THE ROLE OF AGRICULTURE IN THE 
ECONOMIC DEVELOPMENT OF HUNGARY, 1867-1913

by

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ABSTRACT

THE ROLE OF AGRICULTURE IN THE ECONOMIC DEVELOPMENT OF HUNGARY, 1867-1913
Scott M. Eddie
Submitted to the Department of Economics on May 10, 1967, in partial fulfillment of the requirement for the degree of Doctor of Philosophy

This study attempts a quantitative analysis of the question "Was the large-estate dominated agriculture of Hungary a barrier to economic progress?" The performance of Hungarian agriculture is discussed with respect to the following five potential contributions which agriculture could make to general economic development: 1) expand output to meet increased demands for farm products; 2) earn or save foreign exchange; 3) release labor to the industrial sector; 4) provide a source of capital for investment in nonagriculture, including social overheads, and 5) stimulate the industrial sector through increased demand for industrial products.

In the course of the investigation, there are developed and presented estimates of crop output, both in the aggregate and by single crops or groups of crops, and the output of animal products. Estimates of population and labor force trends are also presented, along with calculations of real and money wages and the growth of gross output and of labor productivity in agriculture during the years 1870-1913 and for some sub-intervals of that period. An attempt is also made to estimate the price-elasticity of supply in the short run for the five major grain crops: wheat, rye, barley, oats, and corn. In addition, numerous data on landholding, exports, imports, and prices are included.

The final chapter of the study contains a summary of the preceding chapters and an exposition of the main conclusions derived from the available evidence, both quantitative and qualitative. The answer to the central question of the investigation is that it appears that contrary to the generally-accepted historical opinion, agriculture was not a major obstacle to economic growth in Hungary, and in fact its contributions to development compare favorably to those of agriculture in the United States, Great Britain, Germany, and some other countries at similar stages of their economic development.

Thesis Supervisor: Evsey D. Domar
Title: Professor of Economics
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Chapter I: INTRODUCTION

Much of the literature on both the theory and strategy of economic development includes particular stress on the necessity of an "agricultural revolution" to the long-run success of any industrialization effort. The increase of productivity in the agricultural sector is regarded to be of paramount importance. The policy recommendations toward this goal range from giving the farmers better credit facilities on to the provision of technical assistance, and culminate in the most drastic "solution" to the agrarian problem, land redistribution (either to individuals or to collectives). These discussions almost uniformly assume a model in which - from the onset of the development program, at least - the basic unit of farm land is operated either by the peasant family (whether individual or "extended") or by some sort of cooperative society.¹ This tends to ignore or to consider "unworkable" for development purposes a numerically less significant, but nevertheless important model - one in which large private estates operated as large enterprises (rather than being let in parcels to a numerous peasantry) dominate, with or without a sizable group of independent peasant producers.

The large-estate form of rural organization is notorious for stubborn resistance to land reform and to many other forms of agricultural change. What is not firmly established, however, is whether or not such a farm sector
really presents an insuperable obstacle to modern economic growth. This question is of particular moment in much of Latin America, and the economic historian is fortunate in having, in several European countries, examples of similar land tenure situations which he may study in the hope of helping to point the way toward an answer.

Perhaps the archetype of the quasi-feudalistic latifundia system was found in Hungary before the First World War, and indeed continued to exist and to resist successfully any effort toward significant land reform until after the end of World War II - a scant two decades ago. Hungary, then, would be a good place to start the inquiry - if it could be shown that the agricultural sector which serves as the "horrible example" nevertheless was not a major obstacle to general economic growth, then there could be some room for optimism in countries with a similar, but perhaps less atavistic, organization of their own farm sector.

This inquiry will attempt to determine an answer to the question "Was the agriculture of pre-World War I Hungary a deterrent to the nation's economic growth?" It will proceed by using a standard analytical framework which sets out the possible contributions agriculture can make to overall economic growth, and then will try to establish quantitatively, from available data, whether or not Hungarian agriculture in the period under
review did or did not fail in making these contributions. Finally, it will attempt a brief assessment of the relevance of the Hungarian experience for some currently-developing countries.

A. Introductory description

The Hungary with which this study in concerned is not the small country we know today, but rather the land which was the eastern half of the Austro-Hungarian (Dual) Monarchy, so-called "historic Hungary", a country three times the size of the present state. Historic Hungary occupied an extremely well-delineated geographic area, being encircled on three sides by the arch of the lower Alps and Carpathian mountains, and bounded on the fourth by the Drava and Danube Rivers. The hydrographic map of Hungary is completely dominated by the Danube and its tributaries, there being only two streams in the whole country not belonging to the Danube system.

The period chosen for study begins with the Compromise of 1867, which restored constitutional government to the Hungarians and allowed them to govern their own internal affairs (including economic and social development), and it ends at the First World War. Hungary used this era of Dualism (derived from the idea of the Dual Monarchy - the Emperor of Austria was also King of Hungary) to take the first major steps on the
road to industrialization.

This was the period of railroad building in the Kingdom of Hungary. Starting with the 2700 kilometers extant in 1868, the length of line was increased eightfold by 1913, to 22,000 kilometers, virtually completing the Hungarian railway network. The State, which was the guiding force in this movement, also encouraged other industry, using tax exemptions, preferential shipping rates, State purchases, and direct subsidies. The weapon of protection could not be employed, however, since Austro-Hungary formed a customs union with no internal tariffs. Austria was the most important market for Hungarian goods, taking about 70 percent of Hungary’s exports. These exports reflected both Hungary’s dependence on agriculture and its beginnings of industrialization – wheat, flour, sugar, meat, and livestock accounted for 55 percent of her export trade in the three decades before the War. This will be dealt with in more detail in chapter 4.

Pre-World War I Hungary divides into five main regions of four different types: Transylvania and the Northwest are characterized by hilly and mountainous terrain; the North (so-called Upper Hungary) is an area of heavily-wooded mountains; the Great Hungarian Plain, or Alföld, stretches from the Danube eastward to the foothills of the Transylvanian mountains; whereas westward from the Danube we find
the terrain of gentle hills and plains known as Trans-Danubia. The latter two are the leading agricultural regions.

The climate shows considerable uniformity in the Danube basin (especially in the plains) as regards temperature, the yearly mean over most of the area being generally 10-12 degrees Centigrade. Rainfall ranges typically between 22 and 28 inches per annum on the average, tending to increase as one moves West. The distribution of rainfall normally reaches peaks in June and October or November (this later peak favorable for sowing winter wheat), whereas the summers are often dry and exhibit rather extreme daily temperature fluctuations. One unfortunate characteristic of the area, the wide variation in rainfall from year to year, is a derivative of the "continental" location of the country.

The soil of the Great Plain is generally rich dark-brown prairie soil (tchernozem - the same type as generally found in the so-called Black Soil region of Russia), except for two sandy sections found in the area between the Danube and Tisza rivers and in the Northeast. In the other principal agricultural region west of the Danube the soil is generally a dark- or reddish-brown sylvan type, less rich in humus and less fertile than that of the $Alf sól$.  

Hungary ranked seventh among the nations of Europe in total population in 1910, with 18.3 millions in Hungary proper (see note 1 above) and another 2.6 millions in Croatia-Slavonia. The proportion of this population dependent on agriculture for its living, having been 75 percent in 1870, stood at less than 63 percent in 1910. This agricultural population tended to congregate in the agricultural areas into large country towns, in a pattern similar to that observed in the Ukraine and North Caucasus regions of Russia. The ownership of the agricultural land was of a bipolar type - so-called minifundia and latifundia - and will be discussed in detail in chapter 2. The principal crops were cereal grains, and the raising of livestock was also an important endeavor.

B. Statement of hypothesis to be tested

Not only was the distribution of landed property in Hungary distinctly bipolar in nature during the period under review, there was also no amelioration of this condition until the land reform following World War II. The dominant opinion among historians as well as contemporary observers of this period of Hungarian development is that the land tenure system of agriculture was the primary obstacle in the path of social and economic development after Hungary achieved internal autonomy within the Austrian Empire with the Compromise of 1867. Thus we read statements such as the following
from a prominent historian:

The reign of the big landed estates was luxuriant in both parts of the monarchy and assumed a really pathological extension in the Hungarian countries... Naturally the county elections were controlled even more efficiently by the landed aristocracy than the national elections... and the control of the counties was an excellent opportunity to give elegant and remunerative jobs for their less talented members or for those who squandered their patrimonial possession... The roughness and corruption of the county officials was almost proverbial and their own press organ wrote repeatedly that the Hungarian administration was "sick and impotent... an eternal obstacle to the development of the nation..."
The system of the large estates by their antiquated method of production hindered the accumulation of capital and the development of city life... The dangerous emigration which it created... caused the empire to lose its most active, most courageous, most enterprising human material. The beneficiaries of the system impeded purposely the increasing of agricultural production and the exploitation of the chief resources of agricultural land, in order to enjoy more fully the effects of protective tariffs. This policy became... the deepest cause of cultural and social stagnation... The Monarchy was an atavism in Europe and... the skeleton of this political ichthyosaur was formed by the system of the large feudal estates. 15

or, from the account of a contemporary English observer:

There seems reason for the belief that little progress will be made so long as the subdivision of peasant properties and the increase of large properties (Latifundium), especially entailed estates is allowed to continue, and so long as middle-sized properties do not increase in number. 16

or, from the pen of a Marxist historian,

The landowners, chiefly the large-estate-owning class, made use... of the advantages secured through Dualism.
They preserved their estates of feudal origin, the basis of their class dominance... even at the end of the century, although the liquidation of this relic out of the Middle Ages would have hastened the development of capitalism, and within that agrarian capitalism, in Hungary. They supported the dependent relation /to Austria/ and an important element of it, the common customs territory, because an independent customs territory would have endangered the position of the Austro-Hungarian Monarchy as a great power. Further, they secured from the common customs territory and in general from the class ties with the Austro-Hungarian finance capital /Grosskapital/... significant advantages for overcoming the crisis, although the preservation of this dependent status was an important barrier to the further development of the whole nation. They also preserved and extended the oppression of the nationalities because, through the increased exploitation of the nationalities resident in Hungary... they could obtain an extra profit, to which, at the time of agrarian crisis in the previous century, they were not indifferent. What an advantageous position for the great estates and what a hindrance for national and democratic development! 17

For a more detailed economic assessment of such statements, two items require prior consideration: a) an analytical framework must be established, within which the alleged failure to contribute to overall economic development can be evaluated, and b) it must be established that during the period in question, the landownership structure did not change in a direction which would obscure its alleged force as a growth-inhibiting factor. The general considerations of the role agriculture can play in economic development are outlined in the next section of this chapter, followed by a short section setting out the general line of questioning
to be followed concerning the structure of landownership and its effects on the contribution of agriculture. The empirical analysis of the landownership pattern in Hungary is contained in chapter 2.

C. The role of agriculture in economic development

1. General considerations

Agriculture has been singled out for special treatment, apart from that of other specific industries, in the literature of economic under-development for three main reasons. First of all, sheer size is important: at the beginning of the process of economic growth agriculture is often the only substantial sector. Second, the variability of production, due to the importance of weather as a determinant of output, means that large changes in the level of GNP and hence in the level of living of most of the population result from fluctuations in agricultural output. Modern economic development also entails great structural change: almost by definition, this process means a continuing and permanent decline in the relative importance of the agricultural sector in the economy, a third motive for particular emphasis.

Yet a fourth reason might be offered for focusing special attention on agriculture - it seems to follow "laws" of production different from
those of non-agriculture. Considerations of scale economies appear much less important in agriculture, for example; further, the importance of the passage of time to production assumes proportions so different in the two sectors as to be almost a contrast in kind rather than degree. Despite the differences in these "laws" of production, however, the tools of economic analysis are as applicable to the study of the contribution of agriculture to economic development as to that of any other sector. Thus, although the conditions within which such study is undertaken may vary considerably, the general mode of analysis is still operable.

According to the focus of one's research, different schemata could be put forward for the organization of knowledge of the inter-relationship between agriculture and the industrial sectors of an economy. Since this study is concerned with attempting to assess whether or not Hungarian agriculture was a drag on the economic growth of that country in the period under review, a very standard sort of analysis in terms of the different ways agriculture can contribute (or fail to contribute) to economic development seems most appropriate.
2. The contributions of agriculture to general economic development

   a. The Kuznets schema.

   Professor Kuznets identifies three components which he calls the "product", "market", and "factor" contributions. The first is merely the share of the increment to total national output (or to per capita output) accounted for by the increase in agricultural production in a given time period. The second, or "market", contribution involves providing growth and trade opportunities for other sectors of the economy, while the third treats the release of productive resources from agriculture for use in non-agriculture. In parts 1, 2, and 3, I shall briefly describe Professor Kuznets' analysis, saving criticism for section 4.

   1). The product contribution

   The increment in total product, \( \Delta P \), equals \( \Delta P_a + \Delta P_b \), where \( a \) and \( b \) stand for agriculture and non-agriculture respectively. Let \( r_a \) and \( r_b \) be the rates of growth of these two sectors. Then \( \Delta P = P_a r_a + P_b r_b \), and the product contribution of agriculture is

   \[
   \frac{P_a r_a}{\Delta P} = \frac{1}{1 + \left( \frac{P_b}{P_a} \times \frac{r_b}{r_a} \right)}
   \]  (1.1)

   As industrialization proceeds, there is a shift out of agriculture (i.e., \( P_b/P_a \) rises), implying that the proportional contribution of agriculture to the
growth of GNP will fall, unless \( r_b/r_a \) declines to offset it. The ratio \( r_b/r_a \) is unlikely to fall in the early stages of development - indeed the normal expectation would be that it should rise. (Note that in the mathematically - but certainly not economically - trivial case where \( r_a = 0 \), an acceleration in the growth of non-agriculture will not be noticed in the ratio. Should agriculture be in absolute decline, i.e., \( r_a < 0 \), an increase in \( r_b \) will bring about a decrease in \( r_b/r_a \), so long as \( r_b \) is positive.) The increase in \( r_b/r_a \) reinforces the rise in \( P_b/P_a \), imparting an even more rapid fall in the proportional contribution of agriculture to GNP.

Of paramount concern to the development economist, however, is the course of per capita output, \( P/L \), where \( L \) stands for the total labor force. Breaking this latter into its sectoral components, we have \( L = L_a + L_b \). Using superscripts to denote time periods, we are now concerned with the contribution of agriculture to

\[
\Delta (P/L) = (P^1/L^1) - (P^0/L^0)
\]

or

\[
\Delta \left( \frac{P}{L} \right) = \Delta \left( \frac{P_a}{L_a} \right) \times \left( \frac{L_a}{L^1} \right) + \Delta \left( \frac{P_b}{L_b} \right) \times \left( \frac{L_b}{L^1} \right) + \left( \frac{P_b^0}{L_b^0} - \frac{P_a^0}{L_a^0} \right) \times \Delta \left( \frac{L_b}{L} \right)
\]

(1.3)

The "normal" relation of average productivity, observed even in advanced countries, is \( P_b/L_b > P_a/L_a \). Further, it is unlikely (but not,
of course, impossible) that the rate of growth of $P_b / L_b$ would be less than that of $P_a / L_a$ in an underdeveloped economy, so we come to a conclusion about per capita product similar to that already reached about total product, viz., the shift out of agriculture (the decline of $L_a / L$) means, in the absence of an offset through a greater rate of growth of average productivity in agriculture, that agriculture's contribution to per capita GNP steadily declines as economic growth proceeds. An element of the ambiguity referred to in footnote 4 above is evident in equation 1.3, however - the third term on the right-hand side, $(P_b^0 / L_b^0 - P_a^0 / L_a^0) \times (L_b / L)$, involving as it does the shift and difference in relative shares of the labor force between agriculture and non-agriculture, cannot be apportioned in any precise manner between them. In empirical work, opines Kuznets, this term is not likely to be very large, especially if the time period is short. In an historical study covering a long time span, however, it is much more dangerous to ignore this term, and it will need to be kept in mind in later chapters.

\[ \text{2}: \text{The market contribution}^{26} \]

The market contribution can be made in two ways: from the demand side through purchases from other sectors, and from the supply
side through sales of agricultural products to non-agricultural sectors.

Kuznets suggests that since development of the non-agricultural sectors of the economy is often the primary concern of policy in low-income countries, a measure of this contribution could be obtained by comparing the non-agricultural sectors in the country providing production goods to agriculture with all the non-agricultural sectors. In other words, the percentage of the growth in output of all non-agricultural sectors... accounted for by the... plants that provide the production goods to agriculture, would measure the proportional contribution which marketization of the production process in agriculture made to the industrialization aspects of economic growth within the country. 27

Or, if the main concern is the increase in agricultural net product not consumed within agriculture 28 then "The contribution to economic growth here is the release of a larger proportion of the net product of agriculture as a basis for demand for consumer goods (or, to a more limited extent, of producer goods) from other sectors in the economy and from foreign countries." 29

The character of the other party to a market dealing with agriculture is also of importance:

The market contribution to economic growth will be the greater the higher the growth inducing power of the trading partners whose cooperation via the market is being secured. The same volume of purchases by agriculture from a host of village carpenters, blacksmiths, etc., and from a factory that produces agricultural machinery by advanced methods, will have different impacts on the growth not only of the non-agricultural sectors of the economy but also of agriculture itself. 30
It is here that exports of agricultural products are important as quid pro quo for imports of equipment from already-advanced countries.

Here too, as in the previous section, we find the contribution of agriculture declining as development proceeds, for "...once growth occurs and is accompanied by a decline in the shares of agriculture in both product and labor force, the increased productivity per worker in agriculture reflected in these trends assures an increasing proportion of marketed agricultural net product and at the same time a decreasing proportional contribution of such marketings to the total product of the economy." 31

3). The factor contribution 32

This contribution involves primarily the transfer of labor and savings from agriculture to non-agriculture. The transfer of labor is considered easy (but not automatic) under Lewis-type 33 unlimited supply of labor conditions, which Kuznets feels will be applicable for most countries, especially in the early stages of development, since historical evidence shows rural natural rates of population increase tend to exceed those in urban areas, and even a small relative decrease in agricultural population would imply the shifting of large numbers of people. 34
Agricultural savings are important to capital formation in non-agriculture, especially at first, if only from consideration of sheer size (reinvestment of profits of industry cannot be a major source of capital formation if the industrial sector is tiny, especially if social overhead requirements are heavy). The mechanism of transfer is of some importance (whether voluntary or coercive, for example), as is the amount of capital transferred in the form of investment in the training and rearing of workers who leave agriculture for other sectors.

Thus the factor contribution to non-agricultural development is likely to be large in the early stages of growth, but it most certainly will decline as the share of agriculture in labor force and income decline. For example, rather late in the development process, the absolute number of persons in agriculture will decline, but even though the transfer is a large fraction of the agricultural labor force, this latter is so small in relation to the number of non-agricultural workers that the transfer would represent "only minor fractional additions" to the non-agricultural labor force.

4). Criticism of the Kuznets approach

Professor Kuznets, while presenting a schema useful in several aspects - especially as regards the quantification of some components
of agriculture's contribution to the growth process - fails to take into account the relationships between and among the various contributions. Because agriculture can play its role in overall economic development in two conceptually distinct ways - through its own growth or through contributions to the growth of other sectors - a failure to distinguish clearly between agriculture-led growth and agriculture-supported growth leads to some ambiguities in the Kuznets formulation. Further, it is necessary in any schema to clarify the relation among the demand and supply aspects of agriculture's role in economic development, something which Professor Kuznets fails to take into account.

In the case of agriculture-led growth, an increase in effective demand (in the export market, for example) may stimulate rapid expansion of agricultural output. (Many economists are skeptical that such expansion can form the basis of long-run growth, because of the alleged instability of export markets for primary commodities and small growth potential of domestic markets for food.) On the supply side, the growth potential of agriculture depends upon the ability to increase and maintain input productivity through technological change, as well as upon the available supplies of the various inputs.

If we examine the case of agriculture-supported growth, we see the demand and supply contributions from a different viewpoint.
The principal element of the demand contribution is provision of a market for the consumer and producer goods of the non-agricultural sector. The primary consideration in the supply contribution is the transfer of real resources – food, raw materials, labor and other factors of production – out of the agricultural sector. Within either the demand or supply contributions there may be internal conflict: for example, that portion of agricultural incomes spent on industrial consumer goods reduces the re-investible surplus needed for continued expansion. There may also be conflicts between demand and supply contributions – a policy of maintaining high incomes in agriculture in order that there be a large market for the products of industry may hinder the transfer of resources from agriculture to non-agriculture.

The existence of competitive goals is only one side of the coin. Complementary relations must also be considered. The following paragraph from a standard text on economic development states the problem succinctly (and in the process sounds almost as if it were written in direct criticism of the Kuznets approach):

Note that some of these functions are complementary, but others are competitive. If a peasant or farmer sells his output abroad, he cannot sell it at home. And if he spends his income on industrial products, he cannot save it or pay it to the government in taxes. After those workers with zero net physical product have left the farm, the farmer cannot at the same time maintain his spending, saving and
taxpaying and release more labor, unless he improves either his terms of trade or his productivity; and any increase in productivity at constant terms of trade cannot be used more than once in freeing labor, adding to demand for industrial products, adding to the supply of savings, or paying more taxes. 36

Complementary relations also exist in the Kuznets formulation. For example, any shortfall in the product contribution, because of the restriction this puts on both income and output (or marketable surplus) of the agricultural sector, necessarily must be accompanied by a shortfall in the factor or market contributions, or both. After the manner of Professor Kindleberger, we could say "Income the farmer does not earn cannot be saved, spent on industrial products, or paid in taxes, and output he does not produce cannot be sold abroad or used to feed workers in the industrial sector." Here again the terms of trade between agriculture and industry become important, since a change in relative prices in favor of agriculture could offset such a shortfall in production. But in such a case, costs in the non-agricultural sector must necessarily rise unless some additional external aid beyond any currently received becomes available, both because the real cost of food and other raw materials to the industrial sector has increased and because it now would be more difficult to attract labor from the rural areas. 37 This will almost certainly slow down development, except in the unlikely case that with the change in relative income, the rural savings rate is sufficiently higher
than the rate among urban dwellers to allow for an increase in the
rate of capital formation and technological progress sufficient to
offset the cost increase. This, in turn, assumes a reasonably efficient
mechanism for the transfer of these augmented agricultural savings for
investment in the industrial sector (and why should we not expect at
least a part to be invested in agriculture, since with the terms-of-
trade change the rate of return of investment in farming should have
risen relative to that in industry, cet. par. ?).

Professor Kuznets also fails to distinguish under what conditions
some of his items may or may not be positive contributions to overall
economic growth. If we take the problem of economic development
in its long-run context, the crucial issue is usually finding sources of
capital, sufficient to maintain the level and rate of growth of invest-
ment necessary to sustained growth in output per head of the population.
In this case, the portion of any given level of industrial output which
goes to agriculture as consumer goods is unavailable for capital for-
mation. Hence, any success of this type of "contribution" is at the
cost of growth, not to its benefit. 38 The foregoing argument may,
however, be more applicable to a centrally-planned than to a free
market economy. In the latter, if it be true that industrial growth is limited
by the size of the market, the purchase of consumption goods by the
agricultural sector may not be at the cost of investment and growth. This is again the agriculture- led vs. agriculture-supported growth distinction. Even if the long-run strategy of development is to keep rural consumption levels low and to extract the maximum transfer of resources from agriculture, we may in the short run find productive resources idle. Under such circumstances, any increase in demand from the agriculture sector would be most welcome for its multiplier effects, and the consumption of industrial products by the rural population is a definite contribution, since it does not displace investment, but rather should tend to stimulate it through the effects on incomes.

Yet another problem arises in connection with Professor Kuznets' market contribution. Suppose the non-agricultural sector were to engage in a vigorous and successful program of import substitution. With total demand by the farm sector unchanged, insofar as these substitutes displaced former imports in the purchases of farmers, this shift in the composition of demand in favor of the output of domestic industry would be counted as a contribution of the agricultural sector. Yet what has it contributed? No increase in agricultural productivity or incomes is necessary to accomplish this sort of change, and the agricultural sector has merely been the passive participant in a shift of buying patterns— from which, moreover, if tariffs and other import restrictions remain un-
changed, it must have gained, since presumably the domestic goods
would not be purchased unless they offered better quality at the same
price, or the same quality at a cheaper price, than did the former im-
ports. This appears to be clearly a contribution by the industrial
sector, coming at least under the headings of a "product" contribu-
tion and of the foreign-exchange-saving part of the "market" contrib-
ution.

We find in Kuznets no general discussion of indirect, or de-
rivved demands, and their effect on the magnitude of a contribution. If
agriculture makes a "contribution" by increased demand for domestic
industrial products and this generates a requirement for imports not
covered by an increase in exports from the farms (or, conceivably from
industry, if the growth of demand enabled it to exploit economies of
scale to become more efficient), is this entirely a contribution? Should
we not subtract the import requirement for the production of these goods
to get something closer to the increment to domestic value added as the
real contribution here? Again, of course, if this demand comes at the
expense of investment, is it a contribution at all?

In attempting to be all-inclusive, the Kuznets schema falters
at several points of the analysis, as pointed out above. By failure to
take into account the actual development goals and strategy which govern
the decisions of policy planners in any given developing country, Kuznets' analytical structure runs the risk of calling something a "contribution" which in fact inhibits the achievement of the country's development goals. For the purposes of this investigation, it is not necessary to enter into the controversy over whether economic development is best accomplished through emphasizing agriculture as a leading sector or through squeezing it to support a rapid rate of industrial capital formation. It is necessary, however, to determine which of these two broad types of development strategies lay at the root of the Hungarian government's policy planning.

Official policy was based on the following four principles (as published by the Minister of Commerce):

1. To encourage the development of those industries which work up the products of agriculture, livestock breeding, forestry, mining, and smelting.

2. To encourage the industries which service those industries in the above category.

3. To further such industrial branches as supply items of mass consumption - e.g., cotton textiles - in which Hungary's neighbors had no comparative advantage arising from domestic production of the raw material used.
4. To introduce and encourage the industry which makes machines and equipment, as well as semi-manufactures which are employed by the more important domestic industries. The fourth type, the weakest industry in the land, was acknowledged to need the most intensive development. 39

It is clear from the foregoing that the guiding strategy was to encourage industrial capital formation. Agriculture was to play its role as a supplier of inputs and factors, while increases in effective demand for the products of domestic industry were to come primarily through the growth of industry itself and from import substitution. The model used then was one of agriculture as a supporting, rather than leading, sector in overall growth. Whether the agriculture of Hungary performed adequately in the role assigned it requires an analysis based on its contributions to the growth of other sectors. A framework which is well suited to such a task is described in the following section and used in later chapters.

b. A Johnston-Mellor-Nicholls approach 40

In this schema we find five major contributions agriculture can make to general economic development:
1. It can expand to meet increased demand for agricultural products.

2. Rising farm income can stimulate the industrial sector through increased demand for its products.

3. It can earn or save foreign exchange.

4. It can release labor to the industrial sector.

5. As the dominant sector at the onset of economic development, agriculture "...can and should make a net contribution to the capital required for overhead investment and expansion of secondary industry." ⁴¹

We should note here the importance of increased agricultural productivity to the ability to make the above contributions. In a closed economy, a rate of increase of the productivity of resources used in agriculture greater than the rate of increase of demand for food is a necessary but not sufficient condition for success in fulfilling these roles. In an open economy, the need may be lessened, if foreign aid is available or if the country's comparative advantage lies in non-food items. Still, rising productivity is desirable for its foreign-exchange-earning or -saving power. "Thus, it is clear that, under all circumstances, increasing agricultural productivity makes important contributions to general economic development..." ⁴²
A characteristic feature of most underdeveloped countries is, of course, low agricultural productivity. How to induce the growth in this productivity necessary (or desirable) for general economic development is one of the primary policy goals of such a country, and success here often requires a many-faceted attack dealing with not only the techniques of farming, but extending also to reforms of the institutions within which the economy, and particularly its agricultural sector, operate. Johnston and Mellor distinguish in this regard three phases of agricultural development.

"Phase I: Development of agricultural preconditions.

Phase II: Expansion of agricultural production based on labor-intensive, capital-saving techniques...

Phase III: Expansion of agricultural production based on capital-intensive, labor-saving techniques."^{43}

This is a construct similar to the three stages in the reallocation of labor from agriculture to non-agriculture defined by Ranis and Fei. Their phase I is identified by marginal product of labor $\geq 0$, phase II by marginal product $> 0$ but $< \text{the institutional wage (a wage established by custom - often some sort of traditional subsistence minimum)}$; and phase III by marginal product $> \text{institutional wage}$. (In phase III the actual wage then rises above the former institutional wage as agriculture "goes
commercial" and must compete for labor. Thus, phase II begins at the Lewis "turning point" (in their terms, the "shortage point") and ends at what they call the "commercialization point" - the end of phase II coincides with the end of the "take-off" process. Thus we find Ranis-Fei's phase III identical to Johnston-Mellor's, with the former's phases I and II being subsections of the latter's phase II. Whether or not there were any overlap of the end of Johnston and Mellor's phase I with the beginning of Ranis and Fei's phase I would require a more rigorous formulation of the former model, although such overlap appears unlikely. What is particularly relevant for the present study is Johnston and Mellor's discussion of the likely policy requirements of each stage, and how these are related, particularly with reference to phases I and II:

The labor-intensive, capital-saving approach to agricultural development, appropriate to Phase II, requires an environment in which the possibility of change is recognized and accepted, and in which individual farmers see the possibility of personal gain from technological improvement. Phase I is defined as the period in which these preconditions are met. Improvements in land tenure are likely to be the most essential requirements in Phase I since an unfavorable tenure situation may stifle the incentive for change even though the potential exists for large increases in output.45

The next section will deal in part with some of the ways the tenure sys-
tem might stifle change in the agriculture of a developing country.
D. The main empirical questions

As previously mentioned in section B above, the principal empirical points are two in number, and admit of sequential treatment. First, with respect to the bipolarity and static nature of the structure of land ownership, it is necessary to establish only that the distribution of landed property did not become any less extreme during the course of the period under review. Should the ownership disparities have increased, the obstacles to economic development according to the common view outlined in section B should have increased; therefore, evidence tending to refute the hypothesis that Hungarian agriculture failed to contribute to overall economic development should be all the more convincing. The analysis of the data relating to land distribution is the task of chapter 2.

Second, once the pattern of change in land ownership has been established, we can examine the evidence available with respect to the types of possible contributions (as outlined in part C above) in an attempt to determine if, indeed, Hungarian agriculture failed to contribute. This naturally will involve the establishment of criteria to determine success or failure. Ideally, of course, one would like to develop criteria which would also assess the degree of success or failure. The maximum product contribution, for example,
would come if available resources were allocated optimally throughout the entire economy. Or, in the spirit of the two-sector model, the maximum contribution of agriculture would be the result of an optimum allocation within the agriculture sector, with the allocation in non-agriculture taken as given. With a given body of technical knowledge, a system of landholding dominated by a relatively few large estates could hinder the achievement of optimality in two general ways:

1) "structurally", in which the rigidity of land distribution prevents forming efficient-sized farming units, and 2) "technically", whereby rigidity of technique (caused by such things as rack-rents and monopsony in the rural labor market) prevents efficient allocation of labor and capital, given the land distribution. Optimality calculations are complex and difficult, even for modern nations with a relative wealth of reliable data on soil, rainfall, agronomic characteristics of various crops, input prices, etc., etc. For an historical study such as this one, they are clearly impossible, and we will have to make do with cruder measuring devices. We can only try to establish the dividing line between success and failure, and must be content with rough guesses as to degree. For example, we might postulate that failure in categories 1 and 3 under the Johnston-Mellor-Nichols approach (see section C-3 above) would come if agriculture did not expand production at least as fast as demand for its produce was increasing. The details of this
and the other criteria used will be explained in chapters 3-6, which will deal with the potential contributions in the following order:

Chapter 3: Expansion of agricultural output to meet expanding demand.

Chapter 4: Foreign exchange earnings and trade.

Chapter 5: Release of resources to non-agricultural sectors.

Chapter 6: Agricultural income and purchases from other sectors.

The final chapter will then present a summary and the conclusions drawn from the investigation.
FOOTNOTES: CHAPTER 1


2. The Hungarian "Lands of the Holy Crown of St. Stephen," which included Croatia-Slavonia, enclosed 325 thousand square kilometers. "Hungary proper" (i.e., excluding Croatia-Slavonia), with which our primary concern shall lie throughout, accounted for just under 283 thousand square kilometers. Louis Loczy, *A Geographical, Economic, and Social Survey of Hungary* (Budapest: 1919), 5n. See also the map provided in the text (p.13).


5. For more details of the course of industrialization during the era of Dualism, see my "A Survey of Agriculture and Economic Development in Hungary, 1867-1913," (mimeo, June, 1962), from which these figures are taken.
6. Vladimir Timoshenko, "The Danube Basin as a Producer and Exporter of Wheat," *Wheat Studies*, VI (March, 1930), 195. In the Alföld (Great Plain), for example, the average temperature varies from southern border to northern edge only between 9.3 and 10.5 degrees Centigrade. Zsigmond Róna, *Éghajlat /Climate/ (2 vols.; Budapest: 1909), 1, 71.

7. Timoshenko, 195-196; Róna, I, 78.


14. Timoshenko, *Agricultural Russia...*, 34.

15. Oscar Jászi, *The Dissolution of the Habsburg Monarchy* (Chicago: 1929), 222, 229, 237-38, 239. The title of the chapter from which these statements are taken, "Morbus Latifundii," is indicative of the causal importance attached to the land tenure system. It should also be noted here that Jászi is no extremist, but one of the most objective and scholarly of the historians of this period.


19. Georgescu-Roegen, 5. He goes on to note also that "For industrial uses man has been able to harness one source of energy after another, from the wind to the atom, but for the type of energy that is needed by life itself he is still wholly dependent on the most 'primitive' source, the animals and plants around him." (Ibid.).

20. For example, an alternative schema to those presented here can be found in P. K. Chang, Agriculture and Industrialization (Cambridge, Mass.: 1949). Chang's emphasis on the location of economic activity led him to use an analytical formulation stressing interdependence and "links" between agriculture and industry, in which food, raw materials, labor force, and the activities of the farmer as buyer and seller constitute the primary "links." An example of a study where a narrower focus -- in this case the uses of growth in agricultural incomes and productivity -- leads to a concentration on only some parts of the general schema (the demand of the farm sector for the products of industry and the supply of labor to the non-farm sector) can be found in chapter 10, "Agricultural Transformation," of C.P. Kindleberger's Economic Growth in France
and Britain, 1851-1950 (Cambridge, Mass.: 1964). These two types of alternatives by no means exhaust the spectrum of possibilities, of course.

21. Technically, of course, the interrelations among the sectors make it impossible to identify uniquely the contribution of a single sector to economic growth. Nevertheless, the two-sector model used is useful, even though it is necessary to keep in mind that what we are discussing "...may perhaps be more correctly described as the result of the activities of the economy whose particular locus is the given sector -- rather than as a contribution of the given sector fully creditable to it as if it were outside the economy and offering something to the latter." Simon Kuznets, "Economic Growth and the Contribution of Agriculture: Notes on Measurements," International Journal of Agrarian Affairs, III (April, 1961), 59-75; reprinted in Eicher and Witt, 102-119, especially 104-105. This and all further references are to the page numbers in Eicher and Witt.

22. Ibid., 105, 109, 114.

23. Ibid., 109, 114.

24. This section is a summary, with some additional comments, of ibid., 105-109, using insofar as possible Kuznets' own notation.
25. The proof of equation (1.3), which Kuznets does not provide, is as follows:

\[
\frac{p^1}{L^1} = \frac{p_a^1 + p_b^1}{L^1} = \frac{p_a^1}{L_a^1} \left( \frac{L_a^1}{L^1} \right) + \frac{p_b^1}{L_b^1} \left( \frac{L_b^1}{L^1} \right).
\]  

(1.4)

By adding and subtracting \( \frac{p_a^0}{L_a^0} \left( \frac{L_a^1}{L^1} \right) \) and \( \frac{p_b^0}{L_b^0} \left( \frac{L_b^1}{L^1} \right) \), then combining terms, we get

\[
\frac{p^1}{L^1} = \left( \frac{p_a^1}{L_a^1} - \frac{p_a^0}{L_a^0} \right) \left( \frac{L_a^1}{L^1} \right) + \left( \frac{p_b^1}{L_b^1} - \frac{p_b^0}{L_b^0} \right) \left( \frac{L_b^1}{L^1} \right) + \frac{p_a^0}{L_a^0} \left( \frac{L_a^1}{L^1} \right) + \frac{p_b^0}{L_b^0} \left( \frac{L_b^1}{L^1} \right).
\]

(1.4a)

We can write this as

\[
\frac{p^1}{L^1} = \Delta \left( \frac{p_a}{L_a} \right) \left( \frac{L_a^1}{L^1} \right) + \Delta \left( \frac{p_b}{L_b} \right) \left( \frac{L_b^1}{L^1} \right) + \frac{p_a^0}{L_a^0} \left( 1 - \frac{L_b^1}{L^1} \right) + \frac{p_b^0}{L_b^0} \left( \frac{L_b^1}{L^1} \right),
\]

(1.4b)

since \( \frac{L_a^1}{L^1} = 1 - \frac{L_b^1}{L^1} \).

Similarly, of course, \( \frac{L_a^0}{L^0} = 1 - \frac{L_b^0}{L^0} \), so

\[
-\frac{p^0}{L^0} = -\frac{p_a^0 + p_b^0}{L^0} = -\frac{p_a^0}{L_a^0} \left( 1 - \frac{L_b^0}{L^0} \right) - \frac{p_b^0}{L_b^0} \left( \frac{L_b^0}{L^0} \right).
\]

(1.5)
Hence \( \Delta \left( \frac{P}{L} \right) = \frac{P_1}{L_1} - \frac{P_0}{L_0} = \Delta \left( \frac{P_a}{L_a} \right) \left( \frac{L_a}{L_1} \right) + \Delta \left( \frac{P_b}{L_b} \right) \left( \frac{L_b}{L_1} \right) \)

\[ + \frac{P_a}{L_a} \left( 1 - \frac{L_b}{L_1} \right) + \frac{P_b}{L_b} \left( \frac{L_b}{L_1} \right) - \frac{P_a}{L_a} \left( 1 - \frac{L_b}{L_0} \right) \]

\[ - \frac{P_b}{L_b} \left( \frac{L_b}{L_0} \right) . \]  

(1.6)

By rearrangement of terms, and using the definition

\( \Delta \left( \frac{L_b}{L} \right) = \frac{L_b}{L_1} - \frac{L_b}{L_0} \), this becomes

\[ \Delta \left( \frac{P}{L} \right) = \Delta \left( \frac{P_a}{L_a} \right) \left( \frac{L_a}{L_1} \right) + \Delta \left( \frac{P_b}{L_b} \right) \left( \frac{L_b}{L_1} \right) + \frac{P_a}{L_a} \left( \frac{L_b}{L_0} \right) - \frac{P_a}{L_a} \left( 1 - \frac{L_b}{L_0} \right) \]

\[ + \frac{P_b}{L_b} \left( \frac{L_b}{L_0} \right) \times \Delta \left( \frac{L_b}{L} \right) . \]

(1.7)

The two terms \( \frac{P_a}{L_a} \) and \( - \frac{P_a}{L_a} \) cancel, so by combining the terms containing \( \Delta(L_b/L) \), we arrive at equation (1.3).

26. This section is a summary, with some additional comments, of ibid., 109-114.

27. Ibid., 111.

28. I.e., the "agricultural surplus" as defined by Nicholls (Nicholls, 1).

29. Kuznets, 111.

30. Ibid., 113.

31. Ibid., 113.
32. This section is a summary, with some additional comments, of ibid., 114-119.


35. This importance may of course be considerably reduced if capital imports from abroad are readily available.


38. Unless, of course, the increased consumption (as of, for example, soap, washable clothing, housing improvements, vaccines, etc.) is in fact an investment which makes the human agent in agriculture more productive, inducing greater increments to total production
than would the same amount of resources invested in industry. See Food and Agriculture Organization, Interrelationship between Agrarian Reform and Agricultural Development ("F.A.O. Agricultural Studies," No. 26, prepared by Erich H. Jacoby; Rome: 1953), esp. p. 58.

39. Königlicher Ungarischer Handelsminister, Volkswirtschaftliche Mittheilung aus Ungarn (Vienna: 1899), 10-13. Emphasis in the early part of the era of the Dual Monarchy had been almost exclusively on the provision of infrastructure, predominantly the railroad network, which was built almost entirely either by the State or under State guarantees for income and interest payments. (Only one line, that from Budapest to Pecs, was built without State help.) In fact, the first law passed in 1867 after the basic law regulating relations to Austria was an authorization to borrow money to finance the construction of railroads and canals, which gives some idea of the importance attached to this activity. A. Neményi, Die Verstaatlichung der Eisenbahnen in Ungarn (Leipzig: 1890), 11, 108-109.

40. This section is based primarily on Bruce F. Johnston and John W. Mellor, "The Role of Agriculture in Economic Development," American Economic Review, LI (September, 1961), 581; and on William H. Nicholls, "Agricultural Policy: The Place of Agriculture in Economic

41. Johnston and Mellor, 572. The fifth category I take to include the payment of taxes to government, which Kindleberger includes as a separate contribution (Kindleberger, Economic Development, 218).

42. Nicholls, "...Place of Agriculture...", 338.

43. Johnston and Mellor, 582.

44. Ranis and Fei, 534-540, esp. diagram 1.2 (page 535). They do not, however, identify the beginning of phase II with the beginning of the "takeoff" -- indeed, phases I and II together constitute the "takeoff" stage: "Our analysis begins with an economy's first departure from quasi-stagnation or the initiation of the so-called take-off process." Ibid., 533.

45. Johnston and Mellor, 582 (italics added). It is naturally possible -- I would say even to be expected, except in the most primitive of societies -- to find within a given country regions or segments of agriculture in varying stages of development, such that each of the three phases could be observed somewhere. Thus identifying the agriculture of a particular country as a phase I, II or III type involves some sort of averaging,
although for really effective implementation of policy it would be
necessary to disaggregate sufficiently to be able to assign each
subsector to a single phase with very little ambiguity. For the
purposes of this study, however, such refinement in analysis of the
data is neither necessary nor possible, although differences among
regions, types of landholders, etc. will be discussed when appropriate.

46. This sort of consideration is obviously crucial to a country contemplating
a land reform. For a somewhat fuller treatment, see S.M. Eddie and
paper, June 1966).

47. In the usual formulation, rate of increase of demand for foodstuffs
is equal to the sum of the rate of increase of population plus income
elasticity of demand for foodstuffs times the rate of increase of
income per head.
Chapter II: CHANGES IN THE
STRUCTURE OF LANDOWNERSHIP
IN HUNGARY, 1867 - 1914

A. Historical introduction

The Compromise of 1867 established the Austro-Hungarian Monarchy, united by the person of Franz Josef, who was both Emperor of Austria and King of Hungary. The signing of the Compromise returned constitutional government to Hungary, giving her autonomy in her own internal affairs, a privilege the Hungarian nation had not enjoyed for more than three centuries. The Tripartitum had followed the defeat by the Turks at Mohács in 1526: the western areas of Hungary became a part of the Habsburg dominions; the central regions were occupied by the Turks; and the East (Transylvania) was governed by a local prince who recognized the suzerainty of the Sultan. Turkish rule lasted for a century and a half. After expelling the Turks, the Habsburgs crushed local resistance and brought all of Hungary under their control. In 1849, Hungary was reduced to colonial status following the defeat of the Hungarian revolutionary forces by Austrian and Russian armies in the War of Independence of 1848-1849. Thus began the "Absolutist" period (1849-1867), during which Hungary was ruled from Vienna by decree.

The absolutist era was one of repression by the Austrians and passive resistance by the Hungarians. When defeat at the hands of Prussia
and trouble with the Italian provinces forced Franz Josef to seek an accommodation with the Hungarians to preserve his Empire, the Compromise which he signed released the Hungarian's long pent-up desire for greater independence. Much of this desire found expression in a drive for economic development, which was seen as the key to genuine political independence. It is from 1867 that we can date the real beginning of industrial development in Hungary.¹

The Hungarian government was the guiding force in industrialization during the era of the Dual Monarchy. Its policy concentrated on providing infrastructure and encouraging the establishment of a manufacturing industry.² With the impetus of State guarantees of income, railroad trackage grew eightfold by 1913 - to 22,000 kilometers against the 2,700 kilometers extant in 1868. Manufacturing industry received help through a system of tax exemptions, preferential shipping rates, government purchases, and direct subsidies.³ It was during the period of the Dual Monarchy that the Hungarian milling industry became world-famous, and a considerable expansion of other lines was also effected - among them many branches of food processing, machine building, and the electrical and chemical industries.⁴

Despite the emphasis on industrialization, Hungary remained on essentially agrarian land even at the end of the period. Of the total population in 1910, about 63 percent were still dependent on agricul-
ture for a livelihood,\textsuperscript{5} and half of total exports by value were raw farm products.\textsuperscript{6} Eckstein's calculations for the area of present-day Hungary—about one-third the former Kingdom, and definitely the most industrialized part—estimate that 49.8 percent of net national product in current prices originated in agriculture in the 1911–1913 period, and that mining, manufacturing, small-scale industry, and construction together accounted for just over 23 percent (manufacturing alone = 13.8 percent).\textsuperscript{7}

With the heavy weight of agriculture in the total economy, and with the dominance of the aristocracy and gentry at all levels of government, it is clear that the institutional structure of the rural economy could have had a considerable influence on the pace and character of economic growth in Hungary. The particular institutional characteristic which has received the most attention in the literature is the structure of landownership... The dominance of large properties in the distribution of land holding is usually given as the cause of stifling of incentives for economic progress (both in agriculture and in industry), of the existence of "land hunger" and of the heavy emigration from Hungary in the pre-War period, and of a host of minor problems.\textsuperscript{8} Typically, the statistics of land distribution in some base year are given; the radical skewness of this distribution is self-evident, and therefore
the reader is provided with no more details and usually left to assume that the situation remained static and stagnant. A number of questions thus remained unanswered: Did the landownership pattern show any significant changes between 1867 and 1914? Were there any marked differences in landownership structure regionally within Hungary? And how did the situation in Hungary compare with that in other European countries at the time?

B. Changes in landholding, 1867-1914

Of the changes made during the 1848-49 Hungarian insurrection, the only major one which Franz Josef allowed to stand was the freeing of the serfs. This revolutionary alteration of the pattern of rural institutions set in motion a number of changes, among which the most important for the questions of this paper was that "the Gentry began, in growing measure, to lose the land from under their feet; thus began their exodus into the public bureaucracy." The peasants themselves did not have to pay the landlords any compensation for the loss of their services; this obligation was assumed by the state. Macartney attributes the financial difficulties of the gentry, which forced many to sell their land to meet debt obligations, to the niggardliness of the compensation and the long delays in its payment, coupled with a general and severe shortage of credit.
The survey of landownership undertaken by the Hungarian Finance Ministry in 1867 should, therefore, already reflect the first stage of the process of decline of the gentry class as landowners. 12 The results of the cadastral surveys of 1867, 1885, and 1914 are presented in Tables 1 and 2. 13 The 1867 data include some 1.4 million hectares, or five percent less land, than the other two. Despite the disparity (which cannot be resolved because the 1867 data were published only in summary form), we can still make some useful comparisons by taking into account that (1) each figure can be regarded as a minimum for its category, and (2) the bias imparted by the omissions in 1867 is probably toward the relative underemphasis of the importance of smaller properties in the distribution of that year. This latter consideration rests on the assumptions that the likelihood of missing a property in the enumeration varied inversely with the size of the property, and that the greater probability of missing small holdings was enough to outweigh the acreage differences between them and any large estates which might have escaped inclusion.

With these considerations in mind, we may observe the following:

1) Properties larger than 200 holds (286 acres or 115 hectares) account for just over half of the total landed property in Hungary, and this share appears to have remained nearly constant. The subtotals
For the 0-200 hold class, comes from p. 76.

**1914:** Statistics of Hungary. 1914 (Budapest: 1916), 71. The total, and thus the residual figure.

**1985:** Alfred Heisch, Ungarn Grundbesitzverhältnisse (Halle a/S., Germany: 1893), 4-5.

Sources: 1867: Karoly Kertes, Hazank es Nepe. Our land and our people (2nd ed.). Budapest: 1877; Budapest: 1873;

**D.** Details may not add to totals due to rounding.

**c.** 35 – 200 holds.

**b.** 0 – 35 holds.

**a.** One hold = 1.43 acres = 0.575 hectares.

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2017</th>
<th>2046</th>
</tr>
</thead>
<tbody>
<tr>
<td>1829</td>
<td>2539</td>
<td>n.q.</td>
<td>n.q.</td>
</tr>
<tr>
<td>1833</td>
<td>3523</td>
<td>n.q.</td>
<td>n.q.</td>
</tr>
<tr>
<td>1839</td>
<td>3368</td>
<td>n.q.</td>
<td>n.q.</td>
</tr>
<tr>
<td>1843</td>
<td>3879</td>
<td>119</td>
<td>304</td>
</tr>
<tr>
<td>1847</td>
<td>4847</td>
<td>904</td>
<td>30</td>
</tr>
<tr>
<td>1851</td>
<td>3801</td>
<td>1444</td>
<td>5</td>
</tr>
<tr>
<td>1867</td>
<td>67</td>
<td>37</td>
<td>5</td>
</tr>
<tr>
<td>1871</td>
<td>2262</td>
<td>2222</td>
<td>0.2</td>
</tr>
<tr>
<td>1877</td>
<td>5</td>
<td>5</td>
<td>0.5</td>
</tr>
<tr>
<td>1883</td>
<td>13</td>
<td>13</td>
<td>0.5</td>
</tr>
<tr>
<td>1899</td>
<td>3879</td>
<td>119</td>
<td>30</td>
</tr>
<tr>
<td>1909</td>
<td>4847</td>
<td>904</td>
<td>30</td>
</tr>
<tr>
<td>1924</td>
<td>3801</td>
<td>1444</td>
<td>5</td>
</tr>
<tr>
<td>1929</td>
<td>2262</td>
<td>2222</td>
<td>0.2</td>
</tr>
<tr>
<td>1933</td>
<td>3368</td>
<td>3368</td>
<td>1.43</td>
</tr>
</tbody>
</table>

**Table 1: Changes in Land Ownership, 1867-1914**
### TABLE 2

PERCENTAGE DISTRIBUTION OF THE AREA OF LANDED PROPERTIES

<table>
<thead>
<tr>
<th>Size (Holds)</th>
<th>1851</th>
<th>1867</th>
<th>1885(^a)</th>
<th>1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-30</td>
<td>32.2%</td>
<td>32.2%</td>
<td>33.2%</td>
<td>49.1%</td>
</tr>
<tr>
<td>30-200</td>
<td>14.5</td>
<td>14.4</td>
<td>15.1</td>
<td>49.1%</td>
</tr>
<tr>
<td>200-1000</td>
<td>14.3</td>
<td>14.3</td>
<td>12.5</td>
<td>11.3</td>
</tr>
<tr>
<td>1000-10000</td>
<td>30.6</td>
<td>30.6</td>
<td>30.2</td>
<td>20.3</td>
</tr>
<tr>
<td>Over 10000</td>
<td>8.4</td>
<td>8.5</td>
<td>9.0</td>
<td>19.4</td>
</tr>
<tr>
<td><strong>TOTALS(^b)</strong></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\) The first two size categories for 1885 are 0-35 and 35-200 holds, respectively.

\(^b\) Details may not add to totals due to rounding.

Sources: 1851: Cautes (no first name given), Die Lage der Ungarischen Landwirtschaft (Budapest: 1895), 26. For 1867-1914, see notes to Table 1.
for the over-200 hold categories are 14.29, 14.58, and 14.38 million hectares in the respective surveys. The difference between the 1885 and 1914 totals is thus less than 1.5 percent.

2) There were marked shifts in the relative importance of the subcategories included in the above group. Holdings of between 200 and 1,000 holds (286-1,430 acres) show a steady decline in both numbers and area, while the latifundia — defined in Hungarian statistics as estates over 10,000 holds (14,300 acres) in extent — made a massive gain in acreage at the expense particularly of the next smaller size category (1,000 to 10,000 holds). The additions to the former group of 2.9 million hectares represent an increase of 115 percent over 1885, while the 2.8 million hectare decrease in the latter category is a loss of one third.

3) Besides the decline in the 200-1,000 hold class, the surveys show that the number of properties in the 100-200 hold category also diminished — from an 1867 total of 11,365 to 10,846 in 1914. 14 From this and the preceding results it seems clear that the erosion of the gentry as a landholding class continued while the great estates of the aristocracy and the wealthy capitalists assumed ever greater weight in the land distribution.
The Dual Monarchy had been ushered in by a short period of
good harvests and high grain prices, but this soon gave way to the
generally poor harvests of the seventies and the long decline in
grain prices—especially in that of wheat, the most important crop
in Hungary—which set in at about the same time. When the price
of the compensation bonds, which had been used by many landlords
as collateral for loans of working capital to hire labor, fell as a re-
sult of the war with Prussia in 1866 and the economic crisis of 1873,
many landholders who had weathered earlier storms were forced to sell
off properties to meet their debt payments. The middle-sized pro-
properties (defined in Hungarian statistics as those between 200 and 1,000
holds in size) seem to have borne the brunt of the losses inflicted in
this period. According to the tables, the process of the great aggran-
dizement of the largest estates, however, did not begin in earnest until
sometime after the mid-eighties, and then appears to have come almost
entirely at the expense of the 1,000-10,000 hold class. The latter
group seems to have had the resources to hold its own through the Crash
of 1873, but could not survive the continued decline in grain prices
during the eighties and nineties. Taken together with the small observed
increase in the area of properties under 200 holds, the foregoing obser-
vations provide corroboration for Fellner's 1905 observation that "... the
middle-sized properties were being abraded from two sides: partly fragmented into small holdings, partly absorbed into the large estates.\textsuperscript{18}

The seeming paradox of the small farms surviving the economic crises while larger units succumb can be rather easily explained. The larger estates, when such did come on the market, "were practically never sold in small units to peasants."\textsuperscript{19} This practice, when combined with the restrictions of entail (see below) on much of the estate land, meant that the effective market supply of land facing the high demand of the peasants - the legendary "land hunger" - was severely limited. If a small farmer failed, there was always a host of eager buyers waiting to purchase his plot of ground. The appearance of stability in the data on numbers and area of the smaller holdings could conceal vast turmoil in the form of high rates of turnover in ownership.\textsuperscript{20}

Beyond the mere distribution of properties by size, it is of considerable interest to examine the character of landholding. Although ownership in fee simple predominated, the 1885 survey, for example, revealed that over one-third of the total land area consisted of properties held in mortmain.\textsuperscript{21} Chief among such holdings were the entailed estates of the nobility and the considerable holdings of the State, the towns,\textsuperscript{22} and the churches. Table 3 presents a breakdown of these mortmain holdings from the land surveys we have previously considered.
### TABLE 3

**MORTMAIN PROPERTIES COVERED BY THE VARIOUS SURVEYS**

*(IN THOUSANDS OF HECTARES)*

<table>
<thead>
<tr>
<th>Property owned by:</th>
<th>1867</th>
<th>1885</th>
<th>1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>The State</td>
<td>1567</td>
<td>1603</td>
<td>1625</td>
</tr>
<tr>
<td>Towns and communities</td>
<td>3640</td>
<td>4992</td>
<td>2375</td>
</tr>
<tr>
<td>Other joint-ownership</td>
<td></td>
<td></td>
<td>2075</td>
</tr>
<tr>
<td>associations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fideikommisse</td>
<td>267</td>
<td>1352</td>
<td>1305</td>
</tr>
<tr>
<td>Churches, monasteries, etc.</td>
<td>742</td>
<td>1307</td>
<td>1052</td>
</tr>
<tr>
<td>Schools</td>
<td>-----</td>
<td>77</td>
<td>36</td>
</tr>
<tr>
<td>Foundations</td>
<td>222</td>
<td>143</td>
<td>231</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6437</td>
<td>9474</td>
<td>8701</td>
</tr>
</tbody>
</table>

---

a. Excluding property owned by railroads and corporations (274,000 ha. in 1885 survey and 323,000 in 1914).

b. This includes only properties larger than 100 holds.

c. I. e., entailed lands.

d. Details may not add to totals due to rounding.

Sources: 1867: Cautes, 8; 1885: Hirsch, 9; 1914: *Annuaire Statistique Hongroise*, 1914, 72.
### TABLE 4

**MORTMAIN PROPERTIES IN 1914 BY SIZE OF HOLDING**

<table>
<thead>
<tr>
<th>Size in holds</th>
<th>Area (1000 ha.)</th>
<th>Percent of total acreage in given size class</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - 200</td>
<td>318</td>
<td>36.1%</td>
</tr>
<tr>
<td>200 - 500</td>
<td>766</td>
<td>46.1</td>
</tr>
<tr>
<td>500 - 1000</td>
<td>694</td>
<td>45.4</td>
</tr>
<tr>
<td>1000 - 10000</td>
<td>2835</td>
<td>49.5</td>
</tr>
<tr>
<td>Over 10000</td>
<td>4411</td>
<td>80.7</td>
</tr>
<tr>
<td><strong>TOTAL(^a)</strong></td>
<td><strong>9024</strong></td>
<td><strong>59.1%</strong></td>
</tr>
</tbody>
</table>

\(^a\) Details may not add to total due to rounding.

**Source:** Calculated from figures presented in *Annuaire Statistique Hongroise, 1914*, 72, 76.
It must be stressed that this table can be used for illustration only, since neither the aggregate totals nor the individual items are strictly comparable because of differences in coverage among the three surveys. Mortmain holdings were about one quarter of all land covered in the 1867 survey, and about one-third of all land in 1885. Those mortmain properties greater than 100 holds in extent accounted for more than 30 percent of the total area of landed property (i.e., including all holdings under 100 holds as well) in 1914. Therefore it does not appear that this form of ownership lost any ground in the three decades preceding World War I. The concentration of these holdings in the larger size groups is shown in Table 4, which reveals that nearly three-fifths of the land in properties larger than 100 holds was held in mortmain, with the proportion so held generally increasing as the size of holding increases.

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The actual control of landed property was considerably more concentrated than the statistics would, on the surface, indicate. The principal reasons for this lie with the organization of county government and the ownership of several properties by one person or family. One half of each county central committee, which appointed most officials, was made up of the persons who paid the highest taxes (almost exclusively estate owners); the other half was elected by a limited
franchise and open ballot. Dominance by a very few families was
typical, and because towns bulked so large as landholders, this
political control served to concentrate control of land still further
in the hands of the nobility. In addition, the 1914 statistics (for
example) inform us that the 147 entailed properties listed should
really be counted as only 92, because many owners had estates in
several counties, each of which was counted as a separate property.

Or, from a list of all estates of over 1,000 holds in the single county
of Somogy (in Western Hungary), we can count 109 owners with
628,000 holds (about 900,000 acres). Just nine families, however,
possessed 387,000 of those holds in 45 different properties.

From the foregoing analysis, we see a strongly polarized
system of land distribution, which showed a concentration of owner-
ship both in the static sense – a tiny fraction of all properties ac-
counting for over half the acreage – and in the dynamic sense –
the average size of large holdings was growing.

C. Landholding according to the 1895 agricultural census

The census of agriculture taken in 1895 offers an oppor-
tunity to examine landholding for interregional uniformity or diversity
of pattern. The land distribution data from this census are not comparable
with the other surveys which are summarized in Tables 1 and 2 for two main reasons: (1) The coverage was different for 1895; only those properties which contained some arable land were counted, so that holdings of strictly forest and/or pasture land, which fell overwhelmingly into larger size categories, were excluded from the data, and (2) the land unit for the census was the Betrieb, or operating unit, rather than the ownership parcel. Further, the enumeration took place county by county, so that a property which overlapped into two counties was counted as two farms, unless operated with a common inventory. All of these considerations tend to bias the results downward, i.e., to underemphasize the share of larger properties in total landownership for the country. On the other hand, the definitions adopted do carry with them the advantage of concentrating our scrutiny on those holdings which are more strictly agricultural in the ordinary sense of the word. Chart 1 presents a graphic comparison of the 1867 and 1895 surveys.

Tables 5 and 6 present a summary of the regional landholding data from the 1895 census. The regions are the seven "states" into which Hungary proper was divided for official administrative and statistical purposes; the names as they appear in the tables are translations of the Hungarian names for these areas, which describe quite well the geographical location of each (except for Transylvania in the East).
The size categories are finely enough divided to show a considerable diversity from region to region within some size groups, but the general countrywide similarity in the pattern of landholding is perhaps even more striking. In only one case does the number of properties under 20 holds (28 acres) stray more than two percentage points away from accounting for 90 percent of the total number of properties (the figure is 85.6 percent for the area between the Danube and Tisza rivers), although the share of this class of farms in total land surveyed varies from 22 to 39 percent. This range is overstated, since the three regions which show the highest percentages (Left Bank of the Danube, Tisza-Maros Corner, and Transylvania) are areas on the perimeter of the country containing large areas of forest, where the criterion of inclusion in the census would seem to lead to the greatest degree of overstatement of the relative share of small properties. Even if we follow Hungarian practice in stretching the ordinary definition of "middle-sized" considerably on the upper end, we find the group rather thinly populated everywhere: e.g., all farms between 50 and 1,000 holds (71-1,430 acres) taken together occupy more than one quarter of the agricultural land in only one region - the area of central Hungary between the Danube and Tisza rivers, where the figure reaches 33 percent. For the other regions, the range is 15 to 24 percent. The list of such
CHART 1

DISTRIBUTION OF LANDED PROPERTIES IN HUNGARY

ACCORDING TO 1867 AND 1895 SURVEYS

LEGEND:

- 1867
- 1895

SOURCE: APPENDIX TABLE 1
<table>
<thead>
<tr>
<th>Size</th>
<th>Transylvanian</th>
<th>Transilvanian</th>
<th>Transilvania</th>
<th>Transilvania</th>
<th>Transilvania</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage of Total Number of Agricultural Properties in Each Region by Size Categories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Percentage Distribution, 1895**
### Table 6: Regional Land Distribution; 1995

<table>
<thead>
<tr>
<th>Area</th>
<th>Bank of Tisza</th>
<th>Tisza and Dunabe</th>
<th>Dunabe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transylvania</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tisza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minoris</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Csernecorva</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vajna</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of Total Agricultural Land in Each Region by Size Categories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 10000</td>
<td>100</td>
</tr>
<tr>
<td>500 - 10000</td>
<td>100</td>
</tr>
<tr>
<td>200 - 5000</td>
<td>100</td>
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<tr>
<td>100 - 200</td>
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<td>50 - 100</td>
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</tr>
<tr>
<td>10 - 20</td>
<td>100</td>
</tr>
<tr>
<td>5 - 10</td>
<td>100</td>
</tr>
<tr>
<td>0 - 5</td>
<td>100</td>
</tr>
</tbody>
</table>


Note: Details may not add to totals due to rounding.
comparisons that could be made is almost endless. Suffice it to note here that the theme of a markedly polarized distribution of landed property, established for the country as a unit, runs through the regional data as well, with only minor variations. The comparisons of the aggregate data from the 1895 census of agriculture to the results of the other surveys will be part of the concern of section E.

D. Comparison with other countries

The distribution of landownership in a single country is at best a two-dimensional representation, and the picture does not begin to emerge in any rounded form until one introduces the third dimension through consideration of questions such as "How did the pattern of landholding in Hungary compare with that in other European countries? Was it really the archetype of a latifundia-dominated system?" Table 7 presents some data for selected European countries, particularly Hungary's more immediate neighbors, but we can perhaps more easily perceive the similarities and differences among these countries by looking at Chart 2.

The Lorenz curve is used to reveal in graphic form relative differences in the degree of inequality of landholding. Though size categories and types of land included or excluded differ among the surveys on which the chart is based, the differences are not so great as
to obscure all meaningful comparison between countries. We can
determine probable direction of shift of the Lorenz curve of a given
country, had its data included the same types of property as the data
for the other countries, and thus establish maxima or minima in terms
of variations between any two curves chosen for comparison. With
more than one-fifth of Hungarian landed property and nearly one-third
of that of Rumania omitted from the calculations, the nature of the
properties escaping enumeration \(^{31}\) assures that the shift would be
considerable. I feel it reasonable to assume that the curve for Hungary
would be everywhere to the right of that for Germany, and that that
for Rumania would move very close to the English curve at the lower
end, while standing even farther to the right of it at the upper end.

Keeping these modifications in mind, we can observe that al-
though very great differences in the degree of inequality of landholding
existed among the countries considered, the situation in Hungary was
quite similar to that of her neighbors, Austria, Rumania, and Germany.
The similarity to the German pattern is not particularly surprising, but
the dissimilarity to England, the third of the "classic" cases of large-estate
dominance in the land distribution, is more unexpected. The reasons be-
hind this have their origins far back in Hungarian custom and law: the
practice of equal division of property among heirs, nearly universal among
Table 7

<table>
<thead>
<tr>
<th>Size of Property (in hectares)</th>
<th>Number of Properties</th>
<th>Number of Area</th>
<th>Number of Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary, 1895</td>
<td>1,004</td>
<td>38.3</td>
<td>32.3</td>
</tr>
<tr>
<td>Austria, 1903</td>
<td>0.4</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>0 - 5</td>
<td>21.9</td>
<td>23.4</td>
<td>77.2</td>
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<tr>
<td>5 - 20</td>
<td>18.8</td>
<td>15.1</td>
<td>72.8</td>
</tr>
<tr>
<td>20 - 50</td>
<td>4.7</td>
<td>4.7</td>
<td>79.8</td>
</tr>
<tr>
<td>50 - 100</td>
<td>6.5</td>
<td>6.5</td>
<td>10.3</td>
</tr>
<tr>
<td>100 - 500</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Over 500</td>
<td>0.15</td>
<td>0.15</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Table continued on succeeding page

(Distribution of landed property in selected European countries, around 1900 (Part One))
<table>
<thead>
<tr>
<th>Size of Property</th>
<th>Number of Properties</th>
<th>Number of Properties</th>
<th>Number of Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria, 1908</td>
<td></td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Germany, 1895</td>
<td></td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>England, 1895</td>
<td></td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>OVER 500</td>
<td></td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>100 - 500</td>
<td></td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>50 - 100</td>
<td></td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>20 - 5</td>
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<td>0.4</td>
<td></td>
</tr>
<tr>
<td>5 - 5</td>
<td></td>
<td>0.3</td>
<td></td>
</tr>
</tbody>
</table>

61.6% 22.3%

PART TWO

TABLE 7 (CONTINUED)
Notes to Table 7:

a. Calculated from data appearing in *Annuaire Statistique Hongroise, 1911* (Budapest: 1912), 80. Since the size categories for Hungary are in holds, those listed in the table are only approximate. The actual categories in hectares would be as follows: 0 - 5.8; 5.8 - 28.8; 28.8 - 57.6; 57.6 - 115.1; 115.1 - 575.5; and "over 575.5" hectares.


c. One hectare equals 2.47 acres.

d. Details may not add to totals due to rounding.

e. The English size categories, being in acres, also do not correspond exactly with those used in the table. The actual division which the figures represent is as follows: 0.4 - 8.1 ha.; 8.1 - 20.2; 20.2 - 40.5; 40.5 - 121.4; 121.4 - 404.7; and "over 404.7" hectares.


g. Less than 0.05%.

Source of data for all countries other than Hungary and Bulgaria: George D. Creanga, *Grundbesitzverteilung und Bauernfrage in Rumänien* ("Staats- und Sozialwissenschaftliche Forschungen" /Schmollers Forschungen/, no. 129; Leipzig: 1907), 93, 168, 176, 182.
CHART 2

DISTRIBUTION OF LANDED PROPERTIES

Legend:
- AUSTRIA
- BULGARIA
- ENGLAND
- RUMANIA
- HUNGARY
- GERMANY

Source: Appendix Table 2
the peasantry and lesser gentry, assured a proliferation of small holdings and prevented the formation by agglomeration of a substantial class of middle-sized farms. At the other end of the size scale, the larger estates, especially the latifundia, were kept intact in part through the continuance of entail, which in Hungary recognized several types of inheritance (Majorat, Seniorat, or Primogenitur), but required that in each case the entailed property be passed on intact, and that no part could be alienated in any way.

For England, two thirds of the land area was encompassed within properties of 40 to 400 hectares in extent, whereas only two-ninths of the acreage of holdings covered in the 1895 Hungarian agricultural census could be found in the even longer range of 29 to 575 hectares. Even if every square foot of land not included in this census should happen to have fallen in properties in this 29-575 hectare range, it would then have contained just over two-fifths of the area of all holdings — still far short of the share in England.

England can thus be viewed as occupying a middle ground between the extremes represented in the chart — on the one hand, by the strikingly similar distributions of Hungary, Austria, and Rumania, and on the other by Bulgaria, the peasant land par excellence, where farms under 20 hectares accounted for 95 percent of the number of holdings and 75 percent of the total acreage.
E. Summary and conclusions

We have seen in the preceding sections a pattern of landholding in Hungary characterized by many tiny holdings, a small and dwindling *Mittelgrundbesitz*, and the dominant position of huge estates. The static picture of landownership around the turn of the century conforms very closely to that of Austria and Rumania; comparison to Germany also fails to show any striking differences. The pattern revealed for Hungary as a whole persists region-by-region as well, with the only important reductions in the share of the large estates occurring around the perimeter of the Kingdom from Northeast to Southeast. Even these differences may be more apparent than real, given the criterion for inclusion of a property in the 1895 census and the geography of the regions involved.

Over the approximately one-half century that is the focus of this paper, the latifundia (taking the official definition - estates larger than 14,300 acres) more than doubled their share in the total landed property, with nearly all of this increase - which represents the transfer or absorption of an area about the size of Massachusetts and Connecticut combined, within a country the size of Nevada - occurring in the last three decades before the outbreak of World War I. During the
same time the middle-sized properties, but especially the estates
which we might call "large but not mammoth," were seen to have
dropped in numbers and area, with the former group the first to buckle
under the pressure of credit restrictions and loss of serf labor.

Table 8 is provided to show more precisely which classes
of properties gained or lost most. It would indicate that perhaps
some consolidation was effected among the smaller farms as well as
among the very largest estates, and hints at a new consideration –
that the larger peasant proprietors as a class might have been able to
hold on, or even make some gains in their position. (Cf., the numbers
in the 5-50 and 50-100 holds categories for 1867 and 1895 with those for
the 0-5 holds class). Every class of properties above 100 holds
in size suffered a decline in numbers, except for the latifundia. These
declines are slight for farms of between 100 and 500 holds, but more
marked among the estates of 500 to 5,000 holds. For the latter group,
about one of six or one of seven properties in each of the subcategories
disappeared – usually being absorbed into something larger. Even
though the numbers involved were small, the area was very considerable,
as was noted above.

From Table 2 we have seen that the share of farms under 200
holds changed little: they represented 46 percent of total land in 1867
(and that share may be understated – see part B above), 48 percent in 1885, and 49 percent in 1914. The changes at the top end of the size scale become even more dramatic when we look at mean size of holding. Not only had the number of over-10,000 households properties increased, but the average size of such properties, which in 1867 was just under 9,800 hectares (more than 24,000 acres), had grown by 1914 to more than 17,000 hectares (42,000 acres). In the 200-1,000 houses and 1,000-10,000 houses classes, the losses in land were relatively greater than the decline in numbers, so that the size of the average holding actually fell in each of these categories. In the former category, the mean holding included 279 hectares in 1867, but only 244 hectares in 1914, while for the latter the figures were 1,578 and 1,480 hectares, respectively. 36

Perhaps the foregoing exhibits most forcibly and succinctly the powerful centrifugal effect of the forces affecting the land distribution in Hungary during the era of the Dual Monarchy. The increased polarization of landownership – especially the transfer of 11 percent of the landed property of the country into the latifundia class, leaving this group in possession of one-fifth of the country – is certainly not an insignificant development.
### TABLE 8: NUMBER OF PROPERTIES BY SIZE CATEGORY

**A. Properties Smaller than 100 holds (in Thousands)**

<table>
<thead>
<tr>
<th>Size (Holds)</th>
<th>1867</th>
<th>1895</th>
<th>1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>1444</td>
<td>1280</td>
<td>n.a.</td>
</tr>
<tr>
<td>5-50</td>
<td>1008</td>
<td>1049</td>
<td>n.a.</td>
</tr>
<tr>
<td>50-100</td>
<td>30</td>
<td>36</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>2482</td>
<td>2365</td>
<td></td>
</tr>
</tbody>
</table>

**B. Properties larger than 100 holds (in Thousands)**

<table>
<thead>
<tr>
<th>Size (Holds)</th>
<th>1867</th>
<th>1895</th>
<th>1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-200</td>
<td>11.36</td>
<td>(10.27)</td>
<td>10.85</td>
</tr>
<tr>
<td>200-500</td>
<td>9.25</td>
<td>(6.45)</td>
<td>9.21</td>
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<tr>
<td>500-1000</td>
<td>4.50</td>
<td>(3.14)</td>
<td>3.87</td>
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<tr>
<td>1000-5000</td>
<td>4.70</td>
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<td>3.45</td>
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<tr>
<td>5000-10,000</td>
<td>.49</td>
<td>(3.77)</td>
<td>.41</td>
</tr>
<tr>
<td>Over 10,000</td>
<td>.23</td>
<td></td>
<td>.32</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>30.54</td>
<td>(23.63)</td>
<td>28.12</td>
</tr>
</tbody>
</table>

---

a. Thousands of "exploitations" in 1895.

b. Details may not add to totals due to rounding.

c. Numbers in parentheses to emphasize that criterion of inclusion in 1895 makes numbers increasingly less comparable as size class increases.

Source: See notes to Table 1 and Appendix Table 1.
The data seem to bear out not just that the pattern of landholding was static, but that the situation got "worse" rather than "better". Thus any force toward retardation of development should, in the standard view, have been accentuated. It is the task of the succeeding chapters to try to establish whether or not agriculture in fact stifled economic growth.
FOOTNOTES: CHAPTER II

1. See for example Anton Deutsch, *25 Jahre ungarischer Finanz- und Volkswirtschaft (1867-1892)* (Berlin: 1892); Alexander Eckstein, "National Income and Capital Formation in Hungary, 1900-50", in International Association for Research in Income and Wealth, *Income and Wealth: Series V*, ed., Simon Kuznets (London: 1955); or Wilhelm Offergeld, *Grundlagen und Ursachen der industriellen Entwicklung Ungarns* ('Probleme der Weltwirtschaft: Schriften des Instituts für Seeverkehr und Weltwirtschaft an der Universität Kiel'; Jena: 1914). In this and succeeding chapters, I have endeavored insofar as is practical to give citations to works in English, French, and German. Although this has meant in some cases finding and citing a work in one of these three languages for a fact originally derived from a Hungarian-language source, it is hoped that the much wider accessibility of the Western European languages will contribute significantly to the clarity of footnotes and to the ease of checking any points made in the text.

2. One student has suggested that the state was forced to take the initiative because of the general disinclination of the high nobility, who alone had large amounts of capital in 1867, to engage in industry --
especially in competition with firms already well established in
Austria. Anton Gavajda, "Die Entwicklung der ungarischen In-
dustrie von 1867 bis 1938" (unpublished doctoral dissertation,

3. The weapon of the protective tariff was not directly available
because of the Austro-Hungarian customs union. More advanced
Austrian firms, whose products entered Hungary duty-free, often
exposed the nascent Hungarian industry to "devastating competition".
György Ránki, "Problems of the Development of Hungarian Industry,

4. A quite detailed account of the progress of industry in this period
is provided in Gustav Gratz, A Dualizmus Kóra / The Era of
Dualism / (2 vols.; Budapest: 1934), esp. vol. I, ch. 14 and vol. II,
ch. 32. For a good English-language survey of Hungarian history,

5. Ungarische Statistische Mitteilungen, N.S. (Neue Serie) vol. XLVII
(Budapest: 1913), 28*. The figure refers to "Hungary proper", i.e.,
without Croatia-Slavonia. All subsequent data, unless otherwise
stated, will also refer to "Hungary proper".

6. The following categories from official statistics accounted for 54.6
percent of total exports in 1882–1884 and 46.9 percent in 1911–1913:
Grain, malt, legumes, rice; fruit, vegetables, and plants; draft and slaughter animals; milk and cream, eggs, honey, raw hides, feathers, entrails and bladders; raw tobacco; live and dressed poultry; hemp, flax, and raw wool. Calculated from data in Ungarische Statistische Mitteilungen, N.S. vol. LXIII (Budapest: 1923), 49, 53-76, 94, 106-7, 109, 195-6, 206. See also ch. IV.


8. See for example P. Sándor, 167-193; Drage, esp. 300-342; Oscar Jászi, esp. 220-239; or János Iván, Földbirtokreform és Tarsadalmunk / Land reform and our society / (Budapest: 1935), 3.

9. Although he does note a 'systematic increase' in the share of large estates in total land during the interwar period, Nicolas Spulber repeats the common view that '...of all the East European countries only Hungary had not witnessed any truly significant changes in its land-ownership structure in more than a century.' Nicolas Spulber, The Economics of Communist Eastern Europe (New York: 1957), 234. Cf. Doreen Warriner, The Economics of Peasant Farming (2nd ed.; New York: 1964), 22-23.

of the gentry in adjusting to city life and work in the bureaucracy are a major theme in much of the Hungarian literature of this and later periods. A useful survey can be found in Antal Sivirsky, Die ungarische Literatur der Gegenwart (Bern: 1962).

11. Macartney, 164-5.

12. Macartney states that 20,000 foreclosures were made in less than two decades following the freeing of the serfs. Ibid., 165.

13. An estimation of the landownership distribution was made in the early 1850’s in connection with the provisional land tax decreed by Franz Josef. Because of widespread under-reporting and false reporting of land to avoid tax liability, this early survey does not present an accurate breakdown of the landholding pattern. József Orlicsek, "A kataszteri felmérések főbb területmegoszlási adatai az 1853-1935. évek között" /Principal land distribution data of the cadastral surveys between 1853 and 1935/, Történelmi Statisztikai Közlemények /Historical Statistical Reports/, II (1958), 51. Heinrich Ditz, Die Ungarische Landwirtschaft (Leipzig: 1867), 89.

14. See notes to Table 1.


16. "In den siebziger Jahren konnte kaum eine nennenswerte Ernte erzielt werden." Cautes (no first name given), Die Lage der ungarischen

18. Friedrich von Fellner, *Das System der Rentengüter und seine Anwendung in Ungarn* (Berlin: 1905), 121. As succeeding paragraphs will show, the absorption into larger estates was overwhelmingly the more important of these two forces.

19. John Kosa, "A Century of Hungarian Emigration, 1850-1950", *Slavic Review*, XVI (1957), 503. There were, however, a number of middlemen who made considerable profits by purchasing debt-ridden properties cheaply for subdivision and sale in small parcels at high prices. Eventually the Minister of Agriculture stepped in to halt this form of "exploitation". Andrew György, "The State and Agriculture", in *Hungary of Today*, ed. Percy Alden (London: 1909), 262.

20. One account by a contemporary socialist writes estimates that some 300,000-400,000 transfers of ownership took place annually, only a small fraction of which were inheritances. Jaša Tomić, *Das Bauernproletariat Ungarns* (Neusatz: 1897), 7.


22. The large tracts owned by the towns were a peculiar characteristic of the land distribution in Hungary, and were often cited as obstacles
to agricultural progress: the town lands usually surrounded the inhabited part of the town, so that the farmers lost much time in traversing this area before they could get out to their own fields. Often, too, the town lands were not cultivated, and by taking up the land most advantageous because in closest proximity to the population centers, hindered the development of such activities as truck farming and market gardening. See for example Iván, 89.

23. The difference in total area figures for 1914 between Tables 3 and 4 represents the land owned by corporations, which cannot be separated out according to size. The amount in question -- 328,000 hectares -- makes up less than four percent of the area of mortmain holdings covered, and therefore cannot significantly affect the results so far presented.


27. The results of this census were published in four volumes:

Ungarische Statistische Mitteilungen, N.F. (Neue Folge) vols. XV, XVII, XXIV, and XXVII (Budapest: 1897-1900).

29. Only Hungary and England differed in this respect from the others. See notes a and e to Table 7.

30. This was most marked in the case of Rumania. Omitted were forest (21 percent of total area), vineyard (0.75 percent), waters (six percent), and State domains (3.5 percent), or just over 31 percent of the landed property in the country. George D. Creanga, Grundbesitzverteilung und Bauernfrage in Rumänien ("Staats- und sozialwissenschaftliche Forschungen"/Schmollers Forschungen/ no. 129; Leipzig: 1907), 31. We can assume, however, that all of these save vineyards would tend by their very nature to fit into the larger size categories, and thus their inclusion would only further emphasize the importance of large properties in Rumania. That the same sort of consideration also holds true for Hungary has already been noted (see text above, part C). For the remaining countries all forest and meadow land was included in the data.

31. It is suggestive, if by no means conclusive, to note that the 1895 census counted only four percent fewer properties, but 20 percent less land, than the 1867 survey. See also note 30.


33. On the basis of the 1885 and 1914 totals of 28.2 million hectares for the country as a whole (see Table 1).
34. A "middle holding" is defined in Hungarian statistics as 200-1,000
holds (286-1,430 acres). This seems extreme, but in large part
reflects the very "extensive" nature of Hungarian agriculture in
the period. For a discussion of this point, see Ladislaus Hévey,
Grundbesitzpolitik in Ungarn (Budapest: n.d. -- ca. 1940), 6.
35. Such a conclusion can be at best haltingly tentative, since the
1867 data refer to ownership parcels, while the 1895 data are for
operational units.
36. Averages calculated from data on numbers and area by size class
appearing in Keleti, 148 and 150, and in Annuaire Statistique
Hongroise, 1914, 72.
37. A dispassionate and competent analysis of one aspect of this has
been published by a modern Hungarian economist, Vilmos Sándor,
in his "A Gabonacséplés Gépesítése Magyarországon" / The
Mechanization of Grain Threshing in Hungary /, Agrártörténeti
Szemle / Agrarian History Review / IV (1962), 402-446.
Chapter III: THE EXPANSION OF AGRICULTURAL OUTPUT

In this chapter, agricultural output will be taken to comprise field crops, livestock, and animal products produced on the farm. This definition leaves out some agricultural pursuits - primarily gardening, fruit-growing, bee culture, and silkworm culture - because data are not available to estimate the level of activity in these occupations. More importantly, the production of vineyards has been excluded because the grape harvest was severely affected throughout much of the period under review by the depredations of the plant louse, phylloxera.\(^1\) All the omitted activities took place primarily on small properties; hence, their exclusion from the data tends somewhat to overstate the weight of the larger farms in the determination of the level and rates of change of agricultural production. Any evidence from this chapter tending to refute the notion (mentioned in chapters I and II) that the estate system caused agricultural output to stagnate should therefore be the more convincing for these exclusions.

A. Field crop production

1. The five major grains

Wheat, rye, barley, oats, and corn were the principal crops grown in Hungary, accounting for four-fifths of the total acreage under crops.\(^2\)
The data used in constructing the output index for this group, as well as for all other crops covered, are the official Hungarian government statistics for harvested acreage and yields. These statistics were gathered through a system of local and county reporters, and processed by the statistical office of the central government in Budapest. The acreage figures were supposed to be determined by the local reporter's questioning each farmer in his district, and while it is unreasonable to assume that this was done in all cases, the data can nevertheless be taken as quite accurate. Yields, estimated for the district as a whole on the basis of sampling and consultation with some farmers, must be regarded as less reliable. This is true especially for the early years (before 1879), during which time, even according to official reports, the production data actually became less trustworthy than they had been at the outset. 3

In 1885, a system of local agricultural experts was instituted to report on the harvest, and it is therefore from this date that the most reliable statistics begin. 4

An excellent price series from the Budapest grain exchange, available for the five major grains in monthly as well as yearly averages back to 1867, allows the use of different periods as bases for the production index. Using different bases, we can see if changes in relative prices over the period affect significantly the computed rates of growth of output.
The production index for the five major grains (see Table 9) showed annual rates of growth, between the 1870-1874 average and the 1909-1913 average, of 2.58, 2.53, and 2.54 percent based on the average prices of 1870-1874, 1891-1895, and 1909-1913, respectively. Thus it is clear that the choice of price weights has no significant effect on the rate of growth. Chart 3 is provided to show a comparison of the production index on two of the three bases.

The choice of terminal periods does affect the rate, however. Because the 1870's in general were years "when scarcely a harvest worth the name was achieved", while the years immediately preceding the War showed good harvests, rates of growth calculated between these two termini will tend to overstate actual growth. A sharp peak in production shows up in 1878, and another in 1906. Between these two peak years production grew at an average annual rate of 1.5 or 1.6 percent (depending on the price weights used), which we can take to be a close approximation to the rate of growth of potential output, i.e., that which could be produced under the most favorable weather conditions. Almost identical rates of growth can be calculated between the trough years 1879 and 1904, with somewhat higher rates if the year 1909 is taken as the terminus of the trough-to-trough derivation. From the foregoing consideration, we can be on quite firm ground in estimating the rate of
INDEXES OF GRAIN CROP OUTPUT, 1870 - 1913

<table>
<thead>
<tr>
<th>Year</th>
<th>1870-74 =100</th>
<th>1891-95 =100</th>
<th>1909-13 =100</th>
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<tbody>
<tr>
<td>1870</td>
<td>123.7</td>
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<td>45.5</td>
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<td>1871</td>
<td>96.7</td>
<td>43.1</td>
<td>36.2</td>
</tr>
<tr>
<td>1872</td>
<td>99.0</td>
<td>44.0</td>
<td>37.0</td>
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<tr>
<td>1873</td>
<td>78.3</td>
<td>34.6</td>
<td>29.2</td>
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<td>1874</td>
<td>102.3</td>
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</tr>
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<td>1875</td>
<td>106.3</td>
<td>46.1</td>
<td>38.8</td>
</tr>
<tr>
<td>1876</td>
<td>108.0</td>
<td>47.4</td>
<td>40.0</td>
</tr>
<tr>
<td>1877</td>
<td>131.6</td>
<td>57.1</td>
<td>48.2</td>
</tr>
<tr>
<td>1878</td>
<td>197.5</td>
<td>85.7</td>
<td>72.4</td>
</tr>
<tr>
<td>1879</td>
<td>105.8</td>
<td>46.2</td>
<td>39.0</td>
</tr>
<tr>
<td>1880</td>
<td>164.1</td>
<td>72.1</td>
<td>60.8</td>
</tr>
<tr>
<td>1881</td>
<td>159.4</td>
<td>69.1</td>
<td>58.4</td>
</tr>
<tr>
<td>1882</td>
<td>223.7</td>
<td>96.7</td>
<td>81.8</td>
</tr>
<tr>
<td>1883</td>
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<td>60.0</td>
</tr>
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<td>76.0</td>
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<td>61.0</td>
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<td>81.0</td>
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<td>72.6</td>
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<td>112.3</td>
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<td>223.1</td>
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<td>81.7</td>
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<td>83.3</td>
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<td>92.0</td>
<td>77.8</td>
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<td>95.2</td>
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<td>193.6</td>
<td>83.0</td>
<td>70.4</td>
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<td>86.5</td>
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<td>111.0</td>
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<td>249.4</td>
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<td>103.5</td>
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<td>283.5</td>
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<td>1911</td>
<td>276.3</td>
<td>119.0</td>
<td>100.7</td>
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<tr>
<td>1912</td>
<td>290.0</td>
<td>124.4</td>
<td>105.4</td>
</tr>
</tbody>
</table>
growth of production of the five major grain crops under average weather
conditions to be in the range of 1.5 to 2 percent per annum, with the former
figure as a bare minimum.

2. Other field crops

There are also series stretching back to 1870 which are con-
sistent (or can be made consistent) for acreage and yields of the following
five groups of crops:

1) Other minor cereals

Buckwheat, spelt (German wheat), kétszeres (a mixture
of rye and wheat, about half and half).

2) Grass and forage crops

Millet, clover, alfalfa, sainfoin, fodder beets, panic
grass, vetch, and natural hay.

3) Legumes

Peas, beans, lentils.

4) So-called "industrial" crops

Rape, tobacco, flax, hemp.

5) Root crops

Potatoes, sugar beets.

The above list excludes some crops, perhaps most important among
which is fodder corn, for which the series appears only in later years, as
well as some other minor, but locally very important products, most notably
paprika. The land area accounted for by the covered crops amounts to over 95 percent of the total harvested area in any given year, so that we can safely assume that the inclusion of the omitted crops, could it be made, would not significantly affect the index as calculated. All indices which follow are based on 1909-1913 average prices as weights. The results of this set of calculations are summarized in Table 10.

a. All grains, including minor cereals

Inclusion of the minor cereals in the grain index pushes the 1870/1874 to 1909/1913 output growth rate to 3.0 percent, with the 1878-1906 peak-to-peak growth averaging 1.4 percent per annum, and the 1879-1904 trough-to-trough figures yielding 2.3 percent. As would be expected, the estimate of an "average" growth in grain output does not change when the minor cereals are included; we retain the 1.5 to 2 percent figure derived in the previous section. Recalling that 1885 marks the beginning of the more reliable yield estimates, we note that the 1885/1889-1909/1913 growth appears somewhat slower at 1.4 percent per annum.

b. Grass and forage crops

This group shows a somewhat more rapid rate of growth of output than that of the previous section. From 1870/1874 to 1909/1913, output increases averaged 3.6 percent per annum or 3.1 percent a year between
### TABLE 10
INDEXES OF OUTPUT OF FIELD CROPS AND SUBCATEGORIES OF FIELD CROPS, SELECTED PEAK AND TROUGH YEARSa

1909-13 Average = 100

<table>
<thead>
<tr>
<th>Year</th>
<th>All Field Crops</th>
<th>All Grains</th>
<th>Grass and Forage</th>
<th>&quot;Industrial Crops&quot;</th>
<th>&quot;Industrial Crops&quot; and Sugar Beets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870 P</td>
<td>39.1</td>
<td>47.5</td>
<td>25.4</td>
<td>68.0</td>
<td>9.3</td>
</tr>
<tr>
<td>1873 T</td>
<td>28.6</td>
<td>30.1</td>
<td>24.9</td>
<td>62.3</td>
<td>6.2</td>
</tr>
<tr>
<td>1878 P</td>
<td>60.1</td>
<td>74.1</td>
<td>31.3</td>
<td>109.4</td>
<td>18.1</td>
</tr>
<tr>
<td>1879 T</td>
<td>39.0</td>
<td>40.3</td>
<td>32.9</td>
<td>94.5</td>
<td>16.7</td>
</tr>
<tr>
<td>1882 P</td>
<td>71.4</td>
<td>83.9</td>
<td>45.0</td>
<td>103.8</td>
<td>21.1</td>
</tr>
<tr>
<td>1889 T</td>
<td>60.7</td>
<td>62.2</td>
<td>49.6</td>
<td>102.1</td>
<td>32.7</td>
</tr>
<tr>
<td>1891 P</td>
<td>79.3</td>
<td>88.1</td>
<td>66.1</td>
<td>106.4</td>
<td>38.3</td>
</tr>
<tr>
<td>1894 T</td>
<td>71.9</td>
<td>80.6</td>
<td>53.0</td>
<td>89.9</td>
<td>41.8</td>
</tr>
<tr>
<td>1895 P</td>
<td>86.6</td>
<td>94.0</td>
<td>74.9</td>
<td>85.2</td>
<td>36.2</td>
</tr>
<tr>
<td>1897 T</td>
<td>66.0</td>
<td>58.4</td>
<td>80.1</td>
<td>77.6</td>
<td>40.5</td>
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<tr>
<td>1903 P</td>
<td>92.0</td>
<td>95.4</td>
<td>86.0</td>
<td>113.0</td>
<td>59.5</td>
</tr>
<tr>
<td>1904 T</td>
<td>64.6</td>
<td>70.7</td>
<td>54.1</td>
<td>78.9</td>
<td>45.0</td>
</tr>
<tr>
<td>1906 P</td>
<td>106.8</td>
<td>111.2</td>
<td>102.3</td>
<td>114.9</td>
<td>74.5</td>
</tr>
<tr>
<td>1908 T</td>
<td>85.3</td>
<td>90.6</td>
<td>78.0</td>
<td>105.4</td>
<td>58.6</td>
</tr>
<tr>
<td>1912 P</td>
<td>106.3</td>
<td>105.8</td>
<td>105.5</td>
<td>99.0</td>
<td>131.7</td>
</tr>
</tbody>
</table>

a. Peaks and troughs selected for the index of all field crops, hence do not in some cases correspond to peaks and troughs in output of subgroups.

Source: See text. See text also for definitions of categories.
1885/1889 and 1909/1913. The 1876-1904 (trough-to-trough) rate was 3.7 percent and the 1884-1910 (peak-peak) rate somewhat lower at 3.0 percent. If we exclude natural hay (i.e., pasture and meadow grass) from this category, we find the two total period, trough-to-trough, and peak-to-peak, rates of growth to be 5.4, 4.0, 5.1, and 5.4 percent, respectively. This more rapid rate of growth is consistent with the shift toward more stall feeding and less open grazing of cattle which was an integral part of the shift toward the "western" breeds. 7

c. **Legumes and potatoes**

Because each of the other "root crops" is properly included with another category (see sections b, "Grass and forage crops", and d, "Industrial crops", of this part), and because together potatoes and legumes make up a very minor fraction of total output, they have been lumped together in a single index. The growth of this index is quite similar to that for grain crops - 3.5 percent or 1.2 percent overall (depending on beginning period), with a peak-to-peak change averaging 1.4 percent (1878-1909), and a trough-to-trough average (1873-1904) of 3.9 percent per annum.

d. **"Industrial" crops**

Taking the crops which official Hungarian statistics identify as "industrial" crops - rape, tobacco, hemp, and flax - we find output little
changed over the period with which we are concerned. Although the 1870/74 to 1909/13 rate of growth of output of this class of crop appears as 1.0 percent per annum, the comparison of 1885/1889 with 1909/1913 barely registers any change (0.06 percent p.a.) and a comparison of the trough years 1879 and 1904 shows an actual decline in level of output. The change between the troughs of 1874 and 1904 is a gain averaging 2.0 percent per year, however. The 1878-1910 peak-to-peak comparison reveals very slow growth – somewhat less than 0.2 percent per year.

One important crop used as an input to industrial processes is sugar beets. Inclusion of sugar beets in the above group changes the rates of growth observed for the class as a whole to the following:

1870/1874 - 1909/1913 6.5%
1885/1889 - 1909/1913 6.2%
1873-1904 (trough-to-trough) 6.4%
... 1878-1906 (peak-peak) 5.1%

As is obvious, the rapid increase in sugar beet production (which was the result not only of more acreage but of greatly increased yields, apparently achieved through extremely careful and diligent seed selection) dominates the index. For comparison, the rates of change of output of sugar beets alone are 7.1 percent (1870/1874-1909/1913), 6.7 percent (1885/1889-
1909/1913), 7.3 percent (1872-1904), and 5.2 percent (1883-1910).

e. **Root crops**

For the purposes of this section, root crops include potatoes, sugar beets, and fodder beets (mangold); this category then is one of overlap, taking its elements from three other indices; that of part b, fodder crops; of part c, potatoes and legumes; and the second index of part d, industrial crops.

Made up of three rapidly growing items, the index naturally shows very substantial rates of growth of output: 6.9 percent per annum is the 1870/1874 to 1909/1913 average, or 6.3 percent, 1885/1889-1909/1913, with the trough-to-trough rate (1873-1904) even higher at 7.2 percent, while the rate registered between the peak years of 1878 and 1906 was 5.3 percent.

**f. Overall field crop production**

Of perhaps greater interest than any of its components, however, is the expansion of total output of field crops. The aggregate multiplied somewhat more than 2.5 times between 1870 and 1913, implying an average growth rate between the midpoints of 1870/1874 and 1909/1913 of 2.8 percent. Again using the peak-peak calculation as a rough estimate of growth in potential output, we find the years between
1878 and 1906 recording an average annual increase of just over two percent, with virtually an identical figure between the trough year of 1879 and 1904. Thus attributing to Hungarian agriculture a growth in the harvest from its fields averaging a minimum of two percent per year between 1870 and the first World War seems a reasonable estimate, if we can rely on the yields prior to 1885 not being underestimated. Otherwise, we must accept a slightly lower figure - 1.8 percent - which represents the growth in the index of total field crop output between 1885/1889 and 1909/1913.

Applying this latter figure and leaping ahead somewhat, we find population grew at almost exactly one percent per year between 1880 and 1910 (see chapter V). Thus if we should make a guess as to rate of growth of per capita income of 1.5 percent per year, the 1.8 percent rate of growth of output of field crops (the growth in the real volume of exports of field and garden crops was at almost this same rate between 1882/1886 and 1909/1913 - see chapter IV) would be adequate to satisfy the increase in demand for field crops if the income elasticity of this demand did not much exceed 0.5. If the rate of growth of income were one percent per year per capita, then the income elasticity could go as high as 0.8. While the foregoing are reasonable magnitudes and in accord with estimates for other under-developed countries, we do not find the large margin for error in our guesses which we would like in order to be able to make
a confident conclusion about the adequacy of agriculture's contribution in the growth of field crop output. This remains a borderline case.

B. Livestock and animal products

1. The livestock population

   a. General considerations

   To estimate the output of livestock and of animal products, we have no extended time series with which to work—only some censuses (of varying degrees of accuracy) of the animal population in Hungary. Having only numbers of animals introduces several problems, because there is not necessarily a one-to-one relationship between the stock (numbers of animals) and the flow (output of animal products). Ceteris paribus, the output of final products from a herd of 10,000 cattle would be larger if the herd had been at that size for several years than if it had just grown to that size, because in the growing herd the proportion of calves would likely be higher, representing in large part an investment, the productive fruits of which were yet to be realized. This would of course be true for any kind of livestock. A decline in the number of horses may not mean any decline in final output, but merely that draft power (an intermediate good) is being supplied by some substitute source, such as tractors. Changes in breed composition of herds or flocks may bring about large increases in output of animal products with no increase in actual numbers (a subject of particular
TABLE 11

LIVESTOCK POPULATION ACCORDING TO OFFICIAL CENSUSES

(Thousands)

<table>
<thead>
<tr>
<th></th>
<th>1870</th>
<th>1884</th>
<th>1895</th>
<th>1911</th>
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</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>4497</td>
<td>4879</td>
<td>5829</td>
<td>6184</td>
</tr>
<tr>
<td>Horses</td>
<td>1900</td>
<td>1749</td>
<td>1973</td>
<td>1974</td>
</tr>
<tr>
<td>Donkeys</td>
<td>27</td>
<td>22</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Mules</td>
<td>2.6</td>
<td>0.7</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Goats</td>
<td>409</td>
<td>270</td>
<td>286</td>
<td>331</td>
</tr>
<tr>
<td>Pigs</td>
<td>3574</td>
<td>4804</td>
<td>6447</td>
<td>6415</td>
</tr>
<tr>
<td>Sheep</td>
<td>13,761</td>
<td>10,595</td>
<td>7,527</td>
<td>7,698</td>
</tr>
<tr>
<td>Fowl</td>
<td>n.a.</td>
<td>32,917</td>
<td>29,352</td>
<td>n.a.</td>
</tr>
<tr>
<td>Beehives</td>
<td>488</td>
<td>743</td>
<td>665</td>
<td>n.a.</td>
</tr>
</tbody>
</table>


1884: Ibid., vol. XVII (1887), (Budapest: 1890), III: 76-77.


1911: Annuaire Statistique Hongroise, 1912 (Budapest: 1913), 137.
importance to Hungary, which will be taken up below). Even if the livestock population is static with respect to breed composition, age distribution, and numbers, slaughterings and marketings can be expected to vary in response to changes in prices or in price expectations. By considering more specific cases, the list of reasons why livestock numbers might not give an accurate reflection of the changes in output of animal products could be extended ad infinitum. Numbers can still be used as a rough guide however. If the direction of change in breed composition or in other important variables can be established, we can determine whether the growth in numbers of a particular animal represents a floor or a ceiling to the rate of growth of output of the products which that given animal provides. Such a determination can be made for several of the most important types of animals.

Before looking at the figures for animal population taken from the various censuses, it would be well to consider for a moment the character and reliability of the censuses themselves. The population census of 1869 also counted numbers of livestock; this was followed by separate enumerations of the animal population in 1884, 1895 (part of the general agricultural census), and 1911. The value of the two earlier counts, especially that of 1884, is rather questionable. The principal difficulty was with the method of enumeration in 1884: "In each questionnaire the
livestock population for an entire community was entered, which tempted / the officials/ toward a superficial procedure or toward the registering of data taken out of the air." 10 The later inquiries were conducted farm by farm, and hence present us with much more reliable data. This should be kept in mind when considering the comparisons among the various censuses which follow.

Table 11 shows a general comparison of livestock enumerated by the various censuses. It reveals some indications of an overall tendency toward a more "intensive" agriculture through the steady gains registered in cattle and pigs, in contrast to the static horse population and the sharp decline in numbers of sheep. On the surface it would further seem that this tendency did not continue with any force beyond 1895, since the 1911 figures in each case show only minor changes from 1895.

Within the cattle population, however, we can observe a strong shift away from the native Hungarian breed - a primarily draft animal ill-suited to the production of milk and meat - toward the "western" types of beef and dairy cattle. Thus, while the Hungarian breed made up over 90 percent of all cattle counted in 1869, 11 and 78 percent in 1884, its share fell to 64 percent in 1895 12 and barely exceeded 30 percent by 1911. 13 By 1911, a majority (58 percent) of the cattle population were of the "western" roan breeds (Bern, Simmental, Pirzgau).
So, although the increase in numbers was relatively modest, the complete turnabout in the breed composition could be termed a minor revolution in Hungarian cattle-raising. It is unclear who led this revolution. Data on distribution of the different breeds of cattle by size of farm are unavailable. There is a distribution, however, by region of the country, for 1911\(^{14}\), and if we ranked regions according to the share of large estates in total farm land (available for 1895 only) and compared this to their rank according to the percentage of Western breeds of cattle, a high correlation, while not conclusive evidence, would support the idea that large estates were at the fore. The results are ambiguous, however: the coefficients of rank correlation derived are 0.393, 0.393, and 0.081 if the regions are ranked according to the share of total farmland in holdings of 1,000\(\_\_\_\_\) holds or more, 500\(\_\_\_\_\) holds or more, and 100\(\_\_\_\_\) holds or more, respectively.

No such dramatic change occurred within the swine population - even in 1911, more than nine pigs out of 10 were of the native "lard type" (as contrasted to English and other "meat" breeds).\(^{15}\) It is further impossible to tell how much of the recorded increase in the hog count is due merely to better coverage in the census and how much to actual increase in numbers, but we should note that nearly identical totals for 1895 and 1911 represent not so much stagnation as a successful recovery from an epidemic of hog cholera. This epidemic, which began in 1895, was quite
severe, killing over one and a third million pigs in the next three years alone. 16

b. Comparisons with other countries

Table 12 presents comparisons, among ten European countries, of the numbers of cattle, horses, pigs, and sheep shortly before the turn of the twentieth century. At that time only Rumania and probably Russia - of the countries observed in the table - was considered more backward in its agriculture than Hungary. Yet Hungary does not rank eighth or lower in any of the categories; it is fifth or higher in all save numbers of cattle per unit of area. It has the third highest numbers both of cattle and horses per 1,000 population, is fifth in the same measure for sheep, and first - leading even Denmark - in number of pigs per unit both of area and of population.

Since the focus of this investigation is on the contribution of agriculture to overall economic development, it is appropriate that the numbers be compared to total population, rather than to agricultural population. The amount of farm products, including animal products, available to support the non-agricultural population as well as the farm population - and any surplus above that for export - is the relevant magnitude for consideration. Some qualifications to the preceding paragraph are nevertheless in order. The number of pigs is not a good indicator of how much meat is available per capita. As noted in a previous paragraph, Hungary's swine
### TABLE 12
INTERNATIONAL COMPARISON OF NUMBERS OF CERTAIN LIVESTOCK, CA. 1895

(Rank shown in parentheses)

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Cattle</th>
<th>Horses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>per km²</td>
<td>per 1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>population</td>
<td>population</td>
</tr>
<tr>
<td>Hungary</td>
<td>1895</td>
<td>20.84 (7)</td>
<td>366 (3)</td>
</tr>
<tr>
<td>Austria</td>
<td>1891</td>
<td>30.6 (5)</td>
<td>362 (4)</td>
</tr>
<tr>
<td>Germany</td>
<td>1892</td>
<td>32.4 (4)</td>
<td>355 (5)</td>
</tr>
<tr>
<td>France</td>
<td>1894</td>
<td>24.0 (6)</td>
<td>336 (6)</td>
</tr>
<tr>
<td>Gr. Britain</td>
<td>1894</td>
<td>34.1 (3)</td>
<td>274 (8)</td>
</tr>
<tr>
<td>Italy</td>
<td>1890</td>
<td>17.4 (9)</td>
<td>161 (10)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1893</td>
<td>45.0 (1)</td>
<td>309 (7)</td>
</tr>
<tr>
<td>Russia</td>
<td>1888</td>
<td>4.8 (10)</td>
<td>251 (9)</td>
</tr>
<tr>
<td>Denmark</td>
<td>1893</td>
<td>44.2 (2)</td>
<td>780 (1)</td>
</tr>
<tr>
<td>Rumania</td>
<td>1890</td>
<td>19.2 (8)</td>
<td>500 (2)</td>
</tr>
</tbody>
</table>
TABLE 12 (continued)

(Part Two)

(Rank shown in parentheses)

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Sheep per km²</th>
<th>Sheep per 1000 population</th>
<th>Pigs per km²</th>
<th>Pigs per 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>1895</td>
<td>26.9</td>
<td>(5)</td>
<td>23.0</td>
<td>(1)</td>
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<tr>
<td></td>
<td></td>
<td>476</td>
<td>(5)</td>
<td>407</td>
<td>(1)</td>
</tr>
<tr>
<td>Austria</td>
<td>1891</td>
<td>11.3</td>
<td>(9)</td>
<td>12.5</td>
<td>(5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>133</td>
<td>(10)</td>
<td>149</td>
<td>(6)</td>
</tr>
<tr>
<td>Germany</td>
<td>1892</td>
<td>25.1</td>
<td>(6)</td>
<td>22.5</td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>274</td>
<td>(7)</td>
<td>246</td>
<td>(3)</td>
</tr>
<tr>
<td>France</td>
<td>1894</td>
<td>38.6</td>
<td>(2)</td>
<td>11.2</td>
<td>(7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>540</td>
<td>(4)</td>
<td>157</td>
<td>(5)</td>
</tr>
<tr>
<td>Gr. Britain</td>
<td>1894</td>
<td>95.2</td>
<td>(1)</td>
<td>12.0</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>765</td>
<td>(2)</td>
<td>96</td>
<td>(8)</td>
</tr>
<tr>
<td>Italy</td>
<td>1890</td>
<td>24.1</td>
<td>(7)</td>
<td>6.2</td>
<td>(9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>223</td>
<td>(8)</td>
<td>58</td>
<td>(10)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1893</td>
<td>20.8</td>
<td>(8)</td>
<td>17.3</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>143</td>
<td>(9)</td>
<td>119</td>
<td>(7)</td>
</tr>
<tr>
<td>Russia</td>
<td>1888</td>
<td>8.8</td>
<td>(10)</td>
<td>1.8</td>
<td>(10)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>454</td>
<td>(6)</td>
<td>94</td>
<td>(9)</td>
</tr>
<tr>
<td>Denmark</td>
<td>1893</td>
<td>32.4</td>
<td>(4)</td>
<td>21.6</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>573</td>
<td>(3)</td>
<td>384</td>
<td>(2)</td>
</tr>
<tr>
<td>Rumania</td>
<td>1890</td>
<td>38.1</td>
<td>(3)</td>
<td>7.0</td>
<td>(8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>992</td>
<td>(1)</td>
<td>183</td>
<td>(4)</td>
</tr>
</tbody>
</table>

population was made up of about 90 percent of lard pigs. Thus for swine and perhaps for other animals as well, an adjustment for quality might change the observed rankings somewhat. The observed rankings also give no guide to the productivity or "animal-intensiveness" of a given country's agriculture, since the proportion of population engaged in agriculture - a crucial variable in productivity calculations - is not indicated. Nevertheless, the figures as presented give some indication that the extent of animal husbandry in Hungary can stand comparison with other European states of the same period.

This is not intended to ignore, however, the possibility that a relatively large number of animals might indicate backwardness, not advancement, in the agricultural technology of a country. Nomadic sheep culture would of course be the prime example of such a situation; also large numbers of horses and cattle might indicate a failure to adopt modern mechanical means of providing power. Because of the decline in sheep numbers and the shift away from draft cattle (with no increase in horses to offset it), we can discount such a possibility for Hungary. Indeed, within a settled agriculture perhaps a stronger case can be made that a predominance of crop production over livestock is an indicator of backwardness.
c. Animal stock by size of farm

Of particular relevance for the present study, the distribution of livestock by size of farm unit is available for 1895 and 1911. The details of comparison appear in Table 13. What is immediately striking from Table 13 is the reduction in absolute numbers of each type of animal to be found on the largest (over 1,000 holds) estates. This development is at least partially contemporaneous with the increase in the area of these large properties described in chapter II, indicating an even sharper relative decline in the animal population on this class of farms. In contrast, the numbers of each type of animal covered shows an increase in the under 10 holds categories. The middle and larger farms tended toward declines in the total numbers of the major kinds of livestock.

Relatively, however, the number of all kinds of animals (except goats) per farm rose between 1895 and 1911 for all size categories under 100 holds. For farms larger than this, however, more categories show decreases than increases. The table thus presents the picture of an apparent shift in animal population toward the smaller farms.

In a country such as Hungary, where stall feeding of cattle and other animals appeared to have been on the increase, growth in the livestock population per unit of area can be taken as a rough indicator of growth of "intensivity" of farm operation (although in a ranching area such as the U.S. West
such an indicator might not be valid). It appears that in Hungary, the smaller farm units became more intensive, while the larger farms became more extensive. This can be seen even without being able to make a comparison of numbers of animals per unit area between the two years, if in addition to the above considerations, we note the following:

1) For some classes of farms the change in number of animals per farm is a compound of both a larger number of animals and small number of farms. This is the case for all animals covered in the tables for all size categories under 20 holds, with the single exception of horses. The change in numbers of animals per farm is in most cases large enough that we can assume there was not an increase in the average size of farm within each category sufficient to prevent an increase in the number of animals per unit of area.

2) If we use 100 holds (143 acres) as the dividing line between large and small properties, we find that almost the same number of large properties (24,635 and 24,797) were counted in respective surveys, although the distribution by size had changed. The increase in average size of larger farms noted in chapter II, plus the decline in absolute numbers of most kinds of animals on properties over 100 holds shown in Table 13, must mean that the average number of animals per hold declined for large holdings as a group, although for particular animals the numbers per hold may
<table>
<thead>
<tr>
<th>Size Category (holds)</th>
<th>Pigs</th>
<th>Horses</th>
<th>Cattle</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5</td>
<td>111</td>
<td>111</td>
<td>111</td>
</tr>
<tr>
<td>5 - 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 - 20</td>
<td>2510</td>
<td>1445</td>
<td></td>
</tr>
<tr>
<td>20 - 50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 - 100</td>
<td>588</td>
<td>964</td>
<td>452</td>
</tr>
<tr>
<td>100 - 200</td>
<td>2.82</td>
<td>1.77</td>
<td>1.22</td>
</tr>
<tr>
<td>200 - 500</td>
<td>127</td>
<td>117</td>
<td>918</td>
</tr>
<tr>
<td>500 - 1000</td>
<td>2.02</td>
<td>1.36</td>
<td>1.48</td>
</tr>
<tr>
<td>Over 1000</td>
<td>17.2</td>
<td>11.5</td>
<td>7.41</td>
</tr>
<tr>
<td>Total (000)</td>
<td>186.86</td>
<td>60.5</td>
<td>70.4</td>
</tr>
</tbody>
</table>

Table 13 Numbers of Selected Kinds of Livestock, by Size of Farm (Part One)
<table>
<thead>
<tr>
<th>Size Category (hols)</th>
<th>Sheep</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5</td>
<td>1741</td>
<td>1741</td>
</tr>
<tr>
<td>5 - 10</td>
<td>1002</td>
<td>0.85</td>
</tr>
<tr>
<td>10 - 20</td>
<td>1240</td>
<td>0.54</td>
</tr>
<tr>
<td>20 - 50</td>
<td>1092</td>
<td>5.95</td>
</tr>
<tr>
<td>50 - 100</td>
<td>327</td>
<td>0.05</td>
</tr>
<tr>
<td>100 - 200</td>
<td>286</td>
<td>0.26</td>
</tr>
<tr>
<td>200 - 500</td>
<td>47</td>
<td>0.19</td>
</tr>
<tr>
<td>500 - 1000</td>
<td>26.26</td>
<td>0.37</td>
</tr>
<tr>
<td>Over 1000</td>
<td>0.77</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Notes and sources for this table appear on the succeeding page.
Notes and Sources for Table 13

a. 0-.5 category not included because inclusion of animals owned by persons not owning land and differences in definition of a farm make it impossible to calculate comparable figures on a per farm basis.

Source: 1895: Ungarische Statistische Mittheilungen, N.F. vol. XXIV, 59*-75*;
Annuaire Statistique Hongroise, 1911, 80.

1911: Annuaire Statistique Hongroise, 1912, 126-137.
have increased within some farm size groups.

It is further true that the smaller farms are more animal-intensive in the static sense - i.e., that although the number of animals per farm increases with increasing farm size, the number per unit of area declines. Table 14 shows this relation quite clearly; the only exceptions are in the three largest size categories for sheep and in the largest size category for horses. Sheep, however, are traditionally associated with "extensive" agriculture, and the discrepancy for horses is probably due to the inclusion of the State-owned stud farms - all large estates - in the data.

The 1895 data therefore show an apparent decrease in intensivity of cultivation (according to our rough indicator of livestock population) as farm size increases, and the comparisons which can be made between 1895 and 1911 point to a sharpening of this contrast. If relative prices between field crops and animals did not change, while incomes per head of the population rose, then that segment of agriculture which more quickly shifted toward the production of items more income-elastic in their demand structure would have to be accorded the better mark in adaptability to changing conditions. From Table 15 we can discern little in the way of a shift in relative prices between 1897 (the first year available for the live-stock prices) and 1911. It might therefore appear at first glance that the smallholders were quicker to exploit the opportunity inherent in the greater
TABLE 14

SELECTED LIVESTOCK, NUMBERS PER HOLD, BY SIZE OF FARM, 1895

<table>
<thead>
<tr>
<th>Size Category (Holds)</th>
<th>Cattle</th>
<th>Horses</th>
<th>Swine</th>
<th>Sheep</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>0.46</td>
<td>0.13</td>
<td>0.62</td>
<td>0.24</td>
</tr>
<tr>
<td>5-10</td>
<td>0.28</td>
<td>0.09</td>
<td>0.23</td>
<td>0.18</td>
</tr>
<tr>
<td>10-20</td>
<td>0.21</td>
<td>0.08</td>
<td>0.18</td>
<td>0.17</td>
</tr>
<tr>
<td>20-50</td>
<td>0.15</td>
<td>0.07</td>
<td>0.14</td>
<td>0.17</td>
</tr>
<tr>
<td>50-100</td>
<td>0.11</td>
<td>0.05</td>
<td>0.11</td>
<td>0.14</td>
</tr>
<tr>
<td>100-200</td>
<td>0.11</td>
<td>—</td>
<td>0.09</td>
<td>0.14</td>
</tr>
<tr>
<td>200-500</td>
<td>0.10</td>
<td>—</td>
<td>0.08</td>
<td>0.18</td>
</tr>
<tr>
<td>500-1000</td>
<td>0.09</td>
<td>—</td>
<td>0.09</td>
<td>0.24</td>
</tr>
<tr>
<td>Over 1000</td>
<td>0.06</td>
<td>0.01</td>
<td>0.07</td>
<td>0.24</td>
</tr>
</tbody>
</table>

a. Less than 0.005.

Source: Calculated from figures appearing in Table 13 and Annuaire Statistique Hongroise, 1911, 80.
### TABLE 15

**PRICES OF SELECTED AGRICULTURAL PRODUCTS, 1897 AND 1911**

(1899-1903 average = 100)

<table>
<thead>
<tr>
<th>Product</th>
<th>1897</th>
<th>1911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>89.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>143.3</td>
</tr>
<tr>
<td>Five major grains</td>
<td>86.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>146.4</td>
</tr>
<tr>
<td>Hungarian oxen</td>
<td>90.0</td>
<td>142.5</td>
</tr>
<tr>
<td>Western oxen</td>
<td>84.5</td>
<td>145.7</td>
</tr>
<tr>
<td>Veal Calves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live</td>
<td>97.0</td>
<td>158.9</td>
</tr>
<tr>
<td>Slaughtered</td>
<td>106.9</td>
<td>159.4</td>
</tr>
<tr>
<td>Hungarian cows</td>
<td>90.4</td>
<td>135.6</td>
</tr>
<tr>
<td>Sheep</td>
<td>92.6</td>
<td>147.3</td>
</tr>
<tr>
<td>Pigs</td>
<td>104.1</td>
<td>161.1</td>
</tr>
<tr>
<td>Whole milk</td>
<td>88.9</td>
<td>155.6</td>
</tr>
</tbody>
</table>

<sup>a</sup> 1896 price used because harvest strike in 1897 caused the grain prices of that year to skyrocket.

*Source:* Ungarische Statistische Mitteilungen, N.S. vol. XLIV, (Budapest, 1913), 316-19, 325.
income-elasticity of demand for animal products as compared to cereal grains, and that they therefore rate higher for adaptability. Such a simple formulation ignores two important considerations: the existence of export opportunities and changes in the costs of production.

No evidence has been presented that pig numbers and pork output grew more rapidly than did the output of cereal grains. Indeed, it appears from the data so far presented, that with pig numbers nearly the same in 1911 and 1895, and with the proportion of lard pigs still as high as 90 percent in 1911, pork output may hardly have grown at all. But the production of cereal grains was growing, and with it exports. Although the position is much harder to defend when other animals are being considered, this at least raises the possibility that estate-owners were indeed adaptable to expansion of demand — and because of export demand, this expansion may have been relatively larger for grains than for pigs and pork.

When looking at the changes in output from the supply side, we must note that changes in input prices or in input requirements may mean that expansion in the less-elasticly demanded products may still be consistent with maximization of profits. Changes in cost of production might differ enough to more than offset the effects of differences in demand elasticity on total profits.
Furthermore, the shift observed in Table 13 might be nothing more than a movement toward increased general efficiency of agriculture through specialization in production. If, for example, there existed economies of scale in grain production (e.g., in marketing, credit, transport, education of the farm manager, etc., which might have been a consequence of the particular institutional milieu in Hungary at the time), then the apparent "extensivization" of the large estates and "intensivization" of the smaller farms could both be rational responses to the changing conditions of demand for agricultural products. Lacking any data on production functions, we are left in doubt on this point.

2. The output of animal products
   a. General considerations

Because of the availability of only scattered data from which estimates of output of animal products can be derived, the results presented in this section should be considered only rough approximations to true figures. Further, since we must rely on the animal census results for benchmarks in the estimating procedure, despite the shortcomings mentioned in B. 1. a. above, the confidence with which we can rely on the results must necessarily be considerably less than that associated with the estimates of field crop production.

The output of animal products from which the index will be constructed will consist of the production of milk, wool, meat, and hides. This leaves...
out several items of importance. The omission of animal power and dung used for fertilizer will have no effect on an overall index of agricultural output, since they would be netted out as intermediate products, but this omission does affect the index of animal products taken as a separate entity. The shift away from draft cattle might result in a bias toward overstatement of the growth rate. Eggs and poultry are also omitted for lack of data, as well as other products of rather minor importance—honey, beeswax, silk cocoons, feathers, goat’s milk, etc. To accept an index made up of only some animal products requires the assumption that the production of those items omitted expanded, on the average, at the same rate as the production of the covered commodities. The most important among the exclusions—eggs, poultry, and feathers—might have shown an output expansion faster than the calculated index. Table 16 reveals that although exports of milk and cream, and fresh meat and carcasses, expanded faster than export of eggs and poultry, exports of other important categories of covered products grew more slowly or even declined. We cannot with real confidence assert that output grew faster than, at the same rate as, or slower than exports, since such a relation depends inter alia on the relative rates of growth of domestic and export demand. Lacking information on this and on world supply conditions, the working assumption used here will be that exports grew at roughly the same rate as total production of poultry and
poultry products. If such an assumption be true, the omission of poultry, poultry products, animal power, and dung from the production index should not seriously affect its course over time. Moreover, since poultry raising, like beekeeping, silkworm culture and vine culture, is predominantly an activity of the smaller farms, the omission of its output from the index tends to give a great weight to the products of the estates, which — as mentioned in the first paragraph of this chapter — would make the more convincing any evidence to refute the notion that farm output stagnated under the weight of the inertia of the estates.

b. Production of milk

The output of milk is computed as the product of the number of cows enumerated in the census years times an average of milk production per cow, adjusted for the percentage of cows not being milked. For 1895 and 1911, estimates are available which show this adjusted yield per cow as 752.7 and 847.1 liters per year. In addition, an independent estimate is available for 1857 and 1895, which gives the figures as 500 liters and 760 liters, respectively. For the 1857 to 1895 period, this works out to a growth rate of 1.1 percent per annum on the average. Projecting that rate smoothly through the entire period gives the figures used for 1869 and 1884 — 571 liters and 673 liters per cow per year, respectively. This perhaps overstates the 1869 production, since the improvement in yield per cow
### TABLE 16

**Rates of Growth* of Physical Volume of Exports, Selected Agricultural Commodities (1882/84 average to 1911/13 average)**

**Animals and animal products:**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live slaughter cattle</td>
<td>1.2%</td>
</tr>
<tr>
<td>Fresh meat and carcasses</td>
<td>10.1</td>
</tr>
<tr>
<td>Milk and cream</td>
<td>8.5</td>
</tr>
<tr>
<td>Sheep and goats</td>
<td>-2.6</td>
</tr>
<tr>
<td>Wool</td>
<td>-2.0</td>
</tr>
<tr>
<td>Pigs (1882/84-1892/94<strong>b</strong>)</td>
<td>6.5</td>
</tr>
<tr>
<td>Bacon</td>
<td>5.1</td>
</tr>
<tr>
<td>Poultry (live)</td>
<td>4.1</td>
</tr>
<tr>
<td>Poultry (dressed)</td>
<td>6.7</td>
</tr>
<tr>
<td>Eggs</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Grains and flour:**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All grains</td>
<td>1.1%</td>
</tr>
<tr>
<td>Wheat</td>
<td>-0.2</td>
</tr>
<tr>
<td>Rye</td>
<td>2.8</td>
</tr>
<tr>
<td>Barley</td>
<td>0.1</td>
</tr>
<tr>
<td>Oats</td>
<td>2.2</td>
</tr>
<tr>
<td>Corn</td>
<td>3.3</td>
</tr>
<tr>
<td>Flour<strong>c</strong></td>
<td>3.0</td>
</tr>
</tbody>
</table>

* Continuous compounding.

** An epidemic of hog cholera began in 1895, drastically cutting exports of pigs. (see footnote)

**c. Wheat flour figures unavailable separately before 1906. In 1911/13, wheat flour exports made up 91% of all flour exports by weight.

Source: Calculated from data provided in the cited sources.
represents largely the change away from the low-yielding native Hungarian breed of cattle,\textsuperscript{21} which still accounted for over 90 percent of all cattle enumerated in 1869 (see B.1.a. above).

The production of sheep's milk was also included in the index. Fellner's estimate of the number of ewes milked and yield per ewe in 1911\textsuperscript{22} are used as follows: the fraction ewes milked / total sheep population in 1911 was multiplied times the sheep population of each of the other census years to get an estimate of number of ewes being milked in each of those earlier years. Production was figured at the 1911 rate of 40 liters per ewe milked per year. The value of total milk production from both cows and sheep was then derived using Fellner's 1911/1913 prices of milk at the farm.\textsuperscript{23} A Budapest wholesale market price is also available, but because of the high cost of milk transport which is necessarily included in the price at the organized market, it was preferable to use the "at the farm" price. For some commodities this was impossible, but for most goods (mainly because they are less perishable) the inclusion of some transport in the price distorts relative prices less than with milk.

c. \textit{Meat and hides}

This section, as the previous and succeeding sections, depends heavily on the pioneering work of Fellner already cited. His figures required some changes because they were in the main for the Kingdom of Hungary and had
to be adjusted to coverage of just "Hungary proper", but also because they
were peppered with arithmetic and typographical errors. The reader may
assume that the territorial adjustment has been made in every figure, and I
shall detail only adjustments made for other reasons.

Estimates of the number of bulls and steers, oxen, cows, young beef,
calves, sheep, goats, and pigs slaughtered for consumption purposes are
available for the two later census years from Fellner, who bases them on the
records of numbers of animals of each type killed in publicly-provided
slaughterhouses and butchering stations. He then uses a value per head
at slaughter time for each type of animal, derived from official data in the
censuses or from export values\(^{24}\) to make his estimates of the total value
of animals slaughtered.

For each of the classes Fellner computes from his data and observa-
tions a standard fraction of the total population of each type of animal
slaughtered in an average year. I have used or adjusted these fractions
to derive the 1869 and 1884 slaughter totals from the census data as follows:

1) Bulls and steers: 1/3 slaughtered; no change

2) Oxen: 1/5; no change

3) Cows: 1/7; no change

4) Young beef and calves: 1/4; this is a change from Fellner's
1/5. The observed figures were 24 percent slaughtered in 1895 and 42
percent in 1911, from a considerably understated total population. If the
approximately 1,000,000 animals listed as oxen that would have been included in the young beef category in earlier censuses were transferred in, the observed slaughter for 1911 would have been 26 percent of the total of young beef and calves. In addition, the 1895 and 1911 figures for the slaughter give beef and calves separately, young beef being 22.7 percent and 23.9 percent, respectively, of the total numbers slaughtered in this category in the two years. So for the combined category "young beef and calves" the estimate of numbers slaughtered in 1869 and 1884 are apportioned as 23.3 percent young beef and 76.7 calves for the purposes of computing value of the slaughter.

5) Sheep: 1/5; changed from Fellner's 1/6 because the observed numbers for the 1895 and 1911 slaughter were 22 percent and 18 percent, respectively, of the total number of sheep. Adult sheep accounted for 60 percent of the total slaughtered in 1895 and 58 percent in 1911, so the fraction used to apportion the slaughter in the earlier years for value computation purposes was 3/5 adults, 2/5 lambs.

6) Goats: 1/5; no change. The adult/kid apportionment of the slaughter for 1869 and 1884 was set at 1/2 and 1/2, on the basis that the observations for 1895 and 1911 showed 45 percent of the number slaughtered were adult goats in the former year and 57 percent were adults in the later year.
7) Pigs: 2/5; this is a change from Fellner's earlier estimate, but not his later one. Fellner multiplies the official totals for pigs slaughtered by 1 7/8 to account for the customary killing of piglets on the farm rather than in the public slaughterhouses. His estimate for 1895 is revised upward to correspond to the 2/5 fraction, which seems much more realistic than the 1/5 used earlier in the case of pigs, and for all years the slaughter is divided in the ratio of 8:7 between adult pigs and piglets.

In addition, bison herds, concentrated almost exclusively in Transylvania, provided some meat and hides. The observed figures for 1895 and 1911 show about seven percent of the total bison population were slaughtered, and this figure is applied to the 1869 and 1884 census totals as well. Fellner's 1911 price estimates were used for this and all previous categories to arrive at the value of animals slaughtered for meat and hides.

d. Wool

Fellner uses one kilogram per adult sheep and 0.25 kilograms per lamb as the amount of wool sheared per year on the average around 1895, and changes this to 1.5 kilograms and 0.25 kilograms in 1911. The percentage of adult sheep in the total population is taken to be higher in 1911, so that the average yield per sheep, irrespective of age, is 0.625 kilograms in 1895, but 1.214 in 1911. The 1911 figure of three-quarters of the sheep population being adults seems more realistic (especially in view of the slaughter totals).
than a mere half, so Fellner's figures are adjusted to reflect this change. Further, the 1911 yields per adult sheep are used for every previous year as well, which probably understates the degree of change over the period, since there was probably some quality improvement - either genetically through introduction of superior breeds, as with cattle, or in terms of the care and feeding of the flocks.

e. The overall index of animal products output

Table 17 presents the overall index and its component parts, the derivation of which has been described in the previous section. The performance of Hungarian agriculture according to this index is rather poor, with the total and each of the major components except milk production apparently failing even to keep up with the rate of population growth (see chapter V). For multiple reasons, the rate of growth of the overall index is probably understated, with the most serious shortcomings likely in the estimates of meat and hides produced. A look at the export figures (Table 16) and the figures for the production of fodder crops (Table 10) would seem to indicate that the index calculated on the basis of Fellner's early estimates falls quite far short of an accurate estimate of the growth in production of animal products. If this conclusion is not granted, then we must accept the result that the greater growth in fodder crop production and in exports meant both decreasing efficiency in animal
feeding (or substitution of fodder for some other input, an extremely un-
likely possibility)\textsuperscript{25} and a deterioration in the diet of the average Hun-
garian. I have been unable to find any other evidence to support such a
conclusion, and hence must consider the index of production of animal
products as seriously deficient and unacceptable as a measure of the true
change in this component of agricultural production. It may be true also
that the omission of poultry and poultry products was much too serious a
shortcoming, because of the importance of this group of outputs in the
total.

The lack of any other data or estimates on which to base an ad-
justment of the animal products index precludes the calculation of a
genuinely trust-worthy index of total agricultural production. Where
necessary in succeeding sections, I shall have to employ a proxy variable
for changes in animal products output. The most reasonable choice seems
to be to use an index of fodder crop production (both including and ex-
cluding hay production, to see if conclusions might be altered). While
the use of fodder crop production as a proxy for animal product output may
have a number of drawbacks, among the available data those for crop pro-
duction appear to be the most reliable. We must further assume that the
efficiency of feeding livestock did not decrease over the period, but this
is certainly not an unreasonable assumption.
TABLE 17

INDEX OF GROSS OUTPUT OF ANIMAL PRODUCTS\textsuperscript{a}

\begin{tabular}{|c|c|c|c|c|c|}
\hline
 & 1869 & 1884 & 1895 & 1911 & Rate of growth 1869-1911 \\
\hline
\textbf{Milk} & & & & & 1.5\% p.a. \\
\hline
Index & 52.9 & 59.0 & 76.4 & 100.0 & \\
Rate of growth since previous date & ---- & 0.7\% & 2.1\% & 1.8\% & \\
\hline
\textbf{Wool} & & & & & -1.4\% \\
\hline
Index & 178.8 & 137.6 & 97.8 & 100.0 & \\
Rate of growth since previous date & ---- & -1.7\% & -3.1\% & 0.1\% & \\
\hline
\textbf{Meats and hides} & & & & & 0.4\% \\
\hline
Index & 86.1 & 90.6 & 99.7 & 100.0 & \\
Rate of growth since previous date & ---- & 0.3\% & 0.9\% & ----\textsuperscript{b} & \\
\hline
\textbf{Total of the preceeding three categories} & & & & & 0.7\% \\
\hline
Index & 74.5 & 79.0 & 89.9 & 100.0 & \\
Rate of growth since previous date & ---- & 0.4\% & 1.2\% & 0.7\% & \\
\hline
\end{tabular}

\textsuperscript{a} This table is for illustration only. Some of the figures are seriously deficient (see text, part B.2.e.).

\textsuperscript{b} Less than 0.05 percent.

Source: See text, part B.2.
With the various indexes developed in this chapter, we can at least make some rough comparisons of the output performance of Hungarian agriculture with that of other countries. Such comparisons will be postponed until later, however, to allow the presentation of a more complete picture, which will include in particular productivity measures. These productivity calculations must await the labor force results of chapter V.

C. Short-run flexibility of Hungarian agriculture: farmers’ response to price

The first half of this chapter considered the contribution of agriculture to economic development in an essentially long-run context. Besides the growth of output over time, however, there is also a static or short-run dimension to this contribution, i.e., its magnitude will vary according to the efficiency with which resources within agriculture at any given time are allocated among competing agricultural uses. In the short-run context, the question then becomes "Were Hungarian producers alert and responsive enough to maximize profits?"

The data necessary to answer this question do not exist. With available data, however, we can ask another essentially similar and potentially revealing question: "How responsive were Hungarian farmers to changes in the price of farm products?" Recent literature on farmers' re-
sponse to price has concentrated almost exclusively on the small-peasant type of farming 26; this section will attempt to use the same basic techniques to estimate the response in the large-estate system, that dominated Hungary during the period under consideration. This will hopefully provide a measure by which the short-run responsiveness of Hungarian agriculture can be compared to that observed elsewhere.

It should be noted here, however, that an elastic supply response does not necessarily connote profit-maximizing behavior on the part of producers. Too elastic an increase in output may actually cut profits, if the demand curve facing the producers is inelastic. Since price-inelastic demand curves are the norm for agricultural products (the major exception to this may be world demand for the output of a given country's farms), farmers might be expected soon to learn that large responses to price changes are self-defeating. In an agriculture such as Hungary's, dominated by a relatively few landholders, the recognition of the mutual benefits of restricting the output increase when prices are subject to upward pressure from demand might be rather easily made and communicated. This is a point to which we shall return in the last section of this chapter.

With the foregoing caveat about the usefulness of any comparisons drawn from the data, let us now turn to a consideration of Hungarian farmers' response to price.
1. The basic model

The model with which this study starts is that developed by Nerlove and used in one form or another in all the studies mentioned in footnote 26. Formally, the model appears as follows (using Nerlove's notation):

Output at time $t$, $x_t$, is a function of "expected normal price", $P^*_t$. For the sake of simplicity, this relation is assumed to be linear, i.e.,

$$ x_t = a_0 + a_1 P^*_t + u_t $$

(1.1)

in which $u_t$ is a random residual term.

The "expected normal price" (long-run equilibrium price) at time $t$ is the expected normal price at time $t-1$ plus a correction factor. This correction factor is taken to be some fraction, $\beta$, of the difference between last period's expected normal price, $P^*_{t-1}$, and last period's observed price, $P_{t-1}$. In equation form,

$$ P^*_t = P^*_{t-1} + \beta (P_{t-1} - P^*_{t-1}) \quad 0 < \beta \leq 1 $$

(1.2)

The general solution of the difference equation (1.2) is

$$ P^*_t = H (1 - \beta)^t + \sum_{\lambda=0}^{t} (1 - \beta)^{t-\lambda} \lambda P_{\lambda-1} $$

(1.3)

where $H$ is a constant whose value depends on the initial conditions. Thus we have an expression for the expected normal price, which cannot be directly observed, in terms of past observed prices. This distributed-lag formulation shows the price weights declining as we proceed farther into the past, which accords with one's intuitive feelings that more recent prices have
a greater effect on producers' expectations than do prices more remote
in time.

From equations (1.1) and (1.2) it is possible to derive a single
estimating equation which uses only observed values of output and prices,
as follows:

Merely rearranging terms in equation (1.2) gives

\[ P_t^* = P_{t-1} + (1 - \beta) P_{t-1}^* \quad (1.4) \]

Substituting (1.4) into (1.1) gives

\[ x_t = a_o + a_1 (\beta P_{t-1} + (1 - \beta) P_{t-1}^*) + u_t \quad (1.5) \]

Recognizing that \( P_{t-1}^* = \beta P_{t-2} + (1 - \beta) P_{t-2}^* \) and that further
\( P_{t-i}^* \) for any \( i \) can be derived in the same fashion from (1.4), we can re-
write (1.5) as follows:

\[ x_t = a_o + a_1 (\beta P_{t-1} + (1 - \beta) P_{t-2} + \beta (1 - \beta)^2 P_{t-3} + \ldots) + u_t \quad (1.6) \]

An analogous set of steps can be followed to find last period's output as a
function of past prices:

\[ x_{t-1} = a_o + a_1 (\beta P_{t-2} + (1 - \beta) P_{t-3} + \beta (1 - \beta)^2 P_{t-4} + \ldots) + u_{t-1} \quad (1.7) \]

Multiplying both sides of (1.7) by \( (1 - \beta) \) and subtracting the results
from (1.6) gives

\[ x_t - (1 - \beta) x_{t-1} = a_o \beta + a_1 \beta P_{t-1} + u_t - (1 - \beta) u_{t-1} \quad (1.8) \]
So by adding \((1 - \beta)x_{t-1}\) to each side of the equation, we obtain an estimating equation for \(x_t\) in terms of last period's observed price and last period's observed output

\[
x_t = \pi_0 + \pi_1 p_{t-1} + \pi_2 x_{t-1} + \nu_t
\]

where \(\pi_0 = a_0 \beta\), \(\pi_1 = a_1 \beta\), \(\pi_2 = (1 - \beta)\), and \(\nu_t = u_t - (1 - \beta)u_{t-1}\).

So even though we have postulated output to be a function of expected prices, and expected price to be a function of all past observed prices, the estimating equation itself requires only one past price for each observation on the dependent variable, a very economical result.

Using ordinary least squares to estimate the coefficients of (1.9) involves a problem of bias which will be dealt with in subsequent sections of this paper. For the present, and for comparability to other studies which have used the ordinary least squares technique, consideration of this problem is deferred.

The estimating equation (1.9) can also have an alternative interpretation, from the so-called "adjustment" model (the model presented above may be called the "expectations" model). In the adjustment model, there is postulated a desired output, \(x^*_t\), and it is recognized that it may not be possible to achieve the desired output in the short run, i.e., that there will exist a difference between observed output, \(x_t\), and desired output, \(x^*_t\). The difference between actual output of this period and actual output of last period will be some fraction, \(\delta\), of the difference
between this period's desired output and last period's observed output, i.e.,

\[ x_t - x_{t-1} = \xi (x^*_t - x^*_{t-1}) \quad 0 < \xi \leq 1 \quad (1.10) \]

in which \( \xi \) is called the "coefficient of adjustment". If we assume that \( x^*_t \) is a linear function of \( P_{t-1} \), i.e.,

\[ x^*_t = a_0 + a_1 P_{t-1} + u_t \quad (1.11) \]

the estimating equation which can be derived from these two relations is exactly the same as (1.9) except for a different residual term. \(^{29}\) In some of the estimations which follow, we consider implications of this interpretation. The "adjustment" formulation is used by other writers as well in part because it allows the introduction of other variables (Krishna's "shifter variables".\(^{30}\)) into (1.11) without adding more than one term per "shifter" to the estimating equation (1.9).

2. Further consideration of the basic model

When we attempt to combine the distinctions made in the two forms of the model - i.e., the distinction between desired and actual output and the distinction between expected normal price and actual price - a problem of identification arises. In other words, if we try to make the logical step of relating desired output to expected price, certain difficulties result. Nerlove demonstrated that adding such a relation (he assumed it to be proportional, i.e.,

\[ x^*_t = a P^*_t \quad (2.1) \]

for simplicity) to (1.2) and (1.10) would give an estimating equation of
\[ x_t = a \beta \gamma P_{t-1} + \left[ (1 - \beta) + (1 - \gamma) \right] x_{t-1} + (1 - \beta)(1 - \gamma) x_{t-2} + w_t \]  

(2.2)

Because \( \beta \) and \( \gamma \) enter symmetrically into the expression for \( x_t \), we cannot isolate them. If they could be made to enter the relation asymmetrically, this difficulty could be overcome, and Nerlove suggests a method by which this may be accomplished - finding some other variable which enters into the relation between \( x^*_t \) and \( P^*_t \) would do the trick.

Although it may be impossible to isolate values for \( \beta \) and \( \gamma \) (unless one or both are either zero or one), it may be possible to derive \( a \), the price coefficient from (2.1). Since the price elasticity of output is often the principal point of interest in the sorts of problems with which we are here dealing, being able to derive an estimate of \( a \) becomes a more important consideration than estimating \( \beta \) or \( \gamma \).

The derivation of \( a \) would proceed as follows:

Rewrite (2.2) as

\[ x_t = AP_{t-1} + Bx_{t-1} + Cx_{t-2} + w_t \]  

(2.3)

where

\[ A = a \beta \gamma \]  

(2.4)

\[ B = 2 - \beta - \gamma \]  

(2.5)

\[ C = (1 - \beta)(1 - \gamma) = 1 - \beta - \gamma + \beta \gamma \]  

(2.6)
A regression estimation provides values for $A$, $B$, and $C$. Combining (2.5) and (2.6) and rearranging terms, we have $\beta \gamma = C - B + 1$. Since we have estimates of $C$ and $B$, we can calculate $\beta \gamma$. Substituting this value of $\beta \gamma$ and the estimated value of $A$ into (2.4) allows us to calculate $a$, and this value can in turn be used to derive the elasticity of desired acreage with respect to expected price.

Two problems arise when we attempt to estimate a relation such as (2.2). One, which will be dealt with later (see section C.8. of this chapter), is the introduction of bias into the estimates of the coefficients of the regression equation because of the inclusion of a lagged value of the dependent variable as an independent variable. The other is a problem of multicollinearity: since in most practical applications, the $x$'s are likely to be quite highly serially correlated, the values of $x_{t-1}$ and $x_{t-2}$ used as independent variables are likely to show a very strong correlation with each other.

One thing Nerlove failed to note, however, is that in the particular case of equation (2.2), the multicollinearity problem can be alleviated. If we subtract $x_{t-1}$ from both sides of equation (2.3) - i.e., transform it into an equation using the first difference of the $x$'s as the dependent variable - we find the result to be the following:

$$x_t - x_{t-1} = a \beta \gamma P_{t-1} + (1 - \beta - \gamma) x_{t-1} + (1 - \beta - \gamma + \beta \gamma) x_{t-2} + w_t$$

(2.7)
Pairing like factors for $x_{t-1}$ and $x_{t-2}$ from (2.7), we find that

$$x_t - x_{t-1} = \alpha \beta x_t \ p_{t-1} + (1 - \beta - \gamma)(x_{t-1} - x_{t-2}) + \beta \gamma x_{t-2} + w_t$$

(2.8)

Since we do not expect any strong correlation between $x_{t-2}$ and the difference between $x_{t-1}$ and $x_{t-2}$, the multicollinearity problem has been circumvented by casting the equation into a first difference form rather than leaving it in the form of equation (2.2). Since a lagged value of the new dependent variable (the first difference) appears as an independent variable, we have still to contend with the problem of biased coefficients. As noted before, this consideration will be postponed to a later section.

3. Choice of the dependent variable

Since output = yield times acreage, and because yields are subject to fluctuations due to weather, most studies of price response try to reduce the effect of weather (an assumed random element) on the estimates by using acreage rather than output as the dependent variable in the regression equations. Moreover, yield per acre may also have some price-elasticity (higher prices might be expected to induce the farmer to use greater amounts of labor and other inputs on his land, for example), so estimating the elasticity of acreage with respect to price would be a lower bound to the price-elasticity of output. Therefore, we can expect
that the use of acreage as the dependent variable in the estimating equations will reduce the amount of random variation without resulting in an overestimate of elasticity. In what follows, acreage will be the dependent variable unless otherwise stated.

4. Estimation of the basic model

a. 1870-1913

The first step of the analysis is to estimate equation (1.9) in its simplest form, i.e., without the introduction of any "shifter" variables or any other lags. Since the acreage data begin with 1870, 1871 must be the beginning year for each regression equation because of the inclusion of acreage lagged one year as an independent variable. The raw prices of each crop, expressed in crowns per quintal, are deflated by an index of the prices of the other four crops. It would have been preferable to use a more general deflator which included the prices of everything (or at least every important thing) which competed with the crop in question for use of the land. This was not possible because the necessary prices are not available. Only the prices of the five major grains are available back to 1870 (this series is wholesale prices on the Budapest grain exchange), so it is only they which can be included. Exclusion of other prices is not quite so serious as it may first appear, because the five crops under consideration accounted for four-fifths of all arable land used during the period under review (see footnote 2).
Table 18 summarizes the results of the estimation described above. Regressions were run in both linear and logarithmic form. No significant differences exist between the results of the two forms, so the logarithmic equation is tabulated because its price coefficient is the estimated elasticity of the dependent variable with respect to price (although it should be stressed here that this is elasticity of observed acreage with respect to observed price). In what follows, the same convention using the logarithmic form - when no significant difference exists between it and the linear form - will apply.

From Table 18 we can see that the "fit" of the equation form, as measured by the levels of $R^2$, is quite good (except for the case of oats), but that for two of the five crops the price coefficient at time $t-1$ is not statistically significant at any meaningful level. In the other three cases, where the price coefficient is significant at the ten percent level or higher, calculated elasticity is low (on the order of 0.1). It should be remembered, however, that the price coefficient in the estimating equation is the product of the price coefficient from the original equation - either (1.1) or (1.11) - and either the coefficient of expectation, $\beta$, or the coefficient of adjustment, $\delta$, depending on the model used. Since both of these coefficients are assumed to be less than unity in value, the calculated elasticity is less than the elasticity of observed acreage with respect to expected price (or of desired output with respect to observed price).
TABLE 18

ESTIMATION OF THE EQUATION \( \log x_t = K_1 + A_1 \log x_{t-1} + A_2 \log p_{t-1} \)

1871 - 1913

<table>
<thead>
<tr>
<th>Crop</th>
<th>( K_1 )</th>
<th>( A_1 )</th>
<th>( T)-value</th>
<th>( A_2 )</th>
<th>( T)-value</th>
<th>( \text{signif. level} , A_2 )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( i = 1 )</td>
<td>0.545</td>
<td>0.958</td>
<td>19.6</td>
<td>0.116</td>
<td>1.80</td>
<td>5%</td>
<td>.905</td>
</tr>
<tr>
<td>( i = 2 )</td>
<td>0.651</td>
<td>0.935</td>
<td>19.8</td>
<td>0.073</td>
<td>1.13</td>
<td>15%</td>
<td>.919</td>
</tr>
<tr>
<td>Rye</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( i = 1 )</td>
<td>0.124</td>
<td>0.856</td>
<td>9.32</td>
<td>0.116</td>
<td>1.33</td>
<td>10%</td>
<td>.694</td>
</tr>
<tr>
<td>( i = 2 )</td>
<td>1.42</td>
<td>0.829</td>
<td>19.58</td>
<td>0.109</td>
<td>1.36</td>
<td>10%</td>
<td>.695</td>
</tr>
<tr>
<td>Barley</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( i = 1 )</td>
<td>2.34</td>
<td>0.693</td>
<td>6.74</td>
<td>0.098</td>
<td>1.35</td>
<td>10%</td>
<td>.669</td>
</tr>
<tr>
<td>( i = 2 )</td>
<td>1.87</td>
<td>0.744</td>
<td>7.71</td>
<td>0.043</td>
<td>0.618</td>
<td>----</td>
<td>.657</td>
</tr>
<tr>
<td>Oats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( i = 1 )</td>
<td>2.24</td>
<td>0.682</td>
<td>5.30</td>
<td>0.016</td>
<td>0.354</td>
<td>----</td>
<td>.409</td>
</tr>
<tr>
<td>( i = 2 )</td>
<td>2.21</td>
<td>0.698</td>
<td>5.55</td>
<td>0.053</td>
<td>1.22</td>
<td>15%</td>
<td>.428</td>
</tr>
<tr>
<td>Corn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( i = 1 )</td>
<td>0.581</td>
<td>0.928</td>
<td>18.6</td>
<td>0.010</td>
<td>0.193</td>
<td>----</td>
<td>.896</td>
</tr>
<tr>
<td>( i = 2 )</td>
<td>0.564</td>
<td>0.928</td>
<td>18.6</td>
<td>0.002</td>
<td>0.046</td>
<td>----</td>
<td>.896</td>
</tr>
</tbody>
</table>

* = one-tailed T-test, as will be all subsequent tests of statistical significance, unless otherwise noted.

\( x \) = hectares harvested for given crop, in thousands.

\( p \) = price of crop in question deflated by an index of prices of the other four, 1891-1895 = 1.00. Units thus remain crowns per quintal.
Introducing a lag of two years on the price variable adds little improvement over the above results. For wheat, the significance level of the price coefficient drops to 15 percent, although it remains the same for rye. Some glimmering of price response is detected for oats, but the two-year lag gives no meaningful change for the corn price and reduces considerably the explanatory power of price in the barley equation.

Since it is of little consequence whether a lag of one year or of two is more appropriate for a given crop, in what follows I will attempt in so far as possible to tabulate that form of any estimating equation which gives the best fit (as measured by the level of $R^2$). Any deviations from this rule will be noted as they occur.

Some other modifications of the simple model were attempted, but will not be tabulated here. Trying more specific deflators for the price of a crop (e.g., using the price of a single other crop as deflator rather than an index of the other four) made the results worse than those presented in Table 18. Adding yields (output per hectare) as an additional variable in the estimating equation produced virtually no improvement in the explanatory power of the estimating equation, so the results of this attempt at improvement will also be omitted.
b. 1870-1893 and 1893-1913

The estimates of the preceding section indicate relatively little price response on the part of Hungarian grain producers. It may be due to a number of causes; this section will examine the proposition that looking at the period as a whole may tend to mask the price response because there were two rather distinct trends in grain prices between 1870 and 1913.

From the 1870's to the early nineties, prices generally declined. The next two decades featured a rising trend in grain prices. (See chart 4) Since the price of each crop under consideration reached its minimum in money terms within two years of 1893, I have chosen 1893 as the dividing line between the two subperiods of falling and then rising prices. The estimations for the first of these subperiods are presented in Table 19.

The data of Table 19 begin to point toward some conclusions, as well as toward some serious problems. From examination of $B_2$, the price coefficient, we find that its level of significance has increased for rye, barley, and oats, as compared to the results for the period as a whole. For wheat, however, the statistical significance of the price coefficient disappears, and for corn there is no real improvement. Considering $B_1$, the coefficient for last year's acreage, we find the same problem for the subperiod which existed for the period as a whole, namely, values of this coefficient very close to 1.0. $B_1$ equals either $1 - \beta$ (from the expectations model, equations 1.1 through 1.9 of this chapter) or $1 - \gamma$ (from the adjustment model, equations
### Table 19

**Estimation of the Equation** \( \log x_t = K_2 + B_1 \log x_{t-1} + B_2 \log P_{t-i} \)

**1871 - 1893**

<table>
<thead>
<tr>
<th>Crop</th>
<th>( K_2 )</th>
<th>( B_1 )</th>
<th>( \text{t-value} )</th>
<th>( B_2 )</th>
<th>( \text{t-value} )</th>
<th>( \text{signif. level} B_2 )</th>
<th>( R_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wheat</strong></td>
<td>( i = 1 )</td>
<td>0.0233</td>
<td>1.01</td>
<td>14.3</td>
<td>0.0468</td>
<td>0.476</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>( i = 2 )</td>
<td>-0.0112</td>
<td>1.02</td>
<td>14.3</td>
<td>0.0605</td>
<td>0.640</td>
<td>----</td>
</tr>
<tr>
<td><strong>Rye</strong></td>
<td>( i = 1 )</td>
<td>1.39</td>
<td>0.852</td>
<td>5.43</td>
<td>0.167</td>
<td>1.34</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>( i = 2 )</td>
<td>1.78</td>
<td>0.820</td>
<td>6.12</td>
<td>0.248</td>
<td>2.16</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Barley</strong></td>
<td>( i = 1 )</td>
<td>3.60</td>
<td>0.537</td>
<td>4.22</td>
<td>0.187</td>
<td>2.15</td>
<td>2.5%</td>
</tr>
<tr>
<td></td>
<td>( i = 2 )</td>
<td>2.82</td>
<td>0.628</td>
<td>5.26</td>
<td>0.115</td>
<td>1.43</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Oats</strong></td>
<td>( i = 1 )</td>
<td>3.05</td>
<td>0.573</td>
<td>3.25</td>
<td>0.0404</td>
<td>0.745</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>( i = 2 )</td>
<td>3.19</td>
<td>0.573</td>
<td>3.67</td>
<td>0.106</td>
<td>2.25</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Corn</strong></td>
<td>( i = 1 )</td>
<td>0.890</td>
<td>0.892</td>
<td>11.0</td>
<td>0.0307</td>
<td>0.379</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>( i = 2 )</td>
<td>1.03</td>
<td>0.880</td>
<td>10.8</td>
<td>0.0519</td>
<td>0.671</td>
<td>----</td>
</tr>
</tbody>
</table>
1.1 through 1.11), where $\beta$ is the coefficient of expectation and $\gamma$ is the coefficient of adjustment. A value of $B_1$ near 1.0 implies that the expectation or adjustment coefficient is near zero. Since $B_2$, the coefficient of price, is the product of either $\beta$ or $\gamma$ (depending on the model used) and the "actual" price coefficient from the relation involving desired acreage and/or price, it is not surprising to find estimated values of $B_2$ near zero.

The problem may lie in an inherent weakness of the model itself or in the deflation procedure used. If there is a long-run trend in the output variable (acreage in this case), the deflated price variable may not capture much of this trend if grain prices tend to move together. Lacking an index of the general price level or even of agricultural prices in general, this problem cannot be approached directly. An indirect approach is attempted in part 7 below. The difficulty may also be in the bias introduced by using ordinary least squares to estimate an equation of the type here tabulated, a problem which will be taken up in part 8.

When the basic equation is estimated for the second subperiod, 1893-1913, there is a general and rather dramatic drop in both the level of $R^2$ for the equation as a whole, and in the level of significance of each of the coefficients (see Table 20). It is interesting to note that the estimated coefficient of lagged acreage comes down quite sharply for wheat and rye, and somewhat less sharply for corn, as compared to the first subperiod, implying
an increase in the value of the adjustment or expectations coefficient
( \( \beta \) or \( \gamma \)). So, although the data are consistent on the surface with
Oscar Jászi's claim that from about 1890 on Hungarian grain farmers
turned from an emphasis on increasing production and began instead to
exploit their monopoly position within the protected market of the
Austrian Empire by holding production rather steady, letting increasing
demand push prices up, \(^{36}\) the implied increase in \( \beta \) or \( \gamma \) is not con-
sistent with this claim. Since, however, the very fact that a steadying
of output (acreage) - because of the properties of the model and the
variables used in it, as discussed in the previous paragraph - would
lead to this seemingly paradoxical finding, we cannot reject Jászi's
contention on the basis of the apparent increase in short-run adjustability.
This suggests that a reformulation of the model such that \( x_{t-1} \) did not
enter into the estimating equation would be desirable for analytical as
well a purely statistical reasons, especially since the primary goal of the
analysis is not necessarily to find that equation which gives the best "fit"
to the observed data, but rather to find that which seems best to isolate
the elasticity of output response with respect to price. Before attempting
such a reformulation, however, let us first look at estimates of the first-
difference form of the estimating equation derived from section 2, and then
at the results of breaking down the data regionally within the context of the
original model. We may by this latter procedure find that by aggregating
over the country as a whole we have obscured some of the price effects.

5. **Estimation of the first-difference model**

A series of regressions to test equations of the form of (2.8) were run
for 1872-1913 and also for the two subperiod 1872-1893 and 1893-1913.
The results of this set of estimations are contained in Table 21. As before,
the only modification of the original form of the equation was to introduce
a longer lag on the price variable, so that regressions were attempted both
for \( P = P_{t-1} \) and for \( P = P_{t-2} \). The results are almost uniformly disappointing.
Although the price coefficients for some of the equations turn out to be signi-
ficant at the five percent or even one percent levels of confidence, the co-
efficient of acreage lagged two years \( (x_{t-2}) \), which should be the product
of \( \beta \), the coefficient of expectation, and \( \gamma \), the coefficient of adjustment,
is negative for every equation. A number of these negative coefficients are
not significantly different from zero, but because we have assumed both \( \beta \)
and \( \gamma \) to be positive, finding no positive and significant estimate for the
product of these two coefficients means we shall have to abandon the use of
this particular form of estimating equation, or make some change in the struc-
ture of the model.
TABLE 20

ESTIMATION OF THE EQUATION  \[ \log x_t = K_3 + C_1 \log x_{t-1} + C_2 \log P_{t-i} \]

1893 - 1913

<table>
<thead>
<tr>
<th>Crop</th>
<th>(K_3)</th>
<th>(C_1)</th>
<th>(T)-value</th>
<th>(C_2)</th>
<th>(T)-value</th>
<th>signif. level (C_2)</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i = 2)</td>
<td>4.43</td>
<td>0.470</td>
<td>2.26</td>
<td>0.082</td>
<td>0.960</td>
<td>----</td>
<td>.229</td>
</tr>
<tr>
<td>Rye</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i = 2)</td>
<td>5.03</td>
<td>0.327</td>
<td>1.61</td>
<td>0.169</td>
<td>1.59</td>
<td>10%</td>
<td>.286</td>
</tr>
<tr>
<td>Barley</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i = 1)</td>
<td>2.50</td>
<td>0.652</td>
<td>3.02</td>
<td>0.037</td>
<td>0.325</td>
<td>----</td>
<td>.355</td>
</tr>
<tr>
<td>Oats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i = 2)</td>
<td>1.50</td>
<td>0.668</td>
<td>3.14</td>
<td>-0.11</td>
<td>-0.122</td>
<td>----</td>
<td>.455</td>
</tr>
<tr>
<td>Corn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i = 1)</td>
<td>1.64</td>
<td>0.792</td>
<td>4.94</td>
<td>0.013</td>
<td>0.196</td>
<td>----</td>
<td>.583</td>
</tr>
</tbody>
</table>
TABLE 21

ESTIMATION OF THE EQUATION
\[ x_t - x_{t-1} = K_4 + D_1 p_{t-i} + D_2 (x_{t-1} - x_{t-2}) + D_3 x_{t-2} \]

1872 - 1893

<table>
<thead>
<tr>
<th>Crop</th>
<th>(K_4)</th>
<th>(D_1)</th>
<th>T-value</th>
<th>signif. level</th>
<th>(D_2)</th>
<th>T-value</th>
<th>(D_3)</th>
<th>T-value</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>70</td>
<td>4.48</td>
<td>0.386</td>
<td>-----</td>
<td>-0.157</td>
<td>-0.718</td>
<td>-0.002</td>
<td>-0.034</td>
<td>.043</td>
</tr>
<tr>
<td>Rye</td>
<td>27</td>
<td>16.8</td>
<td>1.47</td>
<td>10%</td>
<td>-0.051</td>
<td>-0.214</td>
<td>-0.214</td>
<td>-1.28</td>
<td>.279</td>
</tr>
<tr>
<td>Barley</td>
<td>281</td>
<td>16.5</td>
<td>1.90</td>
<td>5%</td>
<td>-0.550</td>
<td>-2.35</td>
<td>-0.468</td>
<td>-2.67</td>
<td>.308</td>
</tr>
<tr>
<td>Oats</td>
<td>478</td>
<td>8.83</td>
<td>1.92</td>
<td>5%</td>
<td>-0.287</td>
<td>-1.39</td>
<td>-0.565</td>
<td>-3.10</td>
<td>.466</td>
</tr>
<tr>
<td>Corn</td>
<td>302</td>
<td>3.14</td>
<td>0.265</td>
<td>-----</td>
<td>-0.330</td>
<td>-1.65</td>
<td>-0.167</td>
<td>-2.05</td>
<td>.251</td>
</tr>
</tbody>
</table>

1893 - 1913

| Wheat  | 203     | 38.9    | 2.66    | 1%          | -0.934  | -4.56   | -0.136  | -0.659  | .591  |
| Rye    | 373     | 14.6    | 1.46    | 10%         | -0.540  | -2.47   | -0.540  | -2.14   | .394  |
| Barley | 148     | 3.36    | 0.339   | -----       | -0.630  | -2.36   | -0.174  | -0.763  | .250  |
| Oats   | 133     | -3.28   | -0.501  | -----       | -0.835  | -2.61   | -0.085  | -0.433  | .291  |
| Corn   | 193     | 9.46    | 0.662   | -----       | -0.408  | -1.65   | -0.122  | -0.744  | .143  |

1872 - 1913

| Wheat  | -239    | 24.5    | 2.64    | 1%          | -0.713  | -4.98   | -0.050  | -1.11   | .442  |
| Rye    | -7      | 12.9    | 1.68    | 10%         | -0.254  | -1.64   | -0.152  | -1.57   | .196  |
| Barley | 168     | 6.83    | 1.06    | 15%         | -0.555  | -3.18   | 0.235   | -2.04   | .217  |
| Oats   | 238     | 4.85    | 1.21    | 15%         | -0.351  | .080    | -0.281  | .101    | .74  |
6. Regional Estimates

For this section we will use the official regional division presented in Hungarian statistics of the latter part of the period under review. Referring to the map (Chapter I, page 13), the regions are numbered and identified as follows:

1. Left Bank of the Danube
2. Right Bank of the Danube
3. Between Danube and Tisza
4. Right Bank of the Tisza
5. Left Bank of the Tisza
6. Tisza-Maros Corner
7. Transylvania

In this breakdown, regions 1, 4, and 7 are mostly hilly and mountainous terrain, region 2 includes the "Little Hungarian Plain" and some more hilly areas, especially in its southern section; and the Great Hungarian Plain (Nagy Alföld) begins across the Danube and spreads out over regions 3, 5, and 6. (See Chapter I for a more detailed description.)

The data on agricultural land and output were published regionally since 1891, (when the first countrywide survey was made to verify the reports of the county reporters), so that the inclusion of \( x_{t-1} \) in the equation to be estimated sets the beginning date at 1892. There are unfortunately no wholesale
prices available by regions, but there are series running up to 1910 for retail prices of the five principal grains in the markets of the major towns in Hungary. These are used as the price variable, on the working assumption of proportionality between the wholesale and retail price. Because P is lagged a year, our equation can run to 1911. Where prices from two towns in the same region were available, their mean was used; otherwise the price is that of the single available market series for the region. The regressions were run, as before, using both a one and a two-year lag for the price variable. Rather than tabulate in excruciating detail all 70 of these, I have adopted an arbitrary selection criterion: to be included in the table, the equation must have either a t-value for the price coefficient $> 1$, or an $R^2$ corrected for degrees of freedom $> 0.25$. Though this seems a liberal criterion for inclusion, it serves to eliminate many of the equations. Since in all cases the equation using a one-year lag in the price variable was superior on these grounds to that using a two-year lag, only the former appear in the table, even though (of course) some of the equations containing $P_{t-2}$ meet the inclusion criterion.

In 1897 a series of harvest strikes took place, which seriously affected the amount of grain harvested and hence the price in some localities. Because this is likely to throw the estimates considerably off in those areas, the observation for 1897 was dropped from all the regions (leaving $P_{t-1}$ and $x_{t-1}$ for 1898 as the 1896 observations on these variables). So the series from
which the equation is estimated runs from 1892 to 1911, but includes
19, rather than 20, observations.

Table 22, on the basis of the criterion mentioned above, contains
the results for 23 of the 35 possible equations. The first thing to strike
one about this table is that for barley, oats, and corn the price coeffi-
cient is either insignificant or of the wrong sign in every case. Again
this corresponds to generally high values for β or γ, so without further
probing we cannot be sure whether we can attach any meaning to such a
result, especially since the price variable may be seriously deficient.

We find for wheat two cases out of seven in which the price co-
efficient is significant at the ten percent level or better, and for rye
this happens in six of the seven regions, with generally quite high elas-
ticities of observed acreage with respect to price. For three of the
regions the implied adjustment coefficient, γ, is estimated at what
I would consider a more "reasonable" level, i.e., on the order of 0.5.
Again our model seems to do better for a crop which exhibits only a
small trend up or down in its acreage. Besides the suggestion mentioned
in the previous section of a reformulation which would eliminate \( x_{t-1} \)
from the equation and hopefully eliminate the trend problem, we can
of course attack from the other direction and modify the deflation pro-
cedure or the price variable so that it more accurately reflects any trend
in general grain prices, of which the trend in the price of the given crop is
a part. These are some of the considerations of the next chapter.
TABLE 22

ESTIMATION OF THE EQUATION $x_t = K_5 + E_1 x_{t-1} + E_2 (P)_{t-1}$

REGIONAL DATA

1892 - 1911

<table>
<thead>
<tr>
<th>Crop</th>
<th>Region</th>
<th>$K_5$</th>
<th>$E_1$</th>
<th>T-value</th>
<th>$E_2$</th>
<th>T-value</th>
<th>Elasticity$^b$</th>
<th>Finance level of $E_2$</th>
<th>$R^2c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>4</td>
<td>10.3</td>
<td>.832</td>
<td>8.42</td>
<td>1.80</td>
<td>1.78</td>
<td>.134</td>
<td>5%</td>
<td>.826</td>
</tr>
<tr>
<td>H</td>
<td>5</td>
<td>130</td>
<td>.754</td>
<td>5.36</td>
<td>-.435</td>
<td>-.153</td>
<td>----</td>
<td>----</td>
<td>.598</td>
</tr>
<tr>
<td>E</td>
<td>7</td>
<td>50.3</td>
<td>.769</td>
<td>5.07</td>
<td>1.82</td>
<td>1.54</td>
<td>.085</td>
<td>10%</td>
<td>.572</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>1</td>
<td>-2.05</td>
<td>.685</td>
<td>4.38</td>
<td>3.56</td>
<td>2.17</td>
<td>.323</td>
<td>2.5%</td>
<td>.574</td>
</tr>
<tr>
<td>Y</td>
<td>2</td>
<td>118</td>
<td>.432</td>
<td>1.93</td>
<td>4.21</td>
<td>1.64</td>
<td>.184</td>
<td>10%</td>
<td>.141</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td>125</td>
<td>.490</td>
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<td>-.954</td>
<td>-.556</td>
<td>----</td>
<td>----</td>
<td>.504</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>-17.4</td>
<td>.676</td>
<td>5.52</td>
<td>4.07</td>
<td>3.37</td>
<td>.472</td>
<td>0.5%</td>
<td>.704</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>37.7</td>
<td>.506</td>
<td>2.62</td>
<td>3.83</td>
<td>2.02</td>
<td>.273</td>
<td>5%</td>
<td>.306</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>-7.39</td>
<td>.636</td>
<td>4.18</td>
<td>1.29</td>
<td>2.73</td>
<td>.688</td>
<td>1%</td>
<td>.631</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>-37.2</td>
<td>.920</td>
<td>9.54</td>
<td>3.52</td>
<td>2.91</td>
<td>.517</td>
<td>1%</td>
<td>.859</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>61.4</td>
<td>.753</td>
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<td>----</td>
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<td>.599</td>
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<td>.325</td>
</tr>
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<td>.775</td>
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<td>.919</td>
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<td>.335</td>
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<td>.806</td>
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<td>.949</td>
<td>7.64</td>
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<td>-1.24</td>
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<td>.770</td>
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<tr>
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<td>42.8</td>
<td>.801</td>
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<td>-.433</td>
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<td>.643</td>
</tr>
<tr>
<td>T</td>
<td>5</td>
<td>3.63</td>
<td>.955</td>
<td>6.15</td>
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<td>.236</td>
<td>----</td>
<td>----</td>
<td>.676</td>
</tr>
<tr>
<td>S</td>
<td>6</td>
<td>36.4</td>
<td>.720</td>
<td>4.65</td>
<td>-.720</td>
<td>-.554</td>
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<td>----</td>
<td>.598</td>
</tr>
<tr>
<td>7</td>
<td>15.2</td>
<td>.882</td>
<td>6.98</td>
<td>.409</td>
<td>.391</td>
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<td>----</td>
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</tr>
<tr>
<td>C</td>
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<td>.723</td>
<td>3.61</td>
<td>.118</td>
<td>.232</td>
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<td>.387</td>
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<td>2</td>
<td>27.1</td>
<td>1.02</td>
<td>11.2</td>
<td>-2.52</td>
<td>-2.17</td>
<td>----</td>
<td>----</td>
<td>.873</td>
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<td>R</td>
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<td>12.9</td>
<td>.945</td>
<td>9.42</td>
<td>1.90</td>
<td>.707</td>
<td>----</td>
<td>----</td>
<td>.828</td>
</tr>
</tbody>
</table>

$^a$ Excluding 1897 (see text).
7. Alternative models

The principal concern of this part of the investigation is to attempt to derive some estimate of the degree of responsiveness of Hungarian agriculture to price incentives. This responsiveness or flexibility is in turn a compound of two things: the elasticity of output with respect to price, and either: the coefficient of expectation or of adjustment, $\beta$ or $\xi$. There has been considerable difficulty in establishing estimates of these primarily because of the basic model's inability to deal satisfactorily with a trend in the output variable. This problem stems from two sources - the appearance of the lagged output as an independent variable, and the incomplete nature of the deflators used for the price variable (they contain no correction for terms of trade change or changes in costs of production). Because of lack of data, dealing directly with the second source of trouble is precluded, but there are some ways of dealing with the first problem which promise to get around some of the difficulty with the price variable as well.

One such change is a very simple one: merely substitute the lagged total acreage in the group of crops (call it $Z$, after Krishnâ) for the lagged acreage of the crop in question in the estimating question, making it

$$x_t = K + aP_{t-1} + bZ_{t-1} + w_t$$

(7.1)

where $w$ is the residual term. If there is a trend in $x$ which represents, for example, a terms of trade change or a cost of production change that applies
to the group as a whole, then the variable Z should account for most or all of this, leaving changes in $x$ which are greater than or less than that expected from the trend to be explained by changes in relative prices among the group. Table 23 presents the results of this estimation in a stepwise arrangement, i.e., first the regression of $X_t$ on $Z_{t-1}$ alone, then with the addition of the price variable, to make the relation between Z and $x$ clearer. Since in this and all that follows, there seems to be an important difference in the behavior before and after 1893, the results are tabulated separately for these two periods. These and all subsequent regressions, unless otherwise stated, were run using lags of one year and two years on prices. The result tabulated is for that lag which shows the highest value of $t$ for the price coefficient.

The striking difference in behavior between the two periods is again apparent, as is the weakness of price in explaining variations in the acreage. Rye is the only crop for which a reasonably significant price coefficient carries through the two periods, and only one other coefficient is significant at the ten percent level in the first period. Even if the estimated value of the coefficient were the true value in each case, it would imply an elasticity of observed acreage with respect to price of less than 0.10 for every crop except rye.

Besides the generally poor results obtained from the foregoing equation, it has the further problem of masking entirely any idea of the magni-
TABLE 23

ESTIMATION OF THE EQUATION \( \log x_t = K_6 + F_1 (\log Z)_{t-1} + F_2 (\log P)_{t-i} \)

1871 - 1893

<table>
<thead>
<tr>
<th>Crop</th>
<th>( K_6 )</th>
<th>( F_1 )</th>
<th>( T )-value ( F_2 )</th>
<th>( T )-value of ( F_2 )</th>
<th>Signif. level of ( F_2 )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>-8.54</td>
<td>1.84</td>
<td>12.6</td>
<td>-1.28</td>
<td>-1.06</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>-7.85</td>
<td>1.74</td>
<td>9.95</td>
<td>-1.28</td>
<td>-1.06</td>
<td>----</td>
</tr>
<tr>
<td>Rye</td>
<td>12.1</td>
<td>-5.70</td>
<td>-3.26</td>
<td>.236</td>
<td>1.55</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>13.3</td>
<td>-6.44</td>
<td>-3.66</td>
<td>-1.28</td>
<td>-1.06</td>
<td>----</td>
</tr>
<tr>
<td>Barley</td>
<td>.303</td>
<td>.7385</td>
<td>9.47</td>
<td>.0924</td>
<td>1.12</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>1.36</td>
<td>.642</td>
<td>5.546</td>
<td>-1.28</td>
<td>-1.06</td>
<td>----</td>
</tr>
<tr>
<td>Oats</td>
<td>6.77</td>
<td>.018</td>
<td>.137</td>
<td>.0930</td>
<td>1.507</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>7.29</td>
<td>-.018</td>
<td>-.135</td>
<td>.0930</td>
<td>1.507</td>
<td>10%</td>
</tr>
<tr>
<td>Corn</td>
<td>-4.38</td>
<td>1.33</td>
<td>12.2</td>
<td>-.0403</td>
<td>-.545</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>-4.62</td>
<td>1.35</td>
<td>11.7</td>
<td>-.0403</td>
<td>-.545</td>
<td>----</td>
</tr>
</tbody>
</table>

1893 - 1913

<table>
<thead>
<tr>
<th>Crop</th>
<th>( K_6 )</th>
<th>( F_1 )</th>
<th>( T )-value ( F_2 )</th>
<th>( T )-value of ( F_2 )</th>
<th>Signif. level of ( F_2 )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>2.29</td>
<td>.641</td>
<td>2.61</td>
<td>.0657</td>
<td>.808</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>2.25</td>
<td>.658</td>
<td>2.64</td>
<td>.0657</td>
<td>.808</td>
<td>----</td>
</tr>
<tr>
<td>Rye</td>
<td>7.73</td>
<td>-.0851</td>
<td>-.415</td>
<td>.261</td>
<td>.230</td>
<td>1.99</td>
</tr>
<tr>
<td></td>
<td>6.94</td>
<td>.0529</td>
<td>.261</td>
<td>.230</td>
<td>.230</td>
<td>1.99</td>
</tr>
<tr>
<td>Barley</td>
<td>-1.48</td>
<td>.931</td>
<td>5.22</td>
<td>-.0592</td>
<td>-.624</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>-1.98</td>
<td>.972</td>
<td>5.04</td>
<td>-.0592</td>
<td>-.624</td>
<td>----</td>
</tr>
<tr>
<td>Oats</td>
<td>-1.93</td>
<td>.977</td>
<td>5.54</td>
<td>.0018</td>
<td>.0246</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>-1.93</td>
<td>.977</td>
<td>5.35</td>
<td>.0018</td>
<td>.0246</td>
<td>----</td>
</tr>
<tr>
<td>Corn</td>
<td>-2.62</td>
<td>1.14</td>
<td>4.28</td>
<td>-.0679</td>
<td>-.882</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>-3.28</td>
<td>1.20</td>
<td>4.35</td>
<td>-.0679</td>
<td>-.882</td>
<td>----</td>
</tr>
</tbody>
</table>

\( Z = \) Total area in wheat, rye, barley, oats, and corn (thousand hectares).
tude of $\beta$ or $\chi$. Another approach which does not suffer from this defect is to use deviation from trend as the dependent variable. This has the further advantage of not binding each crop's trend to the trend of $Z$, and gives an estimating equation of the form

$$ (x - \hat{x})_t = K + cP_{t-1} + d (x - \hat{x})_{t-1} + \nu_t \quad (7.2) $$

in which $\hat{x}_t$ is the value of $x_t$ predicted from a regression estimate of the equation

$$ x_t = C + mT \quad (7.3) $$

where $C$ is a constant and $T$ a variable indexing time (in the actual estimation the value of $T$ was simply taken to be the year).

The coefficient $d$ from equation (7.2) is a better estimate of $(1 - \beta)$ or $(1 - \chi)$ than the corresponding coefficient derived from (1.9) if a trend which is caused by something external to the model exists and is not captured in the price variable. The estimates of equation (7.2) are recorded in Table 24. If we consider the adjustment model, then the adjustment coefficients (\$'s) implied by the $G_2$ coefficients from the table fall into the following ranges:

- 1871-1893: 0.73 (oats) to 0.37 (corn)
- 1893-1913: 0.75 (corn) to 0.71 (barley)
- 1871-1913: 0.61 (barley) to 0.31 (oats)
These seem much more reasonable magnitudes than the range of 0.46 to zero implied in the results from Table 20. Again, the data for the second subperiod fit the hypothesis much less well, even though the implied adjustment coefficients are somewhat higher. Again, price response seems rather inelastic, with the coefficients of the price variable insignificant in many of the equations. Elasticity of acreage with respect to price calculated for those crops for which the price coefficient is significant (ranging from 0.10 to 0.25) are low as compared to those found in other studies, at least in comparison to other non-subsistence crops.

The model which Falcon found most satisfactory for his studies of Pakistan relates percentage change in acreage to price, i.e., is an equation of the form

$$Q_t = R + gP_{t-1} + m_t$$  \hspace{1cm} (7.4)

in which $Q_t$ is the percentage change in acreage since the previous year, $R$ a constant, $P$ the deflated price, and $m$ the residual term. This model has a two-fold advantage: it can be estimated by ordinary least squares without bias in the coefficients, and the constant term, $R$, is an automatic correction for trend in the acreage variable. When applied to the Hungarian data, however, this equation fit the data so badly ($R^2 > 0.3$ for only crop, and that in only one of the subperiods) that the results have not been tabulated here.
**TABLE 24**

**ESTIMATION OF THE EQUATION**

\[(x - \bar{x})_t = K_7 + G_1 P_{t-i} + G_2 (x - \hat{x})_{t-1}\]

**1871 - 1893**

<table>
<thead>
<tr>
<th>Crop</th>
<th>(K_7)</th>
<th>(G_1)</th>
<th>(T)-value</th>
<th>signif. level (G_1)</th>
<th>(G_2)</th>
<th>(T)-value</th>
<th>signif. level (G_2)</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>-69</td>
<td>3.92</td>
<td>0.474</td>
<td>---</td>
<td>0.368</td>
<td>1.61</td>
<td>10%</td>
<td>.129</td>
</tr>
<tr>
<td>Rye</td>
<td>-308</td>
<td>23.7</td>
<td>2.35</td>
<td>2.5%</td>
<td>0.616</td>
<td>2.84</td>
<td>0.5%</td>
<td>.374</td>
</tr>
<tr>
<td>Barley</td>
<td>-34</td>
<td>3.34</td>
<td>0.613</td>
<td>---</td>
<td>0.267</td>
<td>1.46</td>
<td>10%</td>
<td>.132</td>
</tr>
<tr>
<td>Oats</td>
<td>-122</td>
<td>10.8</td>
<td>2.60</td>
<td>1%</td>
<td>0.542</td>
<td>3.77</td>
<td>0.5%</td>
<td>.504</td>
</tr>
<tr>
<td>Corn</td>
<td>57</td>
<td>-5.17</td>
<td>-0.373</td>
<td>---</td>
<td>0.633</td>
<td>3.49</td>
<td>0.5%</td>
<td>.455</td>
</tr>
</tbody>
</table>

**1893 - 1913**

<table>
<thead>
<tr>
<th>Crop</th>
<th>(K_7)</th>
<th>(G_1)</th>
<th>(T)-value</th>
<th>signif. level (G_1)</th>
<th>(G_2)</th>
<th>(T)-value</th>
<th>signif. level (G_2)</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>-157</td>
<td>908</td>
<td>0.601</td>
<td>---</td>
<td>0.162</td>
<td>0.587</td>
<td>---</td>
<td>.030</td>
</tr>
<tr>
<td>Rye</td>
<td>-138</td>
<td>-10.3</td>
<td>1.20</td>
<td>15%</td>
<td>0.278</td>
<td>1.28</td>
<td>15%</td>
<td>.177</td>
</tr>
<tr>
<td>Barley</td>
<td>-62</td>
<td>5.47</td>
<td>0.622</td>
<td>---</td>
<td>0.288</td>
<td>1.32</td>
<td>15%</td>
<td>.117</td>
</tr>
<tr>
<td>Oats</td>
<td>-5</td>
<td>47.1</td>
<td>0.084</td>
<td>---</td>
<td>0.153</td>
<td>0.696</td>
<td>---</td>
<td>.027</td>
</tr>
<tr>
<td>Corn</td>
<td>28</td>
<td>-219</td>
<td>-0.196</td>
<td>---</td>
<td>-0.245</td>
<td>1.11</td>
<td>15%</td>
<td>.070</td>
</tr>
</tbody>
</table>

**1871 - 1913**

<table>
<thead>
<tr>
<th>Crop</th>
<th>(K_7)</th>
<th>(G_1)</th>
<th>(T)-value</th>
<th>signif. level (G_1)</th>
<th>(G_2)</th>
<th>(T)-value</th>
<th>signif. level (G_2)</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>-212</td>
<td>11.6</td>
<td>0.996</td>
<td>---</td>
<td>-0.675</td>
<td>3.38</td>
<td>0.5%</td>
<td>.246</td>
</tr>
<tr>
<td>Rye</td>
<td>-126</td>
<td>9.63</td>
<td>1.50</td>
<td>10%</td>
<td>0.536</td>
<td>4.05</td>
<td>0.05%</td>
<td>.309</td>
</tr>
<tr>
<td>Barley</td>
<td>-63</td>
<td>5.69</td>
<td>1.10</td>
<td>15%</td>
<td>0.389</td>
<td>2.78</td>
<td>0.05%</td>
<td>.223</td>
</tr>
<tr>
<td>Oats</td>
<td>-51</td>
<td>4.55</td>
<td>1.17</td>
<td>15%</td>
<td>0.694</td>
<td>5.41</td>
<td>0.05%</td>
<td>.423</td>
</tr>
<tr>
<td>Corn</td>
<td>45</td>
<td>3.17</td>
<td>0.276</td>
<td>---</td>
<td>0.140</td>
<td>3.98</td>
<td>1.5%</td>
<td>.316</td>
</tr>
</tbody>
</table>
Another formulation which shares with the preceding model the advantage of unbiased coefficients from least-squares estimates, and into which a trend factor can easily be introduced, recognizes explicitly the allocational nature of the price deflation procedure by using the proportion of the total acreage accounted for by a given crop as the dependent variable. This share in the total acreage is a function of the relative price, i.e., using our previous designations for variables

\[(X/Z)_t = S + hP_{t-1} + n_t\]  \hspace{1cm} (7.5)

in which \(X/Z\) is the share of the given crop in the acreage devoted to all five, \(S\) is a constant, \(P\) the price of the given crop relative to the others, and \(n\) a random residual term. We should recognize that \(X/Z\) can also have a trend which is not caught by the price variable, as for instance in the case where there are differential changes in costs of production or of marketing of the different crops. Lacking any data on these factors, the crude device of introducing a trend variable (the year) into the equation was employed. Although I normally eschew this practice, since the addition of time as an independent variable usually conceals more than it reveals about what is happening, in this case the isolation of the single factor, price elasticity, is the paramount concern, so anything which promises to isolate this factor better should at least be tried. The results are presented in Table 25, but for 1871-1893, alone,
since only the rye price coefficient was significant in the second period (and the explanatory power of the formulation, as measured by $R^2$, fell markedly in all other cases).

The calculated elasticities (of a crop's share in total acreage with respect to price) fall in the range of 0.09 to 0.28, with the exception of corn. Wheat, the principal cash crop, showed the lowest elasticity among the four other crops. This is just the opposite relation to that found by Hussain as between rice (subsistence crop - elasticity of share with respect to price ca. 0.05 - 0.12) and jute (cash crop, elasticity 0.4) in the peasant agriculture of East Pakistan. Falcon's tests between irrigated and unirrigated wheat (cash and subsistence crops, respectively) in West Pakistan followed the same pattern of elasticities observed by Hussain, as did Krishna's findings, in general. 41 For the Hungarian data, the differences are slight, and little significance can be attributed to them. With the shares differing considerably, and with that of wheat larger than than of any other crop, the change in absolute number of acres as a result of a given percentage change in price would still be larger for wheat than for the other crops, given the elasticities calculated in Table 25. This should be kept in mind when comparing the results from Table 25 with results of other studies.

So far the considerations of the original model as modified, along with the alternative models dealt with, have shown the existence of some
responsiveness to price, albeit a rather inelastic one, for four of the five crops. Corn seems to be the exception to this statement. The short-run elasticities of observed acreage with respect to observed price seems somewhat lower than those found by studies of modern-day peasant agriculture, although not dramatically so. In the form of his model and estimation procedure which corresponds most closely to the estimates of the basic model of this chapter, Nerlove found the elasticity of acreage with respect to observed price for three crops in the United States, 1909-1932, to be the following:

\[
\begin{align*}
\text{Cotton} & \quad 0.27 \\
\text{Wheat} & \quad 0.48 \\
\text{Corn} & \quad 0.10
\end{align*}
\]

His estimates of \( \beta \), the expectations coefficient (or \( \gamma \), if one interprets this as an adjustment model), for the above crops were 0.41, 0.52, and 0.54, respectively. The elasticity of observed acreage with respect to expected price then becomes the following:

\[
\begin{align*}
\text{Cotton} & \quad 0.67 \\
\text{Wheat} & \quad 0.93 \\
\text{Corn} & \quad 0.18
\end{align*}
\]

The coefficients of adjustment or of expectations for Hungary, as estimated from the "deviations" model, fall into a range of adjustment coefficients found by Krishna in the Punjab (for 11 crops, coefficients of
TABLE 25

ESTIMATION OF THE EQUATION \( \left( \frac{X}{Z} \right)_t = S + hP_{t-2} + K(T) \)
1871 - 1893

<table>
<thead>
<tr>
<th>Crop</th>
<th>S</th>
<th>h</th>
<th>T-value</th>
<th>signif. level</th>
<th>elasticity(^a)</th>
<th>K</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>-683</td>
<td>.160</td>
<td>2.01</td>
<td>5%</td>
<td>.086</td>
<td>.379</td>
<td>17.5</td>
</tr>
<tr>
<td>Rye</td>
<td>512</td>
<td>.190</td>
<td>1.23</td>
<td>15%</td>
<td>.159</td>
<td>-.265</td>
<td>-11.1</td>
</tr>
<tr>
<td>Rye*</td>
<td>186</td>
<td>.169</td>
<td>2.02</td>
<td>5%</td>
<td>.189</td>
<td>-.092</td>
<td>-6.44</td>
</tr>
<tr>
<td>Barley</td>
<td>-.93 (^t)</td>
<td>.164</td>
<td>2.08</td>
<td>5%</td>
<td>.140</td>
<td>-.044</td>
<td>-3.44</td>
</tr>
<tr>
<td>Oats</td>
<td>300</td>
<td>.152</td>
<td>3.45</td>
<td>0.5%</td>
<td>.128</td>
<td>-.153</td>
<td>-14.2</td>
</tr>
<tr>
<td>Corn</td>
<td>-140</td>
<td>-.271</td>
<td>-1.04</td>
<td>****</td>
<td>b</td>
<td>.088</td>
<td>3.17</td>
</tr>
</tbody>
</table>

\( \frac{X}{Z} \) = share of given crop in total acreage devoted to the five, in percent.

\( P \) = price of crop in question, deflated (see text)

\( T \) = year

\(^t\) = 1893 - 1913; regression shown is for \( P_{t-1} \), not \( P_{t-2} \)

\(^a\) Elasticity of the share with respect to price, calculated at point of means.

b. Not calculated.
0.24 to 0.77, tending to cluster between 0.45 and 0.55. So it would appear that for the United States, as well as for Hungary and for those present-day underdeveloped countries for which data are available, the results on this score at least are very similar.

The comments of the preceding two paragraphs apply, however, only to half the period under review. One of the most striking findings so far is the apparent dramatic shift in behavior in about the early nineties. Price responsiveness seems to carry over into the latter half of the period only for one rather minor crop, rye (10-15 percent of acreage in grains was planted to rye). Before accepting this conclusion, however, we should attempt to find out if perhaps something is hiding a price response which actually existed during this later subperiod. A return to the regional data might help in answering this question.

The estimation of equation (7.5) is this time without the time variable, because it was not significant in any of the regressions for the period with the exception of rye - by regions yields very little in the way of uncovering hidden price responsiveness. The price coefficient is significant at the five percent level for wheat only in regions 1, 2, 4, 5, 6, and 7; for barley in region 7; for oats in regions 3 and 4; and for corn in no region. Extending the significance range to ten percent adds only barley in region 4 to the above list, and a further extension to 15 percent adds only barley in region 2 and corn in region 6.
The deflation procedure may still mask the price response, however. Falcon has suggested a very simple method for testing this: merely include the prices of all the competing crops undeflated. This will almost certainly introduce problems of multicollinearity, and is very costly in degrees of freedom - a most relevant consideration when using series as short as those available here for the regional estimates. A preferable procedure then might be to make an index of the prices of the competing crops and introduce this along with the undeflated price of the particular crop in question. Estimation of such a model also gives some idea (albeit a very crude one) of cross-elasticities of supply of various crops, a useful piece of information especially if a program of selective, rather than general, price supports or subsidies is contemplated.

For the countrywide data, estimation of the equation

\[
(X/Z)_t = B + \sigma^{-} P_{t-i} + \epsilon (\text{PIO})_{t-i} + e_t
\]  

(7.6)

(in which \(X/Z\) is the share of the given crop in the land devoted to all five grains, \(B\) is a constant, \(P\) is the undeflated price of the crop in question, \(\text{PIO}\) is a price index of the other four, and \(e\) is a residual term) gave results no better than those already recorded using just the single relative price. The lag, \(i\), was taken as both one and two years.

When this same procedure is applied to the regional data, a rather different picture emerges. Where before a measurable price response was a
rarity, it is now pervasive (see Table 26). In most cases, the pattern
of signs: is what one would expect, i.e., $\sigma$ is positive and $\epsilon$ negative,
although for corn this is not the case for any region. The explanation is
probably to be found in the customary rotation of crops in Hungary: corn
entered much more often than other crops into the rotations with wheat and
thus corn plantings tended to follow wheat plantings somewhat; moreover, the price of wheat typically carries a weight of about one-half in
the price index of other crops as it applies to corn, so the positive reaction
of corn acreage to the price index of the other four grains is not surprising.
This sort of reaction could also account for much of the apparent insensi-
tivity of corn acreage to price which characterized all of the previous es-
timations. A similar explanation probably holds for those cases of apparent
positive cross-elasticity and/or negative own-price elasticity observed for
barley in regions 5 and 7, and for oats in region 7. Why this perverse type
of reaction should appear to be the case for wheat in region 5 - one of
the principal wheat growing areas of the country - remains a mystery, however.

The data contained in Table 26 seem to show a rather general pat-
tern of price responsiveness in the allocation of land among the various
grains. Further, it would appear to be the case that were the model complex
enough to take into account standard rotation practices, this responsiveness
would stand in yet sharper relief: those cases of seemingly positive cross-
elasticity of supply in the short run hint at this, and the existence of positive coefficients for both own price and price of others indicated a multicollinearity in the observations on the independent variables which could serve to cover up the "true" level of significance of prices in the allocation decision. The generally better results using a two-year lag may also be due to the problem of rotations — once a winter crop is sown, a spring crop cannot be planted on that same ground until the next following year. This would not bind the choice of which spring crop to the price of two years ago, but such considerations no doubt strongly influence the choice as between winter and spring crops as groups. Insofar as their prices tend to move together, this might be sufficient to account for the greater apparent power of the prices lagged two years in explaining changes in the allocation of grain land.

8. **Limitations of least squares estimation**

The estimation of a model which involves distributed lags, such as that presented in section 1 as the basic model of this inquiry, cannot normally be done by ordinary least squares without bias in the coefficients which result. One way to overcome this estimation bias is to use a two-stage, or instrumental variable approach such as that developed by Nissan Liviatan.
| Region  | \( b \) | \( d \) | \( p \) | \( q \) | \( R^2 \) | \( F \)-value |弹性 | \( \alpha \) | \( \beta \) | \( \eta \) | \( \zeta \) |
|--------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|
| W      | 1.34  | -0.06 | -1.120| 1.180 | 0.49  | 1.79   | 0.86  | 9.58  | 5.03  | 1.22  | 0.02  |
| E      | 0.35  | 0.19  | 2.70  | 2.73  | 1.84  | 0.88  | 1.10  | 4.22  | 1.19  | 4.68  | 0.02  |
| A      | 0.35  | 0.19  | 2.70  | 2.73  | 1.84  | 0.88  | 1.10  | 4.22  | 1.19  | 4.68  | 0.02  |
| F      | 0.35  | 0.19  | 2.70  | 2.73  | 1.84  | 0.88  | 1.10  | 4.22  | 1.19  | 4.68  | 0.02  |
| H      | 0.35  | 0.19  | 2.70  | 2.73  | 1.84  | 0.88  | 1.10  | 4.22  | 1.19  | 4.68  | 0.02  |

Table 26. Estimation of the Equation \( (\alpha Z) = b + \alpha p + \epsilon (p1-2) \)


<table>
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<tr>
<th>Region</th>
<th>( b )</th>
<th>( G )</th>
<th>( D )</th>
<th>( T ) -value</th>
<th>Elasticity</th>
<th>R²</th>
<th>Elasticity</th>
<th>T -value</th>
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<td>0.363</td>
<td>0.88</td>
<td>1.94</td>
</tr>
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</table>

**TABLE 26 (CONTINUED)**

---

 conducted on the point of means. Excluding 1887 (see text).
The essentials of this technique are quite simple. Equation (1.9), for example, which is typical of a class of estimating equations which result from the distributed lag formulation, would be estimated in two steps. First an estimate of \( x_{t-1} \) is obtained from a simple-least-squares regression using a specified set of instrumental variables (which does not include, however, any lagged value of \( x \)). It is then this estimate of \( x_{t-1} \), rather than the actual observation on \( x_{t-1} \), which is used in the estimation of coefficients for equation (1.9). Such a procedure gives consistent estimates for the coefficients of the equation.

Use of such a technique has its limitations, however. It is particularly sensitive to multicollinearity among the variables, and since for estimating equation (1.9) by this technique, \( P_{t-2} \) is a "proper" (Liviatan's terminology) instrumental variable, both \( P_{t-1} \) and \( P_{t-2} \) enter into the estimation relation. We would normally expect rather high serial correlation between prices of succeeding years - which is in fact the case with the data used in this study - hence there is an automatic collinearity problem built into the procedure. The practical result of this is that the matrix to be inverted in one step of the computations tends to become singular or nearly so.

This problem was encountered for one or more crops in one or more of the time divisions in nearly every formulation of the basic model which
was tested by this technique. In all other cases, the results obtained from use of the instrumental variable technique differed so little from the corresponding equations estimated by ordinary least squares that it would be nothing more than an exercise in redundancy to tabulate them here. In general, rye, barley, and oats showed some significant price response in the early period, whereas only that for rye carried over into 1893-1913 — exactly as before. The calculated elasticities were virtually the same, as were the adjustment or expectations coefficients derived from the coefficient of $x_{t-1}$. Given the data being used, the extra refinement offered by the instrumental variable technique neither adds to, nor subtracts from, the confidence we can place in the results achieved from ordinary least squares enough to warrant any change in the conclusions reached.

9. Conclusions

The observed price response in all formulations of the basic model, as well as in most of the alternatives attempted, has either been very small or apparently non-existent. This implies either a) that price was not very important in the acreage decisions of Hungarian grain farmers, or b) that while important, price was overwhelmed by some other consideration, or c) that price expectations and the responses thereto were formed in a manner quite different from that postulated in the models used.
A test of proposition b) might be in order, since during the period under review such a potentially dominant factor was present, namely the great expansion of the railroad network. (see chapter I, part A.)

The expansion of the market made possible by the extension of the transportation network may have been of crucial importance for Hungary, just as Myint suggests. It was for many other economies. To test this proposition, I have postulated an equation in which the amount of land devoted to a given crop in a given year is a function of the deflated price and the length of railroad line in place at the end of the preceding year.

The results of this estimation are presented in Table 27.

The first striking feature of this formulation is the importance of the railroad variable in explaining changes in acreage - it is significant at the 2.5 percent level or higher for 12 of the 15 cases tabulated, and at ten percent or better for two of the remaining three. The observed negative elasticity of rye acreage with respect to railroad mileage is probably due to the status of rye as an inferior good - in particular as an inferior substitute for wheat in bread-making. Why oats should also exhibit this apparent negative elasticity in the early period is less clear. Perhaps with a relatively constant horse population and with increasing yields per hectare, fewer acres of oats were needed to provide the requisite amount of feed.
TABLE 27

ESTIMATION OF THE EQUATION
\[ \log (x_t) = K_8 + H_1 \log (P_{t-1}) + H_2 \log (RR_{t-1}) \]

1872 - 1893

<table>
<thead>
<tr>
<th>Crop</th>
<th>$K_8$</th>
<th>$H_1$</th>
<th>T-value</th>
<th>signif. level $H_1$</th>
<th>$H_2$</th>
<th>T-value</th>
<th>signif. level $H_2$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>3.73</td>
<td>0.018</td>
<td>0.267</td>
<td>----</td>
<td>0.456</td>
<td>17.2</td>
<td>0.05%</td>
<td>.965</td>
</tr>
<tr>
<td>Rye</td>
<td>7.80</td>
<td>0.281</td>
<td>1.78</td>
<td>5%</td>
<td>-0.164</td>
<td>-3.96</td>
<td>0.05%</td>
<td>.452</td>
</tr>
<tr>
<td>Barley</td>
<td>5.39</td>
<td>0.138</td>
<td>1.43</td>
<td>10%</td>
<td>0.130</td>
<td>3.64</td>
<td>0.5%</td>
<td>.755</td>
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<td>0.138</td>
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<tr>
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<td>0.271</td>
<td>13.6</td>
<td>0.05%</td>
<td>.907</td>
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1893 - 1913

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<tr>
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<th>T-value</th>
<th>signif. level $H_1$</th>
<th>$H_2$</th>
<th>T-value</th>
<th>signif. level $H_2$</th>
<th>$R^2$</th>
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</thead>
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<td>Wheat</td>
<td>6.58</td>
<td>-0.039</td>
<td>-0.481</td>
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<td>0.167</td>
<td>2.27</td>
<td>2.5%</td>
<td>.230</td>
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<tr>
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<td>7.26</td>
<td>0.170</td>
<td>1.57</td>
<td>10%</td>
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<td>-1.48</td>
<td>10%</td>
<td>.273</td>
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<td>Barley</td>
<td>4.78</td>
<td>0.112</td>
<td>0.985</td>
<td>----</td>
<td>0.195</td>
<td>2.97</td>
<td>0.5%</td>
<td>.348</td>
</tr>
<tr>
<td>Oats</td>
<td>4.57</td>
<td>-0.027</td>
<td>-0.345</td>
<td>----</td>
<td>0.249</td>
<td>4.65</td>
<td>0.05%</td>
<td>.550</td>
</tr>
<tr>
<td>Corn</td>
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<td>-0.171</td>
<td>----</td>
<td>0.349</td>
<td>5.45</td>
<td>0.05%</td>
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1872 - 1913

<table>
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<th>T-value</th>
<th>signif. level $H_1$</th>
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<th>T-value</th>
<th>signif. level $H_2$</th>
<th>$R^2$</th>
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<td>1.59</td>
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<td>-8.53</td>
<td>0.05%</td>
<td>.652</td>
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<td>Barley</td>
<td>5.68</td>
<td>0.150</td>
<td>2.11</td>
<td>2.5%</td>
<td>0.093</td>
<td>5.81</td>
<td>0.05%</td>
<td>.618</td>
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<td>-0.050</td>
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<td>15%</td>
<td>0.254</td>
<td>10.4</td>
<td>0.05%</td>
<td>.055</td>
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- 176 -
It is also interesting to compare the results of the estimation of this "railroad" model with those of the basic model. In Table 28 I have collected the estimations of acreage elasticity with respect to price and the level of $R^2$ for the basic models and the railroad model for each of the three time periods considered. What is immediately evident is that the basic (Nerlove-type) model has no real superiority over the simple formulation which relates acreage to price changes and expansions of the transportation network in explaining the supply behavior of Hungarian grain farmers for the period under investigation.

Where then has all this brought us? It seems reasonable to conclude from all of the foregoing estimates that although some responsiveness to price did exist, it was an inelastic response, perhaps even more inelastic than that observed for several peasant economies of today (but not necessarily more inelastic than the United States supply response studied by Nerlove).

Every alternative which allowed the division of time series in the mid-1890's exhibited a marked fall-off its explanatory power when applied to the second period. Price responses tended to become more inelastic or to disappear from the estimates after 1893, although some of the regional estimates still show a fairly pervasive, if inelastic, price response. This apparent reduction in the flexibility of Hungarian agriculture occurred along with an increase in tariff protection around the Empire (see Chapter IV).
and an increase in the share of large estates in the land distribution (Chapter II). Thus we cannot reject the hypothesis that the expansion of the large-estate sector did not make Hungarian agriculture less price-responsive.

This does not mean, however, that the Hungarian farmers did not respond to economic incentives. The apparently rather strong response to the expansion of the railroad network is an illustration of this point. The fall-off in price responsiveness in the latter part of the period can also be consistent with profit-maximizing behavior. As noted in the introduction to this section, farmers faced with an inelastic demand curve for their products may learn very quickly that too strong a reaction to price change earns them nothing. As the market for Hungarian grains shrunk geographically and became ever more exclusively a "domestic" - i.e., Austro-Hungarian Empire - market (see Chapter IV), we would expect that the elasticity of demand facing Hungarian grain producers would also have shrunk, especially with the import of available substitutes (i.e., foreign grains) increasingly restricted by tariffs.

Thus, with evidence available, we cannot conclude that Hungarian agriculture was more or less responsive to economic incentives, or more or less intent on profit maximizing, that the agricultures of other countries and times studied by other researchers. Such evidence as can be found seems to indicate only that there is no compelling cause to assume Hungary's responsiveness to be very much different from that of currently underdeveloped.
TABLE 28

OBSERVED ELASTICITIES* AND R² FROM BASIC MODEL AND FROM "RAILROAD" MODEL

1871(2) - 1893

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<th></th>
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<th>E_RR</th>
<th>R²_B</th>
<th>R²_RR</th>
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<td>.25</td>
<td>.28</td>
<td>.655</td>
<td>.452</td>
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<td>Oats</td>
<td>.11</td>
<td>.14</td>
<td>.460</td>
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<td>Corn</td>
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<td>.861</td>
<td>.907</td>
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1893 - 1913

<table>
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<th>E_RR</th>
<th>R²_B</th>
<th>R²_RR</th>
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<tbody>
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<td>Wheat</td>
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<td>.230</td>
</tr>
<tr>
<td>Rye</td>
<td>.17</td>
<td>.17</td>
<td>.286</td>
<td>.273</td>
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<tr>
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<td>----</td>
<td>----</td>
<td>.355</td>
<td>.348</td>
</tr>
<tr>
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<td>----</td>
<td>.455</td>
<td>.550</td>
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<tr>
<td>Corn</td>
<td>----</td>
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<td>.623</td>
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</table>

1871(2) - 1913

<table>
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<tr>
<th></th>
<th>E_B</th>
<th>E_RR</th>
<th>R²_B</th>
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<td>Rye</td>
<td>.11</td>
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<td>.695</td>
<td>.652</td>
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<td>Barley</td>
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<td>.618</td>
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<td>Corn</td>
<td>----</td>
<td>----</td>
<td>.896</td>
<td>.897</td>
</tr>
</tbody>
</table>

a. Elasticity of observed acreage with respect to observed price. Quantity entered if price coefficient was significantly different from zero at the 15 percent level.

Source: Tables 18, 19, 20, and 27.
FOOTNOTES: CHAPTER III

1. Official figures put the extent of producing vineyards in the Kingdom of Hungary at 435.7 thousand hectares in 1885, but by 1895 this had been reduced to 245.4 thousand due to phylloxera. Von Matlekovits calculates that 43.7 percent of Hungary's vineyards were totally destroyed by this disease, which was first noticed in a significant extent in 1875. Von Matlekovits, ḥyḵvi, 278.

2. Average for the period as a whole. A slight decline occurred, so that the share in 1913 was 77 percent.

3. Ungarische Statistische Mittheilungen, N.F. vol. XV, 12*-24*. The source of the troubles seems to have been in lack of adequate financing of the statistical bureau. Work could not begin on a large scale in that office until after its appropriation was sharply increased in 1878. Bokor, 69-88.

4. Ibid., 200.

5. This is taken as 1870/1874 average to 1909/1913 average, or a span of 39 years from the midpoints of the beginning and ending periods.


10. Bakor, 204.

11. Albert Kiss, "Állatenyésztésünk Belterjességének Alakulása az Elmúlt Száz Évében (1857-1957)" / The circumstances of the intensification of our animal husbandry in the past 100 years (1857-1957) / *Statisztikai Szemle / Statistical Review /*, 1958, 17. This figure is for the territory of present-day Hungary, but should not be markedly different for the old Kingdom.


14. Ibid.

15. Kiss, 17.


18. This higher elasticity is of course an assumption, so far as Hungary is concerned, but the weight of evidence from other countries is solidly behind the use of such an assumption.


20. Kiss, 32.


22. Ibid., 500.

23. Ibid.

24. These are probably quite reliable as price indicators. In 1833 a group of experts, which divided into eight subgroups dealing with different classes of commodities, was set up to determine semi-annually the values of exported and imported goods. This move was made explicitly because the value declarations of the parties to the trade could not always be trusted, due both to ignorance and to duplicity. Bokor, 188.

25. The production of hay in 1909-1913, according to official statistics had just about doubled since the late 1880's and had tripled since the 1870's. See Ungarische Statistische Mitteilungen, N. S. vol. VI, 26*-27*; Annuaire Statistique Hongroise, 1909, 113, and 1914, 85.


28. For a discussion of this problem, see Nerlove, 193.


31. For a proof, see Nerlove, 63-64.
32. Ibid., 65.

33. A more general formulation would have included a constant in (2.1). The estimating equation derived from such a formulation would then also include a constant which would be the product of $\beta$, $\gamma$, and the constant term from the new form of (2.1).

The estimated coefficients plus the estimated constant would then form a system of four equations in four unknowns $(a, \beta, \gamma$, and the constant from (2.1). From this system, $a$ can be found, but it is still the case that because $\beta$ and $\gamma$ enter symmetrically (the four equations are not four independent equations), we cannot solve the system for separate values of these two coefficients. Nerlove uses the more general form in his estimations (see Nerlove, esp. 236-241).

34. Although the expectations or adjustment coefficients from the logarithmic form are then geometric, rather than arithmetic, coefficients, the value of the arithmetic coefficients from a linear estimation of the equations differed from the geometric values only in the third decimal place.

35. This is the result of saying, in equation (1.2), that desired output is a function of the price two years ago, rather than of last year's price. No longer lags were introduced, on the ground that the time elapsing between planting and harvest cannot, by definition, be any more than
one year with an annual crop. With perennials, of course, the case is much different. See for example Francis Chan Kwong Wah, "A Preliminary Study of the Supply Response of Malayan Rubber Estates Between 1948 and 1959", Malayan Economic Review, VII (October, 1962), 77-94, where Mr. Chan finds a seven-year lag appropriate.

The choice of 1891-1895 as the base for the price index requires some explanation, since it was a time of very low prices. Alternative price indices based on 1909/1913 were also used, with virtually no detectable difference in any of the results of any of the regressions. Since the use of 1891-1895 does not measurably affect any of the estimates, it is more convenient to apply, being a single base that can be used in both subperiods and in the regional regressions as well (which cover the time 1891-1911).


37. The first six are literal translations of the Hungarian names (see also Chapter II).

38. The estimating equation (7.2) is derived in an exactly analogous fashion to equation (1.9). That this is true is easily demonstrated:

Let $y' = x - \hat{x}$ (thus $y^* = x^* - \hat{x}$)

Then a "deviations" type of the basic adjustment model would appear as follows (ignoring residual terms):
\[ y_t = y_{t-1} = A (y^*_t - y_{t-1}) \]  \hspace{1cm} (7.2a)

\[ y^*_t = G + sP_{t-1} \]  \hspace{1cm} (7.2b)

from which (7.2) follows just as (1.9) follows from (1.1) and (1.2) or (1.10) and (1.11). Note that equation (7.2a) could be written out as

\[ (x - \hat{x})_t - (x - \hat{x})_{t-1} = A \left[ x^*_t - \hat{x}_t - (x_{t-1} - \hat{x}_{t-1}) \right] \]  \hspace{1cm} (7.2c)

since \( y^* \), the desired deviation from trend, equals \( x^* - \hat{x} \). From the equation (7.3) (page 160), we see that as \( m \) approaches zero, \( \hat{x}_{t-1} \) approaches \( \hat{x}_t \). In the limit, with \( x_{t-1} = x_t \), equation (7.2c) reduces to equation (1.1.10), i.e.,

\[ A = \gamma \]

If \( m \neq 0 \), then \( A \neq \gamma \). But because the estimate of \( \delta \) from (1.9) is biased by external factors (for which trend is the proxy), while \( A \) from (7.2) is not, \( A \) gives a better estimate of the actual coefficient of adjustment than does \( \gamma \).

39. For a table of estimates by various researchers of price elasticity of acreage for several crops in Pakistan, see Syed Mushtaq Hussain, "A Note on Farmer Response to Price in East Pakistan", Pakistan Development Review, IV (Spring, 1964), 102. See also footnote 26.

41. These are all summarized in Hussain, 102.

42. The absence or perversity of price response for corn may mean that we have used the wrong price in the equation. Since corn is such an important input into production of pork, it would be natural to expect the price of hogs to affect the amount of corn produced. A series of prices for pigs at the Budapest market is available for 1881-1911, and the results of including the price of hogs in the corn equation can be summarized as follows (for the period 1883-1912, to allow for lags of two years):

\[ x_t = 204 + 0.796x_{t-1} + 1.94P_{t-1} \]

\[ (0.113) \quad (1.24) \]

in which \( x \) is hectares of corn harvested, in thousands; and \( P \) is the price of hogs, in crowns per quintal (100 kg.), undeflated. The numbers in parentheses are the standard errors of the coefficients. The price coefficient in the above equation is significant at the ten percent level, and \( R^2 = .796 \). The price elasticity at the point of means is 0.1. Lacking any other suitable deflator, I tried deflating the hog price by the same price index used to deflate the corn price in earlier regressions. Estimating the regression using this deflated price results in a statistically insignificant price coefficient (\( t = 0.43 \)).

If we expand the equation to take account of both corn price and hogs price, the results are as follows:
\[ x_t = 224 + 0.797x_{t-1} + 0.878P_{t-1}^{\text{corn}} + 1.94P_{t-1}^{\text{hogs}} \\
\text{(0.117)}_{t-1} \quad \text{(11.3)}_{t-1} \quad \text{(1.26)}_{t-1} \]

The own-price coefficient is not significant, the hog price coefficient is
still at the ten percent level, and the value of \( R^2 \) remains unchanged, i.e.,
the inclusion of own price adds nothing to the explanatory power of
the equation used above.

The foregoing indicates only that there may have been a price
response for corn, but since we have no proper deflator for the hog price,
the issue must remain in doubt. In any case, however, the reaction again
shows up to be inelastic.

The simplest formulation of a supply model, i.e., \( x = f(P) \) was
tried for the relation of the hog price to corn acreage, just as it was
tried for all the own-price relations for each crop. For the undeflated
hog price, equation
\[ x_t = \gamma + \beta P_{t-2} \]
gave an \( R^2 \) of .458, a price coefficient significant at better than the
0.05 percent level, and a calculated elasticity of 0.35. For the price
deflated as explained in the text, \( R^2 \) dropped to 0.183, the significance
of the price coefficient dropped, but only to the one percent level, and
the elasticity at point of means was 0.25. The two year lag is used here
because it gave slightly better results than the one-year lag for the above
formulation, although this was just the reverse of the case for those for-
mulations used earlier in this footnote. Because the undeflated price includes a terms of trade component of unknown size, the apparently good results of using hog price must be considerably discounted.

43. Nerlove, 201-204.

44. Krishna, 483.

45. Falcon, "Farmer Response to Price..." (dissertation), 74-75.


48. Ibid., 46.

49. Hla Myint, The Economics of the Developing Countries (New York: 1965), ch. 3.
Chapter IV: THE EXPANSION OF EXPORTS

A. Introduction – the movement toward protectionism in Austria-Hungary

The free trade movement which had swept through most of Europe since the repeal of the English Corn Laws included the Austrian Empire as well. The government of Franz Josef, which had lifted the customs barrier between Austria and defeated Hungary in 1850, was autocratic in its politics but not autarkic in its economics.

The free trade era for Austria-Hungary lasted until 1878. Inaugurated by a treaty with the Zollverein, and continuing even after the lapse of that treaty in 1862, it ended where it began – in negotiations with the Germans. After the failure to reach a trade agreement with Bismarck's government in 1877, the protectionists in Austria gained the upper hand, and the new tariff law of 1878 introduced protection for wool and cotton, raised the duties on some manufactured goods, and required payment of duties in gold – which amounted to a general 15-20 percent increase in all tariffs due to the discount at which Austrian currency (still on a silver and paper standard) was then selling. This "Autonomous Tariff of 1878" was still quite moderate, representing in the main a codification of tariffs already arrived at through treaties, and it retained and even extended free trade in grain. The duties on industrial goods became a part of this Tariff over the objections of the Hungarians.
As an agrarian land only now embarked upon a course of industrialization, Hungary recognized that its interests lay in free trade, in order both to keep the cost of the wide range of necessary imports—especially industrial goods—to a minimum and to ensure the widest possible market for its exports of farm produce. Thus protection for Austrian manufactures within the customs union was recognized as a disadvantage to Hungary. Since the Compromise of 1867 provided for renegotiation of the common customs agreement every ten years, this clash of interests led to some rather bitter proceedings at the first decennial conference. But as Hungarian grain exports lost their competitive position in outside markets, the desire for protection for farm products weakened the opposition to industrial tariffs.

The opening of the era of Dualism was auspicious for Hungary. It began with good harvests in years when those in the rest of Europe were rather poor, leading to a great demand for Hungarian grain at good prices. The new railways had begun to make it possible to get large quantities of grain out to the West, and competition from North America was not yet the serious problem it soon became. This export-led prosperity which came on the heels of the new measure of independence helped to fix the idea that free trade was very much in the best interests of Hungary.

The Crash of 1873 changed the attitude of many, most particularly in Austria, where all along (even during the "free trade era")
the tariff reductions negotiated in the trade treaties with other countries had met stiff opposition in parliament. It was not long after the passage of the tariff law that Germany introduced duties on agricultural products in Bismarck's tariff act of 1879. Although moderate still in its duty levels, this law was protectionist both in its nature and its origin, and was followed in 1887 and 1890 by sharp increases in tariffs on grain. Yet another round of raises, this time including manufactured goods, came with the tariff act of 1902. Though the German grain duties are seen largely as a move to protect Prussian landowners against the encroachments of the North American grain producers, because Germany was Hungary's second largest market (after Austria), Bismarck's policies helped reinforce the effects of overseas competition which began to force Hungary into the protectionist camp, as her grain was displaced by cheaper North American and later Australian grain in former markets, both within and without the Empire.

The history of Austria-Hungary's tariffs in this period is one largely of reaction to German moves, at least in the eyes of Austrian writers on the subject, although sometimes the "reaction" in Austrian trade policy came perilously close to anticipating the "action". We see the Austrian tariff of 1882 "almost slavishly producing a parity with the German tariffs", of 1881, followed by another raise, in 1887, to the levels set in the German
law of 1885. The reason for the rather long delay in the second instance was the preparation for new Parliamentary elections in Austria. Trade policy reached perhaps its most restrictive point in 1889–1891 during the latter part of the customs war with Rumania which began in 1886. This started with Austria-Hungary’s applying the same sort of veterinary restriction on the trans-shipment of cattle against Rumania, Russia, and Turkey that Germany applied against Austria-Hungary. Begun in 1881, this proved to be catastrophic for Rumanian cattle exports, which had been shipped mainly through Hungary.

When the trade treaty with Rumania expired in 1885, renewal negotiations broke down over this issue almost immediately and the customs war was on, lasting de facto until 1891. This worked some hardships on the Hungarian milling industry, which had enjoyed free import of very cheap Rumanian grain (provided it exported the flour equivalent of all such imports), and hurt what little industry there was in Transylvania, as well - leading in some instances to the migration of that industry across the border into Rumania, which was the principal market for its products. The 1887 tariffs lasted until the law of February 13, 1906, which raised some agricultural duties still further, although the increases on meat and animals were meaningless because of the prohibition enforced by strict adherence to the veterinary regulations. Within this law, which carried through to
the end of the period under review, industrial tariffs stayed mostly unaltered. Thus the final step in the pre-War tariff increases was almost exclusively an increase in agricultural duties, strong evidence of the vigor with which Hungarian agriculturalists had come to embrace the protectionist idea. As former export markets were choked off, both by tariffs designed to protect domestic producers in those countries and by lower-cost imports (especially wheat) from North America, Russia, and Australia, Hungarian producers found themselves unable to cut costs sufficiently to remain competitive, even within the Austrian market. With the change in position from major export producers to import-competitors (at least within the context of the Austro-Hungarian Empire as a whole), the original free-trade sentiment of the grain producers of Hungary changed to an advocacy of protectionism.

Although the first step toward protection, the Autonomous Tariff of 1878, was passed over Hungarian opposition, the combination of overseas competition and the ever-higher protection offered agricultural products in nearly all of Hungary's markets outside the Empire finally resulted in a unity of purpose between Austrian industry and Hungarian agrarian interests in support of protection for the Monarchy. The agricultural duties in the 1882 law were designed as something to give away at treaty time, but the intransigence of negotiators on both sides of a
number of tables resulted in their retention in the tariff structure, and by
the time 1887 rolled around, further increases in tariffs, including those
on grain, had considerable support from both halves of the Dual Monarchy.

The Hungarians might have pressed harder for more liberal trade
laws and agreements with other nations, had not the Austrian market
grown at a rather quick pace during the decades before World War I.
Hungary was fortunate that to replace lost outside markets it was able to
rely not only on trade diversion, as a result of rising tariff walls around
the Empire, but also on the internal expansion of the Imperial market.
Thus Hungary was able to increase its total exports even in the face of
increasing protection in the rest of Europe, a point which will be dealt
with in some detail in the following section.

B. The export of agricultural products, 1882–1913

Because of lack of any data at all for many years prior to 1882, and
the unreliability of such data as exist for some of the years, the quantita-
tive discussion must begin with 1882, after the reforms of 1881 established
the basis for much more complete and accurate foreign trade statistics.

As was noted in the previous section, this corresponds to the early period
of protectionism, before duties reached really prohibitive levels. Because
the harvests of the early 1880's were good - in some cases exceptional
we should expect that exports of field crops were high in the early part of the period which we are here considering. While this is perhaps a good thing from the point of view of trying to establish the success or failure of agriculture in contributing to economic growth (we can be reasonably sure that our export growth rates for field-grown crops are not biased upward), it may tend to lead to an overstatement in the shift in composition of exports between the 1880's and the years just before World War I. This should be kept in mind when considering what follows.

The balance of trade for Hungary showed about an equal number of deficit and surplus years from 1882 until the mid-nineties. Four deficit years were followed by seven years in a row of a trade surplus (beginning in 1899), and then by deficits in eight of the last nine years of the pre-War period. During this time, exports grew at an average rate of 2.7 percent per annum, while imports grew slightly faster, at 2.85 percent. As is implied by the changes in Austria's share in Hungary's foreign trade, imports from Austria grew more slowly (2.4 percent) than total imports, while exports to the other half of the Dual Monarchy expanded at a rate more rapid (2.9 percent) than total exports. All growth rates are on the basis of 1882/1884 average to 1911/1913 average – thus 29 years between midpoints on the periods. Being uncorrected for price changes, they represent maxima, since for the period as a whole, it would appear that the general price level rose somewhat, with terms of trade turning in favor of food and farm products.
The most important country by far in Hungary's trade was Austria. At the beginning of our statistical series, over 80 percent of all imports (in value terms) originated in Austria, and around 70 percent of all exports were sold to Austria (see Table 29). Despite the protective tariffs growing up around the Empire, it is clear that Hungary slowly turned more to other sources for her imports, which by the end of the period were just slightly over 70 percent from Austria. Not so with exports - the Austrian market actually took an increased share of Hungary's exports in the years before the War than she did in the early 1880's.

Because the tariff categories used include some processed products which are not technically output of the farm and which cannot be separated out from the published foreign trade statistics, it is not possible to arrive at a completely unambiguous estimate for the share of total exports accounted for by raw agricultural products per se. We can approximate this share quite closely, however, by taking the sum of the following tariff groups and single products, as classified by official Hungarian statistics:

1) Grain, malt, legumes; flour and milling products; rice. Subtract from this flour and milling products.

2) Fruit, vegetables, and plants

3) Draft and slaughter animals
TABLE 29

TRADE WITH AUSTRIA, AS PERCENT OF TOTAL\(^a\), SELECTED YEARS

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1882</td>
<td>84.12</td>
<td>68.61</td>
</tr>
<tr>
<td>1887</td>
<td>86.46</td>
<td>74.37</td>
</tr>
<tr>
<td>1892</td>
<td>82.32</td>
<td>75.88</td>
</tr>
<tr>
<td>1897</td>
<td>77.43</td>
<td>76.18</td>
</tr>
<tr>
<td>1902</td>
<td>76.90</td>
<td>71.32</td>
</tr>
<tr>
<td>1907</td>
<td>77.03</td>
<td>74.48</td>
</tr>
<tr>
<td>1912</td>
<td>71.59</td>
<td>73.73</td>
</tr>
</tbody>
</table>

\(^a\) In value terms

Source: Calculated from data appearing in *Ungarische Statistische Mitteilungen, N. S. vol. LXIII, passim.* This will be source for all subsequent tables in this chapter unless otherwise stated.
4) Animal products (made up of milk and cream, eggs, honey, raw hides, feathers, entrails and bladders)

5) Single products: raw tobacco, live poultry, dressed poultry, hemp, flax, and raw wool

As can be seen, only commodities in their raw state are included, unless some processing is typically done on the farm, e.g., killing and dressing poultry. So constituted, agricultural exports accounted for 54.6 percent of total exports in 1882/1884, and 46.9 percent in 1911/1913. For the two time periods, the above commodities made up 59.3 and 52.3 percent respectively of the value of exports to Austria. Given the relative size of the labor force (see chapter V), and the usual agricultural productivity discount, agriculture's share in total exports appears to have been about equal to its share in national product. 18

Table 30 shows in some detail both the relative shares of different farm products in total exports and in exports to Austria, and the rates of growth of exports of these commodities during the period for which data are available. Despite the increase in grain production, the decrease of the share of this group of crops in total exports is perhaps the most striking single result of examining the tabulation. Further, this decline is almost entirely accounted for by the decline in the share of wheat - a reflection of three separate trends: the decline of agriculture's share in total exports, the slight decline in the
<table>
<thead>
<tr>
<th>Commodity</th>
<th>Share of Value Rate of Growth</th>
<th>Share of Value Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Exports</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Exports to Austria</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**Exports, 1982/84 - 1971/73**

**Table 30: Shares in Total Exports and Rates of Growth of Selected Agricultural Commodities**
<table>
<thead>
<tr>
<th>Commodity</th>
<th>Share in 1882</th>
<th>Share in 1913</th>
<th>Rate of growth of volume in 1882</th>
<th>Rate of growth of value in 1913</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal products</td>
<td>0.2</td>
<td>0.6</td>
<td>0.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Milk and cream</td>
<td>0.3</td>
<td>0.2</td>
<td>0.8</td>
<td>8.5</td>
</tr>
<tr>
<td>Eggs</td>
<td>0.9</td>
<td>3.7</td>
<td>0.2</td>
<td>6.1</td>
</tr>
<tr>
<td>Raw hides</td>
<td>0.9</td>
<td>1.2</td>
<td>0.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Flax, hemp, and other fibers except cotton and wool</td>
<td>0.3</td>
<td>1.2</td>
<td>0.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Hemp</td>
<td>0.1</td>
<td>0.8</td>
<td>0.1</td>
<td>5.3</td>
</tr>
<tr>
<td>Flax</td>
<td>0.1</td>
<td>1.6</td>
<td>0.1</td>
<td>5.9</td>
</tr>
<tr>
<td>Wool</td>
<td>7.3</td>
<td>17.6</td>
<td>7.6</td>
<td>14.8</td>
</tr>
</tbody>
</table>

a. Separate commodities listed under groups are only major ones in that group — not necessarily all.
b. Less than 0.05%.
c. Not calculated.

Source: See text.
share of wheat in total grain production, and the growth — absolutely and relatively — in exports of flour. Flour exports, by growing at more than three percent per annum, increased their share in total exports from 10.6 percent to 13.5 percent. With regard to Austria, the respective figures are 4.8 percent, 8.2 percent, and 16.9 percent. So wheat and flour taken together declined in importance with respect to total exports, but increased their combined share in exports to Austria. It is perhaps in wheat exports where the growth of the Austrian market was most important to Hungary. Whereas in the years 1882-1886, 22.6 percent of all wheat exports went to countries outside the Austro-Hungarian customs union, that share shrank almost to nothing in the later years of the period – in 1912 and 1913 less than one half of one percent of wheat exports went outside the Empire. 19

This represented not only the increased tariffs in most other countries which had formerly been markets for Hungarian wheat, but also a decline in the relative competitiveness of the Hungarian product, particularly against the wheat from the United States and Russia, and later that from Argentina and Australia. 20 Thus the protection erected around the Dual Monarchy enabled the Hungarian wheat producer to survive, another way of saying that it was perhaps the principal economic prop shoring up the large-estate system, since wheat was the estate crop par excellence. Whether or not this constituted a real benefit to Hungary
is a question to which an unambiguous answer is not forthcoming. Certainly it allowed Hungary to maintain its export earnings, but it also reduced the incentive to transform agriculture and make it more productive, which might in the long run have been of much more benefit. Much the same could perhaps also be said for flour, over 40 percent of exports of which went outside the customs territory in 1882-1886; by 1907-1911, this had fallen to 3.6 percent, and remained at about that level until the outbreak of the War. 21 (See Table 31)

Animals and animal products gained in relative importance. Slaughter and draft animals, poultry, and animal products made up just over 18 percent of total exports by value in 1882, but this figure had reached 24 percent by 1913. This occurred despite the decline in exports of sheep and goats (due to the reductions in sheep numbers detailed in the preceding chapters) and of pigs. In this regard, we have seen already the toll taken by hog cholera. Pigs alone accounted for nearly 1/7 (13.95 percent) of all exports in 1894, but with the onset of hog cholera, this fell to 7.1 percent in 1895, to 3.6 percent in 1896, and 3.1 percent in 1897. Thus the 6.8 percent share in total exports for pigs in 1913 represents a recovery, rather than the apparent decline which a look at only the figures for the terminal years might indicate.
<table>
<thead>
<tr>
<th>Average for years</th>
<th>Wheat</th>
<th></th>
<th></th>
<th>Flour</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Exported</td>
<td>Outside Monarchy</td>
<td>Total</td>
<td>Exported</td>
<td>Outside Monarchy</td>
</tr>
<tr>
<td></td>
<td>(1000 tons)</td>
<td>(1000 tons)</td>
<td>%</td>
<td>(1000 tons)</td>
<td>(1000 tons)</td>
<td>%</td>
</tr>
<tr>
<td>1882-86</td>
<td>524</td>
<td>419</td>
<td>22.6</td>
<td>339</td>
<td>137</td>
<td>40.5</td>
</tr>
<tr>
<td>1887-91</td>
<td>668</td>
<td>175</td>
<td>26.1</td>
<td>447</td>
<td>130</td>
<td>29.0</td>
</tr>
<tr>
<td>1892-96</td>
<td>553</td>
<td>45</td>
<td>8.2</td>
<td>603</td>
<td>103</td>
<td>17.1</td>
</tr>
<tr>
<td>1897-1901</td>
<td>412</td>
<td>8.3</td>
<td>2.0</td>
<td>605</td>
<td>90</td>
<td>14.9</td>
</tr>
<tr>
<td>1902-06</td>
<td>512</td>
<td>9.0</td>
<td>1.8</td>
<td>741</td>
<td>79</td>
<td>10.6</td>
</tr>
<tr>
<td>1907-11</td>
<td>417</td>
<td>2.9</td>
<td>0.7</td>
<td>704</td>
<td>25</td>
<td>3.6</td>
</tr>
<tr>
<td>1912-13</td>
<td>463</td>
<td>0.9</td>
<td>0.2</td>
<td>829</td>
<td>18</td>
<td>2.1</td>
</tr>
<tr>
<td>1913</td>
<td>508</td>
<td>1.9</td>
<td>0.4</td>
<td>813</td>
<td>34</td>
<td>4.2</td>
</tr>
</tbody>
</table>

a. Metric tons (= 1000 kg = 2204 lbs.)

Source: Ungarische Statistische Mitteilungen, N.S. vol. LXIII, 29*, 34*.
Another consequence of the decline in sheep numbers is the absolute decrease in wool exports, although part of this drop is due to the increased internal processing which resulted in growth in exports of woolen yarn, cloth and other items made of wool.

Thus the tendency noted in chapter III is borne out by the more detailed figures: exports of agricultural products changed somewhat in composition, such that the items generally more income-elastic in their demand structure became more important, and the export of crude farm products did not keep pace with the growth of exports in general, due in part at least to the increased degree of processing within Hungary before exporting the goods abroad. This last is a reflection of industrial growth, but we have seen from chapter III that the composition change in raw products exports almost certainly did not occur as a result of changes taking place on the large estates. It rather represents an increase in the market activity of the smaller farms, those which became more "animal-intensive" at the same time that the estates were concentrating even more heavily on grains.

The response of the large producers therefore seems to have been to exercise their political power to reserve a market for their traditional produce, rather than to change drastically the kinds of products or the production methods which they employed. The exports of animal products,
which we have already found to owe their developments on smaller properties (see chart).

to depend less on the Austrian market as the years
progressed. Cattle exports by value went 99.7
1882-1886, but only 88.3 percent in 1909-
however, because of the veterinary restricti

Although Austria's share in pigs exported from
79.0 percent in 1882-1886 to 99.9 percent in
the same period we find its share in the purchase
poultry dropping from 91.0 percent to 69.1
products (category 4, page 199) from 63.8

For all animals and animal products (category
the share changed but little. Austria took
exports in these categories in 1882-1886 and

Because of the ambiguities caused by the vet i
imposed against Hungary, and the uncertain
pig exports of the hog cholera epidemic, we
Hungarian producers of animals and animal

Austria-oriented between the mid-1880's and
but it is clear that they did not have to rely
nearly so completely as did the grain produc
FOOTNOTES:  CHAPTER IV

1. This section is based primarily on the following two works: Josef Gruber, "Handelspolitick und Ausgleich in Österreich-Ungarn" (Vienna and Leipzig, 1912), and Alexander von Matlekovits, "Die handelspolitischen Interessen Ungarns", in Beiträge zur neuesten Handelspolitik Österreichs ("Schriften des Vereins für Socialpolitik", vol. XCIII; Leipzig: 1901). Explicit footnote references will be made only for information taken from other sources.

2. Roland Kühr, Die Geschichte des ungarischen Getreidehandels und die Getreidepreisbildung in Österreich-Ungarn (Magyaróvár: 1911).


5. Ibid., 6, 18.


8. In addition, Bismarck implemented other policies aimed directly at Austria-Hungary. Of particular importance for the export trade was...
his railroad policy, which raised rates on foreign grain passing through Germany. Since Hungary had sent much grain out through Hamburg to Stettin, after shipment by rail across Germany, this policy also helped to cut Hungary off from her overseas markets. Veterinary measures, aimed ostensibly at preventing the spread of hoof-and-mouth disease, effectively barred the shipment through Germany of cattle as well.


11. Offergeld, 178.

12. Ibid., 185.

13. The tariff law of 1887 tripled the duty on wheat imports (from 6.6 to 19.7 cents per bushel). This was still less, in 1888, than the duties on wheat of Germany, France, and Italy. Helen C. Farnsworth, "Decline and Recovery of Wheat Prices in the Nineties", Wheat Studies, X (June-July, 1934), 350.

14. Bokor, 69, 137, 183, 186-188.

15. The harvests of 1880 and 1881 were "exceptional", and were followed by the "very exceptional" harvest of 1882 (Cautes, 4), "the best har
Chapter V: THE RELEASE OF RESOURCES TO NONAGRICULTURAL SECTORS

A. Population and labor force

1. An overall view of population growth

In the pre-World War I period, the Kingdom of Hungary stood seventeenth among the nations of Europe in population, ranking behind Russia, Germany, the United Kingdom, France, Italy, and Austria (in that order). From the 15.5 million persons recorded in the 1869 census (13.6 million if Croatia-Slavonia is excluded), Hungary's population grew to 20.9 million (18.3 million) in 1910. This growth did not proceed at a steady pace: due chiefly to the cholera epidemics of 1872 and 1873 and their heavy death toll, the population in 1880 was less than 1.5 percent greater than that of 1869, while the succeeding three decades showed average (continuously compounded) annual rates of growth of 1.04, 0.97, and 0.81 percent, respectively. The average for the period as a whole comes to 0.72 percent per annum.

Table 32 presents a comparison of population growth in Hungary with that of some other European states during the period under review. It is immediately apparent from this table that the increase in population in Hungary was neither uncommonly rapid nor uncommonly slow in comparison with other nations of Europe, except for the stagnation of the first decade.

Growth of population in the various regions presents no striking deviations from the norm for the country as a whole. In general, the population
TABLE 32

AVERAGE ANNUAL RATES OF GROWTH OF POPULATION,

SELECTED COUNTRIES

<table>
<thead>
<tr>
<th>Country</th>
<th>1870-1880</th>
<th>1880-1890</th>
<th>1890-1900</th>
<th>1900-1910</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom of Hungary</td>
<td>0.13&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.04</td>
<td>0.98</td>
<td>0.81</td>
</tr>
<tr>
<td>Austria</td>
<td>0.89</td>
<td>0.88</td>
<td>1.03</td>
<td>1.02</td>
</tr>
<tr>
<td>Germany</td>
<td>0.73&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.12&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.35</td>
<td>1.44</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>---</td>
<td>0.97&lt;sup&gt;d&lt;/sup&gt;</td>
<td>1.55&lt;sup&gt;e&lt;/sup&gt;</td>
<td>1.48</td>
</tr>
<tr>
<td>Italy</td>
<td>0.60</td>
<td>0.69</td>
<td></td>
<td>0.64</td>
</tr>
<tr>
<td>Finland</td>
<td>1.54</td>
<td>1.45</td>
<td>1.10</td>
<td>1.39</td>
</tr>
<tr>
<td>France</td>
<td>0.44</td>
<td>0.19</td>
<td>0.16</td>
<td>0.17</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1.24&lt;sup&gt;f&lt;/sup&gt;</td>
<td>1.00&lt;sup&gt;g&lt;/sup&gt;</td>
<td>1.10&lt;sup&gt;h&lt;/sup&gt;</td>
<td>0.96&lt;sup&gt;i&lt;/sup&gt;</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.96&lt;sup&gt;l&lt;/sup&gt;</td>
<td>0.95</td>
<td>0.98</td>
<td>1.04</td>
</tr>
<tr>
<td>Holland</td>
<td>1.14</td>
<td>1.18</td>
<td>1.24</td>
<td>1.39</td>
</tr>
</tbody>
</table>

<sup>a</sup> 1869-1880  <sup>b</sup> 1871-1875  <sup>c</sup> 1875-1890  <sup>d</sup> 1887-1892  <sup>e</sup> 1892-1900  
<sup>f</sup> 1871-1881  <sup>g</sup> 1881-1891  <sup>h</sup> 1891-1901  <sup>i</sup> 1901-1911  <sup>j</sup> 1866-1880

Source: Thirring, 243.
of the central, Great Plains, and southern areas grew more rapidly, due not so much to differential rates of natural increase as to differential rates of migration. A substantial number of persons moved to Budapest from all regions of the country, while the tide of overseas emigration began later and crested at a lower level in these central and southern regions than it did in the North, West, and East.

2. Urbanization

A steady trend toward urbanization made itself felt during the era of the Dual Monarchy. Because of the special nature of rural settlement in Hungary - the characteristic congregation into what Dovring has termed "very big villages" (1,000-2,000 inhabitants), "small agro-towns" (2,000-5,000), and "big agro-towns" (over 5,000) - the standard United States census rural-urban division at 2,500 population would tend to overstate the number of genuinely urban residents in considerably greater degree than it does in the United States. Hence, I chose 10,000 as a more meaningful dividing line in deriving the percentage of total population living in "urban" areas. The results of this calculation may be seen in Table 33.

The growth of the capital city of Budapest (from 270 thousand in 1869 to 880 thousand in 1910) accounts for a significant proportion of the increase, and is a natural consequence of its position as the primary center of trade and industry for the entire kingdom.
TABLE 33

**URBAN POPULATION**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of Inhabitants of Cities over 10,000 Population (000's)</th>
<th>Percentage of Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1869</td>
<td>1610</td>
<td>10.4%</td>
</tr>
<tr>
<td>1880</td>
<td>1865</td>
<td>11.8%</td>
</tr>
<tr>
<td>1890</td>
<td>2432</td>
<td>13.9%</td>
</tr>
<tr>
<td>1900</td>
<td>3034</td>
<td>15.8%</td>
</tr>
<tr>
<td>1910</td>
<td>3609</td>
<td>17.3%</td>
</tr>
</tbody>
</table>

*Obtained by adding populations of all towns and cities having populations in the given census year of 10,000 or more inhabitants. Tables of population by cities appear in various issues of the *Annuaire Statistique Hongroise*.
3. Agricultural population and labor force

Agriculture, forestry, and fishing accounted for at least three-quarters of the total population of Hungary at the beginning of the period under review, a proportion which fell at each census to reach a level of 64.5 percent in 1910.

The definition of "economically active" in the Hungarian censuses included anyone who earned an income. It thus overstates the labor force, as now customarily defined, by the numbers of pensioners, widows living on annuities, etc. The proportion of such persons in the total population can reasonably be assumed to be quite constant and small, so that relative comparisons of labor force and participation rates over time would be expected to show negligible variation with inclusion or exclusion of this group. A summary of such information from census materials is offered in Table 34.

Table 34 besides revealing the declining relative weight of agriculture in both total population and labor force, shows also a declining labor force participation rate, both overall and in the agriculture sector. The break in this latter trend in 1900 appears to be due largely to the inclusion of a higher percentage of women in the economically active category, especially in agriculture. In so doing it would return the overall labor force participation rate nearly back to the 1869 and 1880 levels. Part of the
apparent secular decline in the participation rate is no doubt due to the heavy emigration around the turn of the century (see section A. 4. of this chapter), since the numbers of emigrants typically include very high proportions of persons of working age, especially males. 13

4. Emigration from agriculture

One of the major contributions which agriculture can make to economic development is to release labor for employment elsewhere. This does not necessarily imply a reduction in the absolute numbers of persons employed in the agricultural sector—a phenomenon we normally expect to find only after economic development has proceeded for some time 14—but merely that the number of persons dependent on agriculture for their livelihood increases at a lower rate than that of the population as a whole. The estimated 75 percent of the population of Hungary dependent on agriculture in 1869, when compared to the 1910 agricultural population, yields an average annual growth of the absolute number of persons in agriculture of 0.36 percent, which is just exactly half the 0.72 percent rate for population as a whole. So agriculture did release labor for other employment. If indeed the labor force participation rate among the agricultural population declined between 1869 and 1910 (but see the reservations on this point in part A.3. above), then the rate of release implied by the growth rates quoted would tend to be overstated slightly, since the decline in the agricultural par-
### TABLE 34

TRENDS IN LABOR FORCE AND PARTICIPATION RATES,

**KINGDOM OF HUNGARY, 1869-1910***

<table>
<thead>
<tr>
<th>Year</th>
<th>Labor force as a % of total population</th>
<th>Agricultural labor force as a % of total agr. population</th>
<th>Agricultural population as a % of total popn.</th>
<th>Agricultural labor force as a % of total LF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1869</td>
<td>47.2</td>
<td>47&lt;sup&gt;b&lt;/sup&gt;</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>1880</td>
<td>46.2</td>
<td>46&lt;sup&gt;b&lt;/sup&gt;</td>
<td>74</td>
<td>71</td>
</tr>
<tr>
<td>1890</td>
<td>44.5</td>
<td>42.8</td>
<td>72.5</td>
<td>69.9</td>
</tr>
<tr>
<td>1900</td>
<td>45.9</td>
<td>46.0</td>
<td>68.4</td>
<td>68.6</td>
</tr>
<tr>
<td>1910</td>
<td>42.9</td>
<td>41.6</td>
<td>64.5</td>
<td>62.5</td>
</tr>
</tbody>
</table>

a) "Economically active"

b) For 1869 and 1880, calculated as follows:

\[
\frac{LF_A}{P_A} = (\frac{LF_A}{LF_T}) \times (\frac{LF_T}{P_T}) \times (\frac{P_T}{P_A}), \text{ where } P = \text{population},
\]

LF = labor force, and A and T represent "agricultural" and "total" respectively.

Sources: Thirring, 315, 320.

*Ungarische Statistische Mitteilungen, N. S. Vols. II, 52*; XXVII, 164*;

XLVIII, 26*, 28*; LXIV, 8-9, 184-86.
ticipation rate slightly exceeded that in the overall rate, according to the census reports. This source of overstatement is certainly very small, and can safely be ignored.

It might be better perhaps to make the comparison between 1880 and 1910, because of the unusual conditions (the cholera epidemics - see section A. 1. above) which drastically cut population growth in the 1869-1880 period. If we do so, we find total population increased at 1.01 percent per year, agricultural population at 0.55 percent, and the non-agricultural population at 2.05 percent. Thus we find the numbers in agriculture growing at just about half the rate of increase of total population, and a difference between the growth rates of total population and of non-agricultural population, i.e., the rate of growth of the share of non-agriculture in total population, of just over one percent per year. How does this compare to the performance of other countries at about the same time? Table 35 presents some data for other European countries. All figures in this table were drawn from periods "so chosen as to represent the phases of most vigorous growth of: non-agricultural employment in each country, to the extent that data are available." 15

From the data in the table, it would appear that rate of growth of non-agricultural population and labor force in Hungary was at a quite respectable pace for its time. This still does not imply, however, that agriculture freed laborers at a rate sufficient to match the growth of employment opportunities
in other sectors. In the extreme case, it might happen that no one leaves the farm, but that all increments to the non-farm labor force must come from natural increase in the urban population, or from immigration, or both. If the share of non-agriculture in the population is to grow, then this rate—the rate of increase of the urban population plus the rate of immigration—must exceed the growth rate of the rural population. If these two sources of growth in the non-farm population cannot provide enough persons to fill all newly-available jobs, agriculture must do so in order not to constrain general economic growth. Even the apparent filling of all new jobs from non-agricultural sources of population increase would not be conclusive evidence that a static agriculture did not impede growth by failing to release labor. If the economy had to divert resources from capital formation (and job creation) in order to expand the rate of immigration or to encourage higher birth rates in the cities in an attempt to alleviate a labor shortage in industry, while portions of the agricultural population were underemployed, then the failure to transfer these underemployed into industrial occupations would be a drag on overall economic development.

Emigration out of the country, however, by substantial numbers of those dependent on agriculture for a living would be prima facie evidence that it was not agriculture's failure to let the people go that acted to restrain growth.
<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>$\frac{\Delta P_T}{P_T}$</th>
<th>$\frac{\Delta P_{NA}}{P_{NA}}$</th>
<th>$\Delta \left( \frac{P_{NA}}{P_T} \right)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>1880-1910</td>
<td>1.0</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1801-1831</td>
<td>1.5</td>
<td>2.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Belgium</td>
<td>1846-1880</td>
<td>0.7</td>
<td>2.1</td>
<td>1.4</td>
</tr>
<tr>
<td>Denmark</td>
<td>1855-1880</td>
<td>1.0</td>
<td>1.3</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>1880-1911</td>
<td>1.1</td>
<td>2.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Norway</td>
<td>1865-1890</td>
<td>0.7</td>
<td>1.9</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>1890-1920</td>
<td>0.9</td>
<td>1.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Sweden</td>
<td>1880-1910</td>
<td>0.7</td>
<td>2.2</td>
<td>1.5</td>
</tr>
<tr>
<td>France</td>
<td>1861-1891</td>
<td>0.1</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1888-1910</td>
<td>1.1</td>
<td>2.2</td>
<td>1.1</td>
</tr>
</tbody>
</table>

$P = \text{population}; \ T = \text{total}; \ NA = \text{nonagricultural}$

a) In some cases this represents growth in employment rather than in population, but for which countries was not specified.

Sources: Hungary: See text
All others: Dovring, "Share of Agriculture......," 93.
During the period considered in this study, Hungary sent considerable numbers of emigrants abroad. Although throughout much of its previous history Hungary had been a land of immigration, especially following the expulsion of the Turks at the turn of the eighteenth century, the flow reversed in the middle of the nineteenth century, when "emigration, as a social movement, began right after the abolition of serfdom..." Estimates of the numbers of emigrants in the early period disagree, although there is general agreement that the flow was very small until the 1870's due in part to the ready availability of employment both on farms and in public works in the fifties and sixties. Reliable official data on emigration in the seventies, eighties, and nineties are not available. Before 1899 Hungary relied on records of foreign ports for its emigration statistics, with the result that official data for the pre-1899 period are seriously inadequate and badly understate the actual flow of emigrés. Schneider examines other contemporary estimates and concludes that the typical estimate of 300,000 emigrants in the 1870-1880 decade is much too high, and sets his own figure at 30,000-40,000. The disparity comes mainly because he thinks many persons who died in the cholera epidemic were counted as having emigrated. Schneider's estimate is probably too low. Thirring, taking into account cholera deaths and deriving figures mainly by comparing rates of natural increase in population to actual rates of population growth, arrives at the following figures for total net emigration from Hungary between censuses:


<table>
<thead>
<tr>
<th>Period</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1869-1880</td>
<td>200,000</td>
</tr>
<tr>
<td>1880-1890</td>
<td>250,000</td>
</tr>
<tr>
<td>1890-1900</td>
<td>165,374</td>
</tr>
<tr>
<td>1900-1910</td>
<td>646,540</td>
</tr>
</tbody>
</table>

These figures give a total which is somewhat under that measured by the official statistics of emigration (see chart 5) and re-immigration for the years after 1899, an occurrence Thirring attributes mainly to data-gathering problems, particularly in regard to re-immigration. Let us accept his estimates as being reasonably accurate, even perhaps a bit conservative.

After arriving at some totals, we must further try to apportion them by sector of the economy. No data on occupations of emigrants are available from the earlier years, but in 1905-1907 and again in 1911-1913, the Hungarian government did record occupations of emigrants (actually of family heads and those leaving independently). In 1905-1907, independent farmers made up 17.0 percent of all emigrants, and agricultural servants and laborers, another 51.6 percent. The corresponding figures for 1911-1913 were 21.0 and 47.4 percent respectively. In toto, then, agriculture provided 68.6 percent and 68.4 percent of emigrants in the two periods enumerated. In 1900, agriculture accounted for 68.4 percent of total population, and for 64.5 percent in 1910. Since agri-
GROSS EMIGRATION
FROM HUNGARY, 1899-
1913 (According to
official statistics)*

*Source: Ungarische Statistische Mitteilungen, N.S.
vol. LXVII (Budapest: 1918), 4-5.
culture provided emigrants in about the same (or even somewhat greater) proportion as its share of total population, it would appear that we cannot accuse the farm sector of not releasing labor which could be employed elsewhere.

There is no reason to suspect that this type of behavior was confined only to later years, and that agriculture was niggardly earlier in its provision of emigrants. Indeed, if anything it would seem that a greater than proportionate share of the migrants in the early decades were from the farm sector, and especially from those areas, such as the Slovakian regions of northern Hungary, where the soil was least fertile. If 68.5 percent of all emigrants were from agriculture between 1880 and 1910, this would account for approximately 726,000 of Thirring's 1.06 million emigrés of that period. If the natural rate of increase of the rural population is taken as one percent per annum (just slightly under the observed rate for total population), the 1910 census would have showed an increase of 3.991 million persons on farms in the absence of any migration. The observed increase was 1.935 million, leaving 2.056 million as apparent migrants to non-farm areas in Hungary or to foreign countries. If 726 thousand of these went abroad, that means that somewhat over one-third of all persons who left the farm did not, for one reason or another, find a place in the non-agricultural sectors of the Hungarian economy. Although, as mentioned before (see note 16), the reasons why they could not or did not find employment in non-agriculture may ultimately reside
in the agricultural system, the evidence seems clear that agriculture did not stifle economic development by preventing large numbers of its labor force from leaving.

In this regard, it would seem that the particular institutional setting actually tended to spur on migration from the farm sector. Schneider mentions time and again "land hunger" as the proximate cause of much of the emigration. Land prices were artificially inflated because of restrictions in the supply of land caused by a combination of entail, the dominance of large estates in the distribution of landownership, and the rarity of division of an estate for sale in smaller lots, if it did come on the market. For many peasants, accumulation of enough capital to buy a piece of land was impossible under conditions existing in Hungary. The only alternatives were then to remain as before, or to migrate — either because one gives up hope of acquiring a farm of one's own, or in the hopes of saving out of higher earnings elsewhere enough to buy a piece of land.

5. Wages in agriculture

Corroboration for the conclusion that agriculture was releasing labor in sufficient quantities to satisfy the requirements of an expanding industrial sector can be sought in the behavior of wages. A steady level of real wages with growth in industrial output would be further evidence that agriculture was indeed releasing labor to the nonagricultural sectors at a rate rapid
enough to meet their growing employment needs. There are unfor-
tunately no available data on the course of industrial wages, but on the
working assumption that wages in agriculture and nonagriculture would
move roughly together, we can examine changes in the wages of farm
workers to get an idea of how wages in general behaved.

From the results of part A.3. from this chapter and of chapter III,
it seems clear that agricultural productivity must necessarily have been
increasing. The production of field crops increased at an average rate
of 2.8 percent per annum between 1870/1874 and 1909/1913, or 1.8
percent if the beginning date is taken as 1885/1889. Between 1880
and 1910, the agricultural population grew at about 0.55 percent per
year. If we use the production of fodder crops as a proxy for the increase
in output of animal products, we find a rate of increase of 3.1 percent
between 1885/1889 and 1909/1913. Even if animals and animal products
accounted for only 30 percent of net farm output, we could quite
confidently assume that total agricultural production was growing in the
1885/1889-1909/1913 period at a rate in excess of two percent per year
on the average. If we can take the same rate of increase in agricultural
output as a reasonable estimate of the growth between 1880 and 1910, then
comparing this to the rate of growth of agricultural population implied an
increase in the average productivity of labor in agriculture of 1.5 percent
per year or more.
The Ministry of Agriculture began to collect detailed data on agricultural wages in 1891. Chart 6 summarizes some of the principal results of these surveys. Although the data for 1908 and 1909 are missing, the chart quite clearly shows a period of relative stability in the daily wage of an agricultural laborer, irrespective of the region in which he lived and/or worked, lasting from at least the early nineties until just after the turn of the century. Then, between 1902 and 1904, a marked upward turn in the daily wage began and continued to 1912, with a slight dropoff in 1913.

Does the increase in the daily wage represent an improvement in the living standards of agricultural laborers? Or is it merely a reflection of the increase in the general price level noted in chapter IV? Comparing the average summer wage for a male adult farm laborer in 1910 and 1900 gives the following results by regions:

<table>
<thead>
<tr>
<th>Region</th>
<th>1910 money wage up 65 percent over 1900</th>
<th>1910 money wage up 65 percent over 1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Bank of Danube</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Left Bank of Danube</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Between Danube and Tisza</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Left Bank of Tisza</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Right Bank of Tisza</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Tisza-Maros Corner</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Transylvania</td>
<td>up 51 percent</td>
<td>up 80 percent</td>
</tr>
<tr>
<td>Average for Hungary proper</td>
<td>up 70 percent</td>
<td>up 70 percent</td>
</tr>
</tbody>
</table>
CHART 6: AVERAGE DAILY WAGE, SUMMER MONTHS,
FOR ADULT MALE FARM LABORER, BY
REGION, 1891-1913

Crown

Right Bank of Danube

Left Bank of Danube

Between Danube and Tisza

Left Bank of Tisza

1891, 93, 95, 97, 99, 01, 03, 05, 07, 09, 11, 13
CHART 6 (CONTINUED)
WAGES BY REGION

Right Bank of Tisza

Tisza-Maros Corner

Transylvania

Countrywide average

Source: See text.
Whether these increases in money wages represent advances in real incomes depends on two factors: the rate of increase of prices of the things that make up a farm worker's budget, and the number of days worked in the year. The second factor, number of days worked, will be taken up in chapter VI. Let us here consider the cost of living of a farm worker.

General indexes of prices are not available for the overall price level, or even for any of its constituent parts. We can, however, arrive at something which would probably constitute an upper bound to the cost of living index for a farm worker by considering expenditures for food, since the terms of trade moved so sharply in favor of agriculture between 1900 and 1910. (1910 is chosen as the terminal date because the series of retail prices used is available only up to that year.) Hungary's leading statistician, Károly Keleti, undertook a massive study of nutrition in Hungary in the early 1880's, from which we can take the average yearly food consumption to arrive at an estimate of the increase in the cost of a basic diet.

Keleti divided food items into 30 categories, and estimated the average yearly per capita consumption of each category during the sample period. He then multiplied each by an "average price" - not precisely defined - to arrive at an estimate of the cost of an average Hungarian diet, which amounted in those years to 90.69 Gulden, or 181.38 crowns.
Using the official published statistics of retail prices for 1900 and 1910, the same diet would have cost approximately 237.16 crowns in 1900 and 323.39 crowns in 1910. We cannot be sure if the 1880's prices and the later prices are consistent, because Keleti does not indicate the origin of his price series, but the 1910 and 1900 prices are consistent with each other. In the ten years after 1900, the cost of the average diet of the 1880's rose 36 percent. If these later prices are consistent with those of the early eighties, then in 1900 the basic diet cost about 31 percent more and in 1910 about 78 percent more than it did around 1880.

Money wages rose 74 percent (country-wide average) between 1900 and 1910, about double the increase in the cost of a diet. It would appear that, if the number of days employment were the same, the standard of living of the agricultural laborer must have risen. If the productivity of labor increased at the same average rate between 1900 and 1910 as it did for the longer period 1885/1889-1909/1913, this would imply that the average productivity of labor was 16 percent higher in 1910 than in 1900. It would therefore appear that in this decade the increase in real wages exceeded the increase in productivity by a good margin. But if the beginning of the period of comparison were shifted to 1890, when the wages were virtually identical to their 1900 levels, this margin disappears, and the increase in real wages can be seen to be almost exactly equal to the gain in average
productivity if 1890 prices were the same as 1900 prices. Because the increase in the cost of food probably represents an upper bound to the increase in the cost of living, the last two or two and a half decades of the period may have meant gains in the standard of living of farm laborers slightly in excess of the increase in labor productivity. This evidence of labor scarcity might well be due to the increased emigration seen from part A.4., which reached almost flood proportion after the turn of the century.

But what of the early years? For the time before 1890, data are scarce, but we can find in official publications some wage series which will allow rough comparisons at least. For most years between 1872 and 1890, the *Magyar Statisztikai Évkönyv* / Hungarian Statistical Yearbook / contains data on average monthly wages for farm labor in some country markets. From these I have selected three principal market towns in different sections of the country, and show the course of wages in these towns from 1872 to 1913 in chart 7. Chart 8 shows country averages for the later years. The average daily wage for the summer is taken as simply the mean wage for June, July, and August for the years between 1872 and 1890. For the later years, the summer wage is taken directly from the published data on agricultural wages referred to in footnote 29. (There are no monthly wages available for the later years.) From the chart, it is apparent that
For each year, the sequence runs Spring-Summer-Fall-Winter, all peaks in above are


Seasonal averages for entire country, official data

Average daily wage for adult male agricultural laborer

Chart 6
wages tended to decline between the two. Differences in the rate of decline seem to be entirely sure that the earlier analysis was consistent, since the method of gathering data are never spelled out. Therefore, these results only tentative, but appear nevertheless.

If we take the average summer months of the three towns (1880-1881 only for Komárom, 1879), we find the 1910 wage was slightly lower than the figure we got for Debrecen, but had declined from its previous level of 0.92 to 1.06, and just barely rose, to 1.06.

Some further increases after 1910 can be observed. Further comparison of Charts 2 and 3 shows the striking similarity of the movement of wages in grain prices. Considerations of supply seem to indicate further that the apparent stabilization of agricultural workers registered in 1910 would thus appear that some of the losses were passed on by the landowners to wages were not regained until increasing prices Empire made it possible for prices to
Up to the turn of the century, then, it appears that wages remained steady or even fell somewhat. This behavior supports the original conclusion that agriculture did not fail to release labor, at least for the first three decades of the era of the Dual Monarchy. In the decade or so before the War, we saw the real wage in agriculture rise. I would argue, however, that this does not represent evidence that the farm sector was failing to release labor. One argument — perhaps a trivial one — is that this increase represented largely a recapture of positions previously lost, so that over the entire period real wages in agriculture remained approximately constant. More important, however, is the large number of persons who left farming (see section A.4.). The rise in farm wages must have been due in part to the scarcity induced by this movement (since we saw wages apparently rising more rapidly than productivity after 1900.). If industrial wages rose as well, it would seem to be much more a result of competition from other countries for the available labor, rather than any failure of Hungarian agriculture to let the workers go.

B. Agriculture as a source of savings

In dealing with this aspect of agriculture’s contribution to economic development, we are on much less firm ground — in fact, on no real ground at all. Such information as exists on this question is so fragmentary, impressionistic, and in part at least, contradictory, that we must be content merely
to note some of the points made, since the drawing of any confident conclusions would certainly be rash.

There is first of all some evidence that the rural savings rate must have been very low indeed. The detailed study by Hungary's most eminent statistician (used in the preceding section) revealed extremely low standards of nutrition and of living in general among the mass of the population, with the typical family budget appearing to be an exercise in deficit finance. Sumptuous levels of consumption, including lavish hospitality and the maintenance of flocks of servants and retainers, receive frequent mention in description of the lives of the landed nobility.

While this in itself does not indicate low savings (especially if the income distribution is highly skewed), there is also reference to low rates of return on land and investment in agriculture on the large estates, leading in many cases to such a level of indebtedness that the lord was forced to sign over management of the estate to the bank (since it could not foreclose on entailed land). Was this situation typical, general? We can't be sure.

Since chapter II pointed out the tiny share of middle-sized farms in the total, the savings behavior of their proprietors would have very little effect on the overall savings rate in the farm section. Being without information about this group of farmers is not so serious, but the lack of reasonably complete and detailed information on the incomes and the ex-
penditures of the nobility presents an insuperable obstacle to making any guess about the savings rate in agriculture.

Even should an estimate of the savings rate be made, further evidence would be necessary to show whether or not these savings found their way into non-agricultural investment. On this score there is a bit more solid evidence. The growth of credit institutions in Hungary was very rapid in this period, and the savings banks in particular, which operated virtually as ordinary deposit banks, were an important vehicle for the transfer of savings from country towns and rural areas into investments in the city (as well as into investments in agriculture). Because of lack of information on depositors, the sources remain a mystery, although the figures in Table 36 show that there must have been a considerable increase at least in the mobility of savings.

Suppose, however, we were able to establish a magnitude for the amount of savings originating in agriculture but used in industry. This would still be a contribution only in the gross sense, since from it we must deduct savings originating in industry but used in agriculture. There is some evidence that the flow from industry to agriculture was of significant proportions, taking the form of purchase of estates (and with them, titles) by wealthy industrialists. Given the social importance of landed property and titles, as well as the abolition by the Hungarians, when they
TABLE 36
SAVINGS DEPOSITS IN HUNGARIAN CREDIT INSTITUTIONS
(millions of crowns)

<table>
<thead>
<tr>
<th>Year</th>
<th>Banks</th>
<th>Savings Banks</th>
<th>Cooperatives</th>
<th>Land Credit Institutions</th>
<th>Total</th>
<th>Percentage Increase over previous period's</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>22.2</td>
<td>234.3</td>
<td>-----</td>
<td>-----</td>
<td>256.5</td>
<td>-----</td>
</tr>
<tr>
<td>1875</td>
<td>48.9</td>
<td>347.3</td>
<td>-----</td>
<td>0.3</td>
<td>396.8</td>
<td>54.7</td>
</tr>
<tr>
<td>1880</td>
<td>80.0</td>
<td>520.0</td>
<td>9.6</td>
<td>0.8</td>
<td>610.5</td>
<td>53.9</td>
</tr>
<tr>
<td>1885</td>
<td>105.0</td>
<td>671.0</td>
<td>33.6</td>
<td>1.3</td>
<td>810.9</td>
<td>32.8</td>
</tr>
<tr>
<td>1890</td>
<td>180.9</td>
<td>843.5</td>
<td>54.8</td>
<td>2.2</td>
<td>1081.5</td>
<td>33.4</td>
</tr>
<tr>
<td>1895</td>
<td>272.1</td>
<td>1053.6</td>
<td>70.7</td>
<td>3.5</td>
<td>1399.8</td>
<td>29.4</td>
</tr>
<tr>
<td>1900</td>
<td>390.8</td>
<td>1264.5</td>
<td>80.4</td>
<td>9.2</td>
<td>1745.0</td>
<td>24.7</td>
</tr>
<tr>
<td>1905</td>
<td>587.1</td>
<td>1598.0</td>
<td>152.0</td>
<td>13.8</td>
<td>2350.9</td>
<td>34.7</td>
</tr>
<tr>
<td>1910</td>
<td>3227.1</td>
<td>213.7</td>
<td>7.7</td>
<td>3448.5</td>
<td>48.4</td>
<td></td>
</tr>
</tbody>
</table>

a. Details may not add to totals due to rounding.

b. Uncorrected for changes in general price level.

Source: Annuaire Statistique Hongroise, various issues.
received internal autonomy in 1867, of the prohibition of the sale of land to Jews, the magnitude of the transfer of profits of industry and commerce into purchase of land was probably considerable. How it compared in size to the transfer of rural savings to industrial-commercial uses is unknown, hence both the direction and the magnitude of the net flow of savings between agriculture and nonagriculture must remain undetermined.

Recalling the considerations of chapter I, we are concerned that agriculture make a sizable and important capital contribution. Evidence of a scarcity of capital, set beside the overwhelming weight of agriculture in the economy of the country, would be an indication of failure on the part of the farm sector to make its contribution in this area. Data on interest rates are extremely hard to come by, but a comparison of the discount rate of the Austro-Hungarian bank with that of other European banks of issue (Table 37) suggests no general shortage in the Empire. Because the financial affairs of the two halves of the empire were so closely linked, we can probably assume that the suggestion holds for Hungary as well as for Austria. But the very connections, and the sizable inflow of credit from Austria (also from Germany, France, and England), obscures the evidence regarding the importance of Hungarian agriculture as a source of savings. This inflow of credit was undoubtedly the force which kept interest rates down, which seems to show that there was indeed a shortage of domestic capital
| Year | Austro-Hungarian Bank | | | German Reichsbank | | | | Bank of England | | | | Bank of France | | |
|------|----------------------|---|---|------------------|---|---|-----------------|---|---|-----------------|---|---|-----------------|---|---|
| 1871 | 6.5% | 5.0% | | 5.0% | 4.0% | | | | | | | | | | |
| 1875 | 5.0  | 4.5  | | 6.0  | 4.0  | | | | | | | | | | |
| 1880 | 4.0  | 4.0  | | 5.5  | 4.0  | | | | | | | | | | |
| 1885 | 4.0  | 4.0  | | 5.0  | 4.0  | | | | | | | | | | |
| 1890 | 5.5  | 4.0  | | 5.5  | 4.0  | | | | | | | | | | |
| 1895 | 5.0  | 4.0  | | 4.0  | 3.0  | | | | | | | | | | |
| 1900 | 5.5  | 4.5  | | 7.0  | 5.0  | | | | | | | | | | |
| 1905 | 4.5  | 3.5  | | 6.0  | 3.0  | | | | | | | | | | |
| 1910 | 5.0  | 4.0  | | 4.0  | 4.0  | | | | | | | | | | |

in Hungary. But we cannot go so far as to say that the failure to provide for all domestic capital needs represents a failure to make its proper contribution to capital formation for economic development. Our criterion of chapter 1 was merely that it should make an "important" contribution. The lack of information on the size of the savings flow from agriculture means only that we do not have to face the thorny problem of quantifying what is "important". Since foreign capital was also important sometime in the early phases of development of almost every advanced nation, we cannot point to the existence of a capital transfer from the Vienna banks (and from Germany, France, and England as well) into Hungary as evidence of agriculture's failure to make its proper savings contribution. We can merely point to this financial arrangement as one of the advantages for development secured to Hungary by the institution of the Dual Monarchy.
1. In 1910. Bowden, Karpovitch, and Usher, 21. Because of the unavailability of some essential data referring to "Hungary Proper", this chapter will deal throughout with the Kingdom of Hungary, i.e., Hungary with Croatia-Slavonia.

2. Kovacsics, appended Table 7 (no page number).

3. von Matlekovits, i.e., Ungarn, I, 81.

4. Ladislaus Schneider, Die Ungarische Auswanderung (Pozsony / Bratislava /: 1915), 53-67.

5. Dovring, Land and Labor, ch. 1. Paul Teleki, The Evolution of Hungary and its Place in European History (New York: 1923), 55-58, presents the generally-accepted view that these large towns owe their existence to persecution of the peasants under Turkish rule. The oppression by Turkish landlords cause widespread migration to the lands of the Sultan, where conditions were relatively easier.

C. A. Macartney repeats this and notes further that under the Turks the towns even enjoyed a measure of prosperity, so that the people "forsook their villages and congregated in the relative shelter of the towns, and thus were born the curious 'village-towns' of the Alföld... each of which incorporated in its boundaries the territory of the deserted villages around it" (Macartney, 69).
It is interesting to note, however, that in the Ukraine and North Caucasus regions of Russia, which were not occupied by the Turks, the same pattern of settlement is typical. See Timoshenko, Agricultural Russia..., 34.

6. Some measure of support for this division can be found in its choice by Károly Keleti, the leading Hungarian statistician of the nineteenth century, in his standard work on Hungary. See Keleti, 473ff.

7. Part of the centralization of trade was not completely "natural", but a result of deliberate government policy. The state railways focused on Budapest, and cross-country connections were execrable, thus diverting a considerable amount of traffic through Budapest that might otherwise have gone directly to its destination. See Drage, esp. 395-396.

8. Thirring, 318-319. The 1869 census includes under "household servants and persons of miscellaneous or unknown occupation" 1.2 million, or more than 16 percent, of the "economically active" population. Thirring assigns 450,000 of these to agriculture, as he does 650,000 of the 950,000 "day laborers without further designation" who make up 13 percent of the economically active in 1880.
Thus augmented, the agricultural labor force forms 75 percent and 71 percent, respectively, of the total labor force in the two census years. From this basis, Thirring puts the "lower-bound" to the proportion of agricultural to total population in 1869 at 75-76 percent, and at 74 percent in 1880. Such an adjustment of the census figures is, in my opinion, necessary. For confirmation, see also Bokor, 173-176; Offergeld, 199; or T. Kolossa, "Beiträge zur Verteilung und Zusammensetzung des Agrarproletäriats in der Österreichisch-Ungarischen Monarchie (1900)", in Studien zur Geschichte..., 241.

9. Calculated from figures appearing in Ungarische Statistische Mitteilungen, N.S. vol. XLVIII, 28*. The figure for Hungary excluding Croatia-Slavonia is 62.4 percent.

10. Provided that the time interval is relatively short or that population growth is not so slow, or advances in medicine or social legislation so rapid, as to increase significantly the share of elderly persons on pensions in the population.

11. Of all the economically active males above the age of 15, 68.4 percent had agriculture as their chief occupation in 1900, as against 62.9 percent in 1910. For the economy as a whole, there were according to the censuses (all succeeding figures refer to 1890, 1900, and 1910, respectively) 125, 118, and 133 dependent persons per 100 economically active,
whereas in agriculture the numbers were 133, 118, and 140. This corresponds to participation rates for all males of 63.4, 64.3, and 64.9, and for all females of 25.9, 27.6, and 21.3 (see Thirring, 316-317). It appears that the variability in female participation rates is due to the changing interpretations of "active" used in the various censuses, rather than to any large changes in economic activity. Alexander Eckstein finds that

one of the most difficult problems in an analysis of Hungarian occupational statistics is to determine the exact size of the active population...In Hungary, as in many other European countries, there is a definite tendency towards under-enumeration of this active population, because farm wives and other members of the farm family, who devote only part of their time to the farm enterprise, are usually not counted.

...It is in the unpaid farm family personnel category that most of the under-enumeration is concentrated. The census questionnaires provide no objectively measurable criterion that would definitely establish whether a farm family member should be assigned to the ranks of the passive or active population, and the decision rests upon the judgment of the individual question or of the census-taker. This accounts for unduly wide inter-censal fluctuations in the numbers of active population; at least this variation cannot be explained either on demographic or economic grounds." (Eckstein, 179)

Even with pronounced swings of the business cycle, such a large deviation from trend (four or five percentage points) would be most unusual. Indeed, "the only thing which seems to have a large impact on participation rates is mobilization for a major war."

12. Which may be closer to the "true" level. Eckstein (p. 182) adjusts the total of "economically active in agriculture" for "under enumeration" in 1910. Presumably he would then have done the same for 1890, had his study included that year.

13. Available evidence appears to corroborate this conclusion for Hungary: Thirring (p. 315) has calculated participation rates for 1900 and 1910 in the areas that make up present-day Hungary, finding 43.4 percent and 42.5 percent, respectively. These compare to 47.0, 46.0, and 48.3 percent for 1920, 1930, and 1941, years when emigration was small. This can be only a rough comparison, however, because of the unknown magnitude of errors in the data and because of the sharply changed economic conditions which prevailed after World War I.


15. Ibid.

16. Two considerations should be mentioned in this regard, however.

First, let us accept the hypothesis that migration is a function of
two kinds of differentials in per-capita income as between the source and destination of the migrants: a) differentials in absolute levels of income for various occupations; and b) relative differentials of income between skilled and unskilled workers in the two areas. (See Stanley L. Friedlander, Labor Migration and Economic Growth (Cambridge, Massachusetts: 1965), 27-28.) Insofar as low productivity in agriculture and its large share in determining per capita income are responsible for a large enough "type a" differential to exist to cause migration, it is conceivable that emigration of farmers out of the country rather than to nonfarm employment within the same country would not be conclusive evidence that agriculture was not a drag on growth. But since the migrants actually left, it cannot be said that agriculture's failure to release them was the inhibiting factor.

What then of the second type of differential? A case could perhaps be made that it was agriculture's "fault" that the differential between farm and non-farm productivity and earnings at home was not sufficient to divert the migrants away from foreign lands and into employment in the industry of their own country, as, for example, if low incomes per capita, due largely again to the great weight and low productivity of agriculture restricted the market to such an extent that scale economies could not be exploited and labor productivity therefore
remained low in nonagriculture as well. Or maybe low incomes prevented investment in skill acquisition. In any case, although agriculture might be at least in part the ultimate source of this obstacle to growth, it is still not the failure to release the workers that is at issue. So for the overall view of agriculture as an inhibiting influence on economic growth the foregoing must be kept in mind, but for the purposes of this particular chapter these caveats can be dismissed.

A similar argument applies with respect to the second consideration, viz., what if agriculture releases enough people, but they don't have the requisite skills to fill the nonfarm jobs? Then we can find both unfilled vacancies in the nonfarm sector and unemployment or emigration of relatively unskilled farmers. The causes of this structural problem may or may not lie completely within the sphere of agriculture, but again this does not reduce the value of the evidence with respect to the release of resources.

Although we can here take note of the existence of these issues, their resolution unfortunately lies outside the boundaries both of available data and of the author's competence. This section will therefore focus on the narrower problem as defined in the text.


20. Ungarische Statistische Mitteilungen, N.S. vol. LXVII (Budapest: 1918), 3*.

21. Schneider, 36; Thirring, 238.

22. Schneider, 36.

23. Thirring, 238.

24. Ibid. Official data show about 1.05 million emigrants net in 1899-1913 alone, nearly as many as Thirring gets for the entire 1869-1910 period. Adding to these the statistics from major ports which Hungary used as its emigrant count for 1871-1899 pushes the total to approximately 1.5 million; see Ungarische Statistische Mitteilungen, N.S. vol. LXVIII, 2-5.

25. Ibid., 32.


27. Kün also credits land hunger as the source of the agrarian socialist movement in Hungary. Kün, III. See also Drage, 314.

28. This is a very conservative figure. Fellner puts it at about 40 percent in 1899/1901, and we have found reason to believe his figures on animal products output are understated to a considerable extent. See Fellner, "Die Schatzung des Volkeinkommens", 121-131, and
29. Published in a yearly series entitled *Mezőgazdasági Munkabérek* Magyarországon /Agricultural Wages in Hungary/ (Budapest: 1892 ff).

30. Compiled from a large sample survey taken between 1880 and early 1884, this study was published in Hungarian and German editions. All references are from the German edition: Karl Keleti, *Die Ernährungsstatistik der Bevölkerung Ungarns* (Budapest: 1887).


33. The categories (Keleti, *Die Ernährungs-Statistik...*, 116) and the prices used for 1900 and 1910 are as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Price (all countrywide average unless otherwise noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Beef</td>
<td>Roasting beef</td>
</tr>
<tr>
<td>2. Pork</td>
<td>Pork</td>
</tr>
<tr>
<td>3. Mutton</td>
<td>Mutton</td>
</tr>
<tr>
<td>4. Veal</td>
<td>Veal</td>
</tr>
<tr>
<td>5. Fowl</td>
<td>Chicken</td>
</tr>
<tr>
<td>6. Fish</td>
<td>Mixed small fish, Budapest</td>
</tr>
<tr>
<td>7. Venison</td>
<td>Venison, Budapest</td>
</tr>
<tr>
<td>8. Sausage</td>
<td>Kolbasz, Budapest</td>
</tr>
<tr>
<td>9. Bacon</td>
<td>Bacon</td>
</tr>
<tr>
<td>10. Lard</td>
<td>Pork lard</td>
</tr>
<tr>
<td>11. Butter</td>
<td>Butter, Grade II</td>
</tr>
</tbody>
</table>
34. Keleti, Die Ernährungse. Statistik...esp. p. 85; Jenö von Czettler, Landwirtschaftliches Gesinde in Ungarn (Berlin: 1910), 22-23. Offergeld (p. 201) mentions the practice in some regions of sleeping during much of the day in the wintertime to cut down the need for calories - a result of extremely low incomes.

35. See for example Jászó, 230-231, or Ditz, 127.


37. von Matlekovits, Ungarn, II, 515.

38. Béla Malcomes, Magyar Mezőgazdaság / Hungarian Agriculture / (2 vols.; Budapest: 1942), II, 51. The "sugar barons", Hatvany and Harkany, are perhaps outstanding examples of industrialists who diverted a large part of their fortunes into the purchase and maintenance of landed estates. Warriner, The Economics of Peasant Farming, 23. Since both Hatvany and Harkany were of Jewish origin, as were most of the other leading merchants and industrialists, this form of using their fortunes would not have been possible without the changes made in the law. By 1890, nearly 20 percent of all properties over 1,000 holds, and 19 percent of those between 200 and 1,000 holds, were owned by Jews. Macartney, 191.
40. Ránki, 206; Drage, 440-442. A fairly detailed account of this "most significant element in Hungary's balance of payments" is presented in Frigyes Fellner, A Nemzetközi Fizetési Mérleg és Alakulása Magyarországon (Budapest: 1908), 70-99.

41. It is not immediately clear whether the Dual Monarchy system, and particularly the common customs territory, was on balance a help or a hindrance to Hungarian economic development. The Hungarians enjoyed an increasingly protected market for their agricultural products after about 1880, but in turn Austria enjoyed a near monopoly on the sale of industrial products in Hungary. Since Austrian goods in general cost more than those from Germany, this acted to counter-balance the advantages of the protected Austrian market for Hungarian farm commodities. The relatively cheap credit available from Vienna was an advantage, but the cost of maintaining a share of the Imperial apparatus, particularly the army, bore heavily on the Hungarians. The assessment of the net balance of advantages and disadvantages would be an interesting study in itself, but lies outside the scope of the present inquiry. For some further details, please refer to chapter IV.
in the decade immediately following the freeing of the serfs (1848), land prices rose about 200-300 percent, and that the rent for a hold of land (1.43 acres) fell in the range of five to ten forints (or 10-20 crowns). Money rents apparently declined with grain prices after 1870, and averaged about 15-16 forints per hectare — therefore around nine forints per hold — in the second half of the nineteenth century. In the late eighties, another source quotes average rents in western Hungary as seven forints per hold on large farms, eight or nine on smaller properties. An English observer reporting on the results of a trip in 1902 reports a rent of about 17 shillings per acre in the area of Magyaróvár (western Hungary) and a countrywide average for medium land of about 15 shillings per acre. This translates into approximately seven forints per hold. The government's figures for 1913 show the county averages for western Hungary falling in the range of 13-19 forints per hold. This is indeed scanty evidence to go on. The apparent increase of rents in the last decade or so before the war is probably a reflection of both the increase in the general price level and of the favorable turn in the terms of trade for agriculture. Any discussion of probable trends in the distribution of income in Hungary over the period under review would require much more detailed and more consistent information on rents than apparently is available.
From chapter V, part A. 5., we saw that real wages apparently declined from the seventies until about the turn of the century, and then rose again at least until the War. It was also noted there that wages followed quite closely the movements in grain prices. The same sort of pattern shows up also in the import statistics for agricultural machinery. It was 1893 before the value of imports of farm machines exceeded the level of 1883 (1882, the first year of the foreign trade statistics, cannot be used because the agricultural machinery figure for that year includes much steam equipment not used in agriculture). After that, imports began to climb markedly only in the early years of the twentieth century. Even at the end, however, they formed a trivial share of total imports - only 0.9 percent, on the average, for 1911-1913, compared with 0.5 percent for 1883-1885.

Increases in imports were concentrated in two types of machinery - those used in reaping and seeding. It is interesting to see in the import statistics the reaction of Hungarian landowners to serious labor problems. The value of harvesting equipment imported in 1898 increased more than four-fold over 1897, the year of the first big harvest strike. Again in 1906, imports of these types of machines were more than triple the 1905 level, as an apparent direct result of the harvest strikes of 1905. There were increases in the imports of all other classes of agricultural machinery in
these years also, but they did not approach anything like the jumps in reaping machine imports. 8

Did increasing agricultural output and incomes stimulate domestic production of inputs to agriculture? Of this we cannot be sure, but the following considerations give some indication of the magnitude of growth in the production of agricultural machinery: according to the factory census of 1898, the manufacture of agricultural machinery accounted for just over six percent of the total gross output of the machine-building industry. 9 Because its output was all sold outside the machine-building sector, the share of the farm machinery subsector in net output of the machinery industry must have been greater than its six-percent share in gross output, but there is no way to tell exactly from the data as published. Exports of farm machinery almost exactly quadrupled (uncorrected for price changes) between 1883/1885 and 1911/1913, a good indication that the industry was growing. Total imports of agricultural machinery in 1898 were 11.2 million crowns, exports 1.9 million, and domestic production 8.3 million. Net imports then amounted to 9.3 million crowns, and domestic production sold in the domestic market, 6.5 million crowns. 10 Therefore, we can conclude that by 1898 the Hungarian factories satisfied just: }
(132 million crowns = £ 5.5 million)\textsuperscript{11} was very small indeed, and farm machinery accounted for less than a tenth of total machinery output. The state of technique of Hungarian agriculture was such, apparently even at the end of the period (judging from import figures), that its demand for the products of industry did not constitute a major stimulus to industrial production.

The foregoing does not take into account such things as fertilizers, building materials, etc., also produced for the farm market, nor does it include any consumer goods purchases by the farm sector. Artificial fertilizers were almost unheard of, even in 1913, and it is difficult to imagine that with the number of animals on large estates declining (see chapter III) there could have been any significant increases in the demand for building materials by the farm sector even with the increase in stall feeding noted in chapter III. I feel it is safe to assume that the demand for farm machinery grew as fast or faster than the demand for other industrial inputs into agriculture, so that the conclusions of the previous paragraph can be more generally applied.

There still remains the translation of a daily wage into a yearly income, a problem for which data are extremely scarce. Beginning only with 1907, the government surveys of agricultural wages included questions on annual earnings. For the three principal market towns shown in Chart 7, we find the
following average annual earnings of a man working as a day laborer in agriculture:

Sopron: 613 crowns in 1913, 636 in 1911, and 533 in 1907.

Szeged: 576, 600, and 405, respectively.

Debrecen: 644, 735, and 523.

Although the labor is of course distributed throughout the year, there is no indication of the distribution in the published statistics, so we will have to be content with showing how many days' work the above figures represent at the summer wage, which might tend somewhat to understa-te the number of days actually worked, since summer wages are generally higher. The results are as follows:

Sopron: 212, 250, and 193 days for 1913, 1911, and 1907, respectively.

Szeged: 123, 159, 157 days, for the years in the same order.

Debrecen: 210, 223, and 138 days, respectively.

The figures show no real trend, and probably represent only variations due to weather and other short-run phenomena. Over the period as a whole, and especially from the mid-nineties, the increased use of machinery did allow a considerable shortening of the harvest season, which resulted in the loss of a significant number of days of employment for the average agricultural laborer apparently not offset by increased demand for his services elsewhere. The increase in daily wages observed is proportionately greater than the increase in
yearly earnings of a farm laborer, if the decrease in number of days’ employment (whether from the changes in demand or from the income effect on supply) be true. Therefore any increases we may have found in daily wage rates can almost certainly be taken as maxima when applied to income growth. 13

So, although the daily wage seems to have risen sharply in the later part of the period under review, because income growth almost certainly was slower, and because this represented in large part the regaining of a previous level of real income, the effect on the nonagricultural sectors via the demand for their products was probably not very significant. If changes in agricultural output and incomes did not mean significant increases in the demand for either production or consumption goods, we cannot immediately conclude that this represents a failure on the part of agriculture to contribute to the development of the nonagricultural sector. As pointed out previously in chapter 1, increased demand by the farm sector for the products of the nonagricultural sector may actually inhibit, rather than encourage, growth, by bidding away resources that otherwise could be used for capital formation (either for industry or for social overheads). A policy of deliberate restriction of the demand of the rural sector in order to free the maximum amount of resources for investment in nonagriculture has been an integral part of a number of development plans or models,
most notably that of the Soviet Union. The lack of growth in the demand of the farmers for goods and services produced off the farm is an aid to growth in circumstances such as those considered above. Thus the lack of data on income change in Hungarian agriculture and on the disposition of that income, on the apparently small size of the farm market as a source of demand for domestic Hungarian industry may not be very important for the outcome of this investigation. A strong argument can be made that the considerations of the previous chapter (the release of resources from the farm sector) are much more important to overall economic development than are those topics which fall into the purview of the present chapter. 14
FOOTNOTES: CHAPTER VI

1. Földárak és Földhaszonbérek Magyarországon 1913. Év Végén / Land Prices and Land Rents at the End of the Year 1913 / ("A Magyar Királyi Földmivelésügyi Ministerium Kiadványai" / Publications of the Royal Hungarian Agriculture Ministry /, 1914, no. 9; Budapest: 1914). Hereafter referred to as "Land Prices".

2. P. Sándor, 175.

3. Ibid., 191.

4. Leuschner, 41.


8. Ibid., 308-311.


10. Ibid., 104.

11. Ibid., 96.

12. P. Sándor, 437-442.
13. Even if the demand curve for labor had stayed the same, we would probably expect days worked to drop as wages rose, i.e., the income effect would be dominant in the labor supply curve. In a very interesting study, this income-effect dominance has been shown to exist uniformly for a large number of countries, even at extremely low levels of income. See Gordon C. Winston, "Income and the Aggregate Allocation of Effort", American Economic Review, LV (May, 1965), 375-385; or ____________, "An International Comparison of Income and Hours of Work", Review of Economics and Statistics, XLVIII (February, 1966), 28-39.

14. And the worst of all possible worlds, in which the agricultural population forms neither a large market for the produce of the non-agricultural sector nor a source of supply of labor to the cities, is the accusation: Gerschenkron levels against France in the century preceding 1914, indicating that while you cannot have it both ways, you may have it neither way. Alexander Gerschenkron, "Reflections on Economic Aspects of Revolutions", in Internal War, ed. Harry Eckstein. (New York: 1964), 188-189.
Chapter VII: SUMMARY AND CONCLUSIONS

This study has attempted to derive, from analysis of available quantitative information, an answer to the question "Was the agriculture of Hungary an obstacle to general economic development of that country between 1867 and the First World War?" This question, posed early in the first chapter, was considered important because a) the time chosen was the period when Hungary, which had previously been little more than a colony of Austria, first had a chance to initiate modern economic development in its own self-interest, and b) this development was begun without any attempt at land reform or other government measures to alter a quasi-feudalistic land tenure structure whose outstanding characteristic was the dominance of the large estates of a landed nobility. After choosing an analytical framework within which to examine this question, it was necessary first to establish that the share of large estates in Hungarian landownership did not decrease: observing both a pervasive contribution to general development and a decline in the importance of large estates would have made very ambiguous any conclusions about how the existence of large landed properties affected overall economic development.

In chapter II various surveys of landownership were utilized to show that, indeed, the large estate sector had not shrank. The most striking
single piece of evidence in this regard was that the share of total acreage accounted for by the *latifundia* (defined as properties greater than 14,300 acres) doubled between 1867 and 1914. During the same interval, the amount of land contained in properties of 1000-10,000 *holds* declined by 30 percent, and that in holdings of 200-1000 *holds* was reduced by nearly a fifth (19 percent). The apparent gain in acreage for the aggregate of properties of 200 *holds* (286 acres) or less in size may or may not be solely accounted for by the disparity in coverage between the 1867 and 1914 surveys, since the former covered five percent less land than the latter. The results of chapter II nevertheless make it quite clear that we are observing a time when the polarity of the land distribution was increasing, and with it the power of the dominant position of the large estates.

If it were then possible to establish unambiguously that agriculture was not a brake on overall economic development in Hungary, it would be a clear demonstration that a quasi-feudalistic landownership structure is not an insuperable barrier to economic growth. A neat and completely unambiguous answer is not to be found, but chapters III through VI, dealing with the performance of Hungarian agriculture as regards the several potential contributions it could have made to general economic growth, do emphasize a number of important points in regard to this performance.
Chapter III dealt with the expansion of agricultural output. A satisfactory index for the output of animal products could not be constructed, but because both the index of gross output of fodder crops and the exports of animals and animal products grew faster than (respectively) the output of all crops and the exports of all agricultural products, it seems unlikely that the output of animal products could have grown at anything less than the rate observed for crop output (above two percent per year on the average from 1870/1874 to 1909/1913, but slightly under two percent for 1885/1889 - 1909/1913, when the data on yields are somewhat more reliable). Therefore the rate at which crop output grew was taken as the minimum for the rate of growth of agricultural gross product.

This led to the conclusion that for approximately the last three decades of the period, productivity per person dependent on agriculture for a livelihood increased at an annual average rate of about 1.5 percent. For a country in the early stages of economic growth, this seems quite a respectable rate indeed. In Great Britain, according to Deane and Cole, the maximum observed increase in output per person occupied in agriculture, for a three-decade period in either the eighteenth or nineteenth centuries, was 1.3 percent between 1821/1831 and 1851/1861, a time which includes the so-called "Golden Age of Agriculture" in Great Britain. Data available for the United States from 1840 to 1900 (roughly the period of the Great Western Expansion) show slightly lower rates of growth in output per gainfully
employed worker in agriculture: Gallman's estimates put the maximum observed growth in value added per worker at about 1.2 percent per year between 1869 and 1899 (in 1879 prices), with the growth being about 0.9 percent for the 1839 to 1899 period.

If the rate of increase of total agricultural production were two percent per year, this would have been sufficient to satisfy growth of demand at constant prices, if per capita incomes were growing at 1.5 percent per year, provided that the income elasticity of demand for farm products as a whole were approximately 0.5 or less. In chapter III, a 1.5 percent rate of growth of per capita income was taken as perhaps a bit high. This statement, however, is open to serious question because of very skimpy evidence. According to Eckstein, agriculture's share in real NNP (1938/1939 prices) remained virtually constant between 1899/1901 (43.3 percent) and 1911/1913 (43.7 percent). Yet agriculture's share in the labor force continued the decline it had shown throughout the period under review, so saying that 1.5 percent per annum increase in per capita income is greater than the rate of increase actually achieved implied either that Eckstein's estimates are wrong or that average labor productivity in agriculture was growing faster than in nonagriculture for those dozen years. For the time before the turn of the century, there is no way to compare rates of productivity increase on the farm with those elsewhere.
due to lack of data on the output of the nonfarm sectors. Hence we
cannot be really sure that the rate of increase of productivity in agri-
culture represents a lower or an upper bound to the rate of increase of
productivity and real incomes in the economy as a whole.

The rates of productivity growth observed could come, however,
with little or no output expansion if redundant labor were to leave the
farm for employment or unemployment elsewhere. An autonomous in-
crease in productivity could free labor to leave with no loss of output,
or already surplus labor, by leaving the farm, could increase output per
person in agriculture simply because such a move leaves fewer persons
in the rural sector. Without rather precise data on applicable produc-
tion functions in agriculture, we cannot be sure how much of the growth
in farm output per head in Hungary was due to the migration of labor
from agriculture, nor which of the mechanisms for increasing produc-
tivity dominated within agriculture. The vast numbers of emigrants
from the rural sector, and the evidence from wage rates which indicate
no increase in scarcity of labor in agriculture until very late in the period
under review would lend support to the thesis that the reduction in the
ranks of the underemployed was a major source of the apparent produc-
tivity increase over much of the period.
In fact, however, agricultural production did not remain static, but grew steadily throughout the Dual Monarchy era. The growth rate of total agricultural output probably did not approach that of the United States in the late nineteenth century, although it seems to have exceeded the best performance of Great Britain, in which the maximum rate of growth of agricultural production over a 30-year period was about 1.8 percent (1821/1831-1851/1861). Hoffman's estimates place the growth rate of real net product in German agriculture at 1.6 percent per annum between 1850 and 1913, with a growth in labor productivity in agriculture averaging 1.2 percent for the same period.

The growth was remarkably steady over the whole period: from 1850/1852 to 1870/1872, the rate was 1.5 percent, and from 1870/1872 to 1911/1913, just slightly over 1.6 percent. When seen in this context, the estimate of a minimum of two percent per year increase in farm output derived in chapter III for Hungary in the last two and a half decades of the Dual Monarchy does not seem particularly low.

The growth in total output, according to the observations of chapter III, was certainly not attributable exclusively to changes taking place on the large estates. The major grains showed smaller percentage gains in output than did fodder crops, and by implication, animal products. Cereals were the specialty of the large estates, which increased in numbers and in
share of total agricultural land included within their boundaries; at the same time, the number of animals of almost all kinds was declining in the large estate sector. Therefore, by implication, the output growth observed must be attributed in considerable part to the efforts of the smaller farmers toward diversification, accounting in large measure for a rate of growth of output on smaller properties higher than on the estates, a very important finding if true.

Besides the growth of output and productivity, flexibility of response to changes in the rest of the economy is also important to agriculture’s role in general economic development. The last section of chapter III tried to evaluate short-run output response to price changes as an indication of the flexibility of Hungarian agriculture. The analysis showed an apparently pervasive, although inelastic, price response. It was found to be somewhat less elastic than that found by other workers among present-day societies, and a number of reasons were adduced why either price elasticity of output or the "adjustment coefficient" would have low values in the Hungarian case.

Two additional considerations were taken up in chapter III. It was first of all argued that under conditions of inelastic demand, such as face many producers of farm products, too elastic a response to price changes is self-defeating by cutting overall profits. The increasing restriction of the market for Hungarian grain to just the Austro-Hungarian
Empire was evidence that the elasticity of demand curves facing Hungarian grain producers almost certainly decreased as the period progressed, a finding consistent with the observed reduction in price-responsiveness of these producers after the mid-nineties. The second argument was that a response to growth in the market - specifically because of the expansion in the railroad network - may not show up in comparing price and output. (The bias actually may be in either direction, i.e., toward a measured price elasticity that is greater or smaller than the "true" price elasticity, depending on such things as the level and elasticity of demand in the expanded market, the level and trend in the cost of transportation, and the speed of adjustment of suppliers to these factors.) The "railroad" model of chapter III was shown to be as good as the basic expectations or adjustment model in explaining changes in the acreage of grain crops. The reduction in observed price elasticity and in the observed elasticity of acreage with respect to railroad mileage is consistent with the reduction in demand elasticity and the slower expansion of demand which characterized the "Austrianization" of the market.

Evidence from chapter II of widespread plowing up of pastures and meadows in the 1850's and 1860's in order to plant grain in response to the burgeoning of market opportunities brought by the railroad lands some further support to the above points.
Economic motivation has also been suggested by some Hungarian historians as the reason why price response seemed to slack off in the latter part of the pre-War period. The lack of output response to price could, in this view, be attributed to a growing realization by the Hungarian landowners of the strength of their monopoly power in the market for food – especially grains – in the Austrian Empire. Thus the rise in grain prices and the shift in terms of trade to favor agriculture after the mid-nineties are seen as the result of output restriction and increased tariffs promoted by the great landlords to retain and enhance this monopoly position after Hungarian grain lost out in European markets outside the Habsburg realm to competitors from Russia, the Americas, and Australia. It is quite possible that the magnates considered it much easier to use their political power to win tariff protection than to change the composition of their output, which may have carried with it a change in their entire style of life.

The pivot around which this argument revolves is the price of wheat, since wheat was the principal export crop of Hungary, and the pre-eminent product of the estates. Chart 9 shows the course of the Hungarian wheat price (taken as the Budapest market price) and the "world price" (taken as the average value of wheat imported into Great Britain) between 1870 and 1913. Despite having the British yearly
averages on an August 1 - July 31 basis, while for Hungary they are for the calendar year, it is nevertheless clear from the chart that Hungarian prices moved very much in concert with the world price during the period. The narrowing differential between the two prices in the seventies and eighties can probably be ascribed to changes in transport costs and increased competition in, and unification of, the international market. After 1906 (when the final jump in Austro-Hungarian food tariffs was enacted - see chapter IV), the Hungarian price could rise and remain above the world price to the end of the period under review. The increase in the wheat price and the general shift in the terms of trade to favor agriculture after the mid-nineties was a world-wide phenomenon felt also in the Austro-Hungarian Empire. Perhaps the terms of trade turned a bit more sharply in favor of Hungarian farmers than of farmers in most other countries, but ascribing nearly the whole of the shift to increasing protection and exploitation of a monopolistic position probably overstates the case.

This is not to say that Hungary owed nothing to protectionism in food grains as it came to be applied after the late seventies or early eighties. Chapter IV showed also that as older markets such as Germany began to dry up because of their own agrarian protectionism and the inflow of overseas grain, Hungary was able to replace lost sales in Austria, where the market was both expanding and being increasingly reserved for the Hungarians.
Chart 9

The price of wheat in Great Britain and Hungary, 1870-1913

Hungary
Great Britain

In U.S. gold dollars per bushel

Source: Parnsworth, 3-46-H7.
A. Converted at par of exchange.
Exports of wheat and wheat flour to countries outside the common customs territory of the Monarchy virtually ceased by 1913 (see Table 31) even though the total export of these two commodities expanded. If we take the Budapest price of wheat as a percentage of the "world" (British) price used in Chart 9, we find a good, but not perfect, correspondence between the relative reduction in exports outside the Monarchy and the relative increase in the Hungarian price (see Table 38). This same sort of market shift was seen to have occurred for exports in general, an increasing share of which went to Austria. 12

The relative share of imports from Austria in total imports fell somewhat, however. Thus Hungary came to depend increasingly on Austria as a market for her produce, but became less dependent on the western half of the Monarchy for necessary imports. One might argue that Hungarian grain and flour had ceased to be competitive on world markets, and in the absence of protective tariffs a greater shift in the output composition of agriculture might have been forced upon the Magyar nobility. Whether it could have accomplished the shift remains an unanswered question. It didn't have to try, not only because continued growth in world demand for food and relative slowdown in the expansion of supply were pushing up farm prices again all over the world beginning about the turn of the century, but also because the Hungarian nobility had the political power to redress whatever competitive disadvantage remained.
### TABLE 38

RELATION OF HUNGARIAN AND WORLD PRICES OF WHEAT AND EXPORTS OF WHEAT OUTSIDE AUSTRIA-HUNGARY

<table>
<thead>
<tr>
<th>Years</th>
<th>Budapest price/world price (in percent)</th>
<th>Wheat exports outside Austria-Hungary (in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1882-86</td>
<td>83</td>
<td>23</td>
</tr>
<tr>
<td>1887-91</td>
<td>87</td>
<td>26</td>
</tr>
<tr>
<td>1892-96</td>
<td>95</td>
<td>8</td>
</tr>
<tr>
<td>1897-1901</td>
<td>105</td>
<td>2</td>
</tr>
<tr>
<td>1902-06</td>
<td>98</td>
<td>2</td>
</tr>
<tr>
<td>1907-11</td>
<td>118</td>
<td>1</td>
</tr>
</tbody>
</table>

Sources: See footnote 10 to this chapter. Also Table 31.
So the Austrian consumer helped to subsidize the system of large, extensive grain-growing estates in Hungary just as the Hungarians claimed they were forced to subsidize Austrian industry. Certainly the Austrians would not have been averse to letting the "bracing winds of competition" invigorate Hungarian agriculture, and in the long-run Hungary's export earnings might have expanded more via a change to more intensive farming and greater relative production of animal products than by remaining with the old staple crops. But the cost of the changeover could have been rather high, especially in the loss of export earnings and the increased cost of importing breeding stock, etc., during the changeover period. Perhaps the availability of credit made possible by the financial ties with Vienna could have offset this temporary foreign exchange gap.

If so, from this standpoint the view of membership in the customs union with Austria as an advantage to the nobility but a disadvantage to the rest of the country is probably correct. But if the cost of a change in the composition of agricultural output was a serious interruption of the progress of industrialization, it is not so clear that only the magnates gained from tariff protection around the Empire.

At this time one of the more important exports of the rural sector of the Hungarian economy was people. Chapter V detailed the relative decline of the farm population, as persons left agriculture for the cities and
foreign lands. It was seen that the system of large estates actually encouraged this migration, especially by making it very difficult for a peasant to acquire his own plot of ground.

Chapter V also discussed the release of another kind of resource, capital from agriculture. On the basis of scant, very incomplete data, it appeared that the savings rate in the rural areas was low, although the build-up of the banking system made the savings of farmers much more mobile. If the nobility banked in the city, however, it probably introduces a severe understatement of rural savings propensities. There seemed reason to believe, however, that even then the net flow of savings from agriculture to industry was very small or even negative: besides the apparent low savings rate in agriculture, and the opportunity for the farmer to invest in his farm, there appeared to be an inflow of savings of some importance from industry and commerce to agriculture, as persons grown wealthy in those pursuits bought estates and titles. This was accentuated by the release of long pent-up demand for land when the old restrictions on the sale of land to Jews were removed in 1867, which of course also allowed Jews to purchase smaller properties. The extent of Jewish holdings in small parcels is unknown.

Chapter VI dealt with the stimulus to demand from the growth of productivity and incomes in agriculture. On the basis of what little evidence was available, the conclusion was that agriculture did not provide
a major stimulus to new industrial production during the period. It was shown that the demand for produced inputs into farming did not grow very fast nor approach a high level anytime during the period. Further, it appeared that little of the productivity increase accrued to the agricultural labor force as wage increases until the last decade or so of the pre-War period. Money wages certainly, and real wages probably, declined from the seventies to the mid-nineties, as producers were able to shift part of the loss from the decline of grain prices back onto the work force. In the most dramatic cases, at least, it was shown that the reaction to demands for more wages were met often not by higher rates of pay but by the purchase of more machinery, and it was not until the heavy emigration really made itself felt - i.e., after the turn of the century - that real wages began to climb in agriculture. In fact, the money wage per day rose about 74 percent on the average between 1900 and 1910, about double the increase in the cost of living. This may have been a somewhat greater rate of increase than the average for nonagriculture. In the milling industry, money wages increased perhaps only 30 to 40 percent between 1901 and 1910, but in construction they jumped anywhere from 50 percent to 100 percent and more. This might be taken as evidence that agriculture was not releasing labor fast enough, but I would ascribe it much more to conditions outside the Hungarian economy, especially
as regards the demand for farm produce and the demand for labor. Since by 1910 agriculture and nonagriculture were sending emigrants abroad in numbers almost exactly proportional to their respective shares in the labor force, an equally strong case could be made that it was the failure of nonagriculture to grow in size and productivity in the face of conditions outside the borders of Hungary that accounted for the relative rise in farm wages. It was also shown, of course, that in large measure this relative gain was merely the recovering of a relative (or even absolute) loss suffered earlier.

Where, then, do we stand on the general question, "Did agriculture present an obstacle to general economic growth in this period?" I think the analysis has shown rather clearly that it certainly did not constitute an insuperable barrier, even though it might have failed to make its "proper" contribution in one or two areas. But for three-quarters of the time reviewed, agriculture expanded output even in the face of declining prices and terms of trade, although the output expansion was not rapid enough to keep the terms of trade from turning back again in the last dozen years or so of the Dual Monarchy era. Rates of increase of output and productivity were seen to compare favorably with those of the United States, Britain, and Germany. Agriculture also did not fail to release labor for employment elsewhere, and the share of nonagriculture in
total population grew in Hungary at a rate fully comparable with that observed in other European countries during their periods of most rapid shift out of agriculture.

Where Hungarian agriculture appeared to be deficient was as a source of savings for industrial capital formation and as a source of demand to stimulate new industrial output. The former was seen not to have been too serious an obstacle because of the ready access to external credit which Hungary enjoyed as a part of the Dual Monarchy. Moreover, if I were to rank the contributions in releasing resources, I would follow Gerschenkron in ranking the labor resource as much the more important. The second may have been serious, especially later in the period when potential export markets, which could have served as a partial substitute for the lack of domestic demand, were being closed off by tariff protection in other countries. In the face of the protectionism of others, Hungary chose to promote import substitution, which does not necessarily depend on an increase of rural purchasing power to effect an increase in demand for domestic industrial output. But Hungary had no protection against the products of established Austrian industries - their products entered duty-free under the common customs agreement, and in this area at least the Dual Monarchy arrangement acted to Hungary’s detriment (but see the slight reservation on this point in footnote 14). A strategy of nurturing infant
industries - which may well have paid off in several areas of endeavor - by protecting a market for them was not open to Hungary. The other measures which the government introduced to encourage industry were not of sufficient scale to overcome this disadvantage to the Hungarians' satisfaction, although we have seen that at least after the turn of the century the growth of industry was rather rapid.

What of the other contribution, earning or saving foreign exchange? Hungary produced a large surplus for export from its farm sector, and it was seen in chapter IV that exports from the farm sector were probably at least in proportion to its share in net national product. This is not, however, unambiguously a mark of success in this contribution, especially if the strategy of industrialization should call for primary emphasis on the domestic capital-goods industry and/or import substitution. The extreme version of such a policy would like to see 100 percent of exports be agricultural produce, so that the entire output of domestic industry could be used for capital formation. Even in a less extreme form, a shortfall in farm exports might force extra industrial exports to pay for essential imports. With a capacity constraint on total industrial output, this would reduce the rate of capital formation. The analysis of chapter IV does not remove this ambiguity, even if we take into account that the
large-estate system is well set up to keep rural consumption restricted and exports high, since we also saw that it was the diversification by the smaller farmers that accounted for a large share of the rather high rates of growth both of output and of exports from the agricultural sector. Nevertheless, the sheer size of the agricultural surplus exported probably earns Hungarian agriculture a good score on this particular contribution.

What might a land reform have done? By the most favorable interpretation of the results of this study, we would have to conclude that farm output might have grown somewhat faster and have become more diversified but that the release of labor from the rural sector might have proceeded a bit more slowly if the large estates had been broken up. What would have happened to capital transfer into or out of agriculture would have depended very much on the reform program, but any substantial net outflow to finance industrial expansion would have been doubtful. We could probably predict that rural consumption would have increased, but whether by enough to reduce the marketed surplus of agriculture remains in doubt. A land reform, conceived as land reforms were in the time before World War I, would seem to have had little to offer as a stimulus to general economic development. This conclusion is reinforced when one notes that in the areas where the estate system might have been weak in its contributions to overall economic growth, there seemed to be offsetting advantages through membership in the Austro-Hungarian customs union (although whether
the customs union was on balance favorable to Hungary still is unsettled). Perhaps most notable among these offsets was the supply of credit available through Vienna to help make up for lack of savings or any shortfall in export earnings. Here is another illustration of the importance of substitutes for so-called "prerequisites" to economic growth. Thus it would seem that while for a number of reasons a large-estate-dominated agriculture might not be the most preferable form of rural organization to promote general economic development, it does not present an insuperable obstacle to that development. It is well adapted to making certain contributions and its shortcomings in others can be at least in part offset by institutional arrangements outside the agricultural sector per se.
FOOTNOTES: CHAPTER VII


4. Another possible explanation consistent with a rate of productivity increase greater in nonagriculture than in agriculture would be that the constant share of agriculture was due to generally poor harvests in 1899/1901 as compared to 1911/1913. From examination of Table 9 and Chart 3 in chapter III, it appears that such was not the case.
5. For 1839-1899, Gallman estimates the growth rate of value added in agriculture as about three percent per year. Gallman, 24.


8. Calculated from figures appearing in ibid., 302-322.

9. I owe this point to Philip M. Raup.

10. The British prices, and the Hungarian prices between 1873 and 1900, are taken from Farnsworth, 346-347. The rest of the Hungarian prices are the Budapest prices converted at the exchange rate into United States gold dollars by exactly the same method used by Miss Farnsworth.

11. These are of course not unrelated. One of the reasons American wheat became such a formidable competitor in the European market was the sharp drop in ocean freight rates. In Hungarian currency, the cost to ship a ton of wheat from New York to Hamburg was 12 crowns in 1870 and only 4.4 crowns in 1907. In contrast, transport from Szolnok (central Hungary) to Hamburg in 1907 cost 58 crowns on the overland route, and 45 crowns if sent out through the port of Fiume. Bela Kenéz, Nép és Fold / The Nation and the Land / ("A Gazdasági Élet Statisztikája" / Statistics of Economic Life / , no. A I, 1; Budapest: 1917), 90.
This could also account for the switch in position of the Hungarian price and British price, since goods had to travel overland going to and from Hungary, but could reach Britain by water.

12. Probably because of the growth of the Austrian market, so that total exports could be maintained and even increased somewhat in absolute amount, the Hungarian magnates apparently never sought an export bonus scheme, even though they had the example of the Prussian Junkers to follow. In Germany, the system of "import certificates" acted in fact as an export premium and allowed the East Elbian landlords to export grain (particularly rye) despite the differential between German production costs and the world market price. See Alexander Gerschenkron, *Bread and Democracy in Germany* (Berkeley: 1943), 68-70.


14. Although the Hungarians complained that the principal reason that they could not get industry started was that the common customs tariff let Austrian goods in duty free, thereby creating an insurmountable initial competitive hurdle (Cf. Ránki, 204), it is also true that Austrian industry was among the weaker and less efficient of Western or Central Europe. (Gerschenkron, *Bread and Democracy* ..., 42). That even their system of preferential shipping rates, State purchases, tax concessions,
and outright subsidies was not enough to overcome the advantages of the rather feeble Austrian manufacturing industries could be read as an indictment of the Hungarians, not of the customs union. Because of a real lack of solid information, this is offered only as conjecture.


APPENDIX TABLE 1

CUMULATED DISTRIBUTION OF LANDHOLDING IN HUNGARY

<table>
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<tr>
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<th>1867</th>
<th></th>
<th>1895</th>
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<td>Share of Total Area</td>
<td>Number of Holdings</td>
<td>Share of Total Area</td>
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<tr>
<td>58.1%</td>
<td>14.2%</td>
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<td>0.2%</td>
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<tr>
<td>94.4</td>
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<td>0.6</td>
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</table>

Source: 1867: Keleti, 148, 150.
1895: Annuaire Statistique Hongroise, 1911, 80.
## APPENDIX TABLE 2

**CUMULATED DISTRIBUTION OF LANDHOLDING, SELECTED EUROPEAN STATES, AROUND 1900**

(Part One)

<table>
<thead>
<tr>
<th>No. of Holdings (H)</th>
<th>Share of Total Area (A)</th>
<th>Hungary, 1895</th>
<th>Bulgaria, 1908</th>
<th>Germany, 1895</th>
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<td></td>
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<td>H</td>
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(Table continued on succeeding page)
APPENDIX TABLE 2 (CONTINUED)

(Part Two)

<table>
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<th>Rumania, 1904</th>
<th>England, 1895</th>
<th>Austria, 1903</th>
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<td>No. of Holdings (H)</td>
<td>Share of Total Area (A)</td>
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<td>1.3</td>
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</table>

Source: See notes to Table 7.
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