícola en la región septentrional de la Provincia de Buenos Aires*, pp. 204–13.

*We have calculated the price considering a field located between 10 and 15 kms from the railroad station and 250 kms from the port, using average prices quoted for that year.

Note: The calculations are based on a farm unit of 100 hectares. Salaries for the farmer's family are not included. The calculation includes installation and maintenance costs for the entire year. Yields and production costs are for the western zone of the northern region of Buenos Aires province.

basic installations, and during the harvest he used salaried labor beyond that provided by his family. However, in a more general sense he was a peasant, deriving his income in ways somewhat different from those that are characteristic of capitalist farmers.⁵⁶ That is, although he was a small entrepreneur, he found his possibilities for accumulating capital blocked by the particular way in which he was linked to the global agricultural structure and by his dependent position within the marketing system.

TABLE 2 *Cost/Benefit in Wheat, Corn and Flax Production, in the Province of Santa Fe, in 1904 (in pesos m/n)*

	<i>Form of Labor Exploitation</i>			
	<i>Salaried Workers Only</i>	<i>Owners</i>	<i>Tenant Paying in Kind</i>	<i>Tenant Paying in Money</i>
<i>Wheat (yields, 7 qt/ha)</i>				
Cost per Quintal	5.38	3.45	4.43	4.84
Profits (or losses) per Quintal	-0.23	1.69	0.71	0.31
<i>Corn (yields, 30 qt/ha)</i>				
Cost per Quintal	2.10	1.55	*	2.20
Profits per Quintal	1.04	1.59	*	0.95
<i>Flax (yields, 6 qt/ha)</i>				
Cost per Quintal	6.60	4.25	5.99	5.80
Profits per Quintal	2.36	4.70	3.00	3.14

Source: Hugo Miatello, *Investigación agrícola en la Provincia de Santa Fe*, pp. 299, 361, 412.

* = No data.

Note: Calculations are based on a 100 hectare farm, 10 kms from the railroad station and 100 kms from the shipping port, and for a family of four adults and three children. For the last three columns (owners, tenants paying in kind and in money), only salaries paid outside the family have been included in the calculations.

The Long Run

Over the long run, consumption probably remained constant. Basic foodstuffs were inexpensive, first, because the country specialized in producing cereals and meat, and, second, because a variety of products were produced on the farm itself—these included fowl, milk, some vegetables, and some meat. In contrast, there is some evidence that rents as well as a few specific inputs became more expensive. Thus, even though the value of harvests did increase, this increase was probably offset by rising costs. In other words, in the long run, the farmer's ability to save, and therefore to invest, remained constant.

How, then, can we explain the continual expansion of the area under cultivation and of production during the period studied? At the time, an astute observer explained: "These lands do not demand much investment to produce an acceptable harvest. The labor of one family is sufficient to plow and sow a hundred hectares or more. Harvesting is

done largely with machinery provided by commercial firms or others interested in the harvest and the fate of the tenant. We do not think it is farfetched to assume that as long as new lands are available to be farmed in this way, it is unlikely that our farmer will modify fundamentally his agricultural or commercial methods."⁵⁷

The incorporation of new lands and an abundant supply of immigrant labor constituted two basic elements in the process of expanding production; but they would not be present forever. The area under cultivation ceased to expand when the ecological limits of the grain zone were reached, some time around 1920, and immigration began to decrease after 1914, stopping almost completely after 1929. In other words, economic growth was not stimulated by capital accumulation generated on existing farms, but by the constant addition of new producers. After it was no longer possible to incorporate new lands and when immigration diminished, the growth rate slowed; in the period between 1914 and 1920, this slow-up was already visible.

The crisis of 1930 precipitated a drop in export prices and a major restriction of overseas markets that severely limited beef exports.⁵⁸ The response of the landowning elite was to seize control of the state and use it aggressively to protect their economic interests and preserve the existing social relations of production. In this way the ranchers sought to preserve for themselves the *greatest* possible benefits under deteriorating market conditions.⁵⁹ We can speculate about what might have happened if, in the midst of the depression, market restrictions on beef exports had not been imposed. Increased cattle production⁶⁰ would have made necessary parallel increases in the production of forage. However, because the ecological limits of agriculture had long since been reached and new lands could not easily be incorporated, it would have been difficult to expand cereal and alfalfa production via the traditional mechanism of tenancy. As a result, it would have become necessary to develop new patterns of mixed agriculture, along European or North American lines, using high levels of capital investment per unit of area. It also would have become necessary to begin to use grains for cattle feed. In other words, to expand cattle ranching would have required, in the end, developing a new and more intensive form of agriculture. But such a course implies that the landed oligarchy consciously would abandon traditional structures and opt to diversify agriculture and ranching and to raise substantially the productivity per hectare. Such deliberate redefinition of the agrarian structure would have meant a kind of elite "suicide," the self-destruction of the oligarchy as a social class, which we consider unlikely.

Still, speculation about what might have happened has a certain

utility, for it allows us to perceive more clearly what actually did occur. In Argentina the economic elite chose to pursue alternatives that left the agricultural sectors as untouched as possible. Rapid industrialization seemed to be the answer;⁶¹ and by the mid-thirties, industrial expansion through import substitution had come to appear as the most viable economic option. The changes in the economy paved the way for significant social changes—internal migration, urbanization, and greater organization of the industrial labor force, for example—so that, in the period between 1943 and 1955, new social sectors—groups in the army, industrial entrepreneurs, and labor, though in a subordinate position—gained control of the state. These perceived a transfer of resources from agriculture to industry as necessary to finance industrialization, and they sought (successfully) to effect such a transfer by freezing and delaying rent payments and by placing controls on export prices and marketing. Through inflation, agricultural profits were reduced, descending to a mere 5 percent of the value of production,⁶² and tenants lacked incentives to develop intensive agriculture. The final result of these policies was that, from the beginning of the 1940s, agricultural production stagnated, and the surplus available for export decreased,⁶³ which in turn restricted industrial expansion.⁶⁴

The Problem of Statistical Verification

The sensitivity of primary-product producers to price changes has been the object of numerous studies.⁶⁵ Opinions have almost always been polarized between those that seek to prove that producers respond “perversely,” and those that have argued that producers react positively to price changes. Economists too closely identified with general equilibrium models have found the latter position comforting. Yet it seems to us that such polarized alternatives are not particularly useful, and our examination of the Argentine case suggests they should be abandoned.

What prices should be considered? Should we examine those for each product individually, or for each product in relation to its competitors? We can provide no definitive answer to this question. Although each farmer had some freedom to allocate his fields among three basic crops, still, this freedom was not unlimited. He could not completely eliminate any one, nor, until promulgation of the laws that froze rents and postponed their payment, was ranching a real option for the typical tenant.⁶⁶ Another problem is how to measure prices. Should we use those quoted on the Cereals Exchange or the average prices paid for each harvest at the shipping ports? A third possibility, suggested by Malenbaum,⁶⁷ would be to consider the average value per hectare

sown. In fact, however, none of these would tell us the effective price received by the farmer. Because of the manner in which production was financed and marketed, a large portion of each crop was already committed to middlemen even before it was harvested.

The data available on the areas that were planted are only estimates. Undoubtedly they have some validity, but do we really know their margins of error? Since they are only approximations, does it make sense to calculate, for example, the price elasticity of the aggregate supply function? In other words, the statistical data available are useful for indicating trends as well as significant variations in major economic indicators; however, it would be unwise to use that data to test more specific relationships.

If this is so, how can we proceed? We believe the following is possible: (1) A typology of agricultural enterprises could be constructed using the Argentine censuses of 1895, 1908, 1914, and 1937 and those agricultural surveys that are available (1898 and 1900–1904); these should be broken down by region in as detailed a form as possible. (2) Using lineal programming, enterprise behavior models could then be constructed. (3) These, in turn, could be used, by introducing various hypothesized cereal and input prices, to simulate behavior. (4) Last, the “numerical experimentation” method⁶⁸ could be used to establish the necessary compatibility between step (3) and the behavior of known global (aggregate) series. This procedure would place the available information, which though disperse is abundant, in systematic order, allowing the examination of a problem that, because of the weakness of the information base, would be impossible to study with traditional econometric methods.⁶⁹ For step (4), a multisector model would be needed to formulate and test relationships between conditions in the agricultural and cattle sectors and the economy at large.

A SECOND EXAMPLE: COSTA RICAN COFFEE EXPORTS (1880–1930)⁷⁰

Elements of the Model

For the Argentine case, three prior conditions were necessary for the export economy to function. These were also present in Costa Rica, i.e.: (a) land suitable for growing highland coffee and other tropical and subtropical crops was available; (b) external markets were expanding; and (c) there was adequate maritime transport. The basic elements of the Costa Rican economy, between 1880 and 1930, are identified as follows:

1. agricultural export activities predominated;

2. the productive forces were distributed in two basic areas—coffee and bananas—thus, a typical “single crop” pattern quickly evolved;

3. however, the two basic crops developed in geographically distinct regions and, for this reason, did not compete for land;

4. small properties predominated in the production of coffee;

5. coffee processing and marketing became highly concentrated in the hands of a small group—the *cafetaleros*—which was clearly defined and had relatively homogeneous economic, social, and political interests;

6. a large portion of banana production was controlled by the United Fruit Company, which also controlled banana marketing and transport, and although some bananas were also produced by Costa Rican nationals, these were forced to sell to the United Fruit Company;

7. population grew at a sustained, constant rate of 2 percent per year. Although the government officially encouraged immigration, in fact this was minimal—at least into the coffee areas; hence they were, in a sense, “closed.” There was some immigration (principally Jamaican and Chinese) into the banana zones that, prior to building the railroad and planting the first trees, were largely unpopulated;

8. as a result the labor supply was limited, and during harvests there were problems of labor scarcity;

9. foreign investment, which could enter freely, was concentrated in transport, banking, and marketing, and in the cases of coffee and bananas, financed marketing almost completely—for bananas it also financed a major portion of production;

10. urbanization proceeded at a moderate rate, and 81 percent of the population still lived in rural areas in 1927. Nevertheless, urbanization was more advanced in the coffee regions than in the areas where bananas were produced;

11. the domestic demand for manufactured goods was met by imports;

12. the domestic demand for food was also met, to a large degree, with imports;

13. the economic surplus produced by the *cafetaleros* was invested in the consumption of luxury goods, which included both public and private building;

14. the economic surplus produced by the United Fruit Company was invested outside Costa Rica;

15. the State adopted and followed *laissez-faire* economic policies.

The Reproduction and Accumulation of Rent and Capital

The role of the cafetaleros in the coffee production process had two major facets: on the one hand, they grew coffee on their own farms; on the other, they held a monopoly control over marketing the beans. As a result, they obtained their total income really from two sources, one, the profits they derived directly from cultivation, and two, the true monopoly rent they obtained from *beneficio* (mill where coffee is processed) processing and marketing. The coffee was produced almost entirely by a large mass of peasant small producers, whose income was also derived from two sources: first, the money they were paid by middlemen for their coffee; and second, the salaries they received for working on the large farms and in the *beneficio* during the harvest. It is not easy to calculate the amount of this monopoly rent, but the small producers complained bitterly. Every time international prices began to drop they spoke of handing over to the *beneficiadores* a "golden nugget" (in Spanish, *grano*, a play on the word for bean) and receiving a "copper nugget" in return.⁷¹

The expansion of coffee production did not result in any major concentration of landholding,⁷² and, in this respect, Costa Rica represents an almost unique exception among agricultural export economies, one that is fundamentally different from other coffee economies such as El Salvador or Guatemala. This peculiar pattern of development can be explained, however, with relative ease. (a) Costa Rica had ample virgin land and a limited population, it was not burdened with an oppressive "colonial heritage," and coffee was its first significant export crop. (b) Because cultivating coffee demands high inputs of labor per unit of surface area,⁷³ the permanent shortage of labor impeded any process of property concentration; without sufficient labor to work them, large properties were useless.⁷⁴ (c) With the adoption of the *beneficio húmedo* (mill for processing coffee by the wet method) in about 1840, the cafetaleros began to emerge as a particularly dynamic entrepreneurial group;⁷⁵ from the first, they were able to assume a virtual monopoly over processing. Although British merchants had initial control of marketing, the cafetaleros, along with some other European immigrants, soon gained a foothold.⁷⁶ Given the level of technology, the ample supply of land, and the limited availability of labor, the most rational use of resources for the entrepreneurs who directed the process was a division of labor, with peasants producing the coffee and cafetaleros doing the processing and marketing.

Coffee is a permanent crop, and in Costa Rica it reaches optimum production between five and ten years after planting. Until recently the

coffee trees were not replaced regularly, and there have been cases of trees more than one hundred years old that were still in production. Coffee also requires high labor inputs: trees have to be planted in nurseries, then transplanted and pruned; the land must be prepared, cleaned, and terraced; other trees and bushes have to be grown to shade the coffee plants; wind barriers must be built, etc. The harvest is even more labor intensive, and even today few labor saving techniques have been developed. Since the 1950s, a number of practical techniques designed to raise yields per hectare have been adopted (including use of artificial fertilizers, procedures to prevent soil leaching and erosion, regular replacement of coffee trees, fumigation and irrigation, etc.), but these, too, have continued to require high labor inputs.

These characteristics now allow us to specify some of the basic economic traits of Costa Rican coffee production:

a. The initial liquid capital investment to begin growing coffee was low. In effect, if land and labor were available, the farmer needed no more than a few saplings.⁷⁷ Of course, he also had to be able to survive the few years that would pass before the trees began to produce.

b. The first requirement, land, was available: after 1830 the coffee zone gradually extended through the Central Valley, west into the Alajuela-San Ramón region, and east into the valleys of Reventazon and Turrialba.⁷⁸ The rate of expansion was slow, primarily because labor was scarce, and we can conclude plausibly that the area under cultivation actually expanded at the same rate as the population. Although the coffee region only covers 2,700 square kilometers, its ecological limits were not reached until 1930.

c. Given the limited population density, the optimum use of labor was a land tenure pattern in which the immense majority of producers were small peasant landowners. In effect, because coffee demanded intensive use of labor, because few labor saving techniques were available, and because salaries were gradually rising,⁷⁹ only in a peasant economy in which family labor was not remunerated could returns be greater than production costs.

This situation stands in strong contrast with the experiences of other Central American countries. In El Salvador,⁸⁰ the expansion of coffee production was accompanied by massive despoiling of indigenous community lands that were suitable for growing coffee. Ever since colonial and even pre-Columbian times, the population density of El Salvador has been greater than in the remainder of Central America, and an abundant labor supply meant that a coffee oligarchy could expand the area under cultivation within a hacienda structure more typical of the rest of Latin America, i.e., a tenure pattern in which land owner-

ship was highly concentrated and payments to permanent and seasonal labor were low. Since the Salvadorean peasant masses never fully accepted this new order, the expansion of coffee was accompanied by violent social repression.

In Guatemala yet a third pattern developed.⁸¹ Although land did become highly concentrated in the hands of a small coffee elite, the indigenous communities were only partially affected. Nevertheless, since the growers still needed labor from these communities, they came to rely on extra-economic forms of coercion. In effect, they recreated many of the same forms of forced labor that had been used during the colonial period.

In Costa Rica, economic growth was not accompanied by significant technological progress; the manner in which the land was cultivated remained relatively unchanged. Accumulation resulted from incorporating new lands, and *the new groves were created exclusively by an investment of labor*. The cafetaleros did not reinvest their economic surplus in the same crop, nor did the peasants (to the extent that they even obtained a surplus). To a very large extent, whatever surplus was generated was probably used to finance increased consumption. The elite invested in imported consumer goods, services, construction, and expenditures outside the country; any remainder they invested in the infrastructure that was necessary to expand the coffee area—roads, transport, machinery for processing, etc.⁸² In other words, as long as the world coffee market imposed no exogenous restrictions, and as long as new land was available (i.e., until the ecological limits for growing coffee had been reached), the decisive internal factor that affected the growth rate of Costa Rica's agro-exporting economy was probably the increase in population.⁸³

In the long run this pattern resulted in land exhaustion and gradually declining yields per hectare, declines that could not be offset by increasing labor inputs. When faced with the low coffee prices of the depression, the country had no choice but to maintain or even increase production, particularly since its economy was so overwhelmingly dominated by a single crop.⁸⁴ However, before production could be increased, a wide-ranging series of technological improvements was necessary; these included artificial fertilizers, irrigation, fumigation, replacing old trees, new and more productive trees, and "*retupición*" (planting a greater number of trees per unit of area). To encourage these innovations, in 1934 the state created the Institute for the Defense of Coffee (IDC); in 1948 the IDC was replaced by the Coffee Office. The IDC and then the Coffee Office not only actively sought to promote technological improvements, but also began to fix categories and prices

for the coffee acquired by the beneficiadores. In this way they sought to limit the fluctuations that characterized small peasant incomes. It was hoped that this would permit a wider margin of savings that would make adopting new technologies possible. The policy seems to have been rather successful. By 1959 groves using artificial fertilizers had increased their average yield per *manzana* (measurement of area equal to 1.75 acres) to 27 bushels⁸⁵ from 9 bushels in 1950. When the quality of the land permitted adopting the new techniques, the shift to more intensive cultivation, including replacing and replanting trees, seems not to have been particularly related to farm size. A study of coffee production costs and profits during 1967–68⁸⁶ found that both inputs and incomes had grown uniformly with the farm size.⁸⁷

Thus, a complete description of Costa Rican coffee export agriculture would be summarized as follows: first, coffee was a permanent crop, and any shift to other crops was, in the short run, not only almost impossible but also would imply accepting major losses; moreover, the nature of coffee was such that domestic demand could expand only as fast as population. Second, technological progress, either in growing or collecting the crop, was almost nonexistent; land-saving technologies have only recently been introduced. Third, the impacts of linkages in the production process were few; consumer and fiscal linkages were somewhat more significant. Last, although coffee production was crucial in the Costa Rican economy, the country's production was insignificant on the world market; it was the variety and quality of Costa Rican coffee that guaranteed its success and it is for this reason that, prior to 1940, the country did not confront serious market or stock problems.

Producer Responses to Price Fluctuations

In 1940, the "Washington Convention" attempted to impose order on the world coffee market; prior to that year there were no quotas limiting Costa Rican coffee exports, and the country was able to sell all that it produced. Hence, in the short run, international price fluctuations did not affect internal production levels.⁸⁸ These were influenced by the care exercised in cultivation and harvest, the use of fertilizers (and eventually irrigation), and especially climate.⁸⁹

In the long run the response to rising international coffee prices was positive. This explains the moderate but continuous expansion of the coffee groves that characterized Costa Rica up to the 1930s. Of course, the simple fact that, since the nineteenth century, Costa Rica had a single-crop economy left it no other real, practical economic alternative—at least as long as there were no restrictions on export volume.

One area that needs to be investigated is the possibilities that existed for increasing domestic food production (and hence replacing imports). Undoubtedly, any such increases were linked to the advance of the agricultural frontier and the process of internal colonization. However, the few studies available do not allow us to draw precise conclusions, either about the economic incentives for domestic food production or their relation to coffee production.

The Problem of Statistical Verification

For Costa Rica, as for Argentina, we confront a problem of sources and statistics. The first coffee census was gathered by the IDC in 1935; thus, in the Costa Rican case, we are forced to begin at a point when the economic structure was already mature and in crisis. In spite of this difficulty, the relatively small size of the area that produced coffee for export allows the use of other sources, such as the property register or notary reports. A few private archives can also still be found, particularly in the processing and marketing companies; these, too, can be consulted.⁹⁰ It is hoped that a detailed reconstruction of the Costa Rican coffee economy from 1850 to 1950 will become available. Still, even with these data, it is most unlikely that it will be possible to test econometric models via the procedures normally used by economists. As for Argentina, simulation and numerical experimentation seem the methods most likely to produce future significant results.⁹¹

CONCLUSIONS

There is a need for a model of economic cycles in Latin American agricultural export economies to be developed; only with such a model can the short- and long-term dynamics of these economies be explained adequately. The model should, of course, be integrated into a larger vision of agro-exporting economies and societies in general; since no such model presently exists capable of providing a framework for *all* the relevant mechanisms and relationships, we must make use of the comparative method as well. Moreover, since the data available for the period from 1880 to 1930 do not allow us to use the standard econometric tests, we have to rely on other forms of proof also. The idea that simple "retrospective econometrics" will be sufficient must be abandoned.

The structural elements of production, such as tenancy and the landholding pattern, are important in export economies; they, too, should be studied more carefully, preferably from a comparative perspective that includes African and Asian examples as well as Latin

American. We still know far too little about these forms. In both Argentina and Costa Rica the organization of production reflected a particularly functional adaptation to the labor market. On the pampas these structural characteristics made direct ownership of the land the basic mechanism of elite social control; in the Costa Rican central valley control was exercised through commercial and financial domination. In both cases economic growth was more a result of incorporating new resources (above all, land) than accumulating capital. Hence producer sensitivity to international price variations was relatively low.

NOTES

1. See, Ernest Labrousse, *Fluctuaciones económicas e historia social* (Madrid: Editorial Tecnos, 1962).
2. Pierre Vilar, "Réflexions sur la 'crise de l'ancien type', 'inégalité des reclus', et 'sous-développement,'" in *Conjonctures économiques et structures sociales, Hommage à Ernest Labrousse* (Paris: École Pratique des Hautes Études, VI section, 1974), pp. 37–38.
3. See, for example, Raúl Prebisch, "El desarrollo económico de América Latina y sus principales problemas," *Boletín Económico para América Latina* 7, no. 1 (feb. 1962). (The original article was published in 1949.) Anibal Pinto Santa Cruz, "La concentración del progreso técnico y de sus frutos en el desarrollo latinoamericano," *El Trimestre Económico*, no. 125 (enero-marzo 1965):3–89.
4. See, for example, Celso Furtado, *La formación económica del Brasil* (México: Fondo de Cultura Económica, 1962), p. 73 and pp. 164–67. It is interesting to note that Samir Amin, although working within a very different theoretical framework, comes to similar conclusions in this respect. See his *L'accumulation à l'échelle mondiale* (Paris/Dakar: Editions Anthropos, 1970), p. 521.
5. For example, a precapitalist mentality has been attributed to Argentine landlords of the pampas region. See Aldo Ferrer, *La economía argentina* (México: F.C.E., 1965), pp. 185–86.
6. See G. Haberler, "Términos del intercambio y desarrollo económico," in *Economía del comercio y desarrollo*, ed. James Theberge (Buenos Aires: Amorrortu, 1971), pp. 377–87; P. T. Ellsworth, "The Terms of Trade between Primary-Producing and Industrial Countries," in *Economic Policy for Development*, ed. I. Livingstone (Hardmonsouth: Penguin Books, 1971), pp. 197–214. A. I. MacBean attempts to demonstrate that terms of trade fluctuations have not seriously affected (in either the short or long run) the growth of national income in underdeveloped countries. See his, *Export Instability and Economic Development* (Cambridge, Mass.: 1966). However, Alfred Maizels immediately demonstrated that MacBean's proof rested on a statistical fallacy. Note his commentary in *American Economic Review* (June 1968):575–80.
7. Cardoso and Faletto, *Dependencia y desarrollo en América Latina* (México: Siglo XXI, 1969).
8. Theotonio dos Santos, *La crisis norteamericana y América Latina* (Santiago de Chile: Prensa Latinoamericana, 1971), the first part, chapter 3, and particularly pp. 81–85.
9. *Ibid.*, pp. 64–65.
10. See, Amartya Kumar Sen, *La selección de técnicas, un aspecto del desarrollo económico planificado* (México: F.C.E., 1969), pp. 92–99.
11. Albert O. Hirschman, "Enfoque generalizado del desarrollo por medio de enlaces, con referencia especial a los productos básicos," *El Trimestre Económico* 44, no. 73 (enero-marzo 1977):100–236. Compare also with studies using the "staple approach" method as applied to Canada and Australia.

12. Joan Robinson, *Essays in the Theory of Economic Growth* (New York: St. Martin's Press, Inc., 1962), p. 34.
13. We have analyzed production and export series data, measured in terms of physical volume, for wheat, corn, and flax in Argentina. We have also examined coffee exportation in Brazil, Costa Rica, Guatemala, and El Salvador. G. L. F. Beckford found a similar trend (Gompertz curve) for cacao exports in Ghana and Nigeria and for rubber exports from Malaya and Indonesia. See, Beckford, "Secular Fluctuations in the Growth of Tropical Agricultural Trade," *Economic Development and Cultural Change* 8, no. 1 (Oct. 1964):80-94.
14. As is well known, Kuznets was the first to note that a logistic function exactly describes the secular trend in production for a variety of products. See S. Kuznets, *Secular Movements of Production and Prices* (Boston: 1930). See also Harold T. Davis, *The Analysis of Economic Time Series* (Bloomington: Cowles Commission, 1941), pp. 15-24.
15. Joseph Schumpeter, *Business Cycles, A Theoretical, Historical and Statistical Analysis of the Capitalist Process* (New York and London: McGraw Hill, 1939); see above all chap. 4 in vol. 1, pp. 130-92.
16. See, Michel Kalecki, *Estudios sobre la teoría de los ciclos económicos* (Barcelona: Ariel, 1970; first published in 1930-33), particularly pp. 21-40; by the same author, "Tendencia y ciclos económicos: una reconsideración," *The Economic Journal* (June 1968), and reprinted in "Homenaje a M. Kalecki," special issue of *Economía y Administración* (Chile: Universidad de Concepción, 1970), pp. 39-55.
17. According to Arun Bose, "a parable or fable in economic theory is a model in which artificial assumptions are introduced relating to objects (entities) that are not observable or are imagined in order to predict a result which will survive even after we abandon the assumptions." *Economía marxiana y postmarxiana* (Madrid: Alianza Editorial, 1976), pp. 23-24.
18. Oskar Lange, *Teoría de la reproducción y acumulación* (Barcelona: Ariel, 1970).
19. Bose, *Economía marxiana*, pp. 24-25. Naturally, here we are referring to the logical possibility of verification. It may be that in many cases the lack of sources will make any real proof difficult or even impossible, and thus limit the reach of theoretical propositions.
20. Concerning this type of model see Witold Kula, *Théorie économique du système féodal* (Paris: Mouton, 1970), above all chaps. 1 and 2. (Siglo XXI has published a Spanish translation.)
21. See Andre Piatier, *Estadística y observación económica*, 2 vols. (Barcelona: Ariel, 1967), 2:135-39.
22. It strikes me that the most typical works adopting this posture are those of Ruy Mauro Marini, *Dialéctica de la dependencia* (México: Editorial ERA, 1974), and of Vania Bambirra, *El capitalismo dependiente latinoamericano* (México: Siglo XXI, 1974). See my critique of Marini in *Estudios Sociales Centroamericanos* (San José, Costa Rica) 10 (enero-abril 1974):149-53.
23. F. H. Cardoso, "The Consumption of Dependency Theory in the United States," *LARR* 12, no. 3 (1977):7-24, provides an excellent summary of the theory's original critical position and evaluates its most recent evolution.
24. This is the period that was most typical of an expanding agro-export economy. About 1914 the geographic limits of agricultural expansion were reached.
25. See, Douglas North, "Ocean Freight Rates and Economic Development, 1750-1913," *Journal of Economic History* 18 (1958).
26. The relatively early process of import substitution was favored by high tariffs (established for fiscal reasons), by rapid urbanization (which stimulated the construction industry, etc.), and by the relatively large size of the internal market, etc. Concerning tariffs, see C. F. Díaz Alejandro's excellent study, chap. 5 of *Essays on the Economic History of the Argentine Republic* (New Haven: Yale University Press, 1970). On the import substitution process see, Vázquez Presedo, *El caso argentino* (Buenos Aires: Eudeba, 1971), chap. 5, and Adolfo Dorfman's classic study, *Historia de la industria argentina* (Buenos Aires: Solar/Hachette, 1970; 1st edition, 1942).

27. Improvement in cattle quality and development of frozen beef exports demanded that cattlemen have available alfalfa fields for feeding the cattle. As the planting of alfalfa on virgin land required prior cultivation of cereals or flax for three or four years, the cattlemen opted to give the land in tenancy for various years, with the tenant committing himself to leave the land, at the termination of the contract, planted with alfalfa.
28. M. Gutelman, *Structures et reformes agraires* (Paris: F. Maspero, 1974), pp. 89–92.
29. The 1921, 1932, 1948, and 1958 laws concerning tenancy and sharecropping regulated contract duration and other aspects. In 1943, supplementary legislation postponed and froze rents, continuing in effect until 1967 when derogated by Law No. 17253. Because of inflation, the real level of rents was reduced considerably.
30. This continued to be true in spite of policies unfavorable to the landowners, such as the postponement and freezing of rents, mentioned above. The nature of the cattle farm was such that even with very low yields per unit of area, the overall profit level could continue to be considerable.
31. See the data on loans, discounts, and advances on current accounts in *El Banco de la Nación Argentina en su cincuentenario* (Buenos Aires, 1941), fols. 257–58, and Joseph S. Tulchin's study, "El crédito agrario en la Argentina, 1910–1926," *Desarrollo Económico* 18, no. 71 (oct.–dic. 1978):381–408.
32. See the data on Law No. 9644 and resulting loans in *Banco de la Nación*, fols. 263–64, and in the *Censo Agropecuario Nacional de 1937*.
33. See, James R. Scobie, *Revolución en las Pampas, Historia social del trigo argentino, 1860–1910* (Buenos Aires: Solar/Hachette, 1968), chap. 6; Héctor Pérez Brignoli, *Agriculture capitaliste et commerce des graines en Argentine (1880–1955)*, Etude d'histoire économique, tesis de 3^{er} ciclo (Université de Paris I, 1975), 2 vols.
34. John Williams, *El comercio internacional argentino en un régimen de papel moneda inconvertible, 1880–1920*, trans R. Prebish (Buenos Aires: Facultad de Ciencias Económicas, Universidad de Buenos Aires, 1922).
35. See Ricardo M. Ortiz, *Historia económica de la Argentina* (Buenos Aires: Ed. Plus-Ultra, 1971), 2da edición, tomo 1, p. 329; John Williams, *El comercio*, pp. 835ff; A. G. Ford, *El patrón oro: 1880–1914* (England and Buenos Aires: Instituto di Tella, 1966), pp. 157ff.
36. Lucio Geller, "Política cambiaria argentina, 1899 y 1914." X Reunión anual de la Asociación Argentina de Economía Política, Mar del Plata, 3–5 November 1975. Mimeographed.
37. *Ibid.*, pp. 14–32.
38. We should also note that beginning with the 1890s a degree of regional specialization emerged on the pampas, responding in part to ecological conditions. Wheat predominated in the west and south, corn in the north, and alfalfa in the west, where cattle were wintered. The center-east was used above all for raising cattle, and the belt around the federal capital for dairy and truck farming.
39. Production costs can be studied by two methods: parity prices, and direct surveys of producers. A study using the former for the period 1935–57 is Antonio J. Vilá, *Precios de paridad para productos agrícolas en la Argentina, 1935–57* (Buenos Aires: Asociación Argentina de Productores Agrícolas, 1958). There are also official statistics for the period beginning in 1960. For the earlier period there are as well a few extremely detailed agricultural surveys. Among the most important are: Hugo Miatello, *Investigación agrícola en la Provincia de Santa Fe* (Buenos Aires: Anales del Ministerio de Agricultura, vol. 1, 1904); Ricardo Huergo, *Investigación agrícola en la región septentrional de la Provincia de Buenos Aires* (Buenos Aires: Ministerio de Agricultura, 1904); *Investigación parlamentaria sobre agricultura, ganadería, industrias derivadas y colonización*, ordenada por la Cámara de Diputados de la Nación en 1896, various vols. (Buenos Aires, 1896–99). The last focuses principally on the first years of the twentieth century. Unfortunately the gap between these years and 1935 is difficult to fill. It seems that there were no studies of production costs during this period.
40. *Investigación parlamentaria*, anexo B, p. 56. The calculus does not include tenants

- plots, and it assumes a farm unit of 100 hectares and average yields of 10 qt/ha. The salaries of the farmer and his family were also included.
41. Miatello, *Investigación*, p. 298. The calculus is based on a 100 has. unit, but does not take into account the salaries of the farmer and his family.
 42. *Investigación parlamentaria*, anexo B., pp. 57–58. Yields of 27 qt/ha are assumed. Otherwise the conditions are the same as those in note 40.
 43. Miatello, *Investigación*, p. 410. Yields of 30 qt/ha and 100 has. units, farmed directly by the owners, are assumed. The salaries of the farmer and his family are not included.
 44. Average production costs per hectare were considered (*Investigación parlamentaria*, Anexo B, p. 68) as well as average rents of 5 pesos (paper) per hectare (p. 208).
 45. Huergo, *Investigación agrícola*, pp. 207, 210–11. The western end of the north of Buenos Aires province was used as an example. Rents were much higher along the border with Santa Fe, and in the case of corn actually reached 36 percent of total costs. *Ibid.*, p. 208.
 46. Miatello, *Investigación*, p. 298. The calculus is applied to wheat. See our comments in note 41.
 47. *Ibid.*, pp. 298, 361, 410. We do, however, have some data for Santa Fe. For the period from 1899 to 1904, railroad transport costs for an average distance of 100 kms represented at the shipping port 8 percent of the total costs per quintal for wheat, 6 percent for flax, and 9 percent for corn.
 48. For an analysis of usurious credit and its impact on precapitalist peasant economies, see Amit Bhaduri, "A Study in Agricultural Backwardness under Semi-Feudalism," *The Economic Journal* 83, no. 329 (Mar. 1973):120–37, and Tulchin, "El crédito agrario."
 49. *Censo Agropecuario Nacional de 1937: Economía rural*, appendixes 4 and 5.
 50. For data on land costs in Buenos Aires province over the period from 1902 to 1964, see *Anuario de la Sociedad Rural Argentina* (Buenos Aires), no. 1 (1928), p. 360; *Censo Agropecuario Nacional de 1937*; D. Fienup and others, *El desarrollo agropecuario argentino y sus perspectivas* (Buenos Aires: Instituto Di Tella, 1972), pp. 352–55.
 51. Miatello, *Investigación*, p. 122.
 52. Juan Alvarez, "La huelga de agricultores," *La Nación* (Buenos Aires), 11 August 1912, p. 8.
 53. Lázaro Nemirovsky, *Estructura económica y orientación política de la agricultura en la República Argentina* (Buenos Aires, 1933), pp. 107 and 110.
 54. *Ibid.*, p. 110.
 55. Miatello, *Investigación*, p. 300.
 56. Concerning these characteristics of peasant economics, see A. V. Chayanov, *The Theory of Peasant Economy*, eds. Daniel Thorner, Basile Kerblay and R. E. F. Smith (Homewood, Ill.: Irvin, 1966); Teodor Shanin, "The Nature and Logic of the Peasant Economy," *Journal of Peasant Studies* 1, no. 2 (Jan. 1974):63–80, 186–206.
 57. Emilio Lahitte, *Informes y estudios de la División de Estadística y Economía Rural* (Buenos Aires: Ministerio de Agricultura, 1908), p. 315.
 58. We are referring to preference policies adopted by the United Kingdom following the Imperial Conference at Ottawa in 1932. Between 1932 and 1935 Great Britain signed seventeen bilateral trade agreements fixing quotas on its traditional suppliers.
 59. The best known example of these policies was the famous Roca-Runciman treaty. For a careful analysis of this pact, see Pedro Skupch's article in Marta Panaia et al., *Estudios sobre los orígenes del peronismo* 2 (Buenos Aires: Siglo XXI, 1973), pp. 36–44.
 60. It is worth remembering that price and income elasticity of the demand for beef in Argentina were very low. See Alieto A. Guadagni, "Estudio econométrico del consumo de carne vacuna en la Argentina en el período 1914–1959," *Desarrollo económico* 3, no. 4 (enero-marzo 1964) and Alieto Guadagni and Alberto Petreceolla, "La función de demanda de carne vacuna en la Argentina en el período 1935–1961," *El Trimestre Económico* (abril–jun. 1965).
 61. It should be noted that industrial expansion between 1880 and 1930 occurred at a rate practically equivalent to that achieved in the following period. The most recent

- studies tend to argue for much greater continuity in the industrialization process than has traditionally been maintained. See, Lucio Geller, "El crecimiento industrial argentino hasta 1914 y la teoría del bien primario exportable," *El Trimestre Económico* (México), no. 148 (oct.-dic. 1970):763-811; Ezequiel Gallo, "Agrarian Expansion and Industrial Development in Argentina (1880-1930)," Documento de Trabajo no. 70, Instituto Di Tella, Buenos Aires, 1970. Mimeograph.
62. Horacio Giberti, *El desarrollo agrario argentino* (Buenos Aires: Eudeba, 1964), pp. 72-79; CIDA, *Tenencia de la tierra y desarrollo socioeconómico del sector agrícola argentino* (Washington, D.C.: Unión Panamericana. O.E.A., 1965), pp. 104-5.
 63. Relatively low food prices seem to have been one of the basic conditions for Argentine industrial growth.
 64. On these points see Fienup et al., *El desarrollo agropecuario*; for a more critical analysis, Guillermo Flichman, *La renta del suelo y el desarrollo agrario argentino* (México: Siglo XXI, 1977).
 65. See, for example, Robert M. Stern, "The Price Responsiveness of Primary Producers," *Review of Economics and Statistics* (May 1962):202-7; Helen C. Farnsworth and William O. Jones, "Response of Wheat Growers to Price Changes: Appropriate or Perverse?" *Economic Journal* 66 (June 1965):271-87.
 66. The choice also depends on geographic zone. In the cattle raising zone (the center and east of Buenos Aires Province), tenancy was always important in cattle production.
 67. See Wilfred Malenbaum, *The World Wheat Economy, 1885-1939* (Cambridge, Mass.: Harvard University Press, 1953), p. 26.
 68. On this method, see Oscar Varsavsky and Eric Calcagno, *América Latina, modelos matemáticos* (Santiago de Chile: Editorial Universitaria, 1971); Osvaldo Néstor Feinstein, "Modelos económicos cuantitativos y experimentación numérica," San José, Costa Rica, 1977. Mimeograph.
 69. This proposal is somewhat similar to the procedure adopted by Ernest Labrousse (see Labrousse, *Fluctuaciones*, pp. 181-229) to study the evolution of "unit rent," that is, the rent per unit of area. Labrousse, however, uses different hypotheses regarding yields (because he lacked precise production estimates) and the costs involved in each kind of farm. By counterposing these with the movement in product prices one obtains acceptable estimates of changing incomes. These aid in understanding concrete cases.
 70. Unlike in the Argentine case, the bibliography available on this theme is very limited. A large part of what follows is based on Carolyn Hall, *El café y el desarrollo histórico-geográfico de Costa Rica* (San José, Costa Rica: Editorial Costa Rica/Universidad Nacional, 1976); Ciro F. S. Cardoso, "La formación de la hacienda cafetalera en Costa Rica (siglo XIX)," *Estudios Sociales Centroamericanos* no. 6 (set.-dic. 1973):22-48.
 71. Hall, *El café*, pp. 47-49.
 72. *Ibid.*, pp. 84ff; Yolanda Baires Martínez, *Las transacciones inmobiliarias en el Valle Central y la expansión cafetalera de Costa Rica (1800-1850)*, Avances de investigación No. 1, Proyecto de Historia Económica y Social de Costa Rica, Universidad de Costa Rica, 1976.
 73. Note also that Costa Rica specialized in highland coffee of a soft variety, that is, the coffee of highest quality. This "qualitative" specialization implied also a need for maximum care in the entire process of cultivating, harvesting, and shelling.
 74. The Costa Rican "colonial heritage" did not leave behind forms of forced labor or a dependent peasantry. The very scant development and marginal character of the area permitted, in contrast, the emergence of a relatively egalitarian society, although one in which equality was made possible by generalized poverty.
 75. After 1840 a number of entrepreneurs were able to conceive and perfect a variety of processing machines. These techniques were imitated later in other countries where coffee became an important crop. See Ciro F. S. Cardoso, "La formación," p. 37 and the same author's "Historia económica del café en centroamérica (siglo XIX): estudio

- comparativo," *Estudios Sociales Centroamericanos*, No. 10 (enero-abr. 1975):36-41.
76. On this point, and for a detailed description of the cafetaleros as a social group, see Samuel Stone, *La dinastía de los conquistadores* (San José: EDUCA, 1975).
77. Given the lack of capital, coffee expansion at first seems to have been financed through buying land by mortgaging future harvests. At least in the *Protocolos Notariales* of San José for 1800-1850 a number of transactions of this type are registered.
78. Hall, *El café*, chap. 3.
79. Cardoso, "La formación," p. 31; "Historia económica," pp. 24-27.
80. See Cardoso, "Historia económica"; David Browning, *El Salvador, la tierra y el hombre* (San Salvador: Ministerio de Educación, 1975).
81. See, Cardoso, "Historia económica"; Julio C. Cambranes, *Aspectos del desarrollo económico y social de Guatemala, a la luz de las fuentes históricas alemanas* (Guatemala: Universidad de San Carlos, 1975); Sanford Mosk, "Economía cafetalera de Guatemala durante el período 1850-1918," *Economía de Guatemala* (Guatemala: Seminario de Integración Social Guatemalteca, 1958), pp. 161-82.
82. The argument that we are developing suggests that on the frontier the economic cost of land is nil.
83. See Héctor Pérez Brignoli, "Las variables demográficas en las economías de exportación: el ejemplo del Valle Central de Costa Rica (1800-1850)," Paper presented at the seminar on "Modos de producción y dinámica de la población," Instituto de Investigaciones Sociales, UNAM, Cuernavaca, April 1978.
84. The extent to which single crop characteristics had come to predominate is revealed even more clearly when one notes that between 1920 and 1930 the cultivation of bananas was reduced because of a series of factors we do not need to examine here.
85. We should also emphasize the development of the cooperative movement, above all in the beneficio. See Hall, *El café*, p. 165.
86. Ministerio de Agricultura y Oficina del Café, *Costos de producción del café en Costa Rica* (San José, 1968).
87. Note that there is a fundamental difference between these results and those found by the CIDA studies for agriculture in Argentina, Brazil, Colombia, Chile, Ecuador, Guatemala, and Peru. In these it was shown that, for 1950-60, upon increasing unit size, productivity per unit of area was drastically reduced. "Medium" sized farms were those that used resources most intensively. See Solon L. Barraclough and Arthur L. Domike, "Agrarian Structure in Seven Latin American Countries," in *Agrarian Problems and Peasant Movements in Latin America*, Rodolfo Stavenhagen, ed. (New York: Anchor Books, 1970), pp. 41-94.
88. See Carlos Merz, "Reflexiones sobre estructura, ritmo y dinámica de la economía de los países de Centroamérica," *Revista del Instituto de Defensa del Café* (San José) (enero 1948):475-92.
89. Above all, regular rain when the plant is flowering and dry weather for the harvest. In the *Boletín de Fomento* (feb. 1911), p. 150, are found statistics for 1854-1910 that show the importance of these factors on coffee harvest volume.
90. See Carolyn Hall, *Cóncavas. Formación de una hacienda cafetalera, 1889-1911* (San José: Editorial Universidad de Costa Rica, 1978); Gertrude Peters Solórzano, "La formación territorial de las grandes fincas de café en la Meseta Central: estudio de la firma Tournon (1877-1955)," (Tesis de grado, Universidad de Costa Rica, 1979).
91. Shortly after we finished this text we had the happy surprise of receiving a draft from Guillermo Flichman and Francisco Garra, "Una vez más acerca del problema de la asignación de recursos en el sector agropecuario pampeano (o por qué Pergamino no es Iowa)," Buenos Aires, draft for discussion, 1978. Mimeograph. It uses a methodology similar to the one we have proposed. [Now published, along with Francisco Garra, "La programación lineal en agricultura. El modelo 'PERGAMIN'," *Estudios CEDES* 1, no. 4/5 (1979).—Ed.]